IVC Course Code : 319

COMPUTER SCIENCE & ENGINEERING

(C.S.E.)

First Year

Intermediate Vocational Course

Paper I : Computer Fundamentals And MS-Office

Paper II : Programmig In C

Paper III : Accountancy & Tally

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ANNUAL SCHEME OF INSTRUCTION AND EXAMINATION FOR
COMPUTER SCIENCE & ENGG COURSE
I YEAR

Part-A		Theory			Practicals		Total	
		Periods	Marks		Periods	Marks	Periods	Marks
1.	General Foundation course	150	50		-	-	150	50
2.	English	150	50		-	-	150	50
Part-B								
3.	**Paper-1** OOPS & JAVA	110	50	**Paper-1** OOPS & JAVA	115	50	225	100
4.	**Paper-II** Relational Data Base Management System	110	50	**Paper-II** SQL,Photoshop &flash player	115	50	225	100
5.	**Paper-III** Data Communication & Computer Net works.	110	50	**Paper-III** Internet Technologies.	115	50	225	100
6.	**OJT**	-	-	**-**	405	100	450	100
7.	**Total**	**630**	**250**		**795**	**250**	**1475**	**500**

EVALUATION OF ON THE JOB TRAINING:

The "On the Job Training" shall carry 100 marks for each year and pass marks is 50. During on the job training the candidate shall put in a minimum of 90 % of attendance.

The evaluation shall be done in the last week of January.

Marks allotted for evaluation:

S.No	Name of the activity	Max. Marks allotted for each activity
1	Attendance and punctuality	30
2	Familiarity with technical terms	05
3	Familiarity with tools and material	05
4	Manual skills	05
5	Application of knowledge	10
6	Problem solving skills	10
7	Comprehension and observation	10
8	Human relations	05
9	Ability to communicate	10
10	Maintenance of dairy	10
	Total	100

NOTE: The On the Job Training mentioned is tentative. The spirit of On the Job training is to be maintained. The colleges are at liberty to conduct on the job training according to their local feasibility of institutions & industries. They may conduct the entire on the job training periods of I year and (450) II year either by conducting classes in morning session and send the students for OJT in afternoon session or two days in week or weekly or monthly or by any mode which is feasible for both the college and the institution. However, the total assigned periods for on the job training should be completed. The institutions are at liberty to conduct On the Job training during summer also, however there will not be any financial commitment to the department.

COMPUTER SCIENCE & ENGINEERING

Paper - I

COMPUTER FUNDAMENTALS & MS-OFFICE

INDEX

UNIT - I

1 Introduction to Computer systems and Hardware

1. Introduction to Computer systems and Hardware

1.1 Introduction to computers, generations of computer

Wooden abacus laid basis for the computers long time back. Which was a simple calculating tool introduced in China, is known to be the foundation of today's computers. But in essence this tool cannot be compared with the super computers of today. After abacus, came slide rule in year 1622 A.D introduced by William Oughtred. Growth of computers had to go through various phases, starting with difference engine by **Charles Babbage** in year 1822.

1.1.1 What is Computer?

Getting the right kind of information is a major challenge as is getting information to make sense. In that Computer technology is radically changing the domains in Science and Engineering. The applications of computers are endless because of its memory, high speed and perfection. Millions of calculations can be made in just a fraction of time. It has been used in all walks of human life like science, logistic and ordering functions, military, industry, education etc. Today, they are used right from scientific research to paying household monthly bills. We as

users cannot even imagine of living without computers. It is the greatest invention of men and has paved ways for many other inventions.

Computer:

A computer can be described as an electronic calculating device that accepts raw data as input, processes it and produces meaningful information as an output. A computer system is made up of both hardware and software components. Hardware consists of the physical components of a computer system like input devices, output devices, processing device (CPU) and the storage device. Software represents the set of programs and instructions that govern the operation of a computer system.

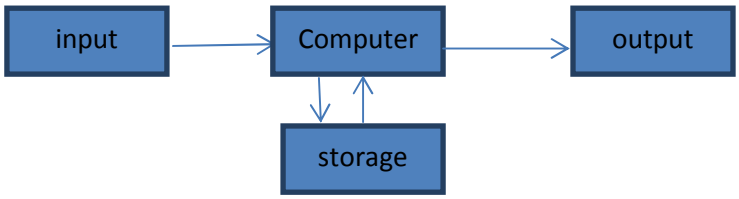


Fig 1.1 basic components of computer system

1.1.2 Characteristics of a computer

1. Speed: - As you know computer can work very fast and no human being can compete to solving the complex computation, faster than computer. It takes only few seconds for calculations that we take hours to complete. You will be surprised to know that computer can perform millions (1,000,000) of instructions and even more per second. Therefore, we determine the speed of computer in terms of Mega Hertz (MHz) or Gega Hertz (GHz). From this you can imagine how fast your computer performs work. For example powering of 63 and 91 i.e (63^91) can take a couple of minutes if a human performs such calculations, but computer can perform millions of such calculations in a fraction of second.

2. Accuracy: - Computer is programmed, so the accuracy of computer is very high and every calculation is performed with the same accuracy. Whatever input we give it gives result with accurately. The errors in computer are due to human and inaccurate data.

3. The efficiency of computers does not decrease with age. The computers can perform repeated ask with the same efficiency any number of times without exhausting there selves. Even if they are instructed to execute millions of instructions, they are capable of executing them all with the same speed and efficiency without exhaustion.

3. Diligence: - A computer is free from tiredness, lack of concentration, fatigue, etc. Computer can work for hours without any break and creating error. If millions of calculations are to be

performed, a computer will perform every calculation with the same accuracy. Due to this capability it overpowers human being in routine type of work.

4. Versatility: - We can use computer to perform completely different type of work at the same time. It means that the computers having capacity to perform completely different type of work in different fileds.

5. Power of Remembering: - Computer has the power of storing any amount of information or data. Any information can be stored and recalled as long as you require it, for any numbers of years. It depends entirely upon you how much data you want to store in a computer and when to lose or retrieve these data.

6. No IQ: - Computer is a dumb machine and it cannot do any work without instruction from the user. It performs the instructions at tremendous speed and with accuracy. It is you to decide what you want to do and in what sequence. So a computer cannot take its own decision as you can.

7. No Feeling: - It does not have feelings or emotion, taste, knowledge, emotions, knowledge, feeling and experience. Thus it does not get tired even after long hours of work. It does not distinguish between users.

8. Storage: - Storage capacity is another big characteristic of a computer. A computer can store large amount of data. This data can be used at any time and also from any location. The storage capacity of a computer is measured in Mega Byte, Gega Byte, Tera Byte. You can also store data in secondary storage devices such as floppies, which can be kept outside your computer and can be carried to other computers.

9. No Intelligence

Computers don't have any intelligence of their own. They follow a set of instructions fed into them by manufacturer. The user knows what to do and when to perform a specific task.

10. They can communicate

Computers have the ability to communicate, but of course there needs some sort of connection (either Wired or Wireless connection). Two computers can be connected to send & receive data. Special software's are used for text and video chat. Friends & family can connect over the internet and share files, photos & videos online.

11. We can do multitasking

Multitasking is also a computer characteristic. Computers can perform several tasks at a time. For example you can listen to songs, download movies, and prepare word documents all at the same time.

1.1.3 Generations of computer system:

The principal electronic computer was designed and manufactured at the University of Pennsylvania based on vacuum tube technology. Vacuum tubes were used to do logic operations and to store data. Generations of computers has been divided into five generations.

I Generation: 1945 – 55

II Generation: 1955 – 65

III Generation: 1965 – 75

IV Generation: 1975 – 89

V Generation: 1989 to present

First Generation

In first generation ENIAC (Electronic Numerical Integrator And Calculator), EDSAC (Electronic Delay Storage Automatic Calculator), EDVAC (Electronic Discrete Variable Automatic Computer) and UNIVAC (Universal Automatic Computer IBM 701) Vacuum tubes were used to perform basic arithmetic operations and it took few milliseconds

Characteristics of first generation computers:

1. Bulky
2. Consume more power with limited performance
3. High cost
4. Uses assembly language – to prepare programs. These were translated into machine level language for execution.
5. Fixed point arithmetic was used
6. Punched cards and paper tape were invented to feed programs and data and to get results.
7. Magnetic tape / magnetic drum were used as secondary memory
8. Mainly used for scientific computations.

Second Generation

In second generation starts the Manufacturers of IBM 7030, Digital Data Corporation's PDP 1/5/8 Honeywell 400 and Transistors were used in place of vacuum tubes.

Characteristics of second generation computers:

1. Small in size
2. Lesser power consumption and better performance
3. Lower cost

4. Magnetic ferrite core memories were used as main memory which is a random-access non-volatile memory
5. Magnetic tapes and magnetic disks were used as secondary memory.
6. Hardware for floating point arithmetic operations was developed.
7. High level languages such as FORTRAN, COBOL etc. were used - Compilers were developed to translate the high-level program into corresponding assembly language program which was then translated into machine language.
8. Separate input-output processors were developed that could operate in parallel with CPU.

Third Generation

In Third Generation System 360 Mainframe from IBM, PDP-8 Mini Computer from Digital Equipment Corporation is designed with Integrated circuits. Small Scale Integration and Medium Scale Integration technology were implemented in CPU, I/O processors etc.

Characteristics of third generation computers:

1. Smaller & better performance
2. Comparatively lesser cost
3. Faster processors
4. In the beginning magnetic core memories were used. Later they were replaced by semiconductor memories (RAM & ROM)
5. Introduced microprogramming, Microprogramming, parallel processing, multiprogramming, multi-user system etc. was introduced.
6. Operating system software were introduced (efficient sharing of a computer system by several user programs)
7. Cache and virtual memories were introduced High level languages were standardized by ANSI eg. ANSI FORTRAN, ANSI COBOL etc.
8. Database management, multi-user application, online systems like closed loop process control, airline reservation, interactive query systems, automatic industrial control etc emerged during this period.

Fourth Generation:

In Fourth Generation Microprocessors were introduced as CPU– Complete processors and large section of main memory could be implemented in a single chip.

Characteristics of fourth generation computers:

1. Tens of thousands of transistors can be placed in a single chip (VLSI design implemented)
2. CRT screen, laser & ink jet printers, scanners etc were developed.
3. Semiconductor memory chips were used as the main memory.
4. Secondary memory was composed of hard disks – Floppy disks & magnetic tapes were used for backup memory
5. Introduced C language, Unix OS and Graphical User Interface
6. Less power consumption

7. High performance, lower cost and very compact
8. Much increase in the speed of operation.

Fifth Generation

In Fifth Generation, IBM notebooks, Pentium PCs-Pentium 1/2/3/4/Dual core/Quad core.. SUN work stations, Origin 2000, PARAM 10000, IBM SP/2 are used occasionally to describe some current computer system that have a dominant organizational or application driven feature.

Characteristics of fifth generation computers:

1. Computers based on artificial intelligence are available
2. Computers use extensive parallel processing, multiple pipelines, multiple processors etc.
3. Introduced ULSI (Ultra Large Scale Integration) technology – Intel's Pentium 4 microprocessor contains 55 million transistors millions of components on a single IC chip.
4. Superscalar processors, Vector processors, SIMD processors, 32 bit micro controllers and embedded processors, Digital Signal Processors (DSP) etc. have been developed.
5. Memory chips up to 1 GB, hard disk drives up to 180 GB and optical disks up to 27 GB are available (still the capacity is increasing)
6. Object oriented language like JAVA suitable for internet programming has been developed.
7. Portable note book computers introduced.
8. Storage technology advanced – large main memory and disk storage available
9. Introduced World Wide Web. (and other existing applications like e-mail, e Commerce, Virtual libraries/Classrooms, multimedia applications etc.)
10. New operating systems developed – Windows 95/98/XP/…, LINUX, etc.
11. The recent development in the application of internet is the Grid technology which is still in its upcoming stage.
12. Quantum mechanism and nanotechnology will radically change the phase of computers.

1.2 Classification of Computers

The computer systems are classified into various types depends on their usage of the computer, operations done in the computers and their sizes. They are

1. General purpose computers.

2. Special purpose computer.

1**. General Purpose Computers**: These computers are generally used for any type of applications. These computers can be used in solving day to day small business applications and also used to solve mathematical equation with same accuracy and consistency. Today's Most of the computers are used in house hold purpose are general purpose digital computers.

2**. Special Purpose Computers**:

These digital computers are designed, made and used for any specific job. These are frequently used for those purposes. Which are serious and essential great accuracy and response like Satellite launching. According to the operational principle of computers, they are divided into analog, digital and hybrid computers.

Analog Computers: These are nearly extinct today. These are unlikefrom a digital computer because an analog computer can do several mathematical operations simultaneously. It uses continuous variables for mathematical operations and utilizes mechanical or electrical energy.

Digital Computers: They use digital circuits and are designed to operation two states, namely bits 0 and 1 and they are analogous to states ON and OFF. Data on these computers is denoted as a series of 0s and 1s. Digital computers are suitable for complex computation and have advanced processing speeds and they are programmable. Digital computers are either one general purpose computers or special purpose ones. General purpose computers, as their name proposes, are designed for particular types of data processing while general purpose computers are meant for general use.

Hybrid Computers: These computers are a mixture of both digitalandanalog computers. In this type of computers, the digital sections perform process control by transformation of analog signals to digital ones.

Based On the sizes of the computers, the computers are classified as follows.

Supercomputers: The extremely calculation-intensive tasks can be effectivelydone by means of supercomputers. Quantum physics, mechanics, weather forecasting, molecular theory are best calculated by means of supercomputers. Their ability of parallel processing and their well-designed memory order give the supercomputers, large transaction processing powers.

Ex. PARAM developed in India.

Servers: They are computers designed to offer services to clientmachines in a computer network. They have bigger storage capacities and powerful processors. Running on them are programs that assist client requests and allocate resources like memory and time to client machines. Generally they are very large in size, as they have large processors and many hard drives. They are designed to be fail-safe and resistant to crash.

Mainframe Computers: Huge organizations use mainframes for highlyserious applications such as bulk data processing and ERP. Most of the mainframe computers have abilities to host

multiple operating systems and operate as a number of virtual machines. They can temporary for several small servers.

Wearable Computers: A record-setting step in the progress of computerswas the creation of wearable computers. These computers can be worn on the body and are often used in the study of behaviour modelling and human health. Military and health professionals have incorporated wearable computers into their daily routine, as a part of such studies. When the users' hands and sensory organs are engaged in other activities, wearable computers are of great help in tracking human actions. Wearable computers do not have to be turned on and off and remain in operation without user intervention.

Minicomputers: In terms of size and processing capacity, minicomputerslie in between mainframes and microcomputers. Minicomputers are also named mid-range systems or workstations. The term initiated to be popularly used in the 1960s to denote to relatively smaller third generation computers. They took up the space that would be required for a refrigerator or two and used transistor and primary memory technologies. The 12-bit PDP-8 minicomputer of the Digital Equipment Corporation was the major successful minicomputer.

Microcomputers: A computer with a microprocessor and its centralprocessing unit is known as a microcomputer. They do not occupy space as much as mainframes do. When supplemented with a keyboard and a mouse, microcomputers can be named personal computers. A monitor, a keyboard and other related input-output devices, computer memory in the form of RAM and a power supply unit come packaged in a microcomputer. These computers can suitable on desks or tables and prove to be the best choice for single-user tasks.

Desktops: A desktop is planned to be used on a single location. Thespare parts of a desktop computer are freely available at relatively lower costs. Power consumption is not as critical as that in laptops. Desktops are commonly popular for daily use in the workplace and households.

Laptops: Similar in operation to desktops, laptop computers are reducedand optimized for mobile use. Laptops run on a single battery or an external adapter that charges the computer batteries. They are enabled with an inbuilt keyboard, touch pad acting as a mouse and a liquid crystal display. Their portability and capacity to operate on battery power have proven to be of great help to mobile users.

Notebooks: They fall in the category of laptops, but are cheap andrelatively smaller in size. They had a smaller feature set and lesser capacities in comparison to regular laptops, at the time they came into the market. But with passing time, notebooks too began featuring almost everything that notebooks had.

Personal Digital Assistants (PDAs): It is a handheld computer andgenerally known as a palmtop. It has a touch screen and a memory card for storage of data. PDAs can also be used as portable audio players, web browsers and smart phones. Most of them can access the Internet by means of Bluetooth or Wi-Fi communication.

Tablet Computers: Tablets are mobile computers that are very handy touse. They use the touch screen technology. Tablets come with an onscreen keyboard or use a stylus or a digital pen. Apple's iPad redefined the class of tablet computers.

1.3 Anatomy of Computer: A computer is an electrical device and it consists of hardware and softwarecomponents.

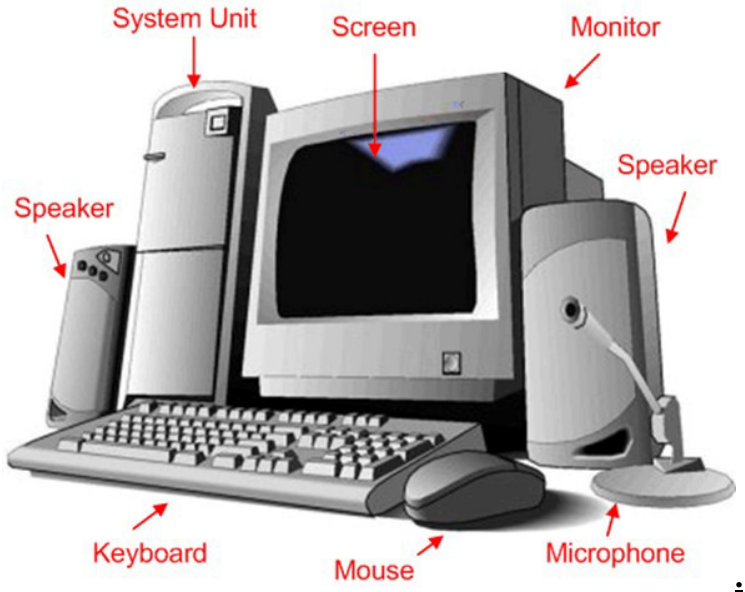


Fig 1.2 Basic model of computer system

A computer system is made up of three main parts.

1. Input
2. System Unit(CPU)
3. Output

Hardware

The physical components of computer system are denoted to as hardware. All electronic and mechanical parts that constitute computer system drop into the category of hardware. For instance, keyboard, mouse, monitor, printer, processor etc. are hardware.

Input devices

An input device sends information to a computer system for processing.An **input**device can send data to another device, but it cannot receive data fromanother device. Instances of an input device include:

- Keyboard
- mouse
- Scanner
- Joystick
- light pen and
- track ball

Which can send data (input) to the computer, but they cannot receive or replicate information (output) from the computer. Which can receive data (output) from the computer, but they cannot send information (input) to the computer.

Processor

It is also called as CPU (Central Processing Unit). It is the brain of the computer that is answerable for controlling and executing program instructions entered through the input devices like keyboard and mouse.

1.4 Number System

In our daily life data can be represent in form of alphabets, numbers, and special symbols but mostly human uses decimal system for representing numeral data. Even if it is any kind of data the computer system represents in binary number system. Generally the following four types of number systems are used to represents the data.

The number system

Basically Number system is divided in to four types

1. Binary Number System
2. Octal Number system
3. Decimal Number system
4. Hexa-decimal Number System

1. Binary Number System:-It is base(radix) of 2 and it has only two digits i.e 0 and 1for representing any number. The value of the numbers is represented as power of 2 i.e. the radix of the system. These power increases with the position of the digits as follows

Position	6^{th}	5^{th}	4^{th}	3rd	2nd	1^{st}
Weights	2^5	2^4	2^3	2^2	2^1	2^0
Decimal equivalent	32	16	8	4	2	1

Ex: 11001(2)

2.Octal Number System :- It is base of 8 and it has only eight digits { 0 ,1,2,3,4,5,6 ,7} for representing any number. The value of the numbers is represented as power of 8. These power increases with the position of the digits as follows.

Position	6^{th}	5^{th}	4^{th}	3rd	2nd	1^{st}
Weights	8^5	8^4	8^3	8^2	8^1	8^0
Decimal equivalent	32768	4096	512	64	8	1

Ex: $(25)_8$
$(154)_8$

Ex : $(25)_8$

3.Decimal Number System :- It is base of 10 and it has only ten digits { 0,1,2,3,4,5,6 ,7,8,9} for representing any number. The value of the numbers is represented as power of 10. These power increases with the position of the digits as follows

Position	6^{th}	5^{th}	4^{th}	3rd	2nd	1^{st}
Weights	10^5	10^4	10^3	10^2	10^1	10^0
Decimal equivalent	100000	10000	1000	100	10	1

EX: $(256)_{10}$

4.Hexa Decimal Number System :- It is base of 16 and it has only ten digits { 0,1,2,3,4,5,6 ,7,8,9,A,B,C,D,E,F} for representing any number. The value of the numbers is represented as power of 16. These power increases with the position of the digits as follows

Position	6^{th}	5^{th}	4^{th}	3rd	2nd	1^{st}
Weights	16^5	16^4	16^3	16^2	16^1	16^0
Decimal equivalent	1048576	65536	4096	256	16	1

EX: $(2A2)_{16}$

1.4.1 Converting the data from any system to any other system

1. **Decimal to Binary**

To convert from decimal to binary divide the decimal number by 2 repeatedly until zero and note the remainders from bottom to top.

Example:

Convert $(75)_{10}=(?)_2$

2	75	Remainder
2	37	1 (LSB)
2	18	1
2	9	0
2	4	1
2	2	0
2	1	0
	0	1(MSB)

thus $(75)_{10} = (1001011)_2$

2. Decimal to Octal:

To convert from decimal to octal divide the decimal number by 8 repeatedly until zero and note the remainders from bottom to top.

Convert $(177)_{10}=(?)_8$

8	177	Remainder
8	22	1 (LSB)
8	2	6
		2(MSB)

thus $(177)_{10} = (261)_8$

3. Decimal to hexadecimal:

To convert from decimal to Hexa Decimal divide the decimal number by 16 repeatedly until zero and note the remainders from bottom to top.

Convert $(4768)_{10}=(?)_{16}$

16	4768	Remainder
16	298	0 (LSB)
16	18	10 (10=A)
16	1	2
	0	1(MSB)

Hence **$(4768)_{10}$** = $(1\ 2\ A\ 0)_{16}$

4. Binary to Decimal:
   Multiply the binary number with the weights of binary system according to their position and note the sum.

Ex : convert $(11001)_2 = (?)_{10}$

$= 1x2^4 + 1x2^3 + 0x2^2 + 0x2^1 + 1x2^0$

$= 16 + 8 + 1$

$= (25)_{10}$

5. Octal to Decimal

   Multiply the octal number with the weights of octal number system according to their position and note the sum.

   Ex: **convert $(632)_8$ =** $(?)_{10}$ $= (6 \times 8^2) + (3 \times 8^1) + (2 \times 8^0)$

   $= (6 \times 64) + (3 \times 8) + (2 \times 1)$

   $= 384 + 24 + 2$

   $= (410)_{10}$

6. Hexa Decimal to Decimal

   Multiply the Hexa Decimal number with the weights of HexaDecimal number system according to their position and note the sum.

Ex : convert $(F4C)_{16} = (?)_{10}$

$= (F \times 16^2) + (4 \times 16^1) + (C \times 16^0)$

$= (15 \times 256) + (4 \times 16) + (12 \times 1)$

$=(3916)_{10}$

1.5 Basic I/O Operations:

The computer system will be of no use without it is able to communicate with the outside world. Input/output devices are necessary for users to communicate with the computer. All input devices bring data INTO the computer and output devices bring data OUT of a computer system. These input/output components are also known as peripherals since they surround the CPU and memory of a computer system. Some generally used Input/output devices are listed in table below.

Input Devices	Output Devices
• Keyboard • Mouse • Joystick • Scanner	• Monitor • LCD • Printer • Plotter

• Light Pen • Touch Screen	

1.5.1 Input Devices

(a) **Keyboard:** it is one of the major hardware components in computer system. It is a text base input device and it allows the user to input alphabets, numbers and other characters. It consists several keys on a board to give data.

Alphanumeric Keypad:

It consist the keys of English alphabets, 0 to 9 numbers, and special characters like / + – % $ / * ( ) etc.

Function Keys:

There are 12 function keys labelled from F1 to F12. The functions allotted to these keys differ from one software package to another. These function keys are also user programmable keys.

Special-function Keys

These keys have different functions assigned to them and can be used only for those special purposes. Functions of some of the important keys are defined below.

- **Enter**

It is like to the 'return' key of the typewriter and is used to execute a command or program.

- **Spacebar** It is used to enter a space at the current cursor location.
- **Backspace** it is used to move the cursor one position to the left and also delete the previous entered character in that position.
- **Delete** It is used to delete the character at the cursor position in text.
- **Insert** Insert key is used to pin between insert and overwrite mode during data entry.
- **Shift** This key is used to type capital letters when pressed along with an alphabet key and also used to type the special characters located on the upper-side of a key that has two characters defined on the same key.

Caps Lock Cap Lock is used to pin between the capital lock features. When 'on', it locks the alphanumeric keypad for capital letters input only.

Tab it is used to move the cursor to the next tab position defined in the document. Also, it is used to insert indentation into a document.

Ctrl

Control key is used in conjunction with other keys to provide extra functionality on the keyboard.

Alt it is also similar to the control key, Alt key is used in combination with other keys to perform specific tasks.

Esc this key is commonly used to negate a command and it is also used to cancel or abort executing programs.

Numeric keypad it is found on the right side of the keyboard and consists of keys having numbers (0 to 9) and mathematical operators (+ − * /) defined on them. This keypad is provided to support quick entry for numeric data.

Cursor Movement Keys These arrow keys and are used to move the cursor in the direction shown by the arrow (up, down, left, right).

(b) Mouse

The mouse is used to point to a specific place on the screen and select in order to perform one or more activities. It can be used to select menu, menu sub menu, size windows, start programs etc.

The straightest kind of mouse has two buttons on top: the left one being used most frequently and it is most used for selecting components. Right button mostly used for viewing the properties of the selected components.

Mouse Actions

Left Click: Used to select an item.

Double Click: Used to start or execute a program or open a file.

Right Click: Usually used to display a set of commands and properties.

Drag and Drop: It allows you to choose and move an item from one location to another. To achieve this place the cursor over an item on the monitor, click the left mouse button and while holding the button down move the cursor to where you want to place the item, and then release it.

(c) Joystick

The joystick is a vertical stick which moves the graphic cursor in the monitor in a way the stick is moved. It usually has a button on top that is used to select the option pointed by the cursor. Joystick is used as an input device mainly used with video games, training simulators and controlling robots

(d)Scanner

The scanner is an input device used for direct data entry from the documents into the computer. It translates the document image into digital form so that it can be stored into the computer. Capturing data like this reduces the possibility of errors normally experienced during large data entry.

Hand-held scanners are usually seen in big stores to scan codes and price data for each of the items. They are also called the bar code reader.

(e) Bar codes

A bar code is a set of lines of unlike thicknesses that represent a number. Bar Code Readers are used to input data from bar codes. Maximum products in shops have bar codes on them .Bar code readers work by shining a beam of light on the lines that make up the bar code and detecting the amount of light that is reflected back

(f) Light Pen

It is a pen shaped input device used to select objects on a display screen. It is relatively like the mouse in functionality but uses a light pen to move the pointer and select any object on the monitor by pointing to the object. The Users of Computer Aided Design (CAD) applications commonly use the light pens to directly draw on screen.

(g) Touch Screen

It allows the user to operate selections by simply touching the display screen. Common examples of touch screen include information smart phones and bank ATMs.

(h)Digital camera A digital camera can store many more pictures than an ordinary camera. Pictures taken using a digital camera are stored inside its memory chip and can be send to a computer by connecting the camera to it. A digital camera takes pictures by translating the light passing through the lens at the front into a digital image.

(i) The Speech Input Device

The “Microphones - Speech Recognition” is a speech Input device. To operate it we need using a microphone to talk to the computer. Also we require adding a sound card to the computer system. The Sound card digitizes audio input into 0/1s .A speech recognition program can process the input and translate it into machine-recognized commands or input.

1.5.2 Output Devices

(a) Monitor

Monitor or screen is an output device that looks like the television screen and uses a Cathode Ray Tube (CRT) to display information. The monitor is associated with a keyboard for manual input of characters and displays the data as it is keyed in. It also displays the program or application output. Like the television, monitors are also available in various sizes.

(b) Liquid Crystal Display (LCD)

LCD was announced in the 1970s and is now useful to display terminals also. Its benefits like low energy consumption, smaller and lighter have paved its way for usage in portable computers (laptops).

(c) Printer

Printers are used to generate paper (commonly known as hardcopy) output. Based on the technology used, they can be categorized as Impact or Non-impact printers.

Impact printers use the typewriting printing mechanism wherein a hammer strikes the paper through a ribbon in order to produce output. For example consider the Dot-matrix and Character printers fall under this category.

Non-impact printers do not touch the paper while printing. They use chemical, heat or electrical signals to print the symbols on paper. For example consider the Inkjet, Deskjet, Laser, Thermal printers fall under this category of printers. When we discuss about printers we mention to two basic qualities related with printers: resolution, and speed. Print resolution is calculated in terms of number of dots per inch (dpi). Print speed is estimate in terms of number of characters printed in a unit of time and is denoted as characters-per-second (cps), lines-per-minute (lpm), or pages-per-minute (ppm).

Figure 1.3: The Printer

(d) Plotter

Plotters are used to print graphical output on paper. It interprets computer commands and makes line drawings on paper using multi-coloured automated pens. It is capable of producing graphs, drawings, charts, maps etc.

Computer Aided Engineering (CAE) applications like CAD (Computer Aided Design) and CAM (Computer Aided Manufacturing) are typical usage areas for plotters.

Figure 1.4: The Plotter

(e) Audio Output: Sound Cards and Speakers:

The Audio output is the capability of the computer to output sound and it need Two components that they are Sound card – Plays contents of digitized recordings, Speakers – Attached to sound card.

Fig 1.5 Sound Cards and Speakers:

1.6 Block diagram of CPU

Computer is an electronic device which accepts input data, does arithmetic logic and shift operations then stores the data in memory, and outputs the information in desired format to the end user.Despite the fact that the size, shape, execution, quality and cost of PCs have been changing throughout the years, the essential coherent structure proposed by Von Neumann has not change. The internal structures of the computers are varying from one system model to another. A block diagram of the basic computer organization is shown below. Here the strong lines indicate the flow of instruction; data and the dotted lines represent the control practiced by the control unit.

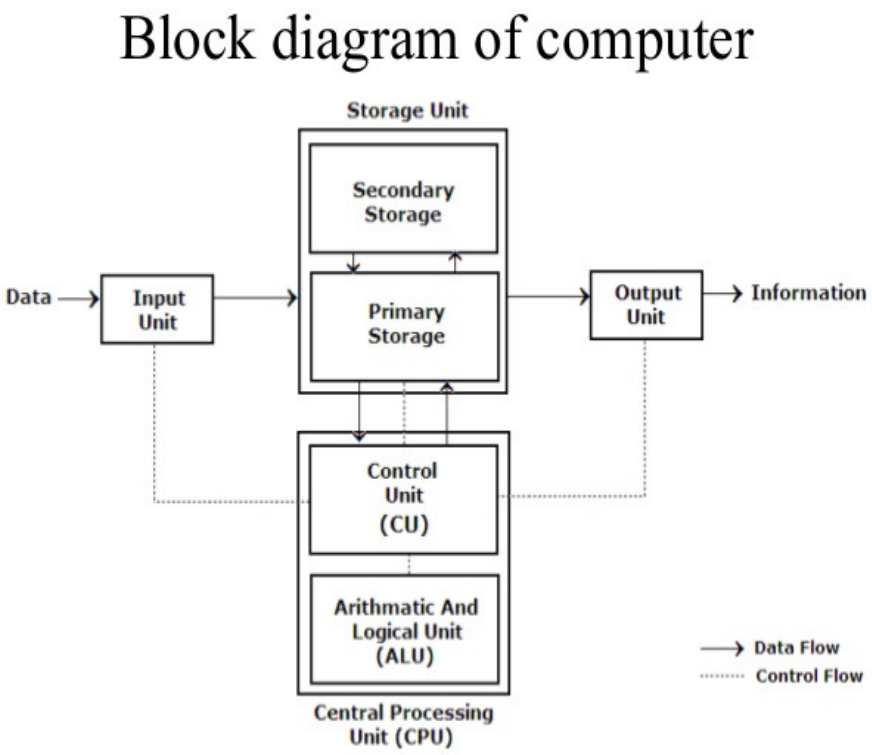


Fig 1.6 block diagram of computer system

The Computer system majorly consists four basic functional units

1. Input unit,
2. Processor unit
3. Output
4. Storage.

1. INPUT UNIT

This is the process of entering data and programs in to the computer system. Therefore, the input unit takes data from us to the computer in an organized manner for processing through an input

device such as keyboard, mouse, MICR, OCR, Etc. The keyboard is wired so that whenever a key is pressed, the corresponding letter or digit is automatically translated into its corresponding code and sent directly to either the memory or the processor and other kinds of input devices are Joy stick, track ball, mouse (pointing devices), scanner etc.

2. **PROCESSOR UNIT**

The heart of the computer system is the Processor unit. It consists two major components.

1. Arithmetic and Logic Unit
2. Control Unit.

Arithmetic and Logic Unit (ALU)

The actual processing of the data and instruction are performed by Arithmetic Logical Unit of the processor. The major operations performed by the ALU are addition, subtraction, multiplication, division, logic and comparison. Data is transferred to ALU from storage unit when required. After processing the output is returned back to storage unit for further processing or getting stored.For example considered two numbers (operands) located in the main memory are to be added. First, these operands are fetched into arithmetic unit and actual addition is carried. Second, the result is then stored in the memory for instant use. Processor contains a number of high speed storage elements called Registers, which may Note that all operands may not reside in the main memory some time may store in registers. These registers are used for temporary storage of frequently used operands. Each register can store one word of data and Access times to registers are 5 to 10 times faster than access time to memory. Most computer instructions are executed in ALU (Arithmetical and logical) of the processor.

Control Unit

The operations of all the units are controls by the control unit, **which acts like the supervisor**. It controls all the Functionalities of a computer system using Timing signal.Timing signals that directs the I/O transfers are generated by the Control Unit. Synchronization signals are also generated by the Control Unit and these used for synchronizing instruction execution. It provides an environment to the end user for executing programs. It controls a monitors various devices with in the system. **The control unit** by selecting, interpreting and executing the program instructions **decides the sequence in which computer programs and instructions are executed.** The control unit and ALU's are usually many times faster than other devices connected to a computer system.

3. **OUTPUT UNIT**

This is the process of producing results from the data for gettinguseful information. Similarly the output produced by the computer after processing must also be kept somewhere inside the computer before being given to you in human readable form through the screen or printer i.einput unit and Output devices accepts binary data from the computer - decodes it into original form and supplies this result to the outside world. E.g. Printer, Video terminals (provides both input & output functions), graphic displays etc.

4. **MEMORY UNIT**

The memory unit stores program and data. There are two classes of memory devices :-

1. Primary memory
2. Secondary memory.

Primary memory

Primary memory is also called as Main memory and it contains a large number of semiconductor cells. Each cell having capable of storing one bit of information. These cells in memory are processed in group of fixed size called WORD with 'n' bit length. The total Number of bits in each word is called the word length and it may be different from 16 to 64 bits. The main memory is organized such that the contents of one word can be stored or retrieved in one basic operation. To be accessing data in memory a distinct address is associated with each word location and before executing a program there is need of storing data and programs into main memory. Once turn off the computer system the data stored with in the memory are lost. Fast memory Expensive Time required to access one word is called Memory Access Time - 10nS to 100nS. This time is fixed and independent of the location. Eg. Random Access Memory (RAM)

Secondary storage

They are used when large amount of data have to be stored permanently in memory It is also known as auxiliary memory. It is closely linked with the main memory. Thus secondary storage is used to hold mass of information i.e., system software, application programs, cinemas, games and data files. Obviously the capacity of secondary storage is very high compared to main memory. Auxiliary memory usually in the form of Magnetic disk, Magnetic tape, CD's, Memory cards, Pen drives, Compact Disk, Floppy Disk Etc.,

1.7 Memory units

As human beings we all understand decimal system but the computer can only understand binary system. Because memory is a large number of integrated circuits inside the computer can be considered as switches. The resulting of continues switch ON or OFF generate the data in form of 1's and 0's Even human gave any kind of data and program, In computer's memory both are stored in the binary form. The binary system has only two values 0 and 1.Therefore, the

computer that takes the information or data in decimal form from you, converts it into binary form, processes it, producing output in binary form and finally again converts the output to decimal form.

In memory a single storage cell is called Bit and within one cell stores either 1 or 0 only. Which stands for one binary piece of information.Every number in binary system can be converted to decimal system and vice versa. Memory unit is made up of several small storage locations called cells. Each of these cells can store a fixed number of bits called word length. Each cell has a unique number assigned to it called the address of the cell and it is used to identify the cells. The address starts at 0 and goes up to (N-1). You should know that the memory is like a large cabinet containing as many drawers as there are addresses of memory. Each drawer contains a word and the address is written on outside of the drawer.

1.7.1 Memory sizes(Capacity):

The size of memory is termed in terms KB, MB, GB etc.,

1Bit - 8 Bits

8 Bits - 1 Byte

1024 Bytes - 1 Kilo Byte

1024 Kilo Bytes - 1 Mega Byte

1024 Mega Bytes - 1 Giga Byte

1024 Giga Bytes – 1 Tera Byte

1024 Tera Bytes – 1 Peta Byte

1024 Peta Bytes – 1Exa Byte

1024 Exa Bytes – 1 Zetta Byte

12024 Zetta Bytes – 1Yotta Byte

1) How many number of bits for 1 GB

1GB =1024*1024*1024*8

=233

=8589934592 bits

2) A computer system consist 15 MB then find how many number of bytes it consist

15MB=15*1024*1024

=220 *15

=15728640 bytes

1.7.2 Memory classifications

Memories majorly classified into 3 categories. they are

1. Main memory (or) primary memory
2. Second memory (or) Auxiliary memory
3. Cache memory

1. Main memory

It is also called as primary memory (or) direct access storage and it is available inside the CPU. It is a fast memory made up of a huge number of cells having a fixed capacity of storage and has unique address. Each address represent inform of Hex Decimal number and starts with 0hx. In computer system majorly uses two different types of main memories, they are

a) Random access memory (RAM)

b) Read only memory (ROM)

a) Random access memory

The primary storage is denoted as Random Access Memory (RAM) because it is potential to randomly select and use any location of the memory directly to store and retrieve data. It takes same time to any address of the memory as the first address. RAM is the hardware location in the computer where the operating system, application programs and data in current use are saved so that they can be accessed by the computers processor. The user has direct access to this part of memory i.e., the user can read and can write into this memory. Hence this memory is also known as **Read / writes memory**. Main memory combines 1 or more bytes into a single unit which is called word. The larger the word size of computer. Early PC's used to have single byte for a word. The major IBM PC's have 2 bytes for a word. The present Intel-based PC's have 4 bytes for a word. Every word in the main memory is given a unique number as an unsigned address. It is volatile in nature i.e., the data in RAM available there only as long as the computer is running. When the computer turned off, the data in RAM is lost.

RAM is of two different types.

i) Static RAM

ii) Dynamic RAM

i) Static RAM (SRAM)

Static RAM uses a set of flip-flop (or) latch as a basic cell to store bit information. SRAM is expensive, needs more power to operate and yields lot of heat. SRAM does notneed to be refreshedperiodically.SRAM keeps its contents as long as electrical power is provided to the chip. If the power is turned off, its contents are lost.

SRAM is very fast but more expensive than DRAM. SRAM is frequently used as cache memory due to its high speed.

ii) Dynamic RAM (DRAM)

DRAM uses a small capacitor as a basic cell to store a bit information. DRAM is less expensive, consumes less power and produces less heat when related with SRAM. DRAMS want periodic refreshing to retain their contents.

Even when power is turned off, DRAM has very short data life typically about four milliseconds.

b) Read – Only Memory(ROM)

In this portion of memory some instructions are permanently loaded during the manufacturing of the computer system. ROM is non-volatile memory because even when the computer is turned off, the contents of ROM remain available. It is a permanent memory because once we write any data in the ROM those are remaining unchanged in memory. ROM performs the necessary Booting process to start the system and then transfers the control to the operating system.

Types of ROM

There are different types of ROM such as

1. PROM (Programmable Read Only Memory)
2. EPROM (Erasable Programmable ROM)
3. EEPROM (Electrically Erasable Programmable ROM)

1. **PROM (Programmable Read Only Memory)**

Building a ROM Chip from scratch is time consuming and expensive process. Due to this reason, developers created a type of ROM well-known as PROM which can be programmed. Special instruments are used to write the content into PROM. Once a PROM has been programmed, its contents can never be altered.

2) EPROM (Erasable Programmable ROM)

An EPROM is programmed in exactly the same manner as PROM. But unlike PROM, an EPROM can be removed and reprogrammed repeatedly. It can be removed by simply exposing the device to a strong source of ultraviolet light for a firm amount of time. When erased, all the contents of EPROM will be erased.

3) EEPROM (Electrically Erasable Programmable ROM)

EEPROM can be erased by electrical signals in its place of ultraviolet light. EEPROM can be removed one byte at a time, rather than removing the entire chip data. Hence the process of reprogramming is flexible, but slow.

Auxiliary Memory (or) Secondary Memory

You are currently clear that the working speed of primary memory or main memory should be as fast as possible to deal with the CPU speed. These fast storage devices **are extremely costly and thus the cost per bit of capacity is likewise high.**Again, the storage capacity of the main memory is also very limited.

Often it is required to store **a huge number of bytes of** data for the CPU to process. Therefore, additional memory is required in all the computer systems. This memory is called auxiliary memory or secondary storage. In this type of memory, the cost per bit of storage is low. However, the operating speed is slower than that of the primary memory. Huge amount of data are stored here on permanent basis and transferred to the primary storage as and when required. Most widely used secondary storage devices are magnetic tapes, magnetic disks and floppy disks, Compact disks and Pen drives etc.,

Magnetic Tape

Magnetic tapes are used for large computers similar to mainframe computers where large volume of data is stored for a longer time. In computer system also you can use tapes in the form of cassettes. The cost of storing data in tapes is cheap. Tapes consist of magnetic materials that store data permanently. It can be 12.5 to 25 mm wide plastic film-type and 500 meter to 1200 meter long. Magnetic tape himself is a strip of plastic coated with a magnetic recording medium. Bits are stored as magnetic spots on the tape along several concentric circles called tracks. Data and programs are stored in blocks referred as records. It provides serial access and so records can access one after another as the tape moves along a fixed read-write mechanism. Information can be removed by recording new data in its place. A tape unit is addressed by specifying the record number and the number of characters in the record. Direct access to a specific record is not possible. It is one of the cheapest and slowest systems for storage and has the advantage that tapes can be removed when not in use.
Advantages of Magnetic Tape

Compact: A 10-inch diameter reel of tape is 2400 feet long and is able to hold 800, 1600 or 6250 characters in each inch of its length. The maximum capacity of such type is180 million characters. Thus data are stored much more compact on tape.

Economical: The cost of storing characters on tape is very less as compared to other storage devices.

Fast: Copying of data is easier and fast.

Long term Storage and Re-usability: Magnetic tapes can be used for long term storage and a tape can be used repeatedly without loss of data.

Magnetic disk

A Magnetic disk is a circular plate built of metal (or) plastic coated with magnetized material. **Regularly the two sides of the disc are utilized** and some discs may be used on one spindle with read/write heads available on each surface. Bits are stored in the magnetized surface in spots along concentric circles called tracks. **The tracks are usually partitioned into** sections called sectors. The subdivision of one disk surface into tracks and sectors is shown in the figure.

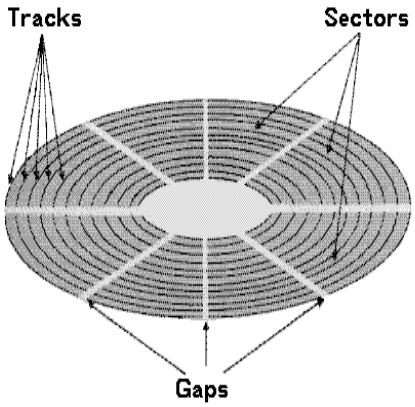


Fig 1.7 magnetic disc

Access is **accomplished** by moving a read-write mechanism to a track in the magnetized surface. A disk system is addressed by address bits that identify the disk number, the disk surface, the sector number and track within the sector. Disks may have multiple heads and simultaneous transfer of bits from several tracks at the same time. Magnetic disks are of two types.

1. Hard disk: Disks that are permanently attached to the unit assembly and cannot remove by the occasional user are called hard disks.

2. Floppy disk: A disk drive with removable disks is called a floppy disk.

Floppy Disk:

It is like to magnetic disk discussed above. It is 3.5 inch in diameter. The capacity of a 3.5 inch floppy is 1.44 megabytes. It is inexpensive than any other storage devices and is portable. The floppy is a low price device particularly suitable for personal computer system.

Fig. 1.8 Floppy Diskette

Optical Disk

With each application and software there is more demand for memory capacity. It is the want to store large volume of data that has managed to the development of optical disk storage medium. Optical disks can be divided into the following categories.

1. **Compact Disk/Read Only Memory (CD-ROM**): CD-ROM disksare made of reflective metals. CD-ROM is written during the process of manufacturing by high power laser beam. Here the storage density is very high, storage cost is very low and access time is relatively fast. Each disk is approximately 4 1/2 inches in diameter and can hold over 600 MB of data. As the CD-ROM can be read only we cannot write or make changes into the data contained in it.
2. **Write Once Read Many (WORM**): The inconvenience that we cannot write anything in to a CD-ROM is avoided in WORM. A WORM allows the user to write data permanently on the disk. Once the data is written it can never be erased without physically damaging the disk. Here data can be recorded from keyboard, video scanner, OCR equipment and other devices. The advantage of WORM is that it can store vast amount of data amounting to gigabytes. Any document in a WORM can be accessed very fast.
3. **Erasable Optical Disk:** These are optical disks where data can bewritten, erased and re-written. This also applies a laser beam to write and re-write the data. These disks may be used as alternatives to traditional disks. Erasable optical disks are based on a technology known as magnetic optical (MO). To write a data bit on the erasable optical disk the MO drive's laser beam heats a tiny, precisely defined point on the disk's surface and magnetizes it.

Flash drive: Flash drives have many names - jump drives, thumb drives,pen drives, and USB keychain drives. Regardless of what you call them, they all refer to the same thing, which is a small data storage device that uses flash memory and has a built-in USB connection. Flash drives are typically no more than two to three inches in length and less than an inch in width. Their size and shape may resemble a thumb or a small pen (which is where the names "thumb drive" and "pen drive" come from).

Flash drives are also very thin, often having a depth of less than a centimetre. Because of their small form factor, they are highly portable and can easily fit in a pocket or on a keychain (hence the name "keychain drive").

Nowadays flash drives can store several gigabytes of information. Since they are small in size but have large storage capacities, flash drives have replaced most previous portable data storage mediums such as floppy disks and removable hard disks like Zip disks. Because they have a built-in USB connection, flash drives also don't require a special disk drive to be used. Instead, they can be used on any computer with a USB port, which nearly all modern computers have. Below is the diagram of a pen drive.

Fig 1.9 flash drive

1.8 Programming Language, general software features, trends and utilities

1.8.1 What is Language?

You are aware with the term language. It is a coordination of communication between you and me. Some of the basic natural languages that we are used for communication for example English, Hindi, and Tamil etc. These are the languages used to communicate among various types of persons. But how you will communicate with your computer. Your computer will not know any of these natural languages for transfer of data and instruction. So there are programming languages especially developed so that you could send your data and instructions to the computer to do specific job. This type of language is called Artificial languages. For example consider FORTRAN, BASIC, COBOL etc. These are programming languages. So instructions or programs are written in a specific language based on the type of program. As an example, for scientific application FORTRAN and C languages are used. On the other hand COBOL is used for business applications.

1.8.2 Programming Languages

The processes of a computer are controlled by a set of instructions called a computer program. The set of instructions to construct a program is called **programming language**. However, all programs must ultimately be converted into a machine language program which a computer can understand.

There are two major types of programming languages. These are Low Level Languages and High Level Languages. Low Level languages are additional divided in to Machine language and Assembly language.

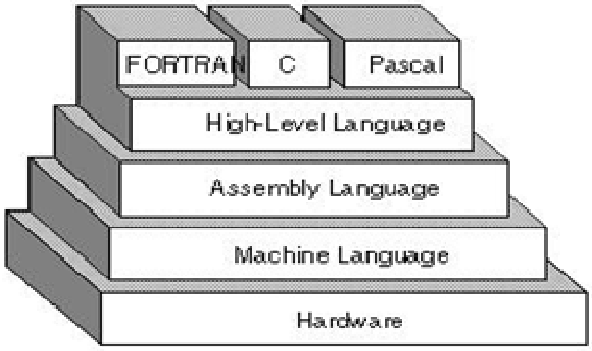


Fig 1.9 levels of programming languages

1. Machine Language:

Computer is an electronic device which can understand any instruction given to it in a binary coded form(0 or 1). A program written in binary form is called as machine language.

Example: 11000000000000011000010011000000000001000

Every instruction consists of minimum 2 parts

instruction part or Opcode part	data part or Operand part

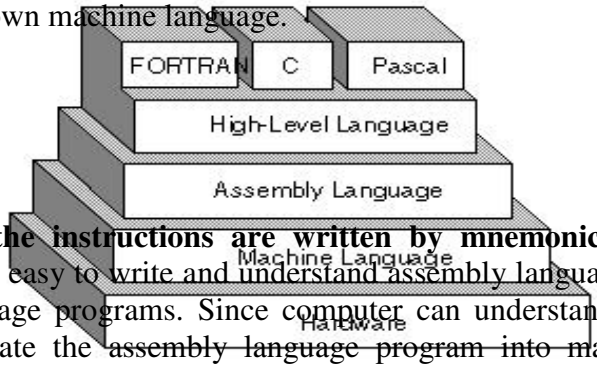
The instruction part is also called as opcode which conveys the computer the operation to be done such as add, subtract, multiply etc. The second part says about the data on which operation has to be done.

Advantages

1. Execution speed is very fast
2. Efficient use of primary memory
3.It does not need any translation because machine code is directly understood by the computer.

Disadvantages

1. Writing a program in machine language is a very difficult.
2. Every machine has its own machine language.
3. Error prone
4. Difficult to modify



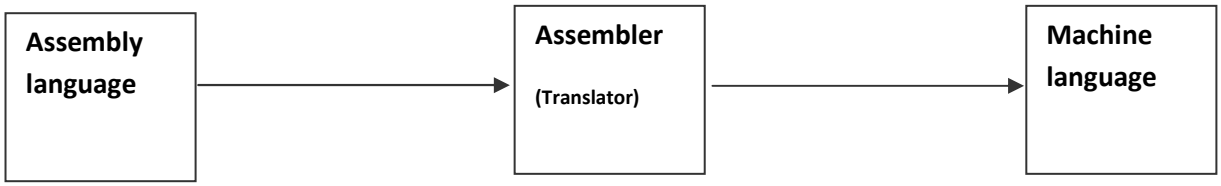
Assembly Language

In assembly language, the instructions are written by mnemonics (symbols) to shorten the program. Hence, it is easy to write and understand assembly language programs for programmers than machine language programs. Since computer can understand only machine language, it is required to translate the assembly language program into machine language program during execution. For this, a translator is needed to translate the assembly language program to machine language program. Such translator is called Assembler. The mnemonics are

nothing but the word replacements for binary opcode also decimal numbers and labels substitutes memory addresses.

Assembler:

An assembler is a computer program that converts assembly language instructions into machine language instructions.



Advantages

1. **Easier to memorize and use:** Assembly language program is easy to use,understand and memorize because it uses mnemonic codes in place of binary codes.

2. **Easy to write input data:** In assembly language programs the input data can bewritten in decimal number system, later they are converted into binary.

3. It is easier to correct errors and modify program instructions.
4. The Assembly Language has the similar efficiency of execution as the machine level language. Because this is one-to-one translator among assembly language program and its equivalent machine language program.

Disadvantages

1. Machine dependent. A program written for one computer might not run in other computers with different hardware configuration.
2. Knowledge of hardware is needful.
3. Time consuming
4. Translators required (i. e Assembler)

High Level Language

In High level language, instructions are written using natural language such as English and mathematical symbols like +, -, %, / etc. for its program construction.. Normally used high level languages are FORTRAN, COBOL and PASCAL etc.

Therefore it is easy to write and understand High level language programs than Assembly language programs and machine language programs. We know computer can understand only machine language. So to translate the high level language program into machine language program during execution, it needs a translator such as compiler or interpreter is used.

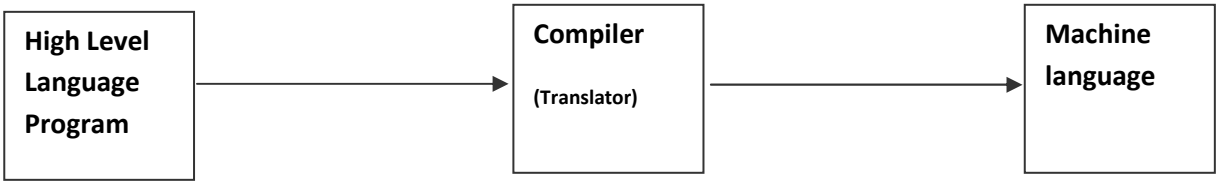
Higher level languages are problem-oriented languages because the instructions are suitable for solving a particular problem. For example COBOL (**Co**mmon **B**usiness **O**riented **L**anguage) is mostly suitable for business oriented language where there is very little processing and huge output. There are mathematical oriented languages like FORTRAN (**For**mula **Tran**slation) and BASIC (Beginners All-purpose Symbolic Instruction Code) where very large processing is required.

Advantages

1. It is easy to study and understand the high level language than machine and assembly languages.
2. Takes less time to write.
3. Easy to maintain.
4. Better documentation.

Compiler

It is a program translator that translates the instruction of a higher level language to machine language. Thus compiler is a program translator like assembler but more refined. It takes the total program one at time and translates into low level language.



The programs written by the programmer in higher level language is called source program and after this program is transformed to machine languages by thecompiler it is called object program. Object program produced by compiler is machine dependent. It means programs compiled for one type of machine will not run in another type. Therefore every type of machine must have its personal compiler for a particular language. Machine independence is achieved by using one higher level language in different machines.

Interpreter

An interpreter is one more type of program translator used for converting higher level language into machine language. It takes one statementof higher level languages, convert it into machine language and directly execute it. Translation and execution are carried out for each statement. It varies from compiler, which translate the entire source program into machine code and does include in its execution.

The benefit of interpreter compared to compiler is its fast response to changes in source program. It removes the need for a separate compilation after changes to each program. Interpreters are easy to write and do not need large memory in computer. The disadvantage of interpreter is that it is time consuming method because each time a statement in a program is executed then it is first converted. Thus compiled machine language program runs much faster than an interpreted program.

1.8.3 Software

Previously stated that programs or instructions have to be fed to the computer to do particular task. So it is needed to provide sequence of instructions so that your work can be done because to

do any particular task with in computer system there is need of software. We can divide the computer components into two major areas, namely, hardware and software.

Hardware

The physical parts, which you can see and touch, are collectively called hardware. It is the machine itself and its several individual equipment. It includes all mechanical, electronic and magnetic devices such as monitor, scanner, printer, electronic circuit, mouse, key board floppy and hard disk. Software, on the other hand, refers to the instructions, or programs, that tell the hardware what to do. In this lesson we will discuss about the other part, namely, software.

What is Software?

As you know computer cannot do anything without instructions from the user. In order to do any particular job you have to give a sequence of instructions to the computer. This set of instructions is called a computer program. Software refers to the set of computer programs, procedures that defines the programs. We can say that it is the group of programs, which increase the capabilities of the hardware. Software guides the PC at every step where to start and halt during a specific job. The process of software development is called programming.

Software Types

Computer software is usually categorized into two broad categories.

1. Application Software
2. System software

Application Software: Application Software is a set of programs to carryout operations for a particular application. Application software is useful for word processing, presentations, billing system, accounting, producing statistical report, medical analysis, small business processing, analysis of numerous data in research, weather forecasting, etc. In future modules you will learn about MS WORD, Excel, Power Point, etc. All these are application software's.

One more example of application software is programming language. Among the programming languages COBOL (Common Business Oriented Language) is more suitable for business application whereas FORTRAN (Formula Translation) is useful for scientific application.

Application software is broken in to two classes. They are general-purpose software and application –specific software.

General purpose software is purchased from a software developer and can be used for more than one application. Examples of general purpose software include word processors, database management systems, and computer aided design systems. They are considered general purpose because they can solve different types of user computing problems.

Application –specific software can be used only for its intended purpose.
A general ledger system used by accountants and a material requirements planning system used by a manufacturing organization are examples of application-specific software. They can be used only for the task for which they were designed they cannot be used for other generalized tasks.
Features of application software are as follows

1. Close to user
2. Easy to design
3. More interactive
4. Slow in speed
5. Generally written in high-level language
6. Easy to understand
7. Easy to manipulate and use
8. Bigger in size and needs large storage space

System Software: System software is a set of one or more programs designed to control the operation of computer system. **System software** consists of programs that manage the hardware resources of a computer and performing tasks such as controlling, monitoring all operations required to do the internal and external functionalities of the computer. It communicates with printers, card reader, disk; tapes etc. monitor the use of several hardware like memory, CPU etc. Also system software is important for the development of applications software. System Software allows application packages to be run on the computer with less time and effort. Remember thatitis not possible to run application software without system software. DOS, UNIX and WINDOWS are some of the commonly used system software. Out of these UNIX and Windows-NT are multi-user operating systems while DOS and WINDOWS are single-user systems.
These programs are categorized into three classes. They are operating system, system support, and system development.

Operating System:
The operating system offers services such as a user interface, file and database access, and interfaces to communication systems such as Internet protocols. The main purpose of this software is to keep the system operating in an efficient way while allowing the users access to the system.

System support
System support software offers system utilities and other operating services. Examples of system utilities are sort programs and disk format programs. Operating services consists of programs that provide performance statistics for the operational staff and security monitors to protect the system and files.

System development software
System development software contains the language translators that translate programs into machine language for execution, debugging tools to confirm that the programs are error free and computer –assisted software engineering (CASE) systems.

Ex: Compilers, Interpreters, Assemblers

Features of system software are as follows:

a. Close to system
b. Fast in speed
c. Difficult to design
d. Difficult to understand
e. Less interactive
f. Smaller in size
g. Difficult to manipulate
h. Generally written in low-level language

1.8.4 Utilities

Utility: A program that does a specific task related to the organization of computer functions, resources, or files, as password protection, memory management, virus protection, and file compression.

Viruses: There are several nasty computer critters out there trying toget into your PC. The most common term we call it virus but it may be virus, Trojan horse, worm and blended threat.

Virus: A virus is a program that replicates itself. It spread by creatingcopies of itself on a computer or by inserting computer code into program or operating system files. Viruses don't always damage files or computers, but they usually affect a computer's performance and stability.

Are all Viruses harmful?

Yes, to varying degrees. Virus harm can range from slowing computer performance to a loss of data and programs. In the worst case, viruses delete or modify data and programs on your computer. Some e mail viruses send personal data in messages when spreading. Even when avirus is not directly damaging the data, the process of replication can slow your PC and Internet connection.

Worm An unwanted computer program that duplicates itself through a computer network. It uses up the network's storage space and resources and can interfere with the ability of network to function at all. Most worms begin as e mail attachments that infect a computer when they're opened.

Trojan horse A Trojan horse is a malicious software program that hides inside other programs. It enters a computer hidden inside a genuine program, such as a screen saver or any other genuine software. It then puts code into the operating system, which allows a hacker to access the infected computer. Trojan horses do not typically spread by themselves; they are spread by viruses, worms, or downloaded software.

Blended threat

A blended threat is a mixture of some or all of the malicious programs discussed in the sections above. Blended threats often begin when someone interacts with a virus. The virus automatically spreads using worm behaviour, and then installs a Trojan horse on the infected computer.

How do I prevent viruses?

Prevention of infection is done by installing an antivirus program. To be most effective, an antivirus program should always be runnig, should scan incoming e mail, and should scan file access.

How do I know if my computer has a virus?

There is no single indicator of a virus infection, but some of the more common effects include poor computer performance, pop-up ads displaying (even when you have turned on a pop-up blocker or disconnected from the Internet).

Summary

The distinguish between Computers and human beings are:

1. Computer is an electrical device and it cannot do any work without instruction from the user. It is you to decide what you want to do and in what sequence. So a computer cannot take its own decision as you can.
2. It does not have feelings or emotion, taste, knowledge and experience. It does not differentiate between users. Computers cannot learn by experience as like humans.

These were some of the several types of computers used today. Looking at the rate of progression in technology, we can definitely seem forward to many more types of PC's in the near future. As like a digestive system of a human body ,With the block diagram of PC's we can have a basic idea of operations in PC's .Computer knows only two states that one is ON and second one is OFF. Binary system has only two digits 0 and 1. So the Binary system is adopted in computers.

Distinguish between a Number and digit as follows

Number means set of digits whereas digit means 0,1,2,3,4,5,6,7,8 or 9.Suppose 47 is a number and it has only two digits 4 and 7. We can convert from any system to any other system as follows. for example, if we need to convert from binary to octal system , first we translate from binary to decimal system and then translate from decimal to octal system.

There are some direct methods to translate from any computer to any other computer.

Input is pass to the computer not only through input devices , we can also pass the input from remote area through internet. We also get output from remote area through internet.

In this unit we discussed about two types of software, namely system software and application software. System software controls the hardware part of the computer. It is designed for performing tasks such as controlling all operations essential to move data into and out of the computer. It interacts with printer, card reader, disk, tapes, etc. and monitors the use of different components like memory, CPU, etc and DOS, UNIX and WINDOWS are three important system software's. Application software is a set of programs written for specific purpose to do the functionalities by the users. Examples of application software's are MS WORD, Lotus 1-2-3,

COBOL, BASIC and FORTRAN. We have discussed about levels of computer language and generation of computer systems.

Printer is used to print the require data on printer. The printed copy is known as printout or hard copy. The storage devices are becoming many more types in day to day changes of our lives. In future very small storage devices can store very much large amount of data. We have discussed about levels of computer language. Both compiler and interpreter are program translators used for converting high level language into machine language. While compiler convert the entire program first and then convert it into machine code once the program is converted by interpreter then execute many number of time without recompilation. An Interpreter converts the program line by line. and

To improve the system performance and to keep the standards we must use utilities such as File management programs, Disk management programs, Memory management, Backup programs, data recovery programs , Data compression programs and Antivirus programs.

Short Answer Type Questions

1. What is a Computer?
2. What are the components used in Second generation computers?
3. What are the types computers based on purpose?
4. What are the types computers based on operation?
5. What are the different number systems?
6. Convert $(22)_{10}$ into $(?)_2$
7. Convert $(44)_{10}$ into $(?)_8$
8. Convert $(43)_{10}$ into $(?)_{16}$
9. Convert$(1110)_2$ into $(?)_{10}$
10. Convert$(25)_8$ into $(?)_{10}$
11. Convert$(2A)_{16}$ into $(?)_{10}$
12. Convert$(420)_8$ into $(?)_2$
13. Convert$(FF)_{16}$ into $(?)_2$
14. Convert$(101010)_2$ into $(?)_8$
15. Convert$(101110)_2$ into $(?)_{16}$
16. Convert$(3D)_{16}$ into $(?)_8$
17. Convert $(125)_8$ into $(?)_{16}$
18. Why binary numbers are used in computers.
19. Define input device.
20. Define output device.
21. Write the names of two input and two output devices.
22. What is a scanner?
23. What is a light pen?
24. What is a printer and printout?
25. Distinguish between bit and byte.

26. Define volatile and non-volatile memory.
27. how many bytes for 1 GB memory?
28. Expand RAM,ROM,PROM and EAPROM
29. Write the names auxiliary storage devices.
30. What is cache memory?
31. What are registers?
32. What is software and hardware?
33. What is computer Language?
34. Name the three different categories of computer languages.
35. What is machine language? Why is it required?
36. What are advantages and disadvantages of machine language .
37. What is assembly language? What are its advantages over machine languages?
38. What is the difference between source program and object program?
39. What is higher level languages? Why are higher level languages are easier to use.?
40. What is compiler? Why is it required?
41. What is interpreter? How does it differ from compiler?
42. What is an utility?
43. What is a virus?
44. What is a worm?
45. What is Trojan horse?
46. What is blended threat?

Long Answer Type Questions

1. Write about the generations of computers.
2. Explain the characteristics of computers.
3. Explain various computers based on purpose.(3 marks)
4. Explain various computers based on operation(3 marks)
5. Explain various computers based on size.(6 marks)
6. Draw the Block diagram of digital computer and explain each unit neatly.
7. Write about number systems.
8. Write about input devices.
9. Write about output devices.
10. Write about primary memory and secondary memory.
11. Write about secondary storage devices.
12. Write about RAM and ROM.
13. Write about different types of software in details

UNIT - II

2 Overview of Operating System

2.1 Introduction to operating system, function and its types

2.1.1 What is an operating system

2.1.2 Abstract view of computer system

2.1.3 Functions of operating system

2.1.4 Types of operating system

2.2 Features of DOS

2.2.1 about DOS

2.3 working with DOS Commands

2.3.1 Working framework

2.3.2 Internal Commands

2.3.3 External Commands

2.4 Features of Windows

2.4.1 Introduction to Windows 7

2.4.2 Desktop Gadgets

2.4.3 Help and Support

2.4.4 Differences between office 2010 and office 2007

2.5 Components of Windows

2.5.1 Multi-tasking

2.5.2 File System

2.5.3 Desktop Components

2.5.4 Control Panel

2.5.5 Windows Explore

2.5.6 Device Manager

2.5.7 File Manager

2.5.8 Program Manager

2.5.9 Display Properties

2.5.10 Taskbar Properties

2. Overview of Operating System

2.1 Introduction to operating system, function and its types

In the early days digital computer system does not have any Operating System but rather programs for dialing the system and using the hardware quickly appeared. In the mid 1960's, UNIVAC and Control Data Corporation, were Supply pretty wide tools for development, scheduling, and execution of jobs on batch processing systems. In the period 1960-1962 IBM System/360 introduces a whole line of computers.It is the first operating system to work on different Computer System and which it is supporting the Hard disc and time sharing Environment. Multices was one more well recognized OS that provides the time sharing environment. It motivated more than a few OS's including Unix operating systems and VMS. In 1974 first microcomputer are introduced by Intel 8080/8085 and It is the predecessor for IBM's PC DOS and MS DOS. In the 1980's DOS dominated the Intel based PC's and Its major contribution was the FAT file system.

Computer systems need basic system software known as an Operating System (OS) to work. The OS is the first software to be loaded when a computer starts up. The entire application programs are loaded after the OS. The process of loading operating system in main memory is called Booting. Whenever an application needs information it requests the OS, which in turn queries the System clock on the motherboard. User interacts with the computer through the OS then OS interprets the inputs given by a user through the Keyboard, Mouse or other input device and takes appropriate actions.

2.1.1 What is an Operating System?

The Operating System acts as an interface between the User, Application Programs, Hardware and the System Peripherals. The major objective of the OS is providing an environment in which the user can execute programs.

Computer Hardware – Central Processing Unit, memory, Input/output devices provide basic computing resources.

System and Application Programs – Assemblers, Linkers, Compilers, database systems, games, business programs, etc. define the ways the computing resources are used to solve the users' problems.

Operating System – Controls and coordinates the computing resources among the system and application programs for the users.

End User – Views the computer system as a set of applications. The End User is generally not concerned with various details of the hardware.

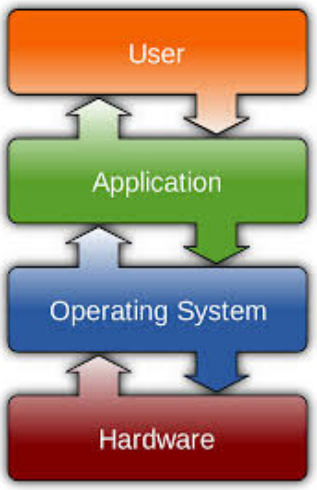


Fig 2.1 Abstract view of operating System

2.1.2 Abstract View of Computer system

When the user want interact with computer system, then user sends their request through application and system software. Such request is converted into interrupt by the operating system and handles the request by the hardware. Finally the operating system sends back the result in the same way to the end user. The following diagram expresses the interaction between user and hardware using operating system.

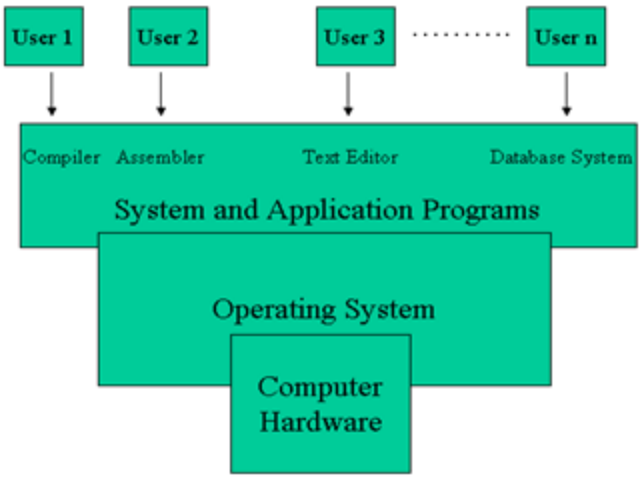


Fig 2.2 hierarchal view of operating system

Operating System objectives:

- **Convenience**: An Operating System makes a computer more helpful to use.

- **Efficiency:** An Operating System allows the computer system resources to be used in an efficient manner.
- **Ability to evolve:** An Operating system should be constructed in such a way as to allow the efficient development, testing, and introduction of new system functions without interfering with the service.

2.1.3 Functions of Operating System:

Program development:

- The Operating System gives a mixture of facilities and services, for example editors and debuggers, to assist the programmer in creating programs.

Program execution:

Execute a program the program must be loaded into main memory. Generally a program is a collection of Instructions and data. A number of steps need to be performed to execute a program. So along with loading programs into main memory there is a need to prepared other services like I/O devices, files must be initialized and other resources must be prepared.

Access to I/O devices:

The Operating System gives a uniform interface that hides these details so that programmers can access such devices using simple reads and writes. Each Input Output device requires its own set of instructions or control signals for operation.

Controlled access to files:

In the multiple programming and multitasking environment, the OS may provide protection mechanisms to control access to For file access. The Operating System must understand the nature of the I/O device and the structure of the data stored in files.

System access:

In shared or public systems, the OS controls Theaccess of data within the files and the device is protected from unauthorized users and resolve the conflicts for resources.

Error detection and response:

A variety of errors can happen while a computer system is running. these include internal and external hardware errors, for example a memory error, device failure, and various software errors. In each case, the OS must provide a response that clears the error condition with minimal effect on running applications.

Accounting:

A good OS will collect usage statistics for various resources and monitor performance parameters like response time, waiting time and number of users within the system..

Operating system goals:

1. The primary goal of an Operating System is make the computer convenient to use.

2. A secondary goal is to use the computer hardware in an efficient manner.

3. Execute user programs and make solving user problems easier.

Major Components of Operating System and it's functionality

1. Process Management:

The process is nothing but a program under execution and it is a heavy weight component. During executing a program operating system need to manage the following functionalities

1. Creation and Deletion of user and system processes.
2. Suspension and resumption of processes.
3. Provision of mechanisms for process synchronization.
4. Provision of mechanisms for process communication.
5. Provision of mechanisms for deadlock handling.

2. Memory Management
Processes must be loaded into main memory to be executed. The major objective of the memory management is Increase system performance and Maximize memory utilization. The following list of functionalities managed by Operating system.

1. Keep track of which parts of memory are being used and by what processes.
2. Decide which processes are to be loaded into memory when memory space becomes available.
3. Allocate and de-allocate memory as needed.

3.File Management
Almost everything is stored in the secondary storage. Therefore, secondary storage accesses must be efficient and convenient Creation and deletion of files.The following list of functionalities managed by Operating system.

1. Creation and deletion of directories.
2. The support of primitives for manipulating files and directories.
3. Mapping of files onto secondary storage.
4. Backup of files onto stable storage media.

4. I/O Management
Operating system offer an abstract level of Hard ware devices and keep the details from applications to make certain proper use of devices, to prevent errors, and to provide users with convenient and efficient programming environment. The following list of functionalities managed by Operating system.

1. Hide the details of H/W devices
2. Manage main memory for the devices using cache, buffer, and spooling

3. Maintain and provide device driver interface.

5 Networking
Allow communications between computers in distributed and client server environment..

6 Protection
Protect hardware resources, Kernel code, processes, files, and data from erroneous programs and malicious programs.

1.7 Command Interpreter
Command Interpreter is one of the most important system programs. Because almost Every OS provides `system programs, some people argue that the command interpreter is a part Of OS. It Allow the users to interact with the OS and Provide a convenient programming environment. The following list of functionalities managed by Operating system.

1. Execute a user command by calling one or more number of underlying system programs or system calls

Examples:

1. Windows DOS command window
2. Bash of Unix/Linux
3. CSHELL of Unix/Linux
4.

2.1.4 Types of Operating Systems:

1. Batch Processing Batch processing is a technique in which an Operating System collects the programs and Data simultaneously in a batch before processing starts. An operating system does the following Activities related to batch processing:

1. The Operating System defines a job which has predefined series of commands, programs and data as a single unit.

2. The Operating System keeps a number a jobs in memory and executes them without any manual information.

3. All Jobs are processed in the first come first served order,

4. When a job completes its execution, its memory is free and the output for the job gets copied into an output spool for later printing or processing.

Advantages

1. Batch processing takes much of the work of the operator to the computer.
2. Improved performance as a new job get started as soon as the previous job is finished, without any manual intervention.

Disadvantages

1. Difficult to debug programs.
2. A job could enter an infinite loop.
3. Due to lack of protection scheme, one batch job can affect other pending jobs.

2. Multitasking

Multitasking is when multiple jobs are executed by the CPU simultaneously by switching Between them. Switches occur so frequently that the users may interact with each program While it is running. An OS does the following activities related to multitasking:

1. The user gives instructions to the operating system or to a program directly, and receives an immediate response.
2. The OS handles multitasking in the way that it can handle multiple operations / executes multiple programs at a time.
3. Multitasking Operating Systems are also known as Time-sharing systems.
4. These Operating Systems were developed to provide interactive use of a computer system at a reasonable cost.
5. A time-shared operating system uses the concept of CPU scheduling and multiprogramming to provide each user with a small portion of a time-shared CPU.
6. Each user has at least one separate program in memory.

3. Multiprogramming

Sharing the processor, when two or more programs reside in memory at the same time, Is referred as multiprogramming. Multiprogramming assumes a single shared processor. Multiprogramming increases CPU utilization by organizing jobs so that the CPU always has one to execute. An OS does the following activities associated to multiprogramming.

1. The operating system keeps several jobs in memory at a time.
2. This set of jobs is a subset of the jobs kept in the job pool.
3. The operating system picks and begins to execute one of the jobs in the memory.
4. Multiprogramming operating systems monitor the state of all active programs and system resources using memory management programs to ensures that the CPU is never idle, unless there are no jobs to process

4.Time-Sharing Systems

Multiprogramming systems : several programs use the computer system

Time-sharing systems : several (human) users use the computer system interactively.

Characteristics:

- Using multiprogramming to handle multiple interactive jobs
- Processor's time is shared among multiple users
- Multiple users simultaneously access the system through terminals

Time sharing **is** multiprogramming. The key differences between time-sharing systems and batch multiprogramming systems are given in the table above

	Multiprogramming	Time Sharing
Principal objective	Maximize processor use	Minimize response time
Source of Directives to operating System	Job control language commands provided with the job	Commands entered at eh terminal

5. Real-Time Systems

Real-time systems are usually dedicated, embedded systems. An operating system does

the following activities related to real-time system activity.

1. In such systems, Operating Systems typically read from and react to sensor data.
2. The Operating system must guarantee response to events within fixed periods of time to ensure correct performance.

6. Distributed Environment

A distributed environment refers to multiple independent CPUs or processors in a computer

system. An operating system does the following activities related to distributed environment

1. The OS distributes computation logics among several physical processors.
2. The processors do not share memory or a clock. Instead, each processor has its Own local memory.

2.2 Features of DOS

2.2.1 about DOS

An Operating system is system software that acts an access interface between the User, Software and Hardware. For all the computers the essential basic software is known as an Operating System (OS) to function. The OS is the first system software to be loaded when a computers turn on. The total application programs are loaded after the OS. Whenever an application needs information it needs the OS which in turn queries the PC clock on the motherboard. User communicates with the computer through the OS then OS interprets inputs given by a user through the Keyboard, Mouse or input device and takes proper actions.

An Operating System can be of Three Types:

Single User MS-Dos, MS-Win 95-98, Win-ME

Multi User UNIX, Linux, XENIX

Network Novel Netware, Win-NT, Win-2000-2003

1. **Single User:** If the single user operating system is loaded in computer's memory; the computer system would be able to handle one user at a time.

2. **Multi user:** If the multi-user operating system is loaded in computer's memory; the computer system would be able to handle more than one user at a time.
3. **Network:** If the network operating system is loaded in computer's memory; the computer system would be able to handle more than one computer at time.

Disk Operating System

MS-DOS is abbreviation for **M**icro**s**oft **D**isk **O**perating **S**ystem and is usually referred to as DOS. **Microsoft Disk operating system** (**MS-DOS**) is a non-graphical command line desk operating system derived from 86-DOS that was created for IBM compatible computers. MS-DOS was first presented by Microsoft in August 1981 and was last updated in 1994 when MS-DOS 6.22 was released. Now, MS-DOS is no longer used; however, the command shell, more usually known as the **Windows command line** is still used by many users.

DOS is a text-based operating system. In disparity to Windows, which has a graphical user interface, and uses the mouse and icons to send commands to the system, DOS commands are entered at the command line in text format.

The major functions of DOS are to manage disk files, allocate system resources according to the requirement. DOS provides features necessary to control hardware devices such as Keyboard, Screen, Disk Devices, Printers, Modems and programs.

Basically, DOS is the medium through which the user and external devices attached to the system communicate with the system. DOS convert the command issued by the user in the format that is understandable by the computer and instruct computer to work accordingly. It also converts the result and any error message in the format for the user to understand.

DOS Boot-up Sequence: When we turn on the computer, if the systemis MSDOS based, then the sequence of files to be executed as follows. The process is called Booting Process.

IO.SYS: A hidden file in the root directory of the primary drive. This fileoffers the basic I/O capabilities for the system, allowing it the ability to communicate with the different peripherals. IO.SYS directs the whole process of loading the Operating System.

MSDOS.SYS: Also a hidden file in the root directory sometimes termedthe kernel for DOS. When an application wants to access a device or peripheral, this file converts the request into actions that IO.SYS can perform.

CONFIG.SYS: A user-configurable text file that typically contains devicedrivers and system setup values.

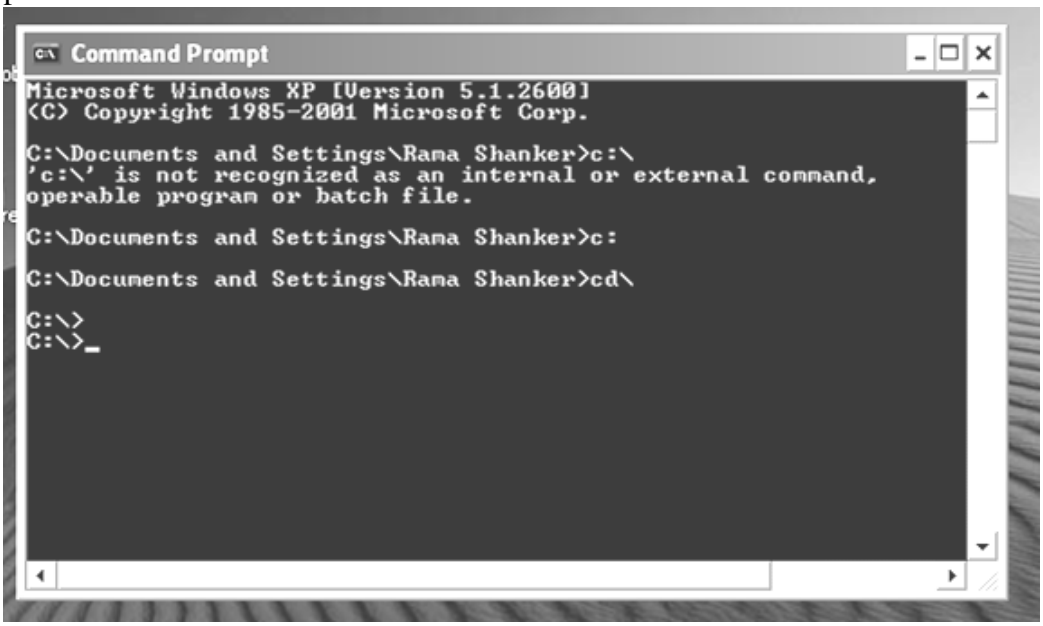
COMMAND.COM: This is the Command Interpreter. It can takecommands from the user, launch programs and transfer this Information to MSDOS.SYS.

AUTOEXEC.BAT: Another user-configurable text file that is used to setsystem variables and load TSRs.

Command Prompt

Later Completion of booting process, the Command prompt appears. Command Prompt offers an entry point for typing MSDOS commands and other computer commands. The most significant thing to know is that by typing commands, you can do tasks on your computer. Command Prompt is typically only used by advanced users.

When you're using Command Prompt, the word command prompt also refers to the right angle bracket (>, also known as the greater than character) that specifies the command line interface can accept commands. It looks like C:\>.



2.3 Home page of DOS

Where C: denotes the Drive letter (Curent Drive)

\ denotes the current folder / Directory

> denotes the end of the Prompt and

_ blinking element (represents the Cursor)

Always a cursor position decides that the current input letter from the keyboard will appear on that position.

2.3 Working with DOS commands

2.3.1 Working Framework

The working framework (OS) is the primary program that must be loaded into the memory of your PC before you can use it for any application. You can begin your computer with disk operating system (DOS) or some other operating system, for example Windows 95, 97, 98 or Windows NT that might be introduced in the Hard disk. In this chapter, we should talk about the basic facilities available in DOS. Switch to MS-DOS and go through most of the text given in this and the next two chapters. If your PC is running under windows 95/98 or Windows NT, perform the following steps to switch to MS-DOS.

- Click the start button in the taskbar and press the windows logo key to open the start menu then click programs in the start menu.
- Windows displays the program submenu.
- In the program menu click MS-DOS Prompt and your screen displays a window that contains MS-DOS Prompt, such as "C:\windows>_".

If you like you can also restart your computer in MS-DOS mode by using the following steps:

1. Close any open programs
2. Click the Start Button in the Task Bar or Press the Windows Logo Key to open the Start Menu.
3. Click "restart in MS-DOS Mode" and then click OK.

Wait for some time and your PC restarts in MS-DOS Mode.

Loading Disk Operating System (DOS)

Different version of DOS, such as 2.0, 3.0, 3.2, 4.0, 5.0, 6.0, 6.2, 6.22, 7.0, 7.2 are available. The latest versions have more features and commands. However, the basic commands and features are included in all versions. You can load DOS prompt the floppy disk drive or Hard Disk Drive. The process of loading the Operating System into main memory is called Booting of the computer. Complete the following steps to load DOS in your PC.

To Load DOS from Hard Disk:

To Load DOS from the Hard Disk of your computer, follow these steps:

1. Switch on the computer by using power ON/OFF switch of the CPU unit of your PC and the power ON/OFF switch is usually located in the front or the rear of the CPU unit.
2. If your display unit (Monitor) has an ON/OFF switch, turn that switch ON too.

3. Do not put any Diskette is drive A:

Wait for some time your PC perform a Self-Test and loads DOS.

Your monitor displays "C>" or "C :\> _" and a DOS prompt message.

To load DOS from Floppy Disk:

If DOS is not installed on the Hard Disk of your PC, or you need to load DOS from the Floppy disk drive due to any reason, follow these steps:

1. Put the DOS diskette in drive A:, Close the drive door if necessary.
2. Switch on the computer by using the power ON/OFF switch of the CPU unit of your PC and the power ON/OFF switch is commonly located in the front or the rear of the CPU unit.
3. If your display unit (Monitor) has an ON/OFF switch, turn that switch ON too.

Wait for some time your PC perform a Self-Test and loads DOS.

Your monitor displays "A>" or "A :\> _" and a DOS prompt message.

Resetting the Computer:

At some point you may need to reset your PC while it is as yet running since DOS does not work properly. To reset your PC you have two choices:

1. Press and hold Ctrl and Alt keys and Press Del. Then release all keys restarting PC without switching OFF the power is called Cold Booting.
2. Press the "Reset" button that is commonly located in the front of the CPU unit. This kind of Booting is called Warm Booting.

System Prompt:

On loading (or Switching to) DOS, the screen shows C :\>, C>, A :\> or a similar message. The message shown by DOS is called DOS Prompt or System Prompt. This prompt serves two purposes:

1. It specifies that DOS is ready to accept a command from the keyboard.
2. It shows the default drive name. For instance, C>, C :\>, indicates that drive C: is a default drive. DOS will use the default drive for all file operations if the user does not specify any drive name with commands.

Changing Default Drive:

To change a default drive type the new drive letter followed by colon (:) and then press Enter. For instance, if the default drives is A and you type C: and press Enter, DOS selects drive C: as the default drive. DOS replays this by changing the prompt to C:\> or a similar message. If you enter a drive letter that does not exists in your PC, DOS displays a message "Invalid Drive Specification".

When you select a floppy drive as the default drive, ensure that there is a diskette is inserted in that drive. Something else DOS gives the following message:

"Not ready reading drive A

Abort, Retrieve, Fail?

If you get this message, insert a diskette in the floppy drive and then press "r" to Retrieve.

What is a File?

File is a collection of text or data stored on a storage device, such as a Floppy Disk or Hard Disk. If you are beginner to computers, it may understand a bit difficult. Well, a computer file is not much not the same from a conventional paper file that you must have used, or at least seen being used. Just as you stored various types of documents (invoice, letters, reminders, memos etc.) in conventional files, computer files too store information.

File Name

Each file is given a name so that it can be referred to future. This name is called Filename. The filename in DOS can be up to eight alpha-numeric characters long. It can also have a period (.) followed by an extension name. The extension name specifies the type of the file. For example 'DOC' may suggest that it is a document file; and 'COM' may suggest that is a command file. The extension name the up to three characters long. For instance, consider the following filename:

mk2.txt

sample.doc

Here sample is a filename. While naming files, you can use the following characters in filename:

A- Z, a- z, 0 – 9, @, #, $, %, ^, &, -, _, { },`, ~,( )

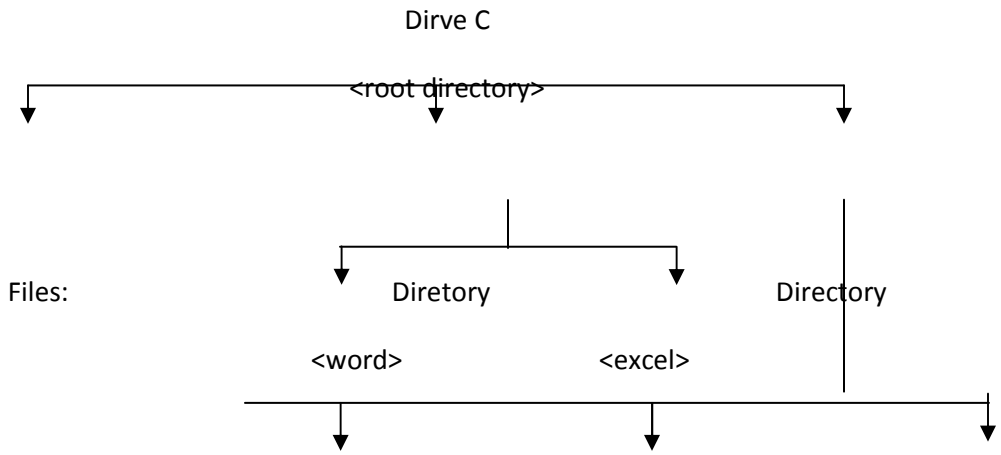
You cannot use remain characters, such as comma (,) colon (:), semicolon (;), <, >, \, /, etc. in filename. Moreover, you cannot use space in filenames. Some examples of invalid file names are:

Filename	Reason
PSCMR 2	Contains space
PASSENGER	Contains more than eight characters
MY, dATA	Contains commas
CHAP_01.DOC3	Extension name contains more than 3 characters

When you are specify a file name more than eight characters in the filename or more than three characters in the extension name, DOS may automatically truncate the filename by removing extra characters. Further, some file names, such as COM 1, COM 2, LPT1, com and PRN are fixed by DOS for its own use. Therefore, do not use these names to name your file.

WHAT IS A Directory?

The storage capacity of the hard disk is commonly quite large (10 MB to a few GB). You can store bulk of files in your hard disk. Even the capacity of a floppy disk is large enough to store many files. A directory is nothing but a named section of a storage device, such as hard disk, floppy disk. In other words, to organize file on hard disk or floppy disk, these are divided into various sections called directories. You can store any number of files in each directory. The directory helps to maintain your file in an efficient manner. Using directories in a storage device is belongs to saving different types of files in an office in individual drawers of a filing cabinet. For example, ABC Company may keep all sales files in the first drawer, all purchase files in the second drawer and all employees' files in the third drawer of a filing cabinet. In the same way, when XYZ Company computerizes its operation, it may store all sales files in the SALES directory, all purchase files in the PURCHASE directory and all employees' files in the EMPOLYEES directory. In the same way, the user Krishna may keep his personal files in the Krishna directory and the secretary of XYZ Company may store the letters in the LETTERS or DOC directory.



DOS always creates a root directory in each device. You can create new directories in the root directory of the hard disk or floppy disk. You can store files in these directories. Moreover, beside files, each directory can also have directories and files. Those, the file and directory organization in DOS looks like the roots of a tree, as show in above figure.

Here, the root directory in drive C contains few files and two directories – WORD and EXCEL. The WORD directory contains a few files as well as a directory TEN. Occasionally, the second level directory (TEN in this case) is called sub-directory. The root directory contains another directory – EXCEL. This directory contains a few files as well as two directories – PURCHASE and ITEMS. Both these directories contain files.

Pathname

You can denote to any file in any directory on the system by using its **pathname**. A pathname is a group of characters that defines what directory the file is in, as well as the name of the file. The full path always starts from the ROOT directory. The ROOT directory is the top directory in a file system.

The pathname of a file in the **current working directory** is just the name of the file by itself. Files and directories that are in a different directory than the current working directory can be mentioned to using:

1. An **absolute pathname** describes another directory in a way that does not depend on where you are. The absolute pathname is always the same, regardless of your working directory.

2. A **relative pathname** describes another other file or directory's location relative to the current working directory. The relative path changes depending on where you are in the directory tree.

There are two types of commands in MSDOS. They are internal and external commands.

2.3.2 Internal Commands

The internal commands reside in COMMAND.COM, which loads into memory when the computer system is turned on; these commands do not reside on disk. Commands are executed from the MS-DOS prompt only. (?)is used to know the description of any command followed by the command. Ex: dir/? Displays the syntax of directory command.

Here some internal commands as follows

Common Micro Soft-DOS Commands		
Command	**Description**	**Usage**
dir	Lists all files in current directory	**Command:** C:\>dir **Result:** List of directories Homework, Personal, Work and the file info.doc
md	Makes a new directory in the directory specified in the command, or in the current working directory if none other is specified	**Command:** md <directory name>
cd	Changes the current directory to the one specified.	**Command:** C:\>cd <directory name>
cd ..	The command changes the directory to the parent directory of the current directory.	**Command:** cd ..
cd \	The command changes to the root directory of the current drive.	**Command:** cd \
move	This command moves files or directories from the original directory specified to the new directory. To move a file or files, you specify the name and location of the file or files you want to move followed by the destination.	**Examples:** move <source><destination>

copy	This command copies files from one location to another.	**Command:** copy <source><destination>
rename	Changes the name under which files and/or directories are stored.	**Command:** rename <original name><new name>
rd	Removes (deletes) a directory. **Note:** to remove a directory, directory must be empty. You must delete all files and subdirectories in order to delete a parent directory.	**Command:** rd<directory name>
del	Used to delete files. If a directory name is given in the command, all files in the directory are deleted.	**Command:** del <file/directory name>
*	Wildcard character, a special symbol that stands for one or more characters. Operating systems care the use of wild cards for identifying Files and Directories.	Usage: M* searches for all files and directories that start with the letter M.
edit	Command used to run the DOS Text Editor program.	**Command:** edit
exit	Closes the DOS window	**Command:** exit
CLS	CLS is a command that allows a user to clear the complete contentsof the screen and leave only a prompt	**Command:cls**
DATE	Display the current date and prompt for a new one. If no date is entered, the current date will be kept.	**Command: date**
TIME	Allows the user to view and edit the computer's time(system time).	**Command: time**
VER	It displays the version of MSDOS	**Command: ver**
REN	Used to rename files and directories from the original name to a newname	**Command: ren**
TYPE	Displays the contents of text files.	**Command: type**

2.3.3 External Commands

The external commands are files that do reside on disk and have an extension of .COM, .EXE, or .BAT.

Format : Format is used to delete information off of a computer diskette orfixed drive.

The syntax of format command as follows.

FORMAT volume [/FS:file-system] [/V:label] [/Q] [/A:size] [/C] [/X]

FORMAT volume [/V:label] [/Q] [/F:size]

FORMAT volume [/V:label] [/Q] [/T:tracks /N:sectors]
FORMAT volume [/V:label] [/Q] [/1] [/4]
FORMAT volume [/Q] [/1] [/4] [/8]

Volume	Specifies the drive letter (followed by a colon), mount point, or volume name.
/FS:filesystem	States the file system (FAT, FAT32, or NTFS).
/V:label	Specifies the volume label.
/Q	Does a quick format.
/C	Files created on the new volume will be compressed by default.
/X	Forces the volume to dismount first if needed. All opened handles to the volume would no longer be valid.

Examples

When using the format command, remember all information on the drive you wish to format will be completely erased.

format a:

Would erase all the contents off a disk. Commonly used on a diskette that has not been formatted or on a diskette you wish to erase.

format a: /q

Quickly erases all the contents of a floppy diskette. Commonly used to quickly erase all information on the diskette.

format c**:**
This would erase the contents of your C: hard disk drive. In other words, unless you wish to erase all your computer's information, this command should not be done unless you're planning to start over.

FDISK: Fdisk is used to delete and create partitions on the harddiskdrivein earlier versions of MS-DOS and Windows.

Syntax

FDISK [/STATUS] /X

/Status Displays partition information

/X Ignores extended disk-access support (will not use LBAsupport). Use this switch if you receive one of the below symptoms

Unable to access a drive from DOS versions prior to 7

Disk access messages.

Stack overflow messages

High amounts of data corruption

Extra drive letters

2.4 Features of Windows

2.4.1 Introduction to Windows 7?

Windows 7 is the latest version of a series of **Operating Systems** that Microsoft has released for use on personal computers. It is the follow-up to the **Windows Vista** Operating System which was launched in 2006. An operating system allows your computer to manage software and

perform necessary tasks. It is also a **Graphical User Interface** that allows you to visually interact with your computer's functions in a logical, fun and easy way.

For instance, in Windows 7 you can view two windows side by side by using the **Aero Snap** feature.

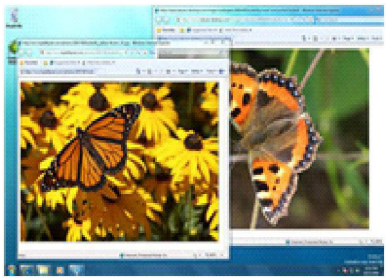


Fig 2.4 Two Windows Overlapping

This feature automatically sizes or snaps two windows to fit together on the screen and allowing you to viewing them next to each other.

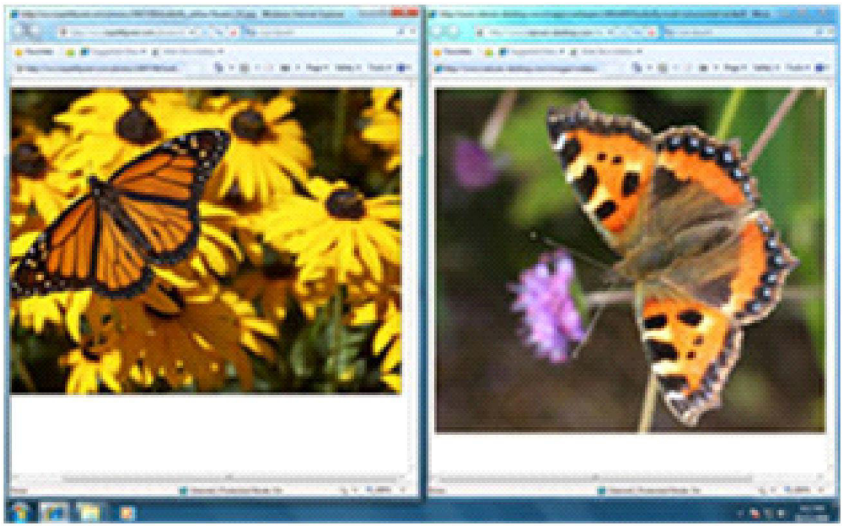


Fig 2.5 Aero Snap View

What Can You Do on Windows 7?

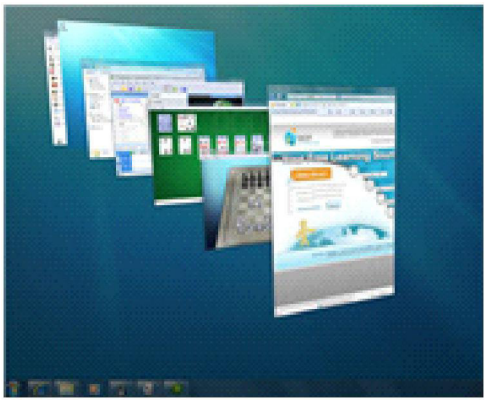


Fig 2.6Aero Flip 3D

Aero

Sort over open windows with Aero Flip 3D.

Aero is an interface that creates your visual interactions with the desktopfun and easy.
Aero Peek creates your open windows transparent. So you may seeyou're desktop. It also permits you to peek at items in your taskbar for a thumbnail preview.

Aero Snap is a fast way to resize your windows to make them easierto read, compare and organize.
Aero Flip permits you to preview all your open windows from a centralwindow or 3D view that you can flip through.

Aero Shake allows you to take your mouse and shake only the openwindow you need to focus on and the rest will disappear.

Taskbar

Fig 2.7 Taskbar

Get instant access with Jump List

The **taskbar** is now more useful to use with larger views and easier access.

Jump Lists permit you to right click on an icon in the taskbar andquickly access items like music, videos or web pages that you use on a regular basis.

Pin allows you to place programs on the taskbar and readjust theorder of the icons as you wish.

Action Centerallows you to control the alerts and pop-ups you receiveregarding maintenance and security.**Search** Find documents fast with the new Search

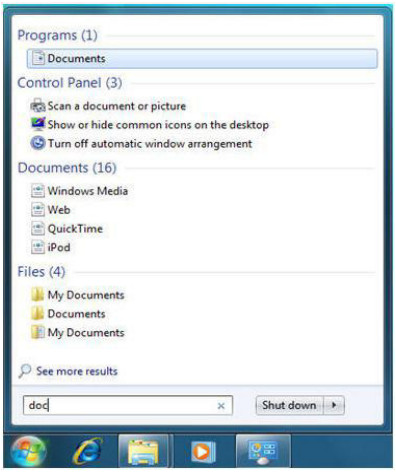


Fig 2.8 Search Bar

Once you start typing in the **Search bar** of the Start Menu you will immediately see a list of relevant options collected by categories with highlighted keywords and text. This allows you to simply scan for the documents, music, pictures and email you are looking for.

2.4.2 Desktop Gadgets

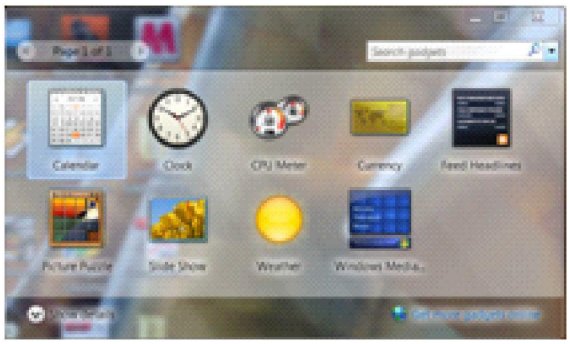


Fig 2.9 Desktop Gadgets

Windows holds mini-programs called gadgets, which suggest information at a glance and provide simple access to frequently used tools. For instance, you can use gadgets to display a picture slide show, view continuously updated headlines, or look up contacts.

Why use desktop gadgets?

Desktop gadgets can store information and tools readily available for you. For instance, you can display news headlines right next to your open programs. This way, if you need to store track of what's happening in the news while you work, you don't have to stop what you're perform to switch to a news website.

You can use the Feed Headlines gadget to display the latest news headlines from sources you select. You don't have to stop working on your document, because the headlines are continuously visible. If you see a headline that interests you, you can click that headline, and your web browser will open directly to the story.

Getting started with gadgets

To know how to use gadgets, let's explore three gadgets: the Clock, Slide Show, and Feed Headlines.

How does the Clock work?

When you right-click the Clock, you'll see a list of tasks that what you can do with the gadget, including closing the Clock, keeping it on top of your open windows, and modifying the Clock's options such as its name, time zone, time format and appearance.

You can right-click a gadget to see a list of tasks you can do with it.

Tip

If you point to the Clock gadget, a Close button and an Options button will present near its upper-right corner.

- Right-click Slide Show and click Options.
- In the Show each picture list, choose the number of seconds to show each picture.
- In the Transition among pictures list, select the transition you want and click OK.
- Right-click Feed Headlines and click Options.
- In the Display this feed list, click the feed you want to display and click OK

Adding and removing gadgets

You can add any gadget by installed on your computer to the desktop. If you need, you can add multiple instances of a gadget. For instance, if you are storing track of time in two time zones, you can add two instances of the Clock gadget and set the time of each accordingly.

Right-click the gadget and then click Close Gadget.

Organizing gadgets

You can drag a gadget to a new position anyplace on the desktop.

2.4.3 Help and support

At one point, you're likely to run into a computer problem or confusing task. To figure it out, you'll essential to know how to get the right help. This article delivers an summary of the best techniques.

Windows Help and Support is the predefined help system for Windows. It's a place to get fast answers to common questions, suggestions for troubleshooting, and instructions for how to do works. If you want help with a program that's not part of Windows, you'll want to consult that program's Help (see "Getting help with a program" below).

To open Windows Help and Support, click the Start button then click  , and Help and Support.

Get the latest Help content

If you're connected to the Internet, make sure Windows Help and Support is set to Online Help. Online Help contains new Help topics and the newest versions of existing topics.

- On the toolbar in Windows Help and Support, click Options, and then choose Settings.
- Under Search results, choose the Improve my search results by using online instruction check box, and then click OK. The words Online Help will be displayed in the lower-right corner of the Help and Support window when you are connected.

Search Help

The fastest way to get help is to type a word or two in the search box. For instance, to get information about wireless networking, type gadgets, and then

press Enter. A list of results seems, with the most useful results shown at the top. Click on the results to read the topic.

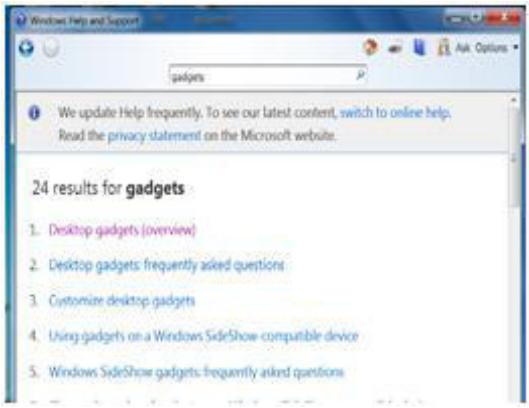


Fig 2.10 Search Help

Tip

- You can also access Help by pressing F1. This function key opens Help in almost any program.

2.4.4 The difference between Office 2010 and Office 2007

Here we look at the new MS Office 2010 Features and Functions.

The Ribbon interface has been extended to all applications in Office, most notably Outlook and OneNote. Users now have the ability to customise the Ribbon.

The Office button in 2007 has been replaced by a File Menu icon.

Main features of Office 2010:

1. New picture formatting tools like artistic effects and colour saturation in Word 2010 and PowerPoint 2010 give you more power to express your ideas visually.
2. Co-Authoring documents in real time in Word, PowerPoint, One note, and Excel Web App. Note SharePoint workspace or a windows live account is required.
3. Excel 2010 has a newly introduced Slicers feature for Pivot tables allowing you to filter data on the fly.
4. In addition, Excel's new Sparkline's feature allows you view trends in data by adding an additional column right alongside your data, containing the graphs in each cell: PowerPoint 2010 has the ability to edit and customize videos, you can trim, add fades and bookmark points in your video. In addition you can record a presentation as a video and save it's as a Windows Media filed.
5. PowerPoint 2010 allows you to broadcast a presentation over the internet. The recipients of the broadcast can view the presentation in a Web browser and do not need to have PowerPoint installed.

6. Outlook 2010 provides you with a new conversation view which allows you to group e-mail replies from a single message into a single mail item. The new quick steps feature in Outlook helps you manage your e-mails more effectively by allowing you to customise actions for certain e-mails you choose.
7. Outlook 2010 allows you to import contacts from social networks such as Facebook or LinkedIn.
8. The new file menu icon exposes the new backstage view which permeates every application. The backstage view not only deals with printing and saving but has options for sharing, versioning, protection and removing metadata.
9. The new backstage view allows you not only to save to local or network PC's but you can save a document to Share point or Windows SkyDrive. (Note in the latter case a windows live account is required).
10. A new Power pivot adds in is available for Excel 2010. Power pivot allows you analyse large volumes of data from a SQL server database.
11. Access 2010 ships with the following new features: web based databases, Application parts, Quick start fields, conditional formatting and Navigation form controls.

2.5 Components of Windows

Introduction

In this chapter we discuss the about multitasking, windows explorer, program and file manager, control panel, file system, desktop components, device manager, etc.,

2.5.1 Multitasking

Multitasking allows the user to perform more than one task at a time. For instance, work on a document file in MSWORD programs, while editing data automatically the beginning character convert into Capitalization and in the same time spell checking is done. Another example for multitask is while playing games along visual effects audio and score counting is done at a time. With Windows 10 operating system, the user can do more than one task a time.

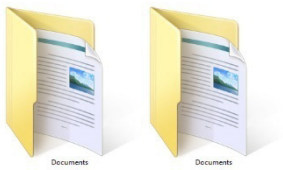
2.5.2 File system

File system uses to perform files and folder in a systematic manner. The following operations are performed in file systems. They are creating, copying, moving, saving, opening, finding, renaming, deleting of files or folders.

Working with files and folders

A file is an item that consist information—for example, text or images or music. When opened, a file can look very much like a text document or a picture that you might find on someone's desk or in a filing cabinet. On your computer, files are represented with icons;(icon is a small picture that represents file, folder, program or other object or function) this makes it easy to recognize a type of file by looking at its icon. Here is an icon:

A folder is a container you can use to store files and sub folders in. If you had thousands of paper files on your desk, it would be nearly difficult to find any particular file when you wanted it. That's why people often store paper files in folders inside a filing cabinet. On your computer, folders work the same way. Here are some typical folder icons:



An empty folder (left); a folder containing files (right)

Folders can also store other folders. A folder within a folder is usually called a subfolder. You can create any number of subfolders, and each can hold any number of files and additional subfolders.

Using libraries to access your files and folders

When it comes to getting organized, you don't need to start from scratch. You can use libraries a feature new to this version of Windows, to access your files and folders, and arrange them in different ways. Here's a list of the four default libraries and what they're typically used for:

Documents library. Use this library to organize and arrange word-processing documents, spreadsheets, presentations, and other text-related files.

Pictures library. Use this library to organize and arrange your digitalpictures, whether you get them from your camera, scanner, or in e mail from other people.

Music library. Use this library to organize and arrange your digitalmusic, such as songs that you rip from an audio CD or that you download from the Internet.

Videos library. Use this library to organize and arrange your videos,such as clips from your digital camera or camcorder, or video files that you download from the Internet.

To open the Documents, Pictures, or Music libraries, click the Start button  , and then click Documents, Pictures, or Music.

Viewing and arranging files and folders

When you open a folder or library, you can change how the files look in the window. For example, you might prefer larger (or smaller) icons or a view that lets you see different kinds of information about each file. To make these kinds of changes, use the Views button in the toolbar.

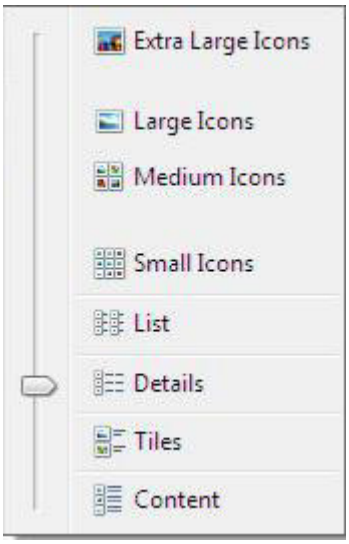


Fig 2.11 Arranging Files and Folders

Each time you click the left side of the Views button, it changes the way your files and folders are displayed by cycling through five different views: Large Icons, List, a view called Details that shows several columns of information about the file, a smaller icon view called Tiles, and a view called Content that shows some of the content from within the file.

Finding files

Depending on how many files you have and how they are organized, finding a file might mean browsing through hundreds of files and subfolders—not an easy task. To save time and effort, use the search box to find your file.

Fig 2.12 Finding Files

The search box is located at the top of every window. To find a file, open the folder or library that makes the most sense as a starting point for your search, click the search box, and start typing. The search box filters the current view based on the text that you type. Files are displayed as search results if your search term matches the file's name, tags or other properties, or even the text inside a text document.

Copying and moving files and folders

Occasionally, you might want to change where files are stored on your computer. You might want to move files to a different folder, for example, or copy them to CDs or memory cards.

Copying

- Select the folder to be copied,
- Click on Copy
- Move the pointer(cursor) to the desired location to where you want
- Click on Paste

Moving

- Select the folder to be copied,
- Click on Cut
- Move the pointer(cursor) to the desired location to where you want
- Click on Paste

Most people copy and move files using a method called drag and drop. Start by opening the folder that contains the file or folder you want to move. Then, open the folder where you want to move it to in a different window. Position the windows side by side on the desktop so that you can see the contents of both.

Creating and deleting files

The most common way to create new files is by using a program. For example, you can create a text document in a word-processing program or a movie file in a video-editing program.

Saving After creation of a file , it has to be saved for need in the future.

When you are ready to save your work, click the Save button. In the dialog box that appears, type a file name that will help you find the file again in the future, and then click Save.

By default, most programs save files in common folders like My Documents and My Pictures, which makes it easy to find the files again next time. You can also save your files in the desired location.

Deleting

When you no longer need a file, you can remove it from your computer to save space and to keep your computer from getting cluttered with unwanted files. To delete a file, open the folder or library that contains the file, and then select the file. Press Delete on your keyboard and then, in the Delete File dialog box, click Yes.

When you delete a file, it's temporarily stored in the Recycle Bin. Think of the Recycle Bin as a safety net that allows you to recover files or folders that you might have accidentally deleted.

Opening an existing file

To open a file, double-click it. The file will usually open in the program that you used to create or change it. For example, a text file will open in your word-processing program.

That's not always the case, though. Double-clicking a picture file, for example, will usually open a picture viewer. To change the picture, you need to use a different program. Right-click the file, click Open with, and then click the name of the program that you want to use.

2.5.3 The Desktop Components (Overview)

The desktop is the main screen area that you see after you turn on your computer and log on to Windows. Like the top of an actual desk, it serves as a surface for your work. When you open programs or folders, they appear on the desktop. You can also put things on the desktop, such as files and folders, and arrange them however you want.

The desktop is sometimes defined more broadly to include the taskbar. The taskbar sits at the bottom of your screen. It shows you which programs are running and allows you to switch between them. It also contains the Start

button , which you can use to access programs, folders, and computer settings.

Working with desktop icons

Icons are small pictures that represent files, folders, programs, and other items. When you first start Windows, you'll s ee at least one icon on your desktop: The Recycle Bin (more on that later). Your computer manufacturer might have added other icons to the desktop. Some examples of desktop icons are shown below.

Examples of desktop icons

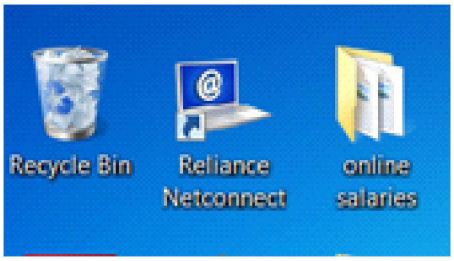


Fig 2.13 Desktop Icons

Double-clicking a desktop icon starts or opens the item it represents.

Adding and removing icons from the desktop

You can choose which icons appear on the desktop—you can add or remove an icon at any time. Some people like a clean, uncluttered desktop with few or no icons. Others place dozens of icons on their desktop to give them quick access to frequently used programs, files, and folders.

If you want easy access from the desktop to your favorite files or programs, you can create shortcuts to them. A shortcut is an icon that represents a link to an item, rather than the item itself. When you double-click a shortcut, the item opens. If you delete a shortcut, only the shortcut is removed, not the original item. You can identify shortcuts by the arrow on their icon.

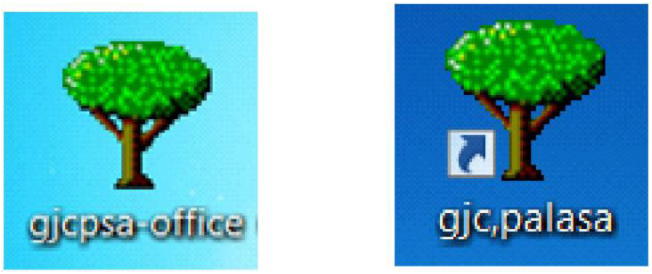


Fig 2.10 A file icon(left) and a shortcut icon(right)

A file icon (left) and a shortcut icon (right)

Right-click the icon, and then click Delete. If the icon is a shortcut, only the shortcut is removed; the original item is not deleted.

Moving icons around

Windows stacks icons in columns on the left side of the desktop. But you're not stuck with that arrangement. You can move an icon by dragging it to a new place on the desktop.

You can also have Windows automatically arrange your icons. Right-click an empty area of the desktop, click View, and then click Auto arrange icons. Windows stacks your icons in the upper-left corner and locks them in place. To unlock the icons so that you can move them again, click Auto arrange icons again, clearing the check mark next to it.

Selecting multiple icons

To move or delete a bunch of icons at once, you must first select all of them. Click an empty area of the desktop and drag the mouse. Surround the icons that you want to select with the rectangle that appears. Then release the mouse button. Now you can drag the icons as a group or delete them.

Fig 2.14 Selecting Multiple Icons

Select multiple desktop icons by dragging a rectangle around them

Hiding desktop icons

If you want to temporarily hide all of your desktop icons without actually removing them, right-click an empty part of the desktop, click View, and then click Show desktop items to clear the check mark from that option. Now no icons are displayed on the desktop. You can get them back by clicking Show desktop items again.

The Recycle Bin

When you delete a file or folder, it doesn't actually get deleted right away— it goes to the Recycle Bin. That's a good thing, because if you ever change your mind and decide you need a deleted file, you can get it back.

Fig 2.12 The Recycle Bin when full (left) and empty (right)

If you're sure that you won't need the deleted items again, you can empty the Recycle Bin. Doing that will permanently delete the items and reclaim any disk space they were using.

2.5.4 Control Panel

You can use Control Panel to change settings for Windows. These settings control nearly everything about how Windows looks and works, and they allow you to set up Windows so that it's just right for you.

Fig 2.15 Control Panel

2.5.5 Windows Explorer

It is also referred as File Explorer or Windows Explorer, Explorer.**Explorer** is a file browser found in every type of Microsoft Windows since Windows 95. It is used to navigate and manage the drives, folders, and files on your computer.

Open Windows Explorer

There are a number of ways to open a new Explorer window, which vary a little depending on which version of Windows you are running.

In all versions of Windows:

- Press **Win + E** (hold down the Windows key and press **E**), or
- Click **Start** and select **Run** (or press **Win + R**), then type **explorer** or **explorer.exe** and press **Enter**.

In Windows 10:

- Press the **Win + X** to open the Power User Tasks Menu, then select **File Explorer**(or press **E**), or

- Click Start, select **Programs**, select **Accessories**, then **Windows Explorer** or **Explorer**.

In Windows 8 and 8.1:

- Right-click the bottom-left corner of the screen to open the Power User Tasks Menu and choose **File Explorer** (or press **E**).

In Windows 7 and earlier versions:

- Right-click the Start button and select **Explorer** or **Open Windows Explorer**.

Instances of how Windows Explorer could be used

Below are instances of what can be done in Explorer.

Open a document

Microsoft has made it easier to find your documents in Windows by creating a My Documents folder. When in Explorer, you can open My Documents and double-click the document file to open the document.

Open a program

Although most programs create a shortcut to programs in the Start Menu or Start Screen after it has been installed, you can also open a program through Explorer. To open a program in Explorer, browse to the Program Files folder by opening the C: drive and then double-clicking the Program Files folder. In the listing of folders, find the program you want to open and double-click its folder. Finally, once in the program folder, find the executable file and double-click that file to run the program. Since file extensions are disabled by default, you can determine an executable by looking for a file with the same name of the program or that has an icon representing the program.

Search for a file or folder

Within the Search tab you can find files or folders on your computers. Press the **F3**shortcut key to open search at any time while in Windows Explorer.

Other system tasks and functions

Using Windows Explorer, you can also perform any of the system tasks listed below:

- Copy a file
- Move a file
- Rename a file or folder
- Delete a file or folder
- Create a shortcut

2.5.6 Device Manager

Using Device Manager, you can view and update the device drivers installed on your computer, check to see if hardware is working properly, and modify hardware settings.

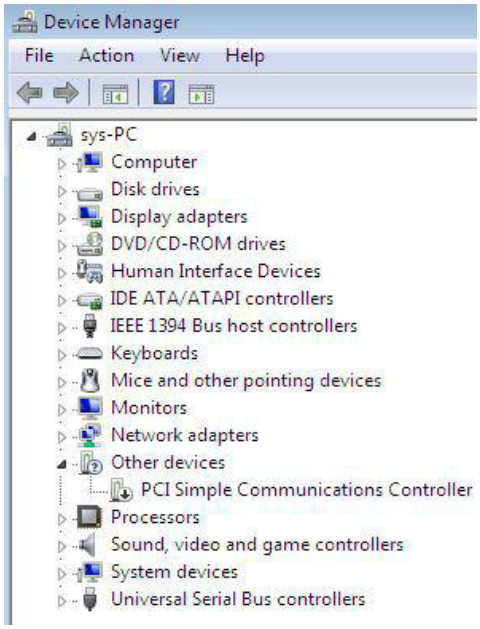


Fig 2.16 Device Manager

If you are prompted for an administrator password or confirmation, type the password or provide confirmation.

Note

Here's another way to open Device Manager: Click the Start button

 . In the search box, type Device Manager, and then, in the list of results, click Device Manager.

2.5.7 File Manager

File manager may refer to any of the following:

1. A **file manager** is a software program that helps a user manage all the files on their computer. For example, all file managers allow the user to view, edit, copy, and delete the files on their computer.

Tip: With recent versions of Microsoft Windows, Windows Explorer (Explorer) is considered the default file manager. With Apple computers, Finder is considered the default file manager.

Note: Although a file manager helps the user view and manager their files it is actually the operating system that is responsible for accessing and storing the files on a storage device.

2. When referring to Microsoft Windows 3.x, **File Manager** is a program included with Windows 3.x that enabled users to manage their files on the computer. File Manager was replaced with Explorer and the My Computer organizational metaphor in Windows 95

2.5.8 Program Manager

Program Manager is the main window of Microsoft Windows that permits users to execute each program on their computer. Users familiar with later versions of Microsoft Windows, such as Windows 98, can think of program manager as the Desktop of Windows 3.x. below is an example of how the Program Manager appeared in Windows 3.1.

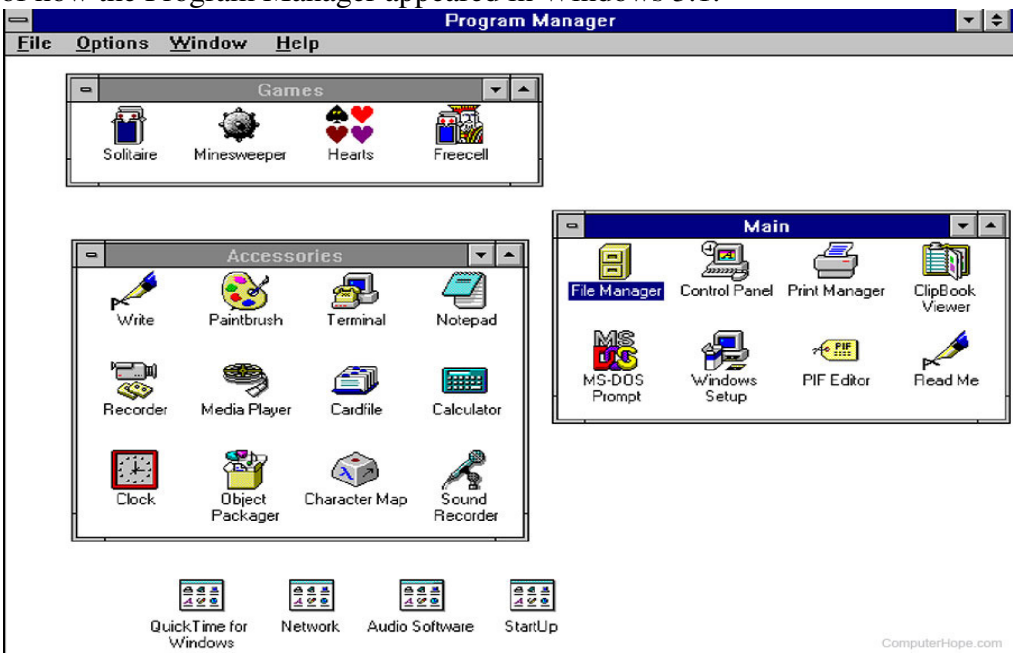


Fig 2.17 program manager

Program manager is quiet available in all versions of Microsoft Windows. Users running Windows 95, 98, NT, 2000, or XP can open it by clicking Start, Run, and typing "program" and clicking ok. The file is known as progman.exe and is located in the root directory of Windows; deleting this file can cause problems with your computer.

Creating program manager Icon

in, such as main (you can tell that it is selected because the top blue bar will be blue). Once the group has been selected, click File, New, and select Program Item.

For the description, you fill in what you want your icon to be named; for example, Notepad. Where it says command line, this is where you are going to specify where the file is; so if you were creating a shortcut for Notepad, you would need to put in c:\windows\notepad.exe. If you

do not know the path to your program, use the Browse button. Once the information is completed, click ok.

Creating a group in Program Manager

Within Program Manager click File, New, and select program group.Once the Program Group Properties window opens type the new name for the group. For example, "Games" is a good example of what a group could be.

2.5.9 Display properties

Setting Monitor Display Properties

It is easy to modify the look and feel of your computer by altering the display settings of your monitor. Changing these properties lets you set the background of the desktop, screen savers, sound schemes and more.

To do this

- Right-click anywhere on your desktop (except on an icon or shortcut) and select "Personalize" from the menu that appears. That will open a window that allows you to change the display properties of the monitor.
- You can click the "Window Color" hyperlink ("Window Color and Appearance" hyperlink in Windows Vista) to select a color scheme to use for Windows.
- If your PC is capable of enabling transparency, then you can check the "Enable transparency" hyperlink to enable transparent window display in Windows.
- You can also use the "Color intensity:" slider to set the intensity of color selected. When you are finished, you can click the "Save Changes" button ("OK" button in Windows Vista) to apply the changes to the color scheme.

You can click the "Desktop Background" hyperlink to display a window where you can select a background image or video for your Windows desktop. You can select a choice from the "Picture location" drop-down ("Location" drop-down in Windows Vista) to select from the video or pictures shown. You can also click the "Browse…" button to open a "Browse" window where you can navigate to the video file or image that you want to use as the background. You can then select it, and click the "Open" button to use the selected image or video clip as your Windows background. At the bottom of the window, you can select the desired option to choose how to position the picture or video. When you are done, you can click the "Save Changes" button ("OK" button in Windows Vista) to apply the background.

Setting screen saver

You can click the "Screen Saver" hyperlink to open the "Screen Saver Settings" window. A screen saver is an animated graphic created so that the desktop image displayed on a computer screen will not burn into the monitor permanently due to constant, unchanging display onscreen. Use the "Screen saver" drop-down to pick the screen saver you want and then click the "Preview" button to see how it looks. Hit the "Esc" button on your keyboard, or move your mouse, to stop the preview and return to the "Screen Saver" tab. The screen saver that is currently selected can be adjusted by clicking the "Settings…" button. Depending on the screen saver selected, the options of what you can change (if any) will be different. Make any selections

you would like in the settings dialog box and then click "OK" to return to the "Screen Saver" tab. In the "Wait:" box, you can set the number of minutes that the computer is inactive before the "Screen saver" starts. If the check box "On resume, display logon screen" is selected, the user's login password will be required to return to the desktop after the screen saver has been activated.

When you are finished using the "Personalize" dialog box, you can then close the window by clicking the "X" in the upper right corner of the window.

2.5.10 The Taskbar

The taskbar is the long horizontal bar at the bottom of your screen. Unlike the desktop, which can get obscured by open windows, the taskbar is almost always visible. It has three main sections:

1. The Start button , which opens the Start menu.
2. The middle section, which shows you which programs and files you have open and allows you to quickly switch between them.

3. The notification, which includes a clock and icons (small pictures) that communicate the status of certain programs and computer settings.

a. Start menu

Fig 2.18 Start Menu

b. Middle section

You're likely to use the middle section of the taskbar the most, so let's look at it first.

If you open more than one program or file at a time, you can quickly start piling up open windows on your desktop. Because windows often cover each other or take up the whole screen, it's sometimes hard to see what else is underneath or remember what you've already opened.

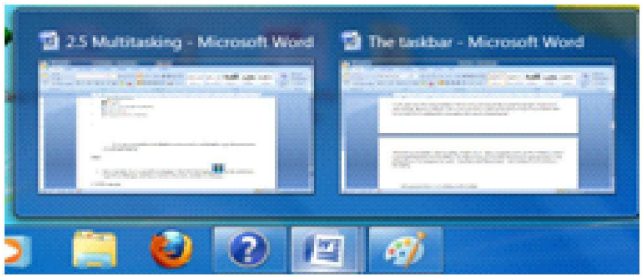


Fig 2.19 Each program has its own button on the taskbar

Click a taskbar button to switch to that window

That's where the taskbar comes in handy. Whenever you open a program, folder, or file, Windows creates a corresponding button on the taskbar. The button shows an icon that represents the open program. In the picture below, two files are opened in ms word named "2.5 multitasking" and one more file "the taskbar".

Minimize and restore windows

When a window is active (its taskbar button is highlighted), clicking its taskbar button minimizes the window. That means that the window disappears from the desktop. Minimizing a window doesn't close it or delete its contents— it temporarily removes it from the desktop.

c. The Notification Area

The notification area, on the far right side of the taskbar, includes a clock and a group of icons. It looks like this.

Fig 2.20 Notification Area

These icons communicate the status of something on your computer or provide access to certain settings. The set of icons you see depends on which programs or services you have installed and how your computer manufacturer set up your computer.

When you move your pointer to a particular icon, you will see that icon's name or the status of a setting. For example, pointing to the volume icon shows the current volume level of your computer. Pointing to the network icon displays information about whether you are connected to a network, the connection speed, and the signal strength.

Double-clicking an icon in the notification area usually opens the program or setting associated with it. For example, double-clicking the volume icon opensthe volume controls. Double-clicking the network icon opens Network and Sharing Center.

To reduce clutter, Windows hides icons in the notification area when you haven't used them in a while. If icons become hidden, click the Show hidden icons button to temporarily display the hidden icons.Click the Show hidden icons button to display all icons in the notification area

Customize the Taskbar

There are many ways to customize the taskbar to suit your preferences. For example, you can move the entire taskbar to the left, right, or top edge of the screen. You can make the taskbar larger, have Windows automatically hide it when you're not using it, and add toolbars to it.

Summary

Operating system can be treated as Master mind as it performs many functions. It provides Booting without an Operating System. It allows us to increase the Logical Memory. For this the Physical Memory of the Computer System can be used. It also provides different Types of Formats like NTFS and FAT File Systems. An Operating System is also responsible for controlling the Errors those have been occurred in the Program. It also helps with system recovery when the System gets Damaged i.e., due to Some Hardware Failure or if System doesn't Works properly. It also rectifies the system errors and provides us the Backup Facility. Every large program is divided into smaller programs by operating system called 'Threads'.These threads are executed one by one.

Today, many computer users are only familiar with Graphical user interface (i.e., tasks are done using mouse and virtual icons provided on the screen) of Microsoft Windows. MS-DOS is a command user interface in which commands are used for performing tasks. For example, in windows double click is done to open the folder and see the files in it. In MS-DOS "cd (space) dirname" is used to display list of files in a directory. Where dirname is nothing but directory name.

Before Windows has been introduced users used to operate MSDOS. But Nowadays MSDOS operating system is used rarely. Everybody is familiar with Windows because it is Graphical User Interface (GUI), where as in MS-DOS user has to remember the commands. There are many commands both internal and external. Here we cannot explain all the commands. But there is a facility to know about any command by using? Followed by particular command.

Windows 7 introduces aero, gadgets etc in latest versions

The following editions of Windows 7 include Aero:

Windows 7 Enterprise

Windows 7 Home Premium Windows 7 Professional
Windows 7 Ultimate

Aero is not included in Windows 7 Home Basic or Windows 7 Starter. You can find out current edition of Windows on which you are working by opening System in Control Panel.

The difference between Copy and Move is When you make a copy a file it will be available both at source as well as in the destination, whereas when you make a move the file is only in the destination and no more it is available in the in the source place.

Model Questions

Short Answer Types Questions

1. Define an operating system.
2. What is GUI?
3. What is CUI?
4. Expand GUI, CUI, BIOS and MSDOS.
5. What are the main functions of DOS?
6. What is an internal command?
7. What is an external command?
8. What is an aero?
9. What is search bar?
10. What is gadget?
11. What is help and support in windows?
12. What is multitasking?
13. What is file system?
14. What are four default libraries in library?
15. What is an icon?
16. What is a folder?
17. What is desktop?
18. What is recycle bin?
19. What is control panel?
20. What is device manager?
21. What is notification area in taskbar?

Long Answer Types Questions

1. Write the main functions of an operating system?
2. Write the Booting process in MSDOS.
3. Write about some internal commands.
4. Write about format and fdisk commands.
5. Write about aero options.
6. Write about gadgets.
7. Explain the help and support in windows.
8. Write about file system.
9. Write about desktop components
10. Write about control panel
11. Write about device manager
12. Write about taskbar?

UNIT - III

MS-Word

3.1 Introduction to Word Processing

- 3.1.1 Getting to Know word 2010
- 3.1.2 The Ribbon or Menu Bar
- 3.1.3 Backstage view
- 3.1.4 The Quick Access toolbar
- 3.1.5 Compatibility mode

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- 3.2.2 Opening an Existing Document
- 3.2.3 Saving a Document
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- 3.2.5 Working on Multiple Documents
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3.4 Formatting text and Paragraph

- 3.4.1 Formatting text
- 3.4.2 Formatting Paragraph

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- 3.5.1 Find and Replacing Text
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- 3.7.1 Modify Page Margins and Orientations
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3.8 Columns, tables and other Features

- 3.8.1 Create a Table

3. MS-Word

3.1 Introduction to Word Processing

Word 2010 is a **word processor** that allows you to create various types of documents such as letters, papers, flyers, and faxes. In this lesson, you will be introduced to the **Ribbon** and the new **backstage view**, and you'll learn how to create **new** documents and **open** existing ones.

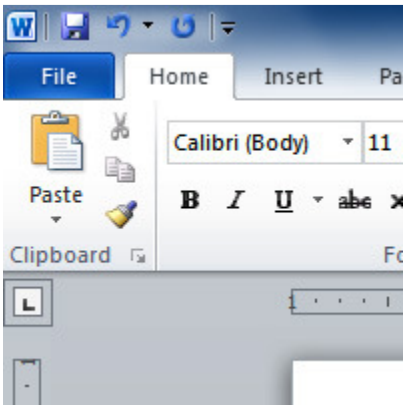


Fig: 3.1File Menu

3.1.1 Getting to know Word 2010

Word 2010 is a bit different from earlier versions, so even if you've used Word before you should take some time to familiarize yourself with the interface. The toolbars are similar to those in Word 2007, and they include the **Ribbon** and the **Quick Access toolbar**. Unlike Word 2007, commands such as **Open** and **Print** are housed in **backstage view**, which replaces the **Microsoft Office button**.

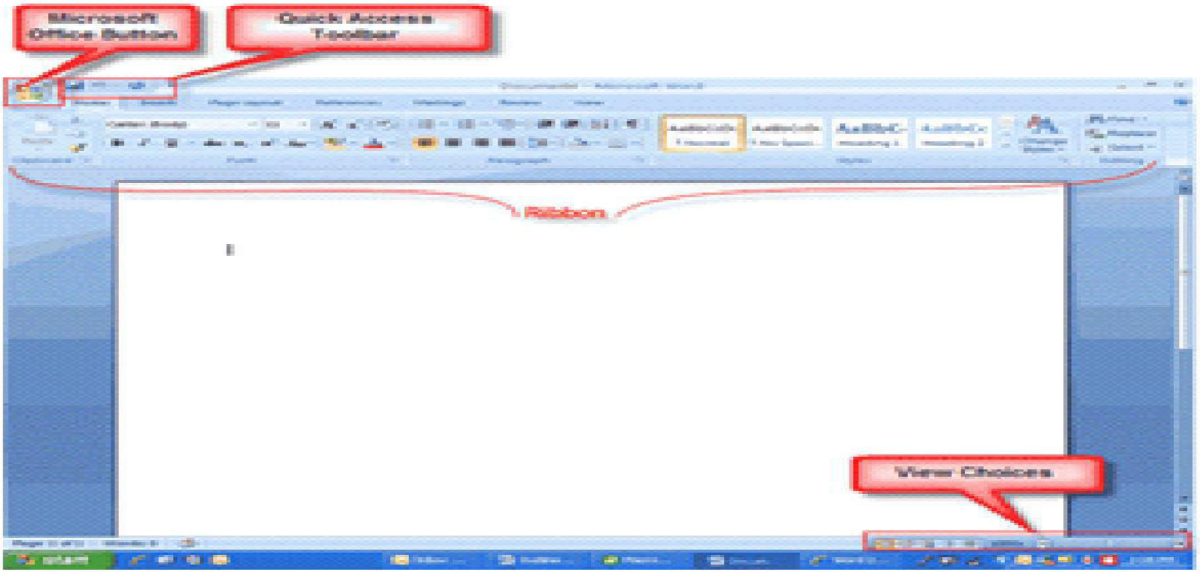


Fig 3.2 Screen Layout

3.1.2 The Ribbon or Menu Bar

The new **tabbed Ribbon system** was introduced in Word 2010 to replace traditional menus. The **Ribbon** contains all of the commands you'll need in order to perform common tasks. It contains multiple **tabs**, each with several **groups** of commands, and you can add your own tabs that contain your favorite commands. Some groups have an arrow in the bottom-right corner that you can click to see even more commands.

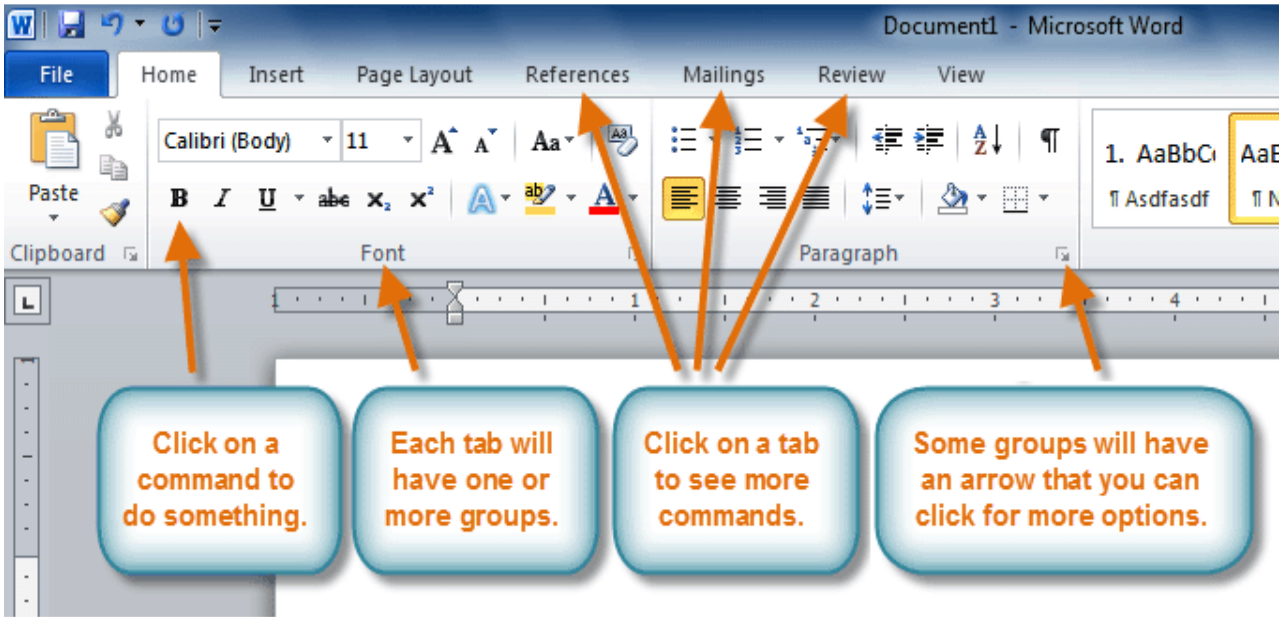


Fig 3.3 tabbed ribbons or menu bar

Certain programs, such as **Adobe Acrobat Reader**, may install additional tabs to the Ribbon. These tabs are called **add-ins**.

To minimize and maximize the Ribbon:

The Ribbon is designed to be easy to use and responsive to your current task; however, you can choose to **minimize** it if it's taking up too much screen space.

1. Click the **arrow** in the upper-right corner of the Ribbon to minimize it.

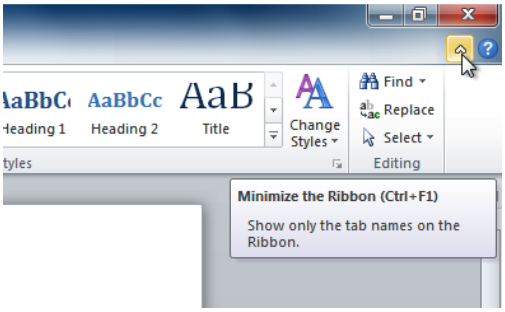


Fig 3.4 maximizes and minimizes ribbon

2. To maximize the Ribbon, click the arrow again.

When the Ribbon is minimized, you can make it reappear by clicking on a tab. However, the Ribbon will disappear again when you're not using it.

To customize the Ribbon:

You can customize the Ribbon by creating your own **tabs** with the commands you want. Commands are always housed within a **group**, and you can create as many groups as you want in order to keep your tab organized. If you want, you can even add commands to any of the default tabs, as long as you create a custom group in the tab.

1. Right-click the **Ribbon** and select **customize the Ribbon**. A dialog box will appear.

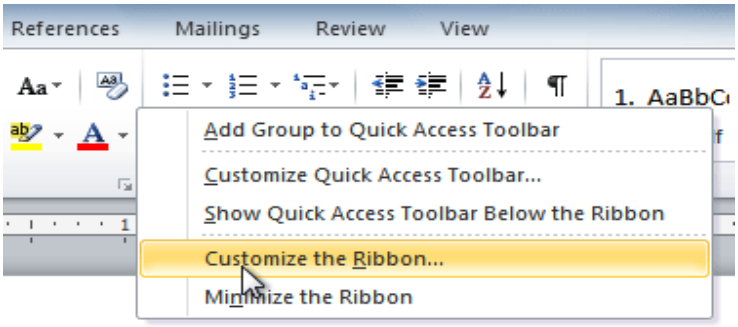
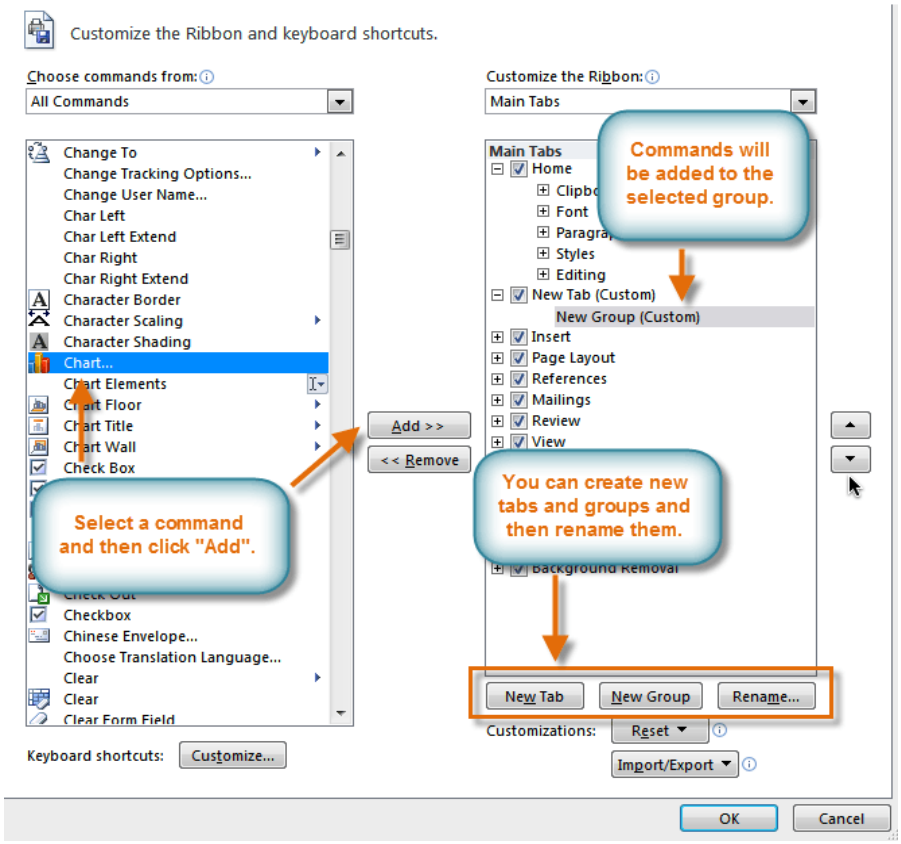


Fig 3.5 customize the ribbon

2. Click **New Tab**. A new tab will be created with a new group inside it.
3. Make sure the new group is selected.
4. Select a command from the list on the left, then click **Add**. You can also drag commands directly into a group.
5. When you are done adding commands, click **OK**.



Figs 3.6 customize the ribbon and key board shortcuts.

If you don't see the command you want, click the **Choose commands from:** drop-down box, then select **All Commands**.

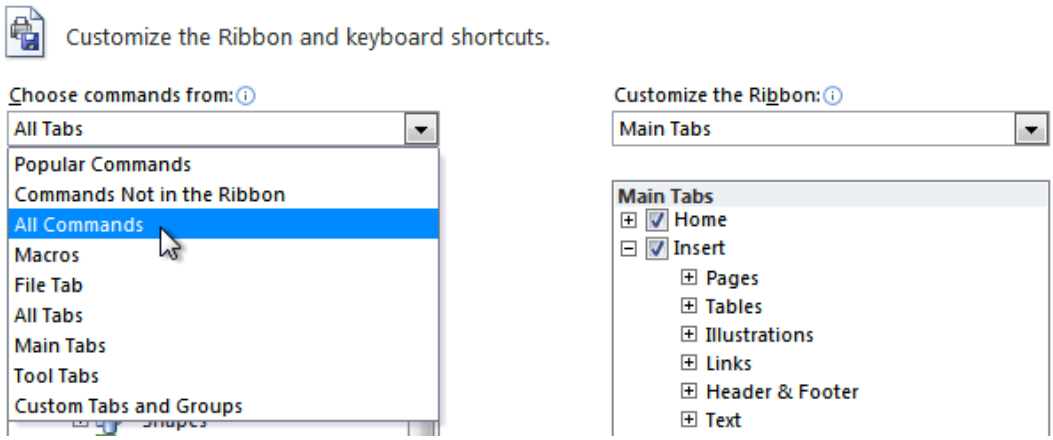


Fig 3.7 customizes the ribbon and key board shortcuts.

3.1.3 Backstage view

Backstage view gives you various options for saving, opening, printing, and sharing your files. It's similar to the **Microsoft Office button menu** from Word 2007 and the **File menu** from earlier versions of Word. However, instead of just a menu it's a full-page view, which makes it easier to work with.

To get to Backstage view:

1. Click the **File** tab.

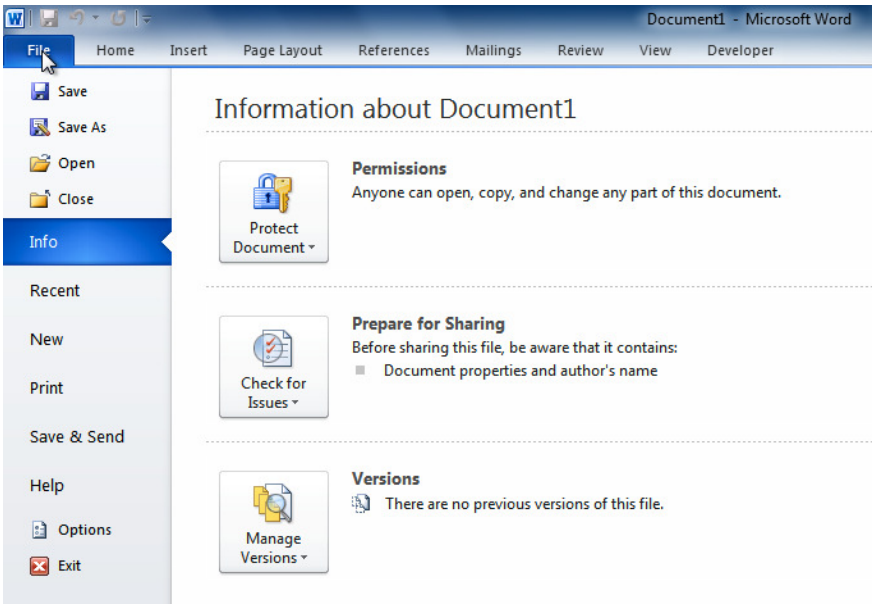


Fig 3.8 Backstage View

2. You can choose an option on the left side of the page.
3. To get back to your document, click any tab on the Ribbon.

Click the buttons in the interactive below to learn about the different things you can do in Backstage view.

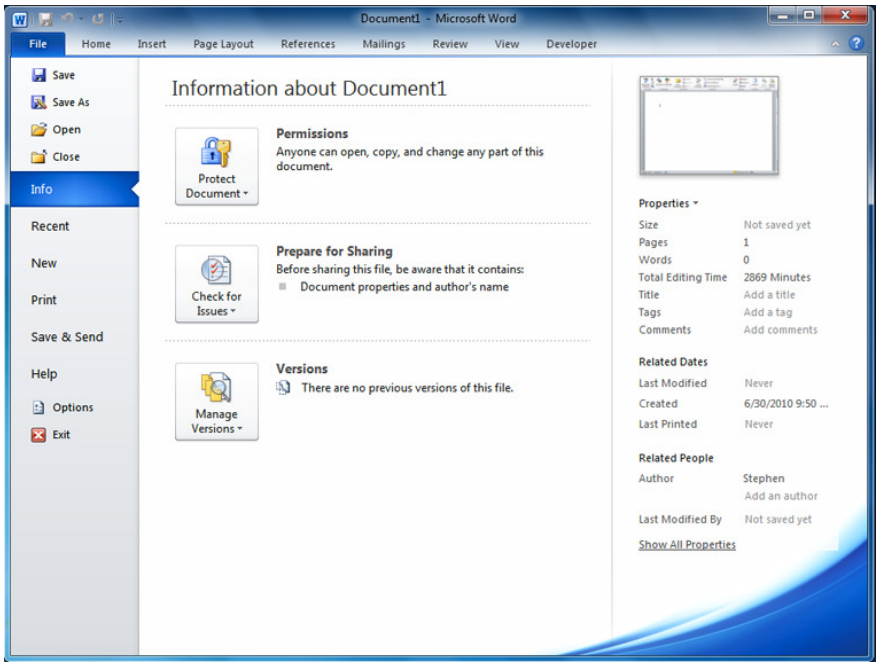


Fig 3.9 permission and prepare for sharing in back stage view

3.1.4 The Quick Access toolbar

The **Quick Access toolbar**, located above the Ribbon, lets you access common commands no matter which tab you're on. By default, it shows the **Save**, **Undo**, and **Repeat** commands. You can add other commands to make it more convenient for you.

To add commands to the Quick Access toolbar:

1. Click the **drop-down arrow** to the right of the **Quick Access toolbar**.
2. Select the command you want to add from the drop-down menu. It will appear in the Quick Access toolbar.

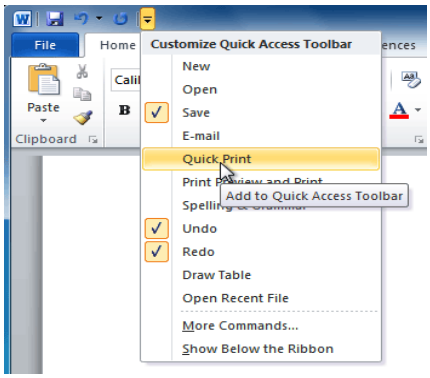


Fig 3.10 Quick Access menu bar

The Ruler

The **Ruler** is located at the top and to the left of your document. It makes it easier to adjust your document with precision. If you want, you can hide the Ruler to free up more screen space.

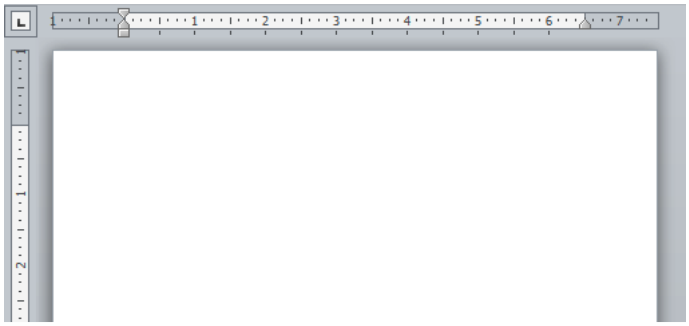


Fig 3.11 ruler for document adjustment

To hide or view the Ruler:

1. Click the **View Ruler** icon over the scrollbar to hide the ruler.
2. To show the ruler, click the **View Ruler** icon again.

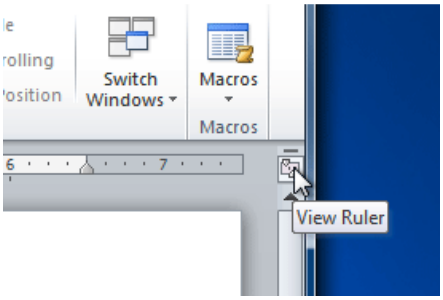


Fig 3.12 view and hide button for ruler

3.1.5 Compatibility mode

Sometimes you may need to work with documents that were created in earlier versions of Microsoft Word, such as Word 2007 or Word 2003. When you open these types of documents, they will appear in Compatibility mode.

Compatibility mode disables certain features, so you'll only be able to access commands found in the program that was used to create the document. For example, if you open a document created in Word 2007, you can only use tabs and commands found in Word 2007.

In the image below, you can see how Compatibility mode can affect which commands are available. Because the document on the left is in Compatibility mode, it only shows commands that were available in Word 2007.

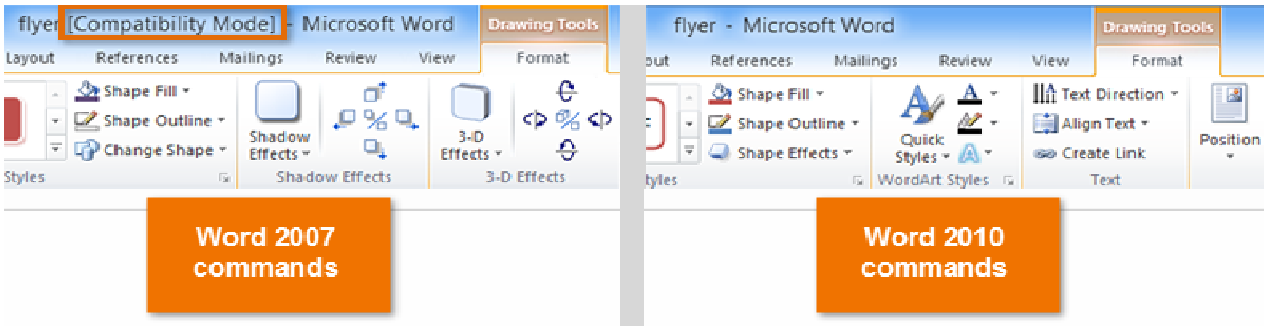


Fig 3.13 comparison of drawing tools in 2007 and 2010

To exit Compatibility mode, you'll need to **convert** the document to the current version type. However, if you're collaborating with others who only have access to an earlier version of Word, it's best to leave the document in Compatibility mode so the format will not change.

You can review this support page from Microsoft to learn more about which features are disabled in Compatibility mode.

To convert a document:

If you want access to all Word 2010 features, you can **convert** the document to the 2010 file format.

Note that converting a file may cause some changes to the **original layout** of the document.

1. Click the **File** tab to access Backstage view.
2. Locate and select the **Convert** command.

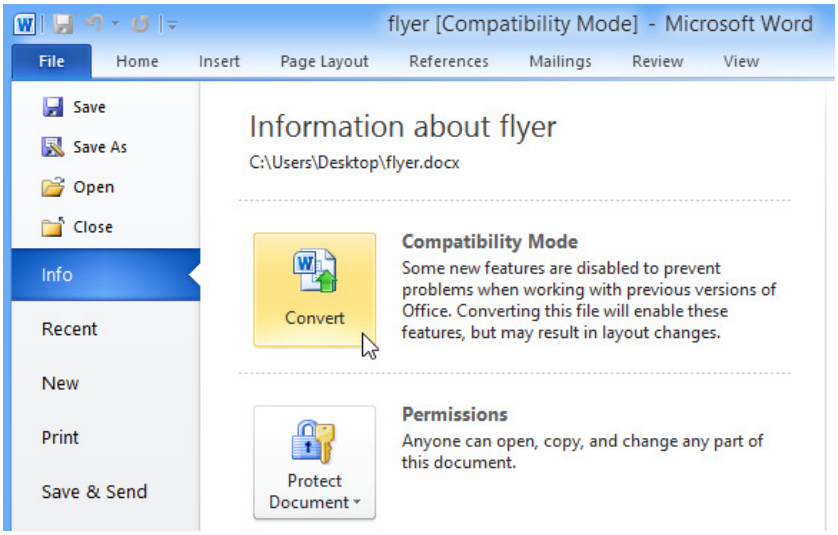


Fig 3.14 converting document

3. A dialog box will appear. Click **OK** to confirm the file upgrade.

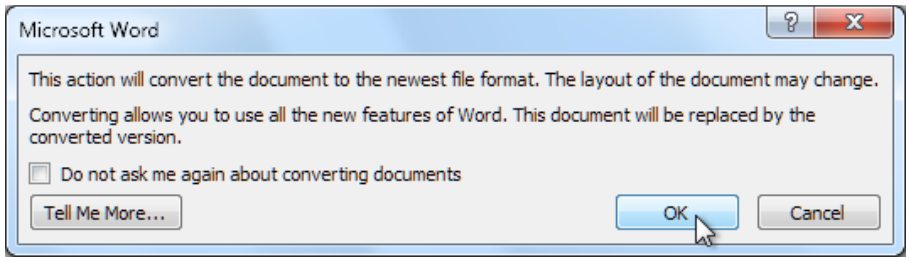


Fig 3.15 popup for converting

4. The document will be converted to the newest file type

3.2 Editing a Document

There are several ways to create a new document, opening an existing document, and saving documents in Word

3.2.1 Opening a New Document:

Click the **Microsoft Office Button** and Click **New** or

Simply use the shortcut key creating a new empty document**CTRL+N** (Depress the CTRL key while pressing the "N") on the keyboard

You will notice that when you click on the Microsoft Office Button and Click **New**, you have many choices about the types of documents you can create. If you wish to start from a blank document, click **Blank**.

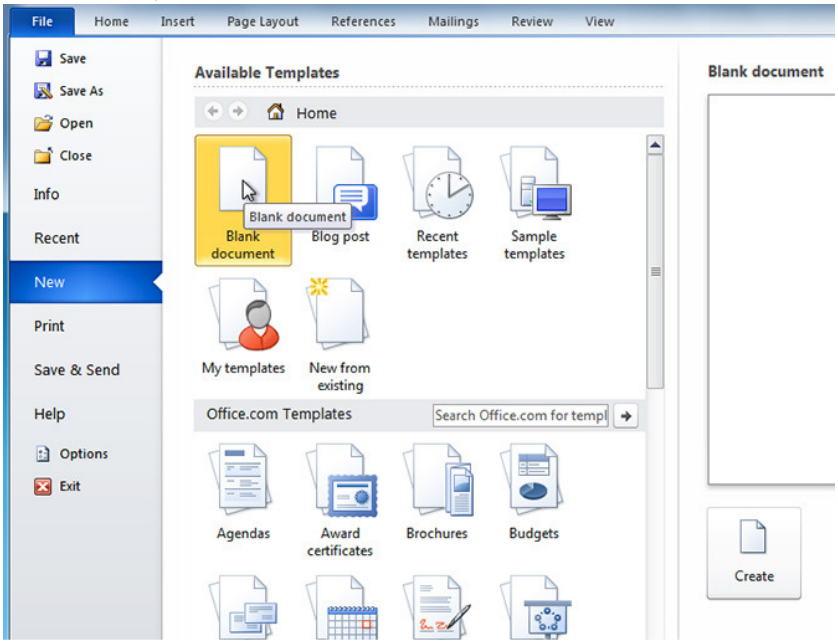


Fig 3.16 open for blank document

You have a search option where you can type the template which you want and you can browse it

3.2.2 Opening an Existing Document

- Click the Microsoft Office Button and Click Open, or
- Press CTRL+O (Depress the CTRL key while pressing the "O") on the keyboard, or
- If you have recently used the document you can click the Microsoft Office

Button and click the name of the document in the Recent Documents section of the window Insert picture of recent docs

3.2.3 Saving a Document:

- Click the Microsoft Office Button and Click Save or Save As(remember, if you're sending the document to someone who does not have Office 2007, you will need to click the Office Button, click Save As, and Click Word 97-2003 Document), or
- Press CTRL+S (hold the CTRL key and press "s") on the keyboard, or

- Click the **File** icon on the Quick Access Toolbar

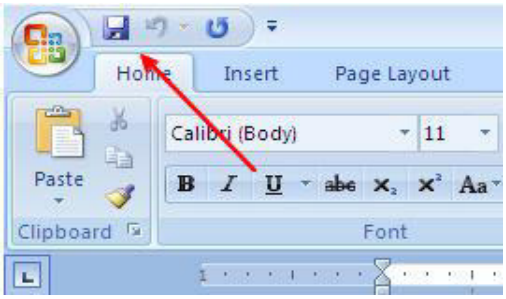


Fig 3.17 Saving a Document

3.2.4 Renaming Documents

To rename a Word document

- Click the **Office Button** and find the file you want to rename.
- Right-click the document name with the mouse and select **Rename** from the shortcut menu.
- Type the new name for the file and press the **ENTER** key.

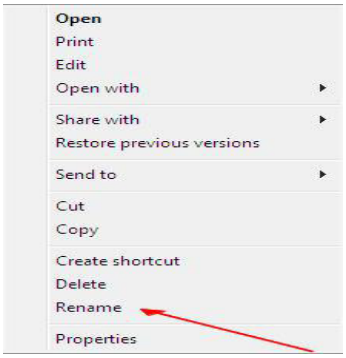


Fig 3.18 renaming word document

3.2.5 Working on Multiple Documents

We can work with more than one document at a time. All open documents will be listed in the **View Tab** of the Ribbon when you click on Switch Windows. The current document has a checkmark beside the file name. Select another open document to view it.

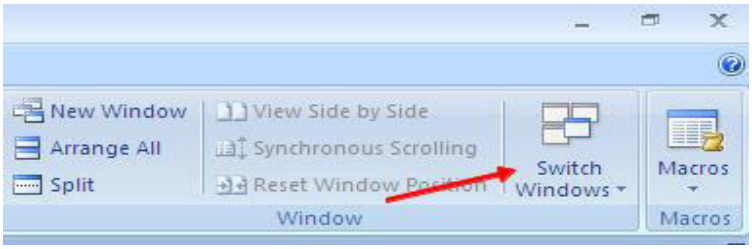


Fig 3.19 Working on Multiple Documents

3.2.6 Document Views

There are many ways to view a document in Word.

Print Layout: This is a view of the document as it would appear when printed. It includes all tables, text, graphics, and images.

Full Screen Reading: This is a full view length view of a document.

Good for viewing two pages at a time.

Web Layout: This is a view of the document as it would appear in a web browser.

Outline: This is an outline form of the document in the form of bullets.

Draft: This view does not display pictures or layouts, just text.

To view a document in different forms, click the document views shortcuts at the bottom of the screen  or

Click the **View Tab** on the Ribbon

Click on the appropriate document view.

Fig 3.20 print layouts of word document

3.2.7 Closing a Document:

To close a document:

Click the **Office Button** ->Click **Close**

3.2.8 Typing and inserting Text

To enter text, just start typing! The text will appear where the blinking cursor is located. Move the cursor by using the arrow buttons on the keyboard or positioning the mouse and clicking the left button. The keyboard shortcuts listed below are also helpful when moving through the text of a document:

Move Action	**Keystroke**
Beginning of the line	**HOME**
End of the line	**END**
Top of the document	**CTRL+HOME**
End of the document	**CTRL+END**

3.3 Move and Copy Text:

In order to move or copy the text from one place to another place first we have to select the text which we want to copy or move

3.3.1 Selecting Text

To change any attributes of text it must be highlighted first. Select the text by dragging the mouse over the desired text while keeping the left mouse button depressed, or hold down the **SHIFT** key on the keyboard while using the arrow buttons to highlight the text. The following table contains shortcuts for selecting a portion of the text:

Selection	**Technique**
Whole Word	Double-click within the word
Whole paragraph	Triple-click within the paragraph
Several words or lines	Drag the mouse over the words , or hold down **SHIFT** while using the arrow keys
	Choose **Editing** I **Select** I **SelectAll** from the Ribbon , or use ctrl+A

Deselect the text by clicking anywhere outside of the selection on the page or press an arrow key on the keyboard.

3.3.2 Inserting Additional Text

Text can be inserted in a document at any point using any of the following methods:

Type Text: Put your cursor where you want to add the text and begintyping

Copy and Paste Text: Highlight the text you wish to copy and right click and click

Copy (ctrl+c), put your cursor where you want the text in the document and right click and click **Paste (ctrl+v)**.

Cut and Paste Text: Highlight the text you wish to copy and right click and click **Cut**, put your cursor where you want the text in the document and right click and click **Paste**.

Drag Text: Highlight the text you wish to move, click on it and drag itto the place where you want the text in the document.

You will notice that you can also use the Clipboard group on the Ribbon.

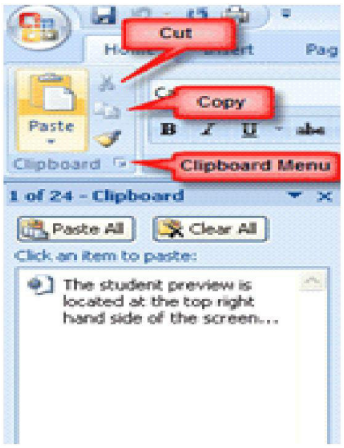


Fig 3.21 Clipboard button

3.3.3 Rearranging Blocks of Text

To rearrange text within a document, you can utilize the **Clipboard Group** on the **Home Tab** of the Ribbon. Insert picture of clipboard group labeled.

Move text: Cut and Paste or Drag as shown above

Copy Text: Copy and Paste as above or use the Clipboard group on the Ribbon

Paste Text: Ctrl + V (hold down the CTRL and the "V" key at thesame time) or use the Clipboard group to Paste, Paste Special, or Paste as Hyperlink

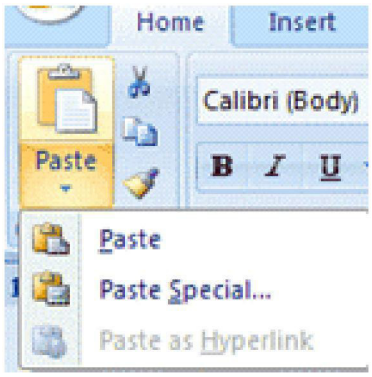


Fig 3.22 Paste button

3.3.4 Deleting Blocks of Text

Use the **BACKSPACE** and **DELETE** keys on the keyboard to delete text. Backspace will delete text to the left of the cursor and Delete will erase text to the right. To delete huge amount of data simply select the data which you want to delete and simply press **delete** key on the keyboard.

Help System

Click the **Microsoft Office Help** button in the upper right or the **F1** key on your keyboard to open Help on your computer. The first time you use the Help feature in Microsoft Office programs, the online Help window appears in a default location and size on your screen. You can change the way the Help window is displayed. After that, when you open the Help window, the settings that you made are maintained.

Each program in Microsoft Office has a separate Help window. This means that when you open the Help window from one program, such as Microsoft Office Word, and then go to another program, such as Microsoft Office Outlook, and open Help, you see two separate Help windows. Microsoft Office maintains unique settings for each of these Help windows. For example, the Help window for Word maintains a different position, size, and **Keep on Top** state than the Help window for viewpoint.

3.4 Formatting Text and Paragraph

To create and design effective documents, you need to know how to **format text**. In addition to making your document more appealing, **formatted text** can draw the reader's attention to specific parts of the document and help communicate your message.

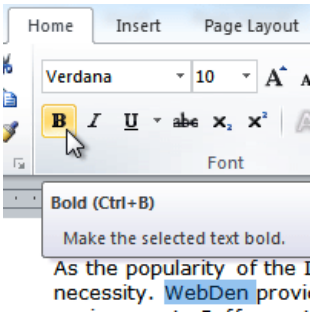


Fig: 3.23 font styles

In this lesson, you'll learn to format the **font size**, **style**, and **color**; **highlight** the text; and use the **bold**, **italic**, **underline**, and **change case** commands.

3.4.1 Formatting text:

Formatted text can emphasize important information and help organize your document. In Word, you have several options for adjusting the **font** of your text, including **size**, **color**, and inserting special **symbols**. You can also adjust the **alignment** of the text to change how it is displayed on the page.

To change the font size:

1. Choose the text you want to modify.
2. Click the **drop-down arrow** next to the **Font Size** box on the **Home** tab. A drop-down menu appears.
3. Select the desired font size from the menu. Instead, you can type the value you want and then press **Enter** on your keyboard.

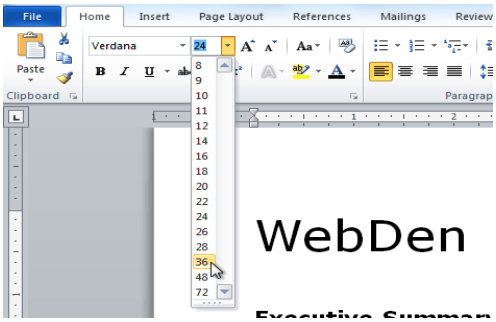


Fig: 3.24 slider for font sizes

You can also use the **Grow Font** and **Shrink Font** commands to change the size.

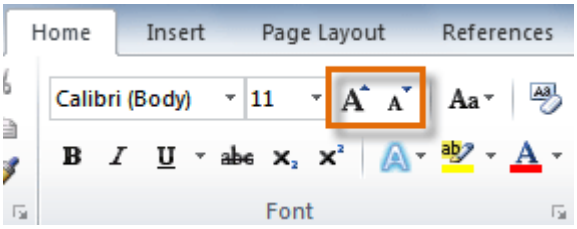


Fig: 3.25 font shrink and growing buttons

To change the font:

1. Select the text you want to modify.
2. Click the **drop-down arrow** next to the **Font** box on the **Home** tab. The **Font** drop-down menu appears.
3. Move the mouse pointer over the various fonts. A live preview of the font will appear in the document.

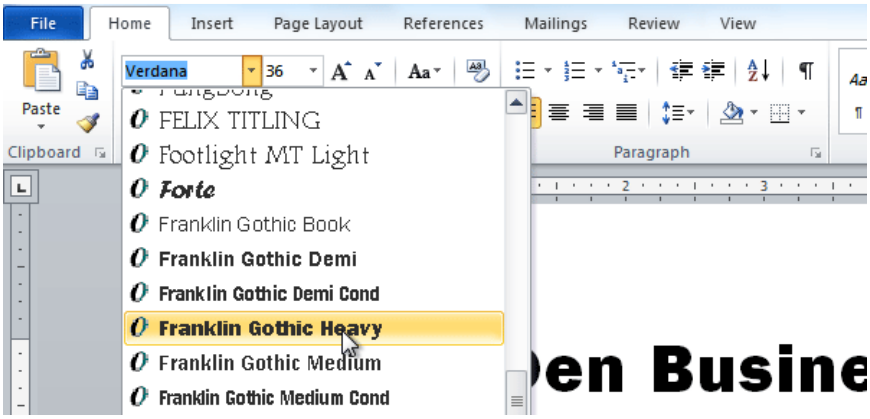


Fig:3.26 different types of font styles

4. Select the font you want to use. The font will change in the document.

To change the font color:

1. Select the text you want to modify.
2. Click the **Font Color** drop-down arrow on the **Home** tab. The **Font Color** menu appears.
3. Move the mouse pointer over the various font colors. A live preview of the color will appear in the document.

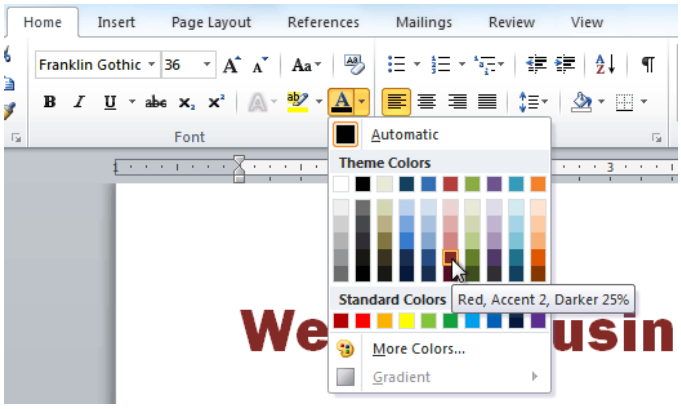


Fig:3.27 custom font color

4. Select the font color you want to use. The font color will change in the document.

Your color choices aren't limited to the drop-down menu that appears. Select **More Colors** at the bottom of the list to access the Colors dialog box. Choose the color you want, then click OK.

To Highlight text:

1. From the **Home** tab, click the **Text Highlight Color** drop-down arrow. The **Highlight Color** menu appears.

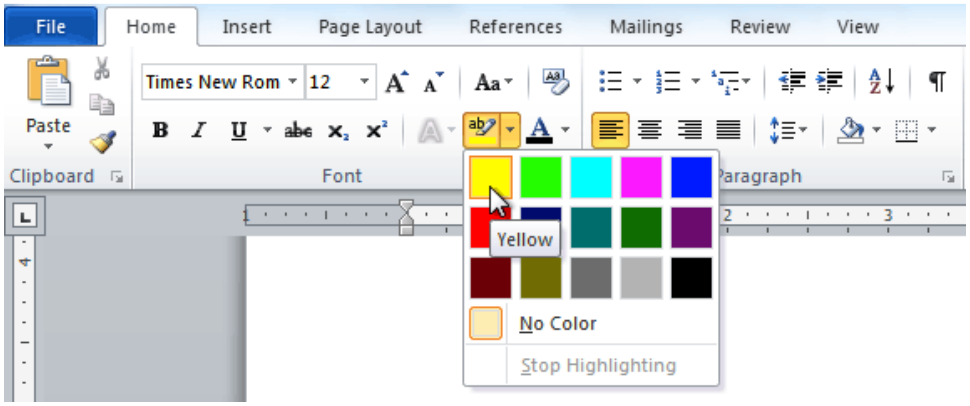


Fig:3.28 font colors

2. Select the desired highlight color.
3. Select the text you want to modify. It will then be highlighted.

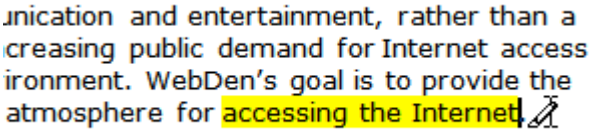


Fig:3.29 font high lighting

4. To switch back to the normal cursor, click the **Text Highlight Color** command.

To use the bold, italic, and underline commands:

1. Select the text you want to modify.
2. Click the **Bold(ctrl+b)**, *Italic(ctrl+i)*, or Underline(ctrl+u) command in the **Font** group on the Home tab.

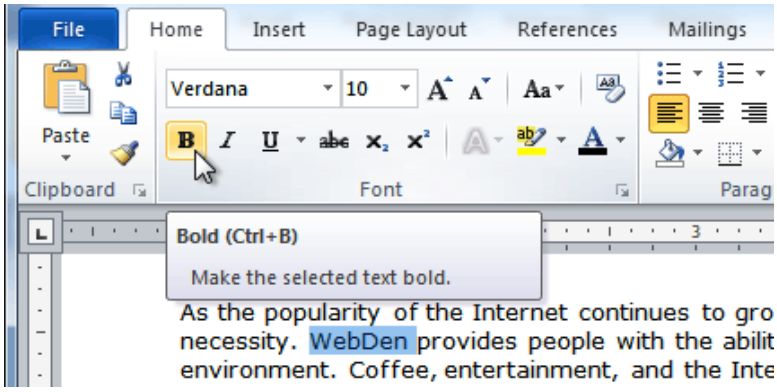


Fig:3.30 bold selected text

To change text case:

1. Select the text you want to modify.
2. Click the **Change Case** command in the **Font** group on the Home tab.
3. Select the desired case option from the list.

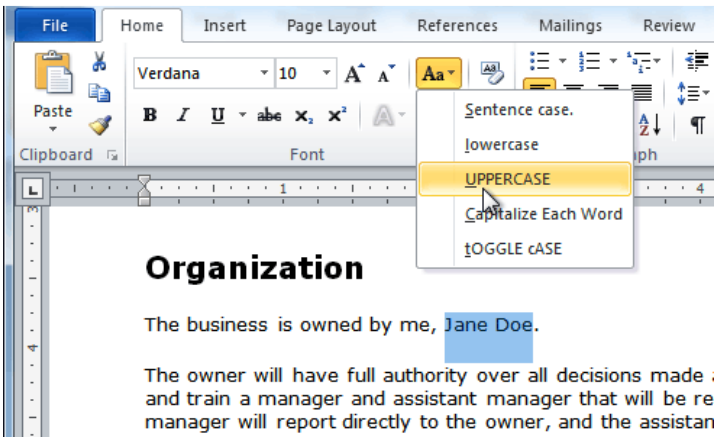


Fig: 3.31 case sensitivity of font

To change text alignment:

1. Select the text you want to modify.
2. Select one of the four **alignment options** from the **Paragraph** group on the **Home** tab.
    - **Align Text Left:** Aligns all selected text to the left margin
    - **Center:** Aligns text an equal distance from the left and right margins
    - **Align Text Right:** Aligns all selected text to the right margin
    - **Justify:** Aligns text equally on both sides and lines up equally to the right and left margins; used by many newspapers and magazines

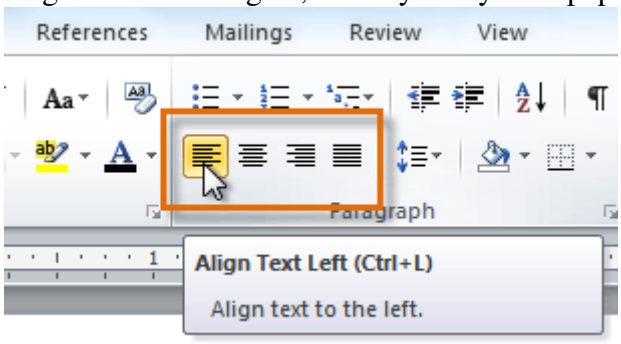


Fig: 3.32 font alignment

Copy Formatting

If you have already formatted text the way you want it and would like another portion of the document to have the same formatting, you can copy the formatting. To copy the formatting, do the following:

Select the text with the formatting you want to copy.

Copy the format of the text selected by clicking the **Format Painter** button on the Clipboard Group of the Home Tab.

Fig 3.33 Copy formatting

Apply the copied format by selecting the text and clicking on it.

Clear Formatting

To clear text formatting:

Select the text to which you want to clear the formatting

Click the **Styles** dialogue box on the Styles Group on the Home Tab

Click **Clear All**

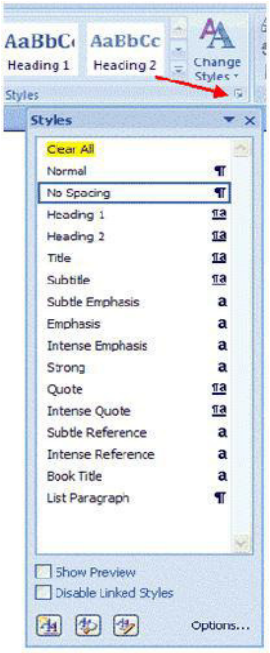


Fig 3.34 clear formatting

3.4.2 Formatting Paragraph

Formatting paragraphs allows you to change the look of the overall document. You can access manyofthe tools of paragraphformatting by clicking the **Page Layout** Tab of the Ribbon or the **Paragraph** Group on the Home Tab of the Ribbon.

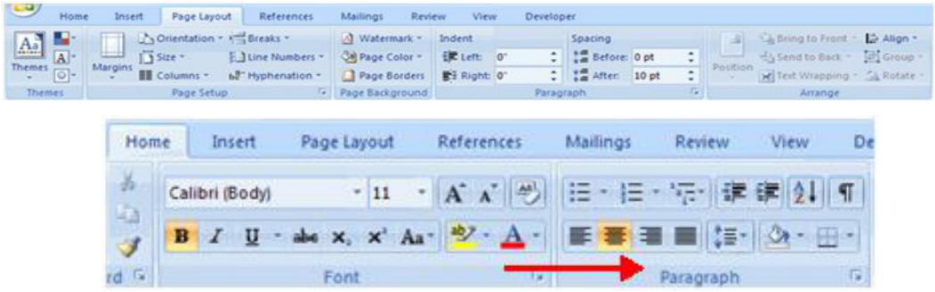


Fig 3.35 Formatting paragraph

The paragraph alignment allows you to set how you want text to appear.

To change the alignment:

Click the **Home Tab**

Choose the appropriate button for alignment on the Paragraph Group.

Align Left: the text is aligned with your left margin.

Center: The text is centered within your margins.

Align Right: Aligns text with the right margin.

Justify: Aligns text to both the left and right margins.

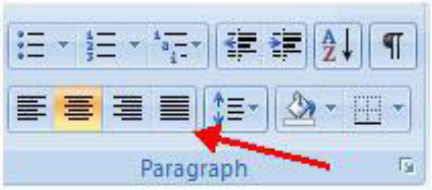


Fig 3.36 Paragraph alignment

Indent Paragraphs

Indenting paragraphs allows you set text within a paragraph at different margins.

There are several options for indenting:

First Line: Controls the left boundary for the first line of a paragraph

Hanging: Controls the left boundary of every line in a paragraph exceptthe first one

Left: Controls the left boundary for every line in a paragraph

Right: Controls the right boundary for every line in a paragraph

To indent paragraphs, you can do the following:

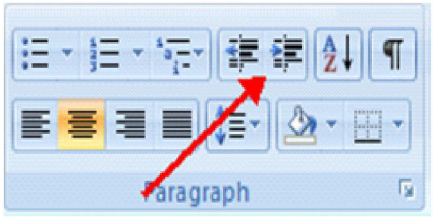


Fig 3.37 Indent alignment

Click the **Indent** buttons to control the indent.

Click the **Indent** button repeated times to increase the size of the indent.

Click the dialog box of the **Paragraph** Group

Click the **Indents and Spacing**

TabSelect your indents

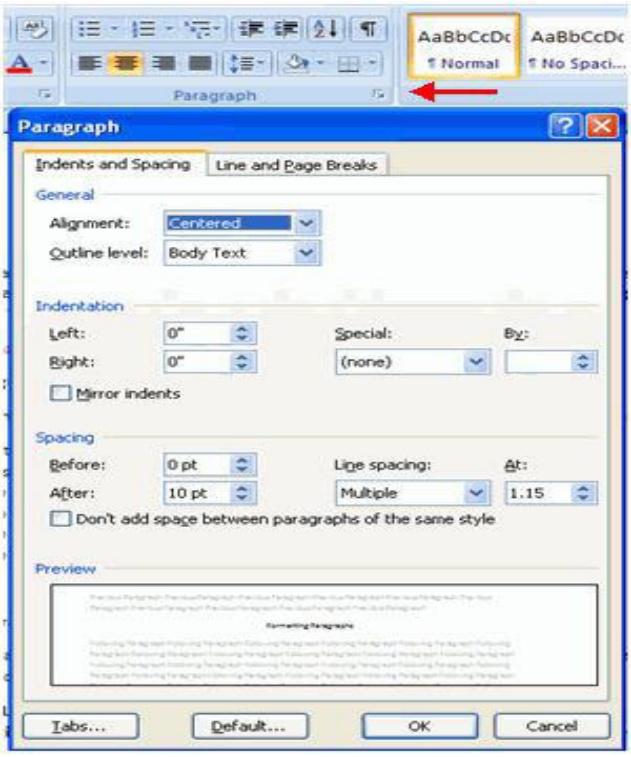


Fig 3.38 Paragraph group

Add Borders and Shading

You can add borders and shading to paragraphs and entire pages. To create a border around a paragraph or paragraphs:

Select the area of text where you want the border or shading.

Click the **Borders** Button on the Paragraph Group on the Home Tab

Choose the **Border and Shading**

Choose the appropriate options

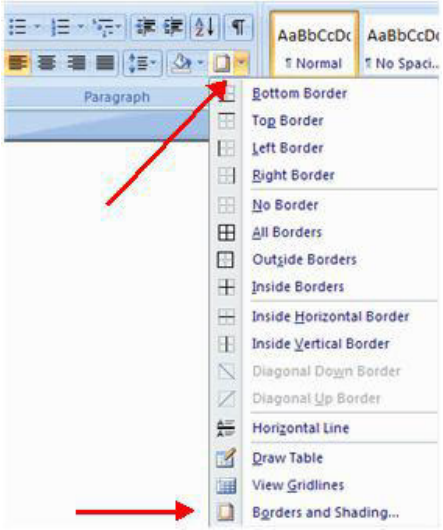


Fig 3.39 Borders and Shading

Apply Styles

Styles are a present collection of formatting that you can apply to text. To utilize **Quick Styles:**

Select the text you wish to format.

Click the dialog box next to the **Styles Group** on the Home Tab. Click the style you wish to apply.

Fig 3.40 Paragraph group

Change Spacing Between Paragraphs and Lines

You can change the space between lines and paragraphs by doing the following:

Select the paragraph or paragraphs you wish to change.

On the Home Tab, Click the **Paragraph** Dialog Box

Click the **Indents and Spacing** Tab

In the **Spacing** section, adjust your spacing accordingly.

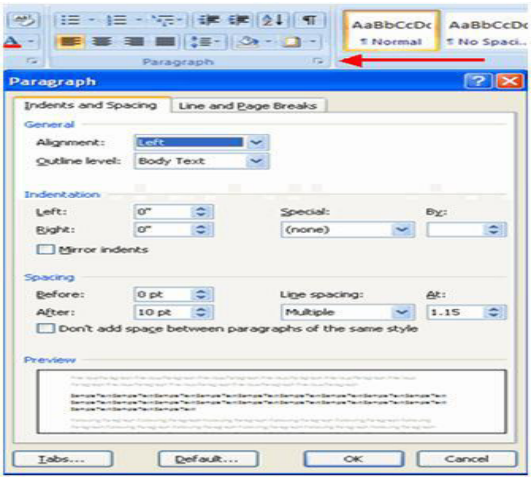


Fig 3.41 Spacing between paragraph and lines

3.5 Find and Replace Text and Spell Checking

3.5.1 Find and Replace Text

To find a particular word or phrase in a document:

- Click**Find**on the**Editing Group**on the Ribbon
- To find and replace a word or phrase in the document, click**Replace**on the **Editing Group** of the Ribbon.

Undo Changes

To undo changes:

- Click the**Undo Button**on the Quick Access Toolbar

Fig 3.42 Undo group

3.5.2 Spell Checking:

Introduction:

Are you worried about making mistakes when you type? Don't be. Word provides you with several **proofing features** that will help you produce professional, error-free documents. In this lesson, you will learn about the various **proofing** features, including the **spelling and grammar** tool.

Checking spelling and grammar:

To make your document appear professional, you'll want to make sure it is free from **spelling and grammar** errors. Word has several options for checking your spelling. You can run a spelling and grammar **check**, or you can allow Word to check your spelling **automatically** as you type.

To run a spelling and grammar check:

1. Go to the **Review** tab.
2. Click on the **Spelling & Grammar** command.

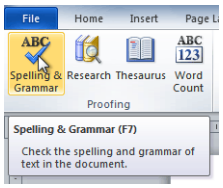


Fig 3.43 spelling and grammar

3. The **Spelling and Grammar** dialog box will open. For each error in your document, Word will try to offer one or more **suggestions**. You can select a suggestion and click **Change** to correct the error.

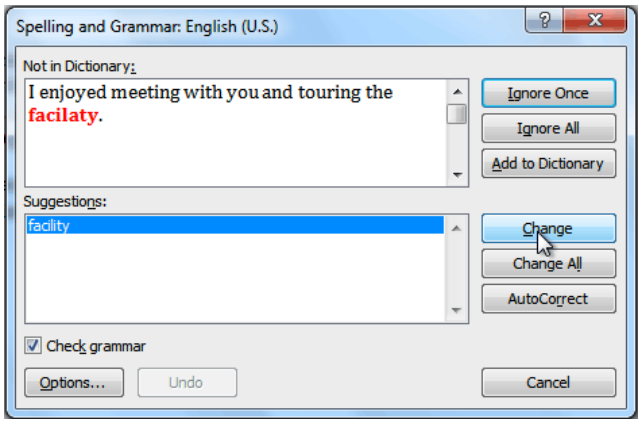


Fig 3.44 spelling and grammar checking

4. If no suggestions are given, you can manually type the correct spelling.

Ignoring "errors"

The spelling and grammar check is **not always correct**. Particularly with grammar, there are many errors Word will not notice. There are also times when the spelling and grammar check will say something's an error when it's actually not. This often happens with people's names, which may not be in the dictionary.

If Word says something is an error, you can choose not to change it. Depending on whether it's a spelling or grammar error, you can choose from several options:

For spelling "errors"

- **Ignore Once:** This will skip the word without changing it.
- **Ignore All:** This will skip the word without changing it, and it will also skip all other instances of this word in the document.
- **Add to Dictionary:** This adds the word to the dictionary so it will never come up as an error. Make sure the word is spelled correctly before choosing this option.

For grammar "errors"

- **Ignore Once:** This will skip the "error" without changing it.
- **Ignore Rule:** This will skip this "error" and all other instances that relate to this grammar rule.
- **Next Sentence:** This skips the sentence without changing it and leaves it marked as an error. This means it will still show up if you do another spelling and grammar check later on.

If you're not sure about a grammar error, you can click **Explain** to see why Word thinks it's an error. This can help you determine whether you want to change it.

Automatic spelling and grammar checking

By default, Word automatically checks your document for **spelling and grammar** errors, so you may not even need to run a separate spelling and grammar check. These errors are indicated by **colored wavy lines**.

- The **red line** indicates a misspelled word.
- The **green line** indicates a grammatical error.
- The **blue line** indicates a contextual spelling error. This feature is turned off by default.

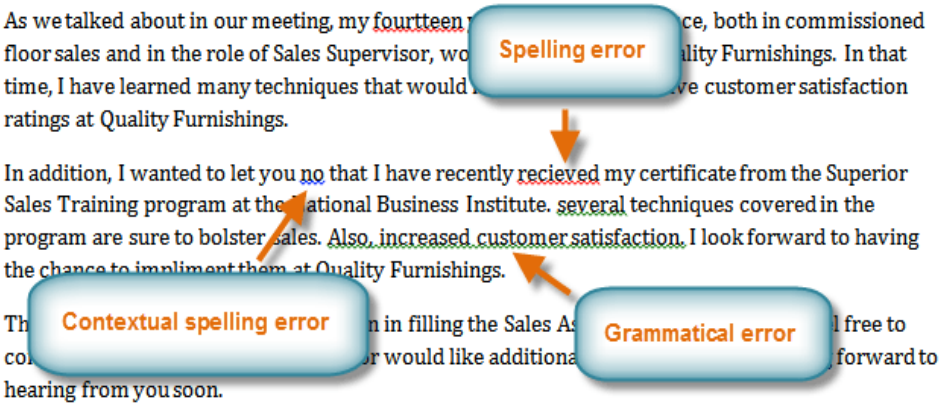


Fig 3.45 graphical representation of contextual, grammatical and spelling errors

A **contextual spelling** error occurs when the wrong word is used but the word is spelled correctly. For example, if you write **Deer Mr. Theodore** at the beginning of a letter, **deer** is a contextual spelling error because **dear** should have been used. **Deer** is spelled correctly, but it is used incorrectly in this letter.

To use the spelling check feature:

1. Right-click the **underlined word**. A menu will appear.
2. Click the **correct spelling** of the word from the **listed suggestions**.
3. The corrected word will appear in the document.

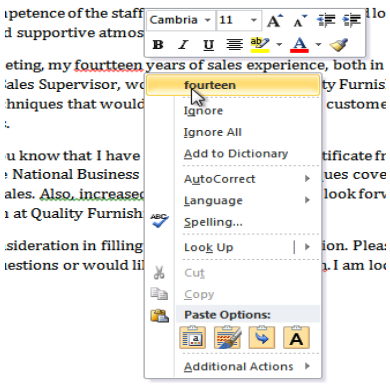


Fig 3.46 features of spell checking

You can choose to **ignore** an underlined word, add it to the **dictionary**, or go to the **Spelling** dialog box for more options.

To use the grammar check feature:

1. Right-click the **underlined word or phrase**. A menu will appear.
2. Click the **correct phrase** from the **listed suggestions**.
3. The corrected phrase will appear in the document.

You can also choose to **Ignore** an underlined phrase, go to the **Grammar** dialog box, or click **About This Sentence** for information on the grammar rule.

To change the automatic spelling and grammar check settings:

1. From **Backstage view**, click **Options**.
2. Select **Proofing**. The dialog box gives you several options to choose from.
   - If you don't want Word to automatically check spelling, uncheck **Check spelling as you type**.
   - If you don't want grammar errors to be marked, uncheck **Mark grammar errors as you type**.
   - To check for contextual spelling errors, check **Use contextual spelling**.

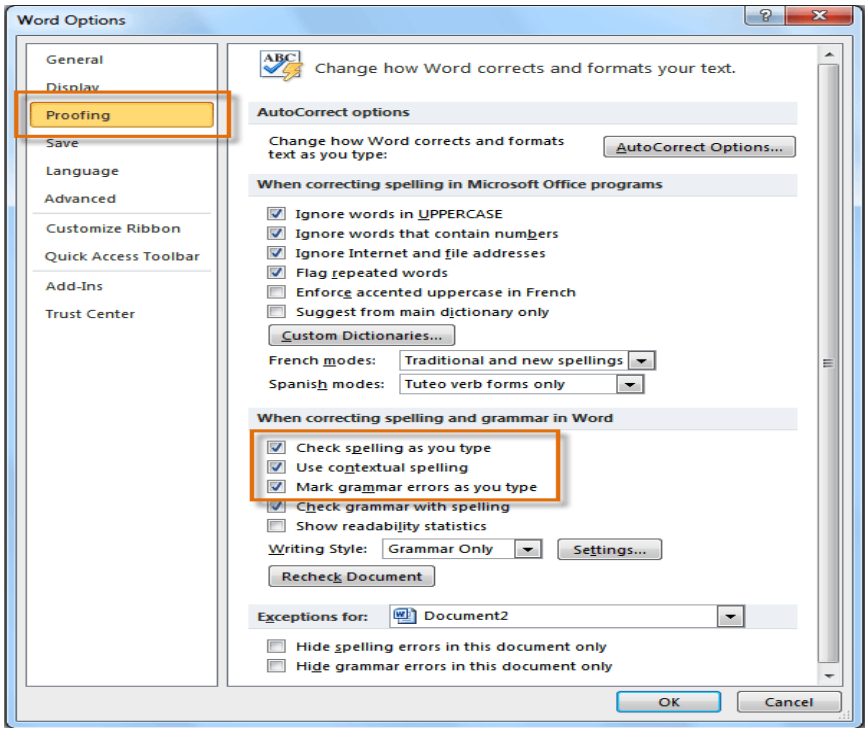


Fig 3.47 proofing

If you've turned off the automatic spelling and/or grammar checks, you can still run a check by going to the **Review tab** and clicking the **Spelling & Grammar** button.

To hide spelling and grammar errors in a document:

If you're sharing a document like a resume with someone, you might not want that person to see those annoying red, green, and blue lines. Turning off the automatic spelling and grammar checks only applies to your computer, so the lines may still show up when someone else views your document. Luckily, you can hide spelling and grammar errors in a document so the lines will not show up on any computer.

1. From **Backstage view**, click **Options**.
2. Select **Proofing**.
3. In the drop-down box next to **"Exceptions for:"** select the correct document (if you have more than one document open).
4. Put a check mark next to **Hide spelling errors in this document only** and **Hide grammar errors in this document only**.
5. Click **OK**.

3.5.3 Thesaurus

The Thesaurus allows you to view synonyms. To use the thesaurus:

- Click the**Review**Tab of the Ribbon
- Click the**Thesaurus**Button on the Proofing Group.

- The thesaurus tool will appear on the right side of the screen and youcan view word options.

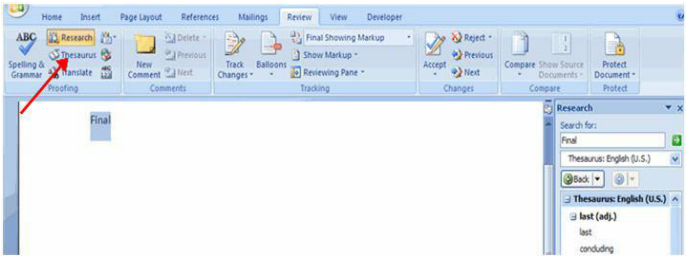


Fig 3.48 Thesaurus

You can also access the thesaurus by right-clicking any word and choosing **Synonyms** on the menu.

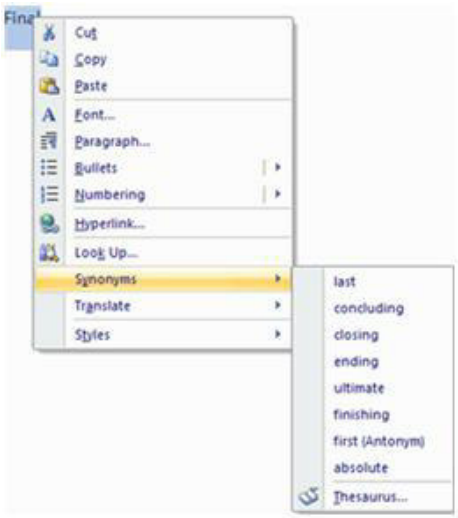


Fig 3.49 Synonyms

Add AutoText to the Quick Access Toolbar

1. Click the **Microsoft Office Button**, and then click **Word Options**.
2. Click **Customize**.
3. In the list under **Choose commands from**, click **All Commands**.
4. Scroll through the list of commands until you see **AutoText**.
5. Click **AutoText**, and then click **Add**.

The **AutoText** button now appears in the Quick Access Toolbar. Click AutoText to choose from a gallery of AutoText entries.

Create a new AutoText Entry

1. In your Word document, select the text that you want to add to your gallery of AutoText entries.
2. In the Quick Access Toolbar, click **AutoText**, and then click Save Selection to AutoText Gallery.

Fill out the information in the **Create New Building Block** dialog box:

- **Name**Type a unique name for the building block.
- **Gallery**Select the gallery that you want the building block to show up in.
- **Category**Select a category, such as**General**or**Built-In**, or createa new category.
- **Description**Type a description of the building block.
- **Save in**Click the name of the template in the drop-down list. Atemplate must be open to be displayed in the drop-down list of template names.
- **Options**Choose one of the following:
- Select**Insert content in its own page**to place the building block ona separate page with page breaks before and after the building block.
- Select**Insert content in its own paragraph**to make the content intoits own paragraph, even if the user's cursor is in the middle of a paragraph.
- Select**Insert content only**for all other content.**Note:**After typing theshort name of autotext gallery, press function key F3, then it is replaced by the lengthy name.

Customize AutoCorrect

You can set up the AutoCorrect tool in Word to retain certain text the way it is. To customize AutoCorrect:

Fig 3.50 Customize Autocorrect

- Click the**Microsoft Office**button
- Click the**Word Options**Button
- Click the**Proofing**tab
- Click**AutoCorrect Options**button
- On the**AutoCorrect Tab**, you can specify words you want to replaceas you type.

Create a New Default Dictionary

Often you will have business or educational jargon that may not be recognized by the spelling and/or grammar check in Word. You can customize the dictionary to recognize these words.

- Click the**Microsoft Office**button
- Click the**Word Options**Button
- Click the**Proofing**tab
- Click the**When correcting Spelling**tab
- Click**Custom Dictionaries**
- Click**Edit Word List**
- Type in any words that you may use that are not recognized by thecurrent dictionary.

Check Word Count

To check the word count in Word 2007 look at the bottom left corner of the screen. It will give you a total word count or if you have text highlighted it will tell you how many words are highlighted out of the total.

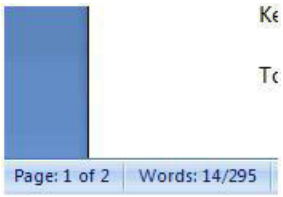


Fig 3.51 Check Word Count

3.6 Tabs

Using **tabs** gives you more control over the placement of text. By default, on pressing a **tab** key the insertion point will be 0.5" towards right. On continuing pressing the points will be 0.5",1.0",1.5" and so on. By adding **tab stops** to the **Ruler** you can change the size of the tabs, and one can apply more than one tab stop to a single line in Word. For example, on a resume you could **left-align** the beginning of a line and **right-align** the end of the line by adding a **Right Tab**, as shown in the image below.

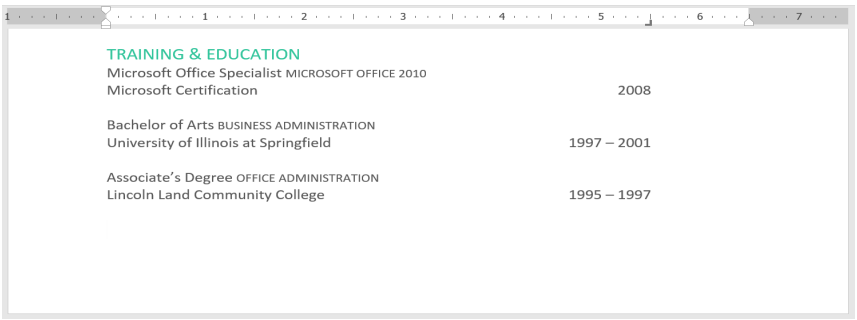


Fig 3.52 sample of using tabs

If you can't see the Ruler, select the **View** tab, then click the check box next tothe **Ruler**.

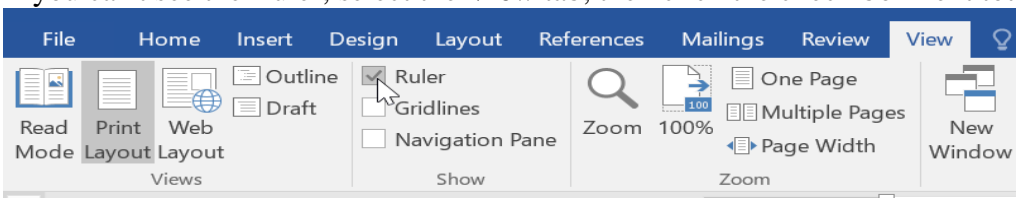


Fig 3.53 enable ruler through View menu

The **tab selector** is located to the left of horizontal ruler. Hovering the mouse over the tab selector displays the name of the active **tab stop**.

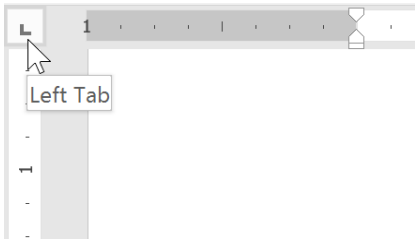


Fig 3.54 tab selector to view or hide ruler

Types of tab stops:

1. **Left Tab** left-aligns the text at the tab stop.
2. **Center Tab** centers the text around the tab stop.
3. **Right Tab** right-aligns the text at the tab stop.
4. **Decimal Tab** aligns decimal numbers using the decimal point.
5. **Bar Tab** draws a vertical line on the document.
6. **First Line Indent** inserts the indent marker on the Ruler and indents the first line of text in a paragraph.
7. **Hanging Indent** inserts the hanging indent marker and indents all lines other than the first line.
8. **Tab stop position:** Type the position on the ruler where you want to createa new tab stop, or select an existing tab stop from the list to modify its properties.
9. **Default tab stops**: Specifies amount of spacing that is applied each timeyou press the TAB key.
10. **Tab stops to be cleared:** Displays tab stops that have been marked fordeletion from the **Tab stop position** list. Cleared tabs are deleted from the list when you click **OK**.

3.6.1 Alignment

Left: Sets a left start position of text that will then run to the right as youtype.

Center: Sets the position of the middle of the text. The text centers on thisposition as you type.

Right: Sets a right start position of text that will then run to the left as you type.

Decimal: Aligns numbers around a decimal point. Independent of the number of digits, the decimal point will be in the same position.

Bar: Inserts a vertical bar at the tab position. Not used for positioning text.

3.6.2 Leader

1. Omits any lead characters to be added in front of the tab stop.

2. Specifies for a tightly dotted line to be added in front of the tab stop.

3. Specifies for a line of dashes to be added in front of the tab stop.

4. Specifies for a solid line to be added in front of the tab stop.

5. Specifies for a loosely dotted line to be added in front of the tab stop.

Set: Creates a new tab or updates a previously set tab stop position withthe options you specified

Clear: Marks a selected tab stop position for deletion. Cleared tabs aredeleted from the list when you click **OK**.

Clear All: Marks all stored tab stop positions for deletion. Cleared tabsare deleted from the list when you click **OK**.

3.7 Enhancing a Document (Page Layout)

Before printing a document we have to set the pages by using page setup.In this we can set margins, orientation(portrait or landscape),paper size, multiple columns, page breaks, page borders, page colors ,water marks, etc.,

3.7.1 Modify Page Margins and Orientations

The page margins can be modified through the following steps:

- Click the**Page Layout**Tab on the Ribbon
- On the**Page Setup**Group, Click**Margins**
- Click a**Default Margin**, or
- Click**Custom Margins**and complete the dialog box

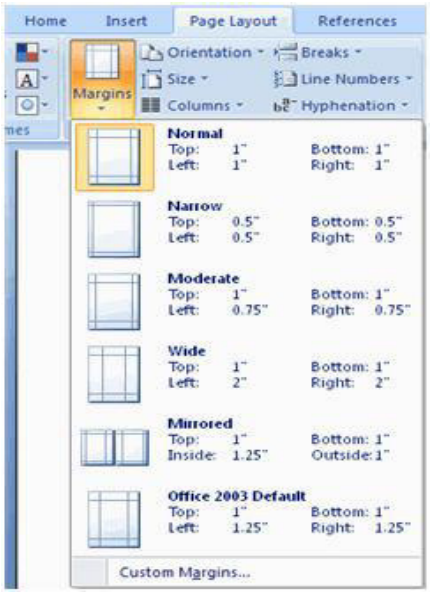


Fig 3.55 Page layout margins

To change the Orientation, Size of the Page, or Columns:

- Click the**Page Layout**Tab on the Ribbon
- On the Page Setup Group, Click the**Orientation**,**Size**, or**Columns**drop down menus
- Click the appropriate choice

3.7.2 Apply a Page Border and Color

- To apply a page border or color:
- Click the**Page Layout**Tab on the Ribbon
- On the Page Background Group, click the**Page Colors**or**PageBorders** drop down menus.

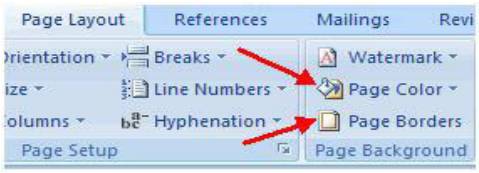


Fig 3.56 Page colorsnd borders

3.7.3 Insert Common Header and Footer Information

To insert Header and Footer information such as page numbers, date, or title, first, decide if you want the information in the header (at the top of the page) or in the Footer (at the bottom of the page), then:

- Click the**Insert**Tab on the Ribbon
- Click**Header or Footer**
- Choose a style

Fig 3.57 Header & footer

- The**Header/Footer Design**Tab will display on the Ribbon
- Choose the information that you would like to have in the header orfooter (date, time, page numbers, etc.) or type in the information you would like to have in the header or footer.

Fig 3.58 Design tab

3.7.4 Create a Page Break

To insert a page break:

- Click the**Page Layout**Tab on the Ribbon
- On the**Page Setup**Group, click the**Breaks Drop Down Menu**

Click**Page Break**

Fig 3.59 Create a page break

3.7.5 Insert a Cover Page

To insert a cover page:

- Click the**Insert**Tab on the Ribbon
- Click the**Cover Page**Button on the Pages Group
- Choose a style for the cover page

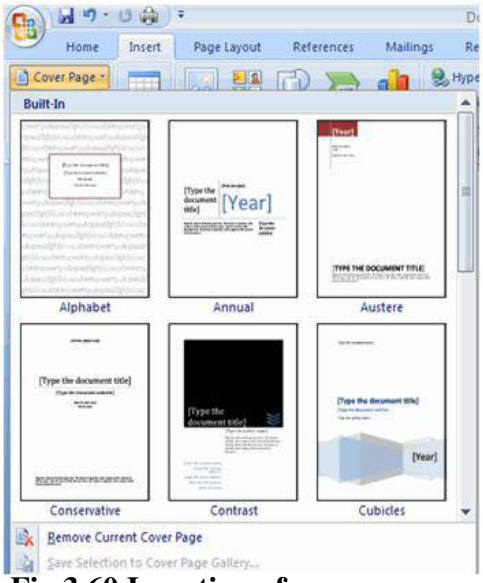


Fig 3.60 Inserting of cover page

3.7.6 Insert a Blank Page

To insert a blank page:

- Click the**Insert**Tab on the Ribbon
- Click the**Blank Page**Button on the Page Group

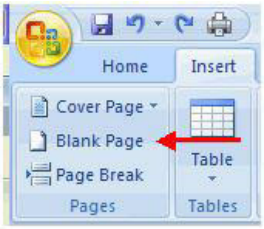


Fig 3.61 Inserting a blank page

Insert a blank table:

1. Place your insertion point in the document where you want the table to appear.
2. Select the **Insert** tab.
3. Click the **Table** command.
4. Hover your mouse over the diagram squares to select the number of **columns** and **rows** in the table.
5. Click your mouse, and the table appears in the document.
6. You can now place the insertion point anywhere in the table to add text.
7. **Adding a page number:**

We can add page numbers to the header or footer by clicking the **Page Number** command and then selecting **Top of Page** or **Bottom of Page**. If you have an existing header or footer, it will be removed and replaced with the page number.

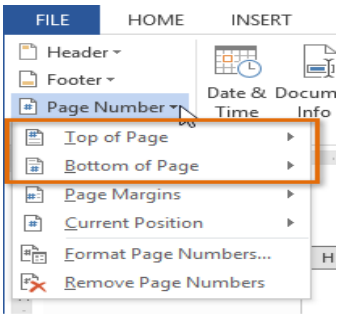


Fig 3.62 page number of top and bottom

3.8 Tables

A Table is a collection of cells which are arranged in rows and columns. A Table can be used for various tasks mainly for presenting both textual data and numerical data.

Look at the table below. In word we can create such tables easily. The tables facility in word is very powerful and flexible. Table can have any number of rows and columns.

Stud .id	Name	English	Telugu	Hindi
101	Sirisha	65	59	72
102	Manisha	85	75	81
103	Hanisha	76	78	80

Tables are used to display data in a structured format i.e., in rows and columns.

3.8.1 Create a Table

To create a table:

- Place the cursor on the page where you want the new table
- Click the**Insert**Tab of the Ribbon
- Click the**Tables**Button on the Tables Group. You can create a tableone of four ways:
- Highlight the number of row and columns
- Click**Insert Table**and enter the number of rowsandcolumns.
- Click the**Draw Table**, create your table by clicking andentering the rows and columns.
- Click**QuickTables**and choose a table

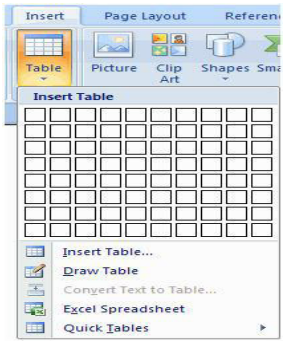


Fig:3.63 Inserting a new blank table

Enter Data in a Table

Place the cursor in the cell where you wish to enter the information. Begin typing.

Modify the Table Structure and Format a Table

To **modify** the structure of a table:

 Click the table and notice that you have two new tabs on the Ribbon:
3.8.2 Design and Layout. These pertain to the table design and layout.

Fig 3.64 Design and layout

On the Design Tab, you can choose:

- **Table Style Options**
- **Table Styles**
- **Draw Borders**

To **format** a table, click the table and then click the **Layout** Tab on the Ribbon. This Layout tab allows you to:

- **View Gridlines and Properties**(from the Table Group)
- **Insert Rows and Columns** (from the Rows & Columns Group)
- **Delete the Table, Rows and/or Columns**(from the Rows & ColumnsGroup)
- **Merge or Split Cells**(from the Merge Group)
- **Increase and Decrease cell size**(Cell Size Group)
- **Align text within the cells and change text directions**(AlignmentGroup).

To ADD a Row or a Column for an existing table:
Inserting Row:

1. To add a Row place the insertion point in a row **below** the location where you want to add a row.
2. Right-click the mouse. A menu appears.

3. Select **Insert Rows Above/Below**.

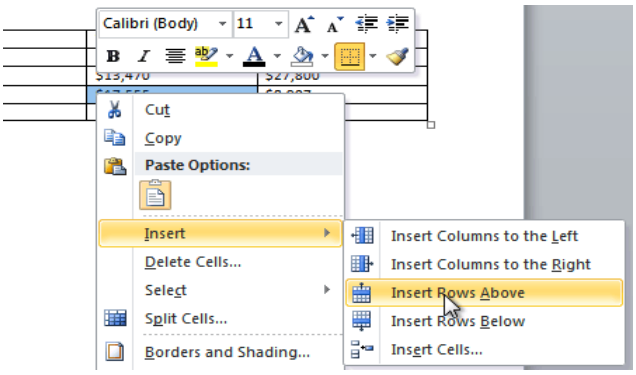


Fig 3.65 inserting a new column

1. A new row appears **above/below** the insertion point.

3.8.3 Inserting column:

1. Place the **insertion point** in a **column adjacent** to the location where you want the new column to appear.
2. Right-click the mouse. A menu appears.

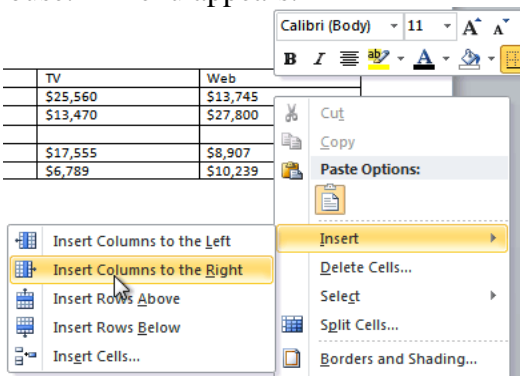


Fig 3.66 insert column to the right or left

3. Select **Insert ➡ Insert Columns to the Left** or **Insert Columns to the Right**. A new column appears

To Delete a Row:

1. Select the row or column.
2. Right-click your mouse. A menu will appear.
3. Select **Delete Cells**.
4. Select **Delete entire row** or **Delete entire column**, then click **OK**.(Or use shift options based on requirement)

3.9 Graphics, templates and wizards

In this chapter discussed about graphics, templates and wizards.

3.9.1 introduction to Graphics

Word provides a set of drawing tools that you can use to create simple graphics. The pictures, clip art, shapes, smart art, equations etc are available in insert tab.Word

2007 allows you to insert special characters, symbols, pictures, illustrations, and watermarks.

Symbols and Special Characters

Special characters are punctuation, spacing, or typographical characters that are not generally available on the standard keyboard. To insert symbols and special characters:

- Place your cursor in the document where you want the symbol
- Click on the **Insert** Tab on the Ribbon
- Click on the **Symbol** button on the Symbols Group
- Select the appropriate symbol.

\

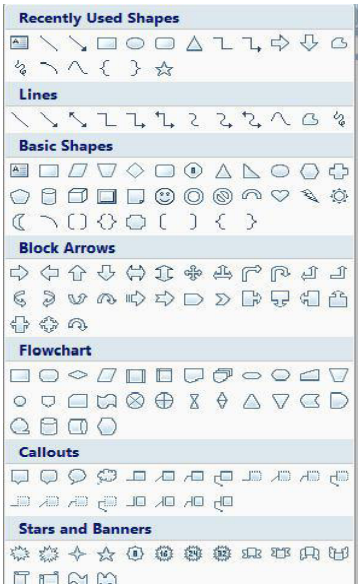


Fig 3.67 Shapes

Equations

Word 2007 also allows you to insert mathematical equations. To access the mathematical equations tool:

- Place your cursor in the document where you want the symbol□
- Click the **Insert** Tab on the Ribbon

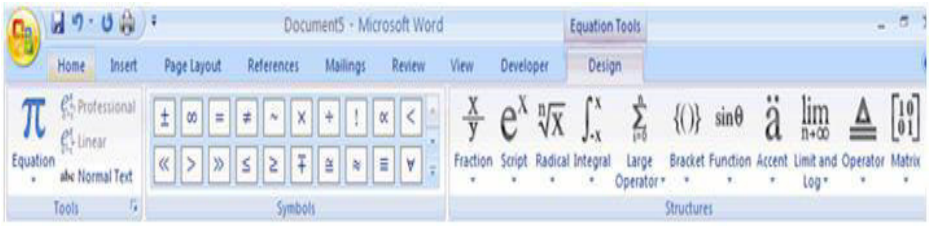


Fig 3.68 Equations

- Click the **Equation** Button on the Symbols Group
- Choose the appropriate equation and structure or click Insert New Equation
- To edit the equation click the equation and the **Design** Tab will be available in the Ribbon

Illustrations, Pictures, and Smart Art

Word allows you to insert illustrations and pictures into a document.

To insert **illustrations**:

- Place your cursor in the document where you want the illustration/ picture
- Click the **Insert** Tab on the Ribbon
- Click the **Clip Art** Button
- The dialog box will open on the screen and you can search for clip art.

Choose the illustration you wish to include

Fig 3.69 Clip art

To insert a Picture

- Place your cursor in the document where you want the illustration/ picture
- Click the **Insert** Tab on the Ribbon
- Click the **Picture** Button
- Browse to the picture you wish to include
- Click the **Picture**
- Click **Insert**

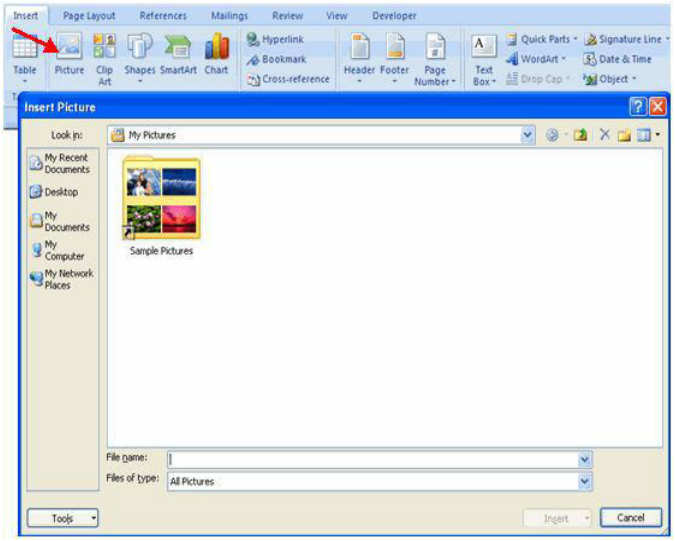


Fig 3.70 Inserting of picture

Smart Art is a collection of graphics you can utilize to organize informationwithin your document. It includes timelines, processes, or workflow. To insert SmartArt.

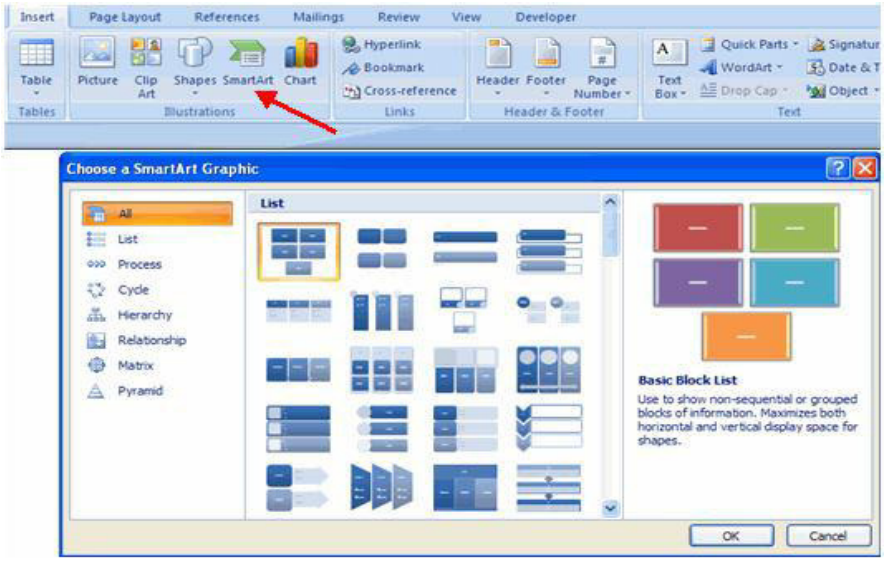


Fig 3.71 Smart art

Place your cursor in the document where you want the illustration/ picture

- Click the **Insert** Tab on the Ribbon
- Click the **SmartArt** button
- Click the **SmartArt** you wish to include in your document
- Click the arrow on the left side of the graphic to insert text or type the text in the graphic.

Resize Graphics

All graphics can be resized by clicking the image and clicking one corner of the image and dragging the cursor to the size you want the picture.

Watermarks

A watermark is a translucent image (it may be either text or an image) that appears behind the primary text in a document. To insert a watermark:

- Click the **Page Layout** Tab in the Ribbon
- Click the **Water mark** button in the Page Background Group
- Click the **Watermark** you want for the document or click **Custom Watermark** and create your own watermark
- To remove a watermark, follow the steps above, but click **Remove Watermark**

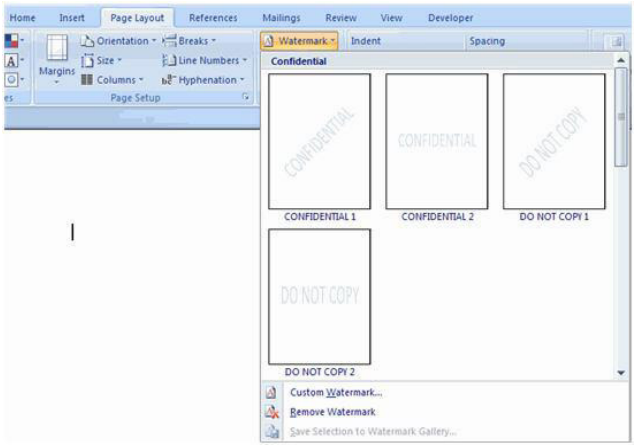


Fig 3.71 Watermark

3.9.2 TEMPLATES

A template is a predesigned document you can use to design documents quickly without formatting them. A template may have predefined margin size, font style and size, and spacing etc.

Creating a new document with a template

Templates can help you create a more professionally designed document. Templates are designed for many purposes —whether you need to create a business card or a simple award certificate. To use templates, you'll need to know creating a new document with a template and inserting text into the template.

To insert a template:

1. Click the File tab to go to Backstage view.
2. Select New. The New Document pane appears.
3. Click Sample templates to choose a built-in template, or select an Office.com template category to download a template.

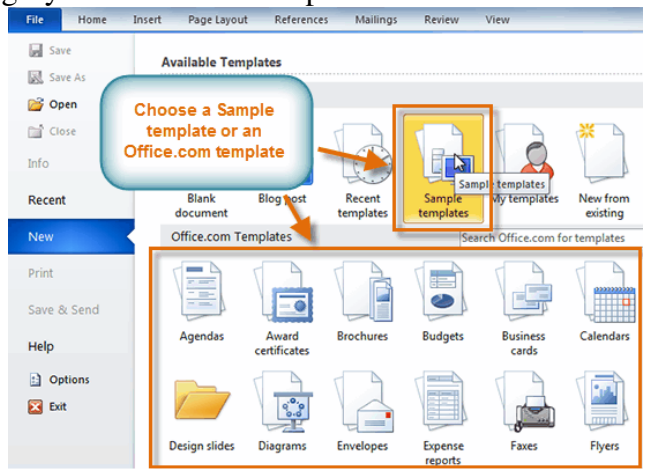


Fig 3.72 sample templates

4. Select the desired template, then click on **Create**. A new document will appear with the template you have selected.

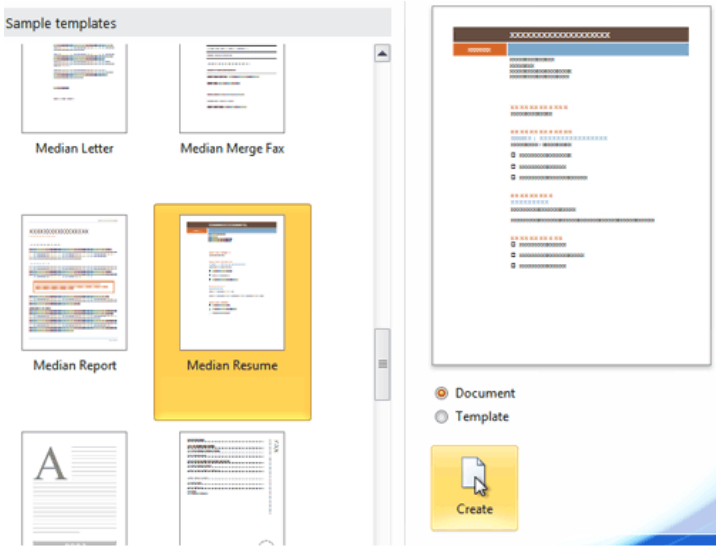


Fig 3.73 creating document using templates

Entering information into a template

To insert text into a template:

Templates contain **placeholder text** that is surrounded by **brackets**. To personalize your document, you have to replace the placeholder text with your own text.

Some templates simply use regular text as the placeholder. In that case, delete the text and type in your own text.

1. Click the text you want to replace. The text will appear **highlighted**, and a template **tag** will appear.
2. Enter some text that will replace the placeholder text.

3.9.3Document Wizard

The Document Wizard offers an easy way to create a basic document that you can use as a starting point. On one occasion you have created the basic document, you can use the Document Editor to more improve the document's definition, formatting, and layout to create a refined, visually pleasing, boardroom-quality document.

Use the following procedure to create a basic document with the Document Wizard.

You can also make a document using a document template, which permits you to start with a predefined structure. You can also create a document from a report, which displays the report within a document. For more information on these various methods, including instructions..

To create a document using the Document Wizard

1. Open MicroStrategy Developer
2. Log in to the MicroStrategy Analytics Modules project source using the login ID User. Leave the password blank and click OK.
3. Expand the MicroStrategy Tutorial project, then expand My Personal Objects, and then select My Objects. This is where you can make your document.

4. From the File menu, point to New and then choose Document. The New Document dialog box opens.
5. Select Document Wizard and click OK. The Document Wizard opens and the Welcome page is displayed. The Welcome page describes the process that the wizard guides you through. Click Next to begin. The Select the Document's Data Source and Specify a Title page opens.
6. You must specify the object to be used as the source for the document's data; this is typically a report. Click to navigate to the Regional Profit and Margins report. This report is located in Reports\Subject Areas\Enterprise Performance Management. Then click Select.
7. In the Document title field, type Regional Profit and Margins and then click Next. The Select Fields for the Document page opens.
8. Determine the objects to be used in the document. You can add or remove objects later using the Document Editor. Click the double right arrows to move all the objects to the selected fields list and click Next. The Select How the Document Is Grouped page opens.
9. This determines how the data is grouped in the document.

Select Region and click the right arrow -> to move it to the right side of the page. Select Year and click the right arrow ->again. Region should be above Year in the selected fields list. Use the up and down arrows to change the order if necessary. In this case, with Region above Year, data is grouped first by Region and then by Year within each region. When you are finished, click Next. The Specify Group Sorting page opens.

10. Each grouping item selected in the previous page is listed in the Sort By table, with Criteria and Order columns for each item. The Criteria is what the object is sorted by. Since the items are all attributes, you can choose which attribute form to sort on. The Order determines whether the grouping item is sorted in ascending or descending order. Since the Criteria is defined as Default, you cannot select the Order.

Leave the default selections and click Next. The Select a Template for the Document's Layout page opens.

11. These selections determine the general layout (the position and placement of items on the document) to be used as a starting point. In the next part of this evaluation you learn to modify the layout of the document using the Document Editor. Select Stepped in the list of Available layouts. Then select the Portrait orientation option and click next. The Select the Document's Formatting Auto style page opens.
12. This page allows you to select the Auto style for your document. An Auto style is a predefined collection of formatting properties, which is applied to a document to change its formatting and appearance.

Select the Tutorial Sample Autostyle and click Finish.

The document is created and displays in the Document Editor, with all your selections appearing in the appropriate document sections as shown in the following image. The layout and formatting, such as colored sections and text characteristics, are already applied as a result of the layout and auto style you selected.

3.10 Mail Merge

Mail Merge is a very useful tool that allows user to produce multiple letters, envelopes, labels, name tags, and more using information stored in a list, database, or spread sheet. When

implementing a **Mail Merge**, user need a **Word document** (you can start with an existing one or create a new one) and a **recipient list**, which is an **Excel workbook**.

USING MAIL MERGE

1. Open a Word document (**create new if not exist**).
2. In the **Mailings** tab, click on the **Start Mail Merge** command and select **Step by Step Mail Merge Wizard** from the menu obtained.

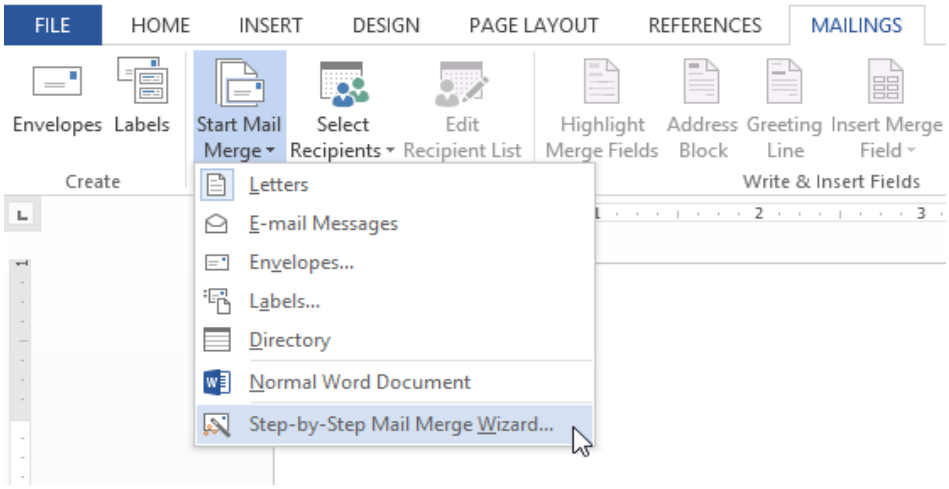


Fig 3.74 mail merge menu and their sub menus

There are six main steps to complete a merge. The appeared Mail Merge pane and will guide you. The following example explains how to create a form letter and merge the letter with a **recipient list**.

Step 1:

- Choose the **type** of document you want to create. Let us select **Letters in our example**. Then click **Next: Starting document** to move to Step 2.

Fig 3.75 type of documents in mail merge

Step 2:

- Select **Use the current document** and then click **Next: Select recipients** to move to Step 3.

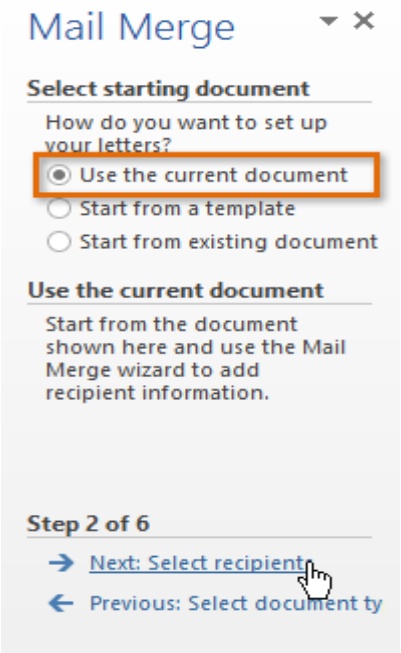


Fig 3.76 mail merge with current document

Step 3:

Now you'll need an address list so that Word can automatically place each address into the document. The list can be in an existing file, such as an Excel workbook, or you can type a new address list from within the Mail Merge Wizard.

1. From the Mail Merge task pane, select Use an existing list and then click Browse... to select the file.
2. Locate your file and click **Open**.
3. If the address list is in an Excel workbook, select the **worksheet** that contains the list and click **OK**.
4. In the **Mail Merge Recipients** dialog box, you can **check** or **uncheck** each box to control which recipients are included in the merge. By default, all recipients should be selected. When you're done, click **OK**.

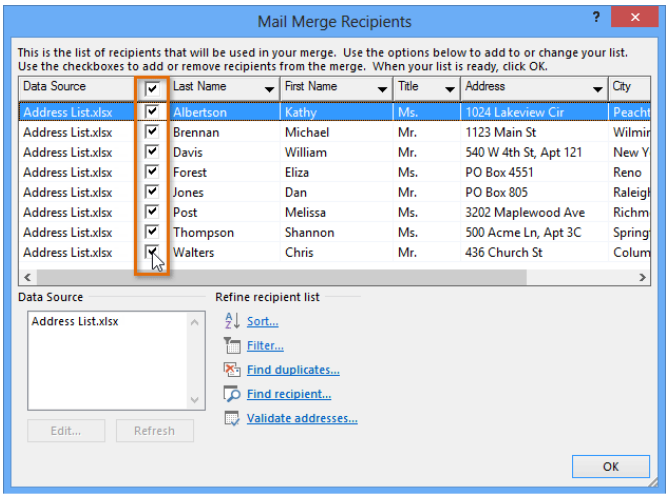


Fig 3.77 mail merge recipient dialog box

5. From the **Mail Merge** task pane, click **Next: Write your letter** to move to Step 4.

If you don't have an existing address list, you can click the **Type a new list** button and click **Create**. You can then type your address list.

Step 4:

Now you're ready to write your letter. When it's printed, each copy of the letter will basically be the same; only the **recipient data** (such as the **name** and **address**) will be different. You'll need to add **placeholders** for the recipient data so Mail Merge knows exactly where to add the data.

To insert recipient data:

1. Place the insertion point in the document where you want the information to appear.
2. Choose one of the four **placeholder** options: **Address block**, **Greeting line**, **Electronic postage**, or **More items**.
3. Based on your selection, a dialog box may appear with various options. Select the desired options and click **OK**.

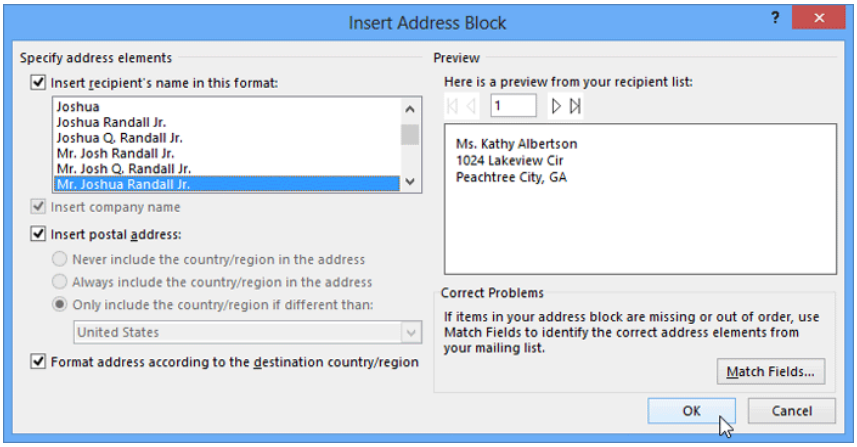


Fig 3.78 selection of options

4. A placeholder will appear in your document (for example, **«Address Block»**).

5. Repeat these steps each time you need to enter information from your data record. In our example, we'll add a **Greeting line**.
6. When you're done, click **Next: Preview your letters** to move to Step 5.

For some letters, you'll only need to add an **Address block** and **Greeting line**. Sometimes, however, you may want to place **recipient data** within the body of the letter to **personalize it** even further.

Step 5:

1. Preview the letters to make sure the information from the recipient list appears correctly in the letter. Also left and right scroll arrows can be used to view each document.
2. Click **Next: Complete the merge** to move to Step 6.

Step 6:

1. Click **Print...** to print the letters.
2. A dialog box will appear. Click **All**, then click **OK**.
3. The **Print** dialog box will appear. Adjust the print settings if needed, then click **OK**. The letters will be printed.

3.11 Miscellaneous Features of Word

Finally there are some more facilities such as list (bullets and numbers) and word art.In the documents if we desire to explain point wise, then we can give numbering or can give bullets.

3.11.1 Lists

Lists allow you to format and arrange text with numbers, bullets, or in and summarize.

Bulleted and Numbered Lists

Bulleted lists have bullet points, numbered lists have numbers, and summarize lists combine numbers and letters depending on the organization of the list.

To **add** a list to existing text

- Select the text you wish to make a list
- From the Paragraph Group on the Home Tab, Click the **Bulleted or Numbered Lists** button.

Fig 3.79 different types of list

To create a new list

- put your cursor where you wish for the list in the document
- Click the **Bulleted or Numbered Lists** button

- Begin typing

Nested Lists

A nested list is list with a number of levels of indented text. To create a nested List:

- Create your list following the directions above
- Click the **Increase or Decrease Indent** button

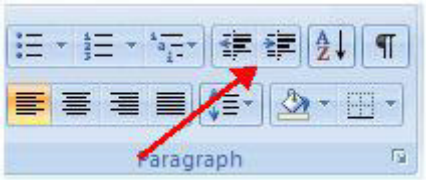


Fig 3.80 Increase or Decrease Indent button

Formatting Lists

The bullet image and numbering format can be altered by using the **Bulletsor Numbering** dialog box.

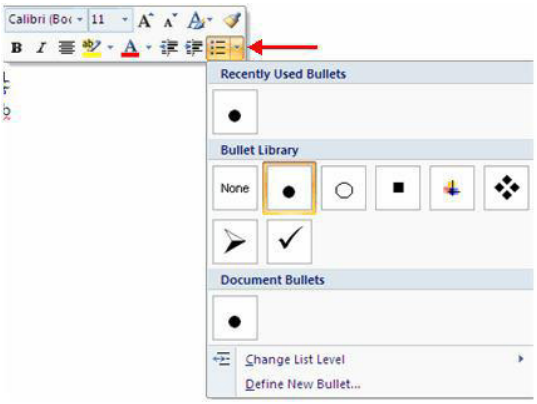


Fig 3.81 formatting list

1. Select the whole list to change all the bullets or numbers, or Place the cursor on one line within the list to modify a single bullet
2. Right click
3. Click the **arrow** next to the bulleted or numbered list and decide a bullet or numbering style.

3.11.2 Word Art

Word art is used to shown the textual data with diverse styles and various sizes. Sometimes we have to design textual data in a mixture of styles. Then we have to prefer word art On the **Insert** tab, in the **Text** group, click **WordArt**, and then choose the WordArt style that you want.

1. **Type your text in the text boxWord**

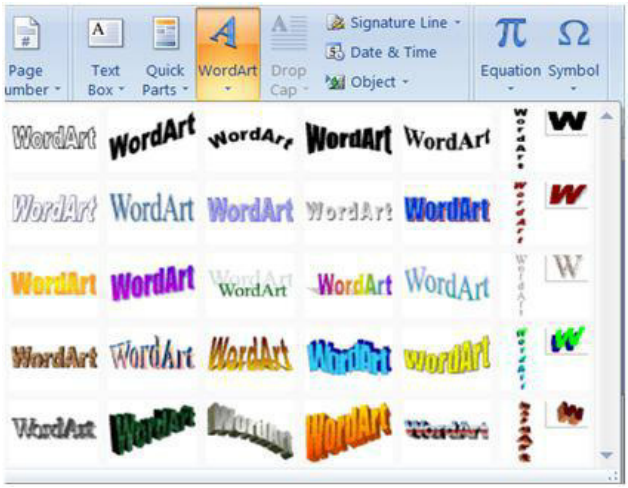


Fig 3.82 different kinds of word arts

Do one or more of the following:

1. To modify the text, select it, and then make the changes that you want.
2. To modify the font, see Change the font, font size, or font colour, or Apply bold, italic, or highlight formatting to text.
3. To add an effect to WordArt, see Add or delete a fill, summarize, or effect for text or WordArt.
4. To rotate the WordArt, observe Rotate or flip a picture, shape, or WordArt in Word 2007.
5. To resize the WordArt, observe Change the size of a picture, shape, text box, or Word Art.
6. To align the WordArt, observe Align or arrange a picture, shape, text box, or WordArt.
7. To move the WordArt, notice to Move a picture, shape, text box, or WordArt

Summary

In windows 10, the screen layout is changed from the previous versions of windows. In windows10 ribbon, tabs, groups and buttons are also looking in different.

To edit a document, you want to open it. On selecting the file,open command, word displays the open dialogue box. If the file you need to open is not there in the current directory, you can change the directory and then select the file for opening.

To move the cursor to the preferred location on the screen, you can either take the help of the mouse or use the keyboard. You can scroll the document vertically or horizontally by using scroll bars. To fasten the editing we must know the short cuts of keyboard. Suppose if you press

ctrl+home the cursor must be beginning of the document. You can use undo , redo etc for editing.

You can easily move the selected text to any part of the document. word allows you to move the text with the keyboard as well as mouse. When you make copy(copy and paste) it is present at both places source and destination. When you make a move(cut and paste) it is present only at the destination and no more in the source.

Students should practice copy and move only by using keyboard without using mouse and also only by using mouse without keyboard.Help system provides facility to the each and every feature in word you are using and it is readily available by showing the icon.Word allows you to format the paragraph by applying various font styles, colors, highlighting, strikethrough, spacing between lines, borders and shading, alignment etc. whatever the facility you used to the document looks better.

In the document we can use find with many options such as match case, whole words only, pattern matching and sounds like etc., to find a text.Spell checker is used to make error free document. Autocorrect automatically fixes errors based on a list. Auto text is normally used to quickly type lengthy or difficult to type text that you need routinely in your document.

To create a multi column table ,you can use tabs. By default, word creates tabs at every 0.5" position. However we can define our own tabs stop position. .We can create four types tabs. These are left aligned, right aligned, centered and decimal aligned.After completion of setups in the page layout , we must see print preview before printing a document . If there are any changes have to be made we can change by using page layout again.

When you enter text in the cell of a table ,word automatically changes the cell height to accommodate the text you type. Use the tab key to move the cursor to the next cell and Shift+tab key to move the cursor to the previous cell. Text entered in the table can be formatted by using the normal text formatting commands.

With the help of this graphics ,you can create lines, rectangles, squares, ellipses, circles, arcs, text boxes, etc. You can also control the line thickness , colour and styles of the lines you draw. You can also insert the pictures and also you can drag the pictures as well as objects to the desired location.In sample mail merge we have shown only three addresses but we can perform many more.We need not use the default fields and also can change the field names as we require such as designation, post, etc. For changing the name of a field follow

Select recipients > type new list > customize columns > add > field name .

In the documents, sometimes the sentences may be required to give numbering or marking. For this we have to use lists. If we want to make special effects to any text we prefer word art.

Model Questions

Short Answer Type Questions

1. What is a Ribbon?
2. What is office button?
3. What is quick access toolbar?
4. What are the tabs in the ribbon?
5. What are the shortcuts for open and save a file?
6. What are the shortcuts for new and close a file?
7. What is the difference between copy and move?
8. What is help system?
9. What are the alignments in paragraph?
10. What are the indents in paragraph?
11. What is formatting a text?
12. What is auto text?
13. What is autocorrect?
14. What is word count?
15. What is default dictionary?
16. What is thesaurus?
17. What is undo changes?
18. What are different types tab alignments?
19. What are the options in page layout?
20. What is orientation?
21. What is header and footer?
22. Draw a table with any data of your choice.
23. What is clip art?
24. What is smart art?
25. What is water mark?
26. What is mail merge?

Long Answer Type Questions

1. Write the stepwise procedure to create, edit and save a document in word
2. Write about document views.
3. Write about move and copy.
4. Write about formatting the paragraph.
5. Write about find and replace.
6. Write about spell checker.
7. Write about tabs.
8. Explain the options in detail in page layout
9. Write about tables.
10. Write about graphics.
11. Write about mail merge.
12. Write about bullets and numbering.
13. Write about word art.

UNIT - IV
MS-Excel

4.1 Introduction to Spread Sheet

- 4.1.1 Microsoft Office Button/FILE Button
- 4.1.2 Ribbon or Menu Bar
- 4.1.3 Quick Access Toolbar
- 4.1.4 Mini Toolbar

4.2 Creating Worksheets and feeding data

- 4.2.1 Create a Workbook
- 4.2.2 Feeding Data

4.3 **Using functions**

4.4 Editing cells and Using commands and functions

4.5 Moving and Copying, Inserting and Deleting Rows and Columns

4.6 Formatting worksheet

- 4.6.1 Add Borders and Colors to Cells
- 4.6.2 Change Column Width and Row Height
- 4.6.3 Hide or Unhide Rows or Columns
- 4.6.4 Merge Cells
- 4.6.5 Align Cell Contents

4.7 Opening, Saving and Printing a Workbook

4.8 Working with Charts

- 4.8.1 Create a Chart
- 4.8.2 Modify a Chart
- 4.8.3 Chart Tools

4.9 Macros

4.10 Tables and Pivot Tables

- 4.10.1 **Tables**
- 4.10.2 **PivotTables**

4.1 Introduction to Spread Sheets

Let's begin with Excel 2010 you will notice that there are many related features to previous versions. You will also observe that there are many new features that you'll be able to utilize.

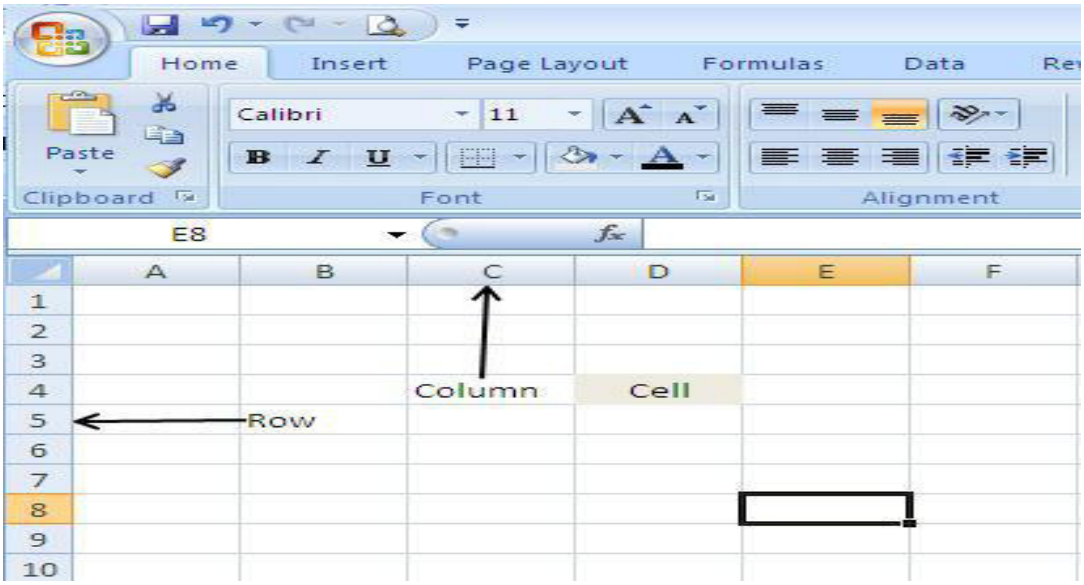


Fig. 4.1 Spread Sheet Preview

There are three main features that you should remember as you work within Excel 2010: File, the Quick Access Toolbar, and the Ribbon. In 2007 instead of having FILE button consist **Microsoft Office Button.** The function of these features will be more fully discussed below.

Spread sheet

A spread sheet is an electronic document that stores different types of data. There are vertical columns and horizontal rows. The intersecting part of rows andcolumn is called cell. So spread sheet is a collection cells. A cell can contain data and can be used in calculations of data within the spread sheet. Each cell can be represents by it ids like A1, A2… And B1, B2..., etc. An Excel spread sheet can have workbooks and worksheets. The workbook is the folder for related worksheets.

4.1.1 Microsoft Office Button/FILE Button

The Microsoft Office Button or FILE button does many of the functions that were located in the beginning of the Excel. This button allows you to create a new workbook, Open an existing workbook, save and save as, print, send, or close, view the recent workbooks.

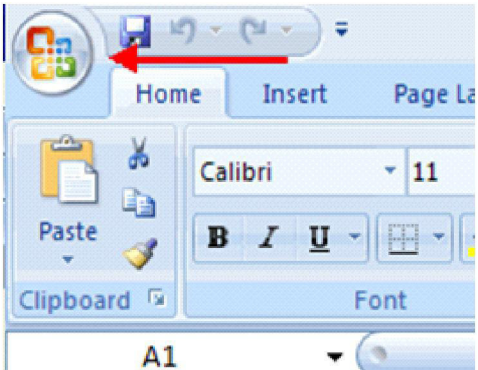


Fig. 4.2 Microsoft Office Button

4.1.2 Ribbon or Menu Bar

The ribbon or Menu Bar is the panel at the top portion of the document. It consist several menus in form separate tabs. It has seven tabs: Home, Insert, Page Layouts, Formulas, Data, Review, and View. Each tab is divided into groups or sub menus. The sub menus are logical collections of features designed to perform function that you will utilize in developing or editing your Excel spread sheets.

Fig. 4.3 Ribbon

Commonly utilized features are displayed on the Menu Bar. To view extra features within each group and to change the default setting, click the arrow at the bottom right corner of each group.

1. **Home**: Clipboard, Fonts, Alignment, Number, Styles, Cells, Editing
2. **Insert**:Tables, Illustrations, Charts, Links, Text
3. **Page Layouts**: Themes, Page Setup, Scale to Fit, Sheet Options, Arrange
4. **Formulas**: Function Library, Defined Names, Formula Auditing, Calculation
5. **Data**: Get External Data, Connections, Sort & Filter, Data Tools, Outline
6. **Review**: Proofing, Comments, Changes
7. **View**: Workbook Views, Show/Hide, Zoom, Window, Macros

4.1.3 Quick Access Toolbar

The **quick access toolbar** is a customizable toolbar that has commands that you may want to use. You can place the quick access toolbar above or below the ribbon. To modify the location of the quick access toolbar, select on the arrow at the end of the toolbar and click **Show below the Ribbon**.

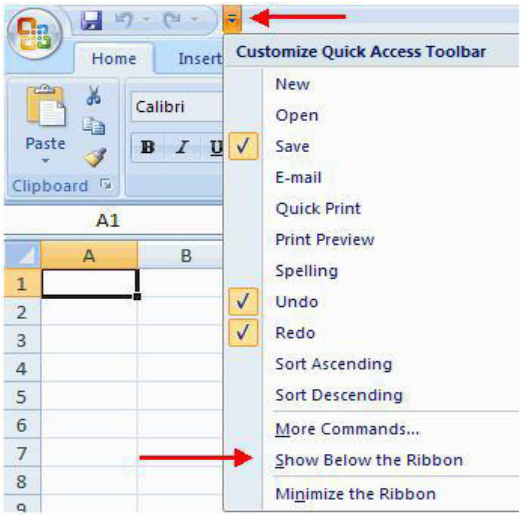


Fig. 4.4 Quick Access Toolbar

You can also add items to the quick access toolbar. Right click on any item in the Office Button or the Ribbon and click Add to Quick Access Toolbar and a shortcut will be added.

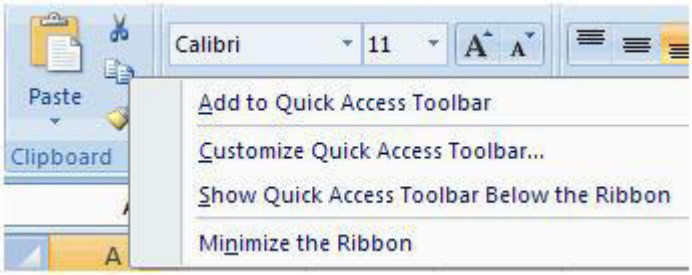


Fig. 4.5 adding short cut for Quick Access toolbar

4.1.4 Mini Toolbar

A new feature in Office 2007 is the Mini Toolbar. This is a floating toolbar that is displayed when you select text or right-click text. It displays common formatting tools, such as Bold, Italics, Fonts, Font Size and Font Color.

Fig. 4.6 Mini Toolbar

4.2 Creating a Work Sheets and Feeding the data

Firstly you want to create the worksheet so that you can enter the data and perform many other operations.

4.2.1 Create a Workbook

Select Microsoft Office Toolbar->Select New->Select Blank Document

The procedure of opening a new or opening an existing document is like to opening a new or existing document in MS Word

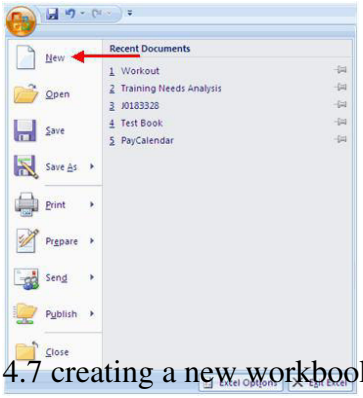


Fig 4.7 creating a new workbook

Note: Workbook is the group of one or more than one work sheets

Creating a Single Worksheet:

Every Excel **workbook** contains at least one or more **worksheets**. If you are working with a large amount of related data, you can use worksheets to help organize your data and make it easier to work with.

Note: By default every excel workbook will have 3 worksheets

To rename worksheets:

1. Right-click on the **worksheet tab** to which you need to change the name. The **worksheet** menu appears.
2. Select **Rename**.

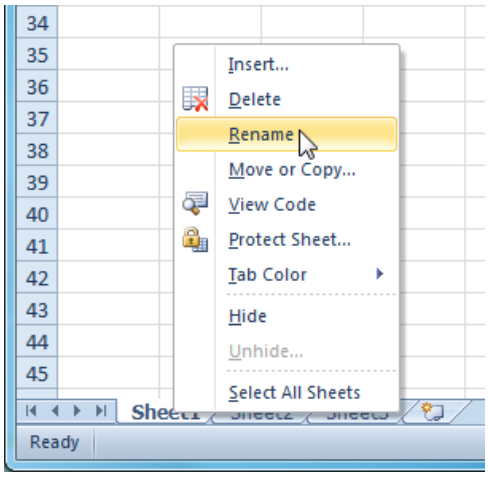


Fig 4.8 Renaming worksheet

3. The text is now highlighted by a black box. Type the name of your worksheet.

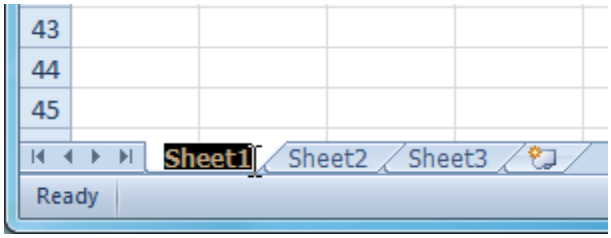


Fig 4.9 Highlighting name for renaming

4. Click anywhere outside the tab. The worksheet is renamed.

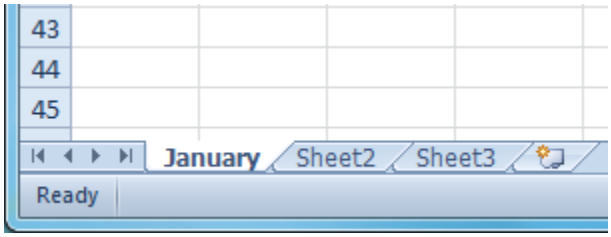


Fig 4.10 worksheet after renaming

To insert new worksheets:

To create a new worksheet you have to click the **Insert Worksheet** icon. A new worksheet will appear.

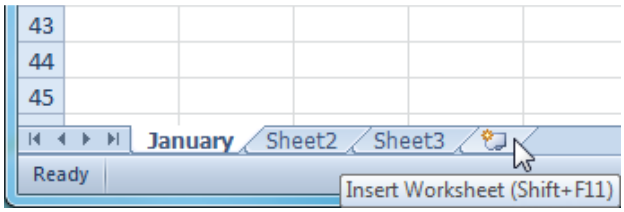


Fig: 4.11 Insert worksheet icon to create new work sheet

You can modify the setting for the default number of worksheets that appear in Excel workbooks. To access this setting, go into **Backstage view** and click **Options**.

Note: Shortcut key to create a new worksheet ->**shift+f11**

To delete worksheets:
You can also delete the worksheets from the workbook, with those containing data.
Select the worksheets you want to delete.

1. Right-click one of the choose worksheets. The **worksheet** menu appears.
2. Click on **Delete**. The selected worksheets will be deleted from your workbook.

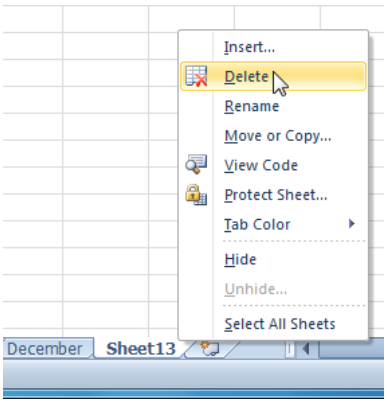


Fig 4.12 pop-up menu to delete a worksheet

To copy a worksheet:

1. Right-click the worksheet you want to copy. The **worksheet** menu appears.
2. Select **Move or Copy**.

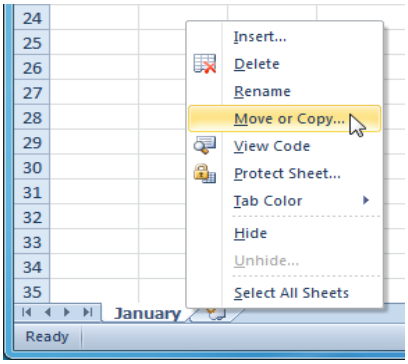


Fig 4.13 pop-up menu for move or copy a work sheet

3. The **Move or Copy** dialog box seems. Tick on the Check box to **Create a copy**.

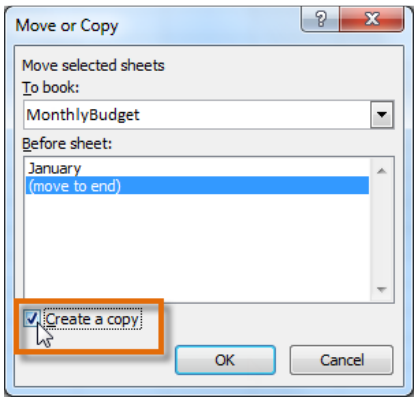


Fig: 4.14 pop-up for creating a new excel copy

4. Click on **OK**. Your worksheet is copied. It will have the same title as your original worksheet, but the name will include a version number, such as **January (2)**.

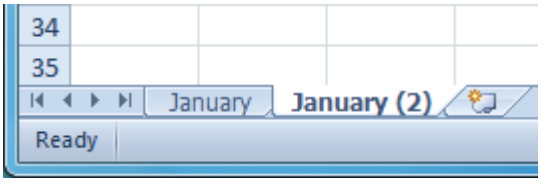
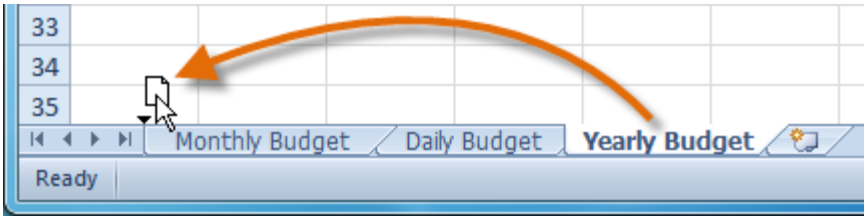


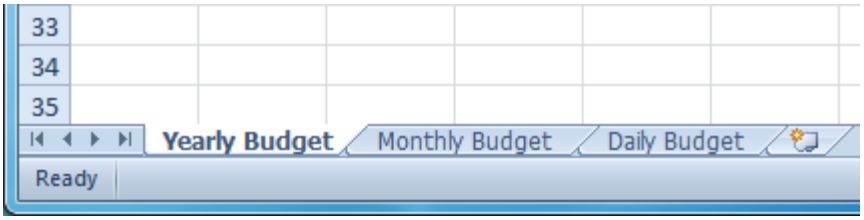
Fig 4.15 moving

To move a worksheet:

1. In order to move a worksheet from one place to another place you have to click the worksheet you want to move. The mouse will modify to show a small worksheet icon.
2. Drag the worksheet icon until a small black arrow appears where you want the worksheet to be moved.



3. Release your mouse, and the worksheet will be moved.



To color code worksheet tabs:

You can color worksheet tabs to help organize your worksheets and make your workbook easier to navigate.

1. Right-click the worksheet tab you want to color. The **worksheet** menu appears.
2. Select **Tab Color**. The **color** menu appears.
3. Select the color you want to change your tab.

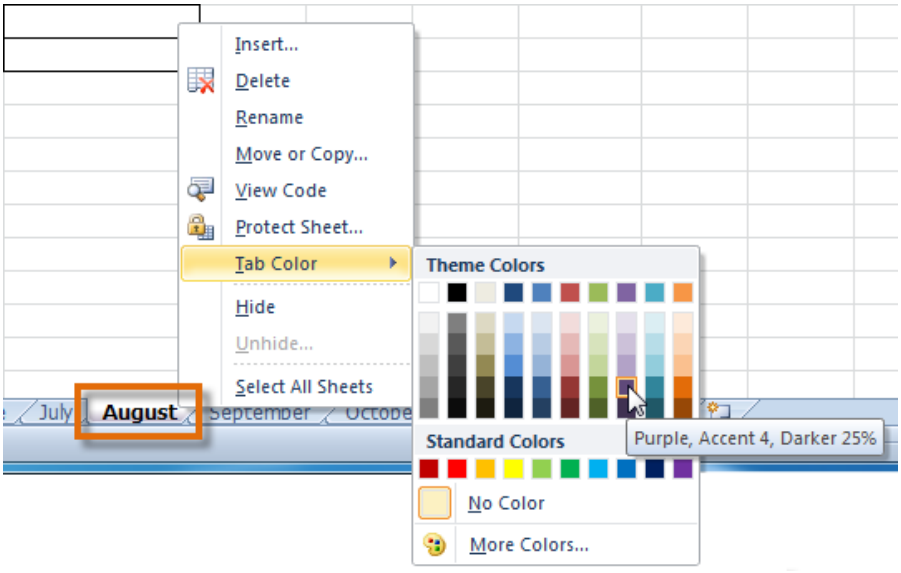
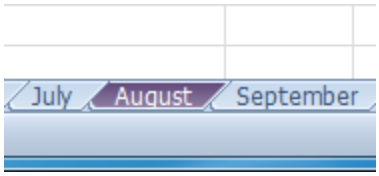


Fig 4.16 moving color

4. The tab color will change in the workbook. If your tab still appears white, it is because the worksheet is still selected. Select any other worksheet tab to see the color change.



Grouping and ungrouping worksheets

You can work with each worksheet in a workbook individually, or you can work with multiple worksheets at the same time. Worksheets can be combined into a **group**. Any changes made to one worksheet in a group will be made to every worksheet in the group.

To group worksheets:

1. Select the **first worksheet** you want in the group.

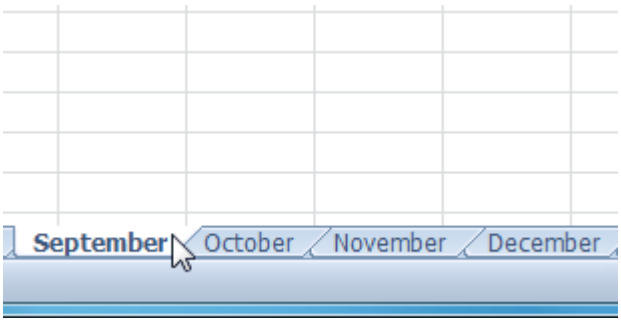
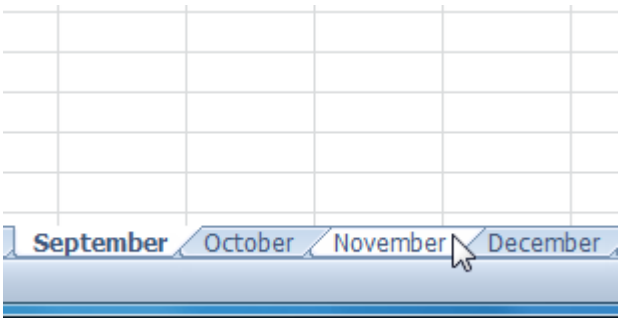


Fig 4.17 grouping worksheet

2. **Press and hold the Ctrl key** on your keyboard.
3. Select the **next worksheet** you want in the group. Continue to select worksheets until all of the worksheets you want to group are selected.



4. **Release the Ctrl key**. The worksheets are now grouped. The worksheet tabs appear white for grouped worksheets.

While worksheets are grouped, you can navigate to any worksheet in the group and make changes that will appear on every worksheet in the group. If you click a worksheet tab that's not in the group, however, all of your worksheets will become ungrouped. You will have to group them again.

To ungroup all worksheets:

1. Right-click one of the worksheets. The **worksheet** menu appears.
2. Select **Ungroup**. The worksheets will be ungrouped.

Freezing worksheet panes

One of the most useful feature in Excel is it has the ability to freeze specific rows or columns in your work sheet . It is called **freezing panes**. When you freeze panes, you select rows or columns that will remain visible all the time, even as you are scrolling. This is particularly helpful when working with large spreadsheets.

To freeze rows:

1. Select the row **below** the rows you want frozen. For example, if you want rows 1 and 2 to always appear at the top of the worksheet even as you scroll, then select row 3.

	A	B	C	D
1	Monthly Budget - January			
2	Bills	Payment	Date Due	Paid
3	Fixed Expenses			
4	Cable / Internet	$ 89.99	15-Jan	Visa

2. Click the **View** tab.
3. Click the **Freeze Panes** command. A drop-down menu appears.
4. Select **Freeze Panes**.

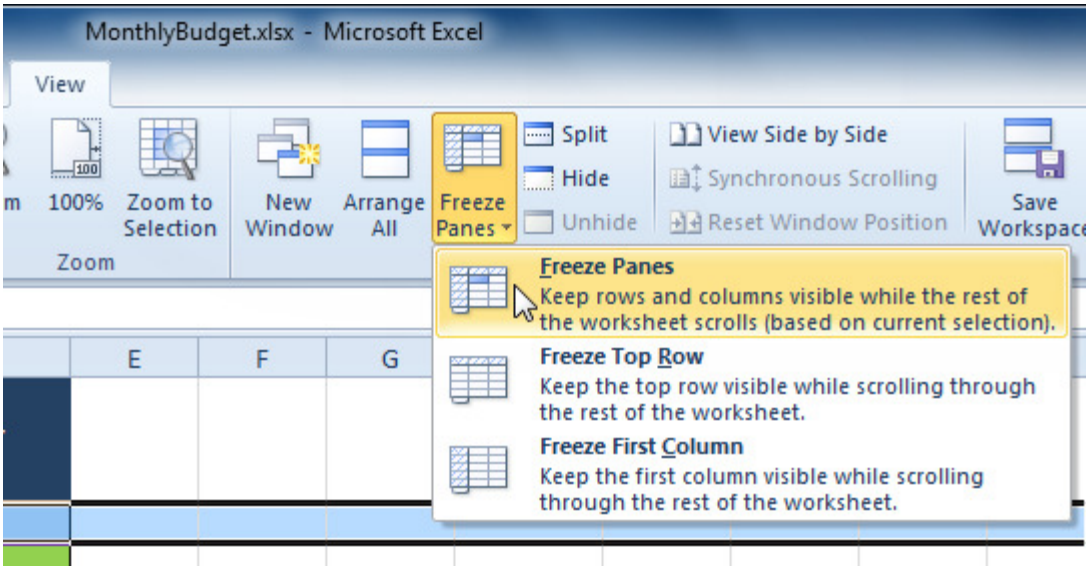
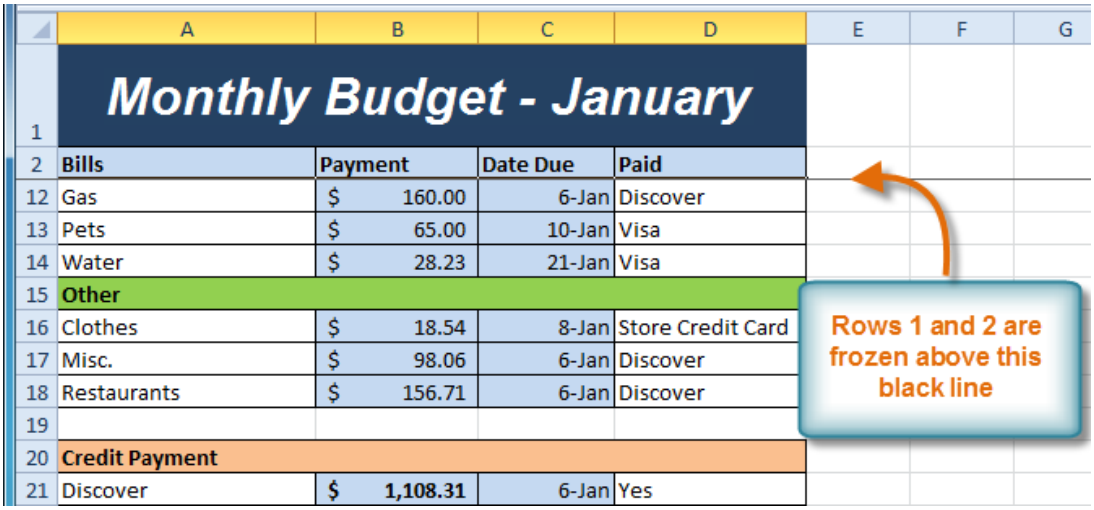


Fig 4.18 freeze panes

5. A black line appears **below** the rows that are frozen in place. Scroll down in the worksheet to see the rows below the frozen rows.

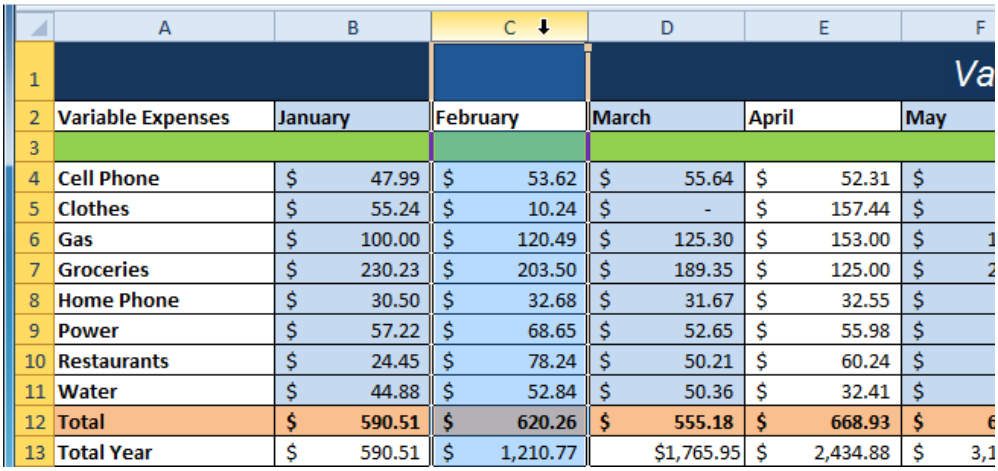


	Bills	Payment	Date Due	Paid
12	Gas	$ 160.00	6-Jan	Discover
13	Pets	$ 65.00	10-Jan	Visa
14	Water	$ 28.23	21-Jan	Visa
15	Other			
16	Clothes	$ 18.54	8-Jan	Store Credit Card
17	Misc.	$ 98.06	6-Jan	Discover
18	Restaurants	$ 156.71	6-Jan	Discover
19				
20	Credit Payment			
21	Discover	$ 1,108.31	6-Jan	Yes

Fig 4.19 freeze rows

To freeze columns:

1. Select the column to the **right** of the columns you want frozen. For example, if you want columns A and B to always appear to the left of the worksheet even as you scroll, select column C.



	Variable Expenses	January	February	March	April	May
3						
4	Cell Phone	$ 47.99	$ 53.62	$ 55.64	$ 52.31	$
5	Clothes	$ 55.24	$ 10.24	$ -	$ 157.44	$
6	Gas	$ 100.00	$ 120.49	$ 125.30	$ 153.00	$
7	Groceries	$ 230.23	$ 203.50	$ 189.35	$ 125.00	$
8	Home Phone	$ 30.50	$ 32.68	$ 31.67	$ 32.55	$
9	Power	$ 57.22	$ 68.65	$ 52.65	$ 55.98	$
10	Restaurants	$ 24.45	$ 78.24	$ 50.21	$ 60.24	$
11	Water	$ 44.88	$ 52.84	$ 50.36	$ 32.41	$
12	Total	$ 590.51	$ 620.26	$ 555.18	$ 668.93	$
13	Total Year	$ 590.51	$ 1,210.77	$1,765.95	$ 2,434.88	$

Fig 4.20 freeze columns

2. Click the **View** tab.
3. Click the **Freeze Panes** command. A drop-down menu appears.
4. Select **Freeze Panes**.
5. A black line appears to the **right** of the frozen area. Scroll across the worksheet to see the columns to the right of the frozen columns.

To unfreeze panes:

1. Click the **View** tab.
2. Click the **Freeze Panes** command. A drop-down menu appears.
3. Select **Unfreeze Panes**. The panes will be unfrozen, and the black line will disappear.

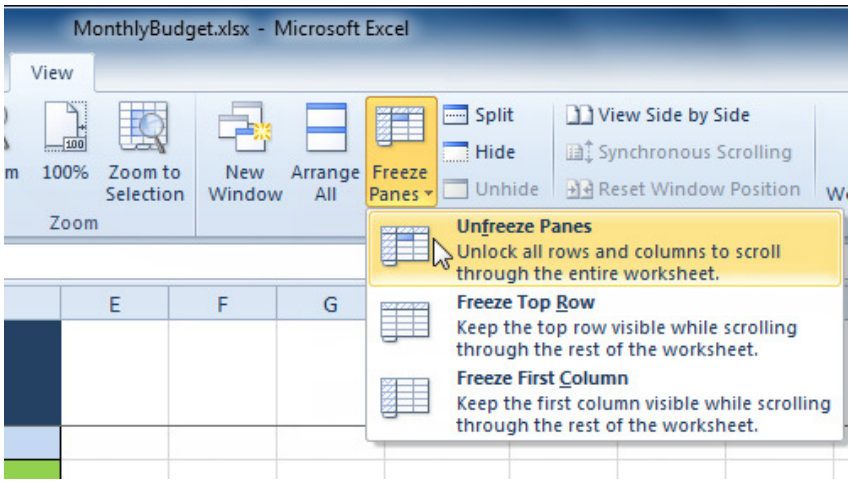


Fig 4.21 unfreeze panes

4.2.2 Feeding Data

Introduction

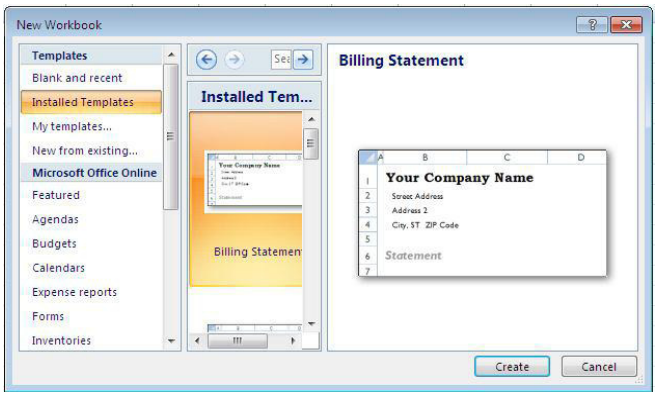


Fig. 4.22 Feeding

In the work sheet the rows are specified by 1, 2, 3, 4…and the columns are specified by A, B, C, D,.. . The cell address denoted by means of column number and row number. For example a cell B3 means row number 3 and column number B.

There are many ways to enter data in Excel:

We can directly feed the data in the active cell or we can enter the by using the formula bar.

To enter data in an active cell.

- choose the **cell** where you want to enter the data -> and start typing

To enter the data by using the formula bar:

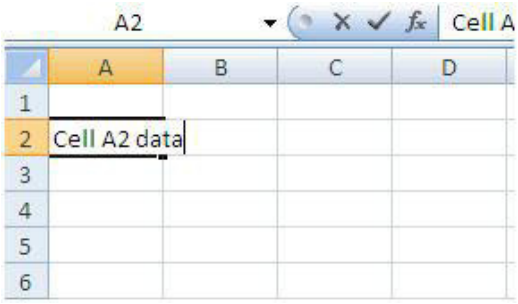


Fig. 4.23 Selecting a Random cell

- choose the cell where you would like to enter the data
- Place the cursor in the **Formula Bar**
- Start typing the data

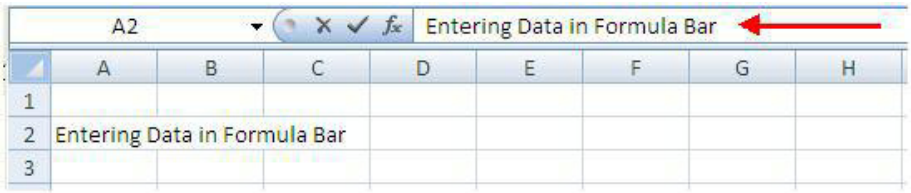


Fig. 4.24 Formula Bar

4.3 Using functions

Simple formulas

A **formula** is an equation that performs a calculation. Like a calculator, Excel can execute formulas that financial, text, auto sum, logical, date & Time..Etc. One of Excel's most valuable features is its ability to calculate using a cell address to denote. You can create a simple formula to add, subtract, multiply or divide values in your worksheet. Simple formulas always start with an equal sign (=), followed by constants that are numeric values and calculation operators such as plus (+), minus (-), asterisk (*), or forward slash (/) signs.

Overview of Function Library: The function library is a large group of functions onthe Formula Tab of the Ribbon. These functions include

AutoSum: Easily calculates the sum of a range

Recently Used: All recently used functions

Financial: Accrued interest, cash flow return rates and additional financialfunctions

Logical: And, If, True, False, etc.

Text: Text based functions

Date & Time: Functions calculated on date and time

Math & Trig: Mathematical Functions

Note:

The key thing to remember is that all the formulas in Excel must begin with an **equals sign** (=).

The following are represents different way to enter formulas in excel.

Manually enter Excel formulas:

Long Lists: =SUM (B4:B13)=>syntax: SUMS(Starting cell: Ending cell)

Short Lists: =SUM (B4, B5, B6,B7); =SUM (B4+B5+B6+B7). Or, place your cursor in the first empty cell at the bottom of your and press the plus sign, then click B4; press the plus sign again and click B5; and so on to the end; then press Enter. Excel adds/totals this list you just "pointed to:" =+B4+B5+B6+B7.

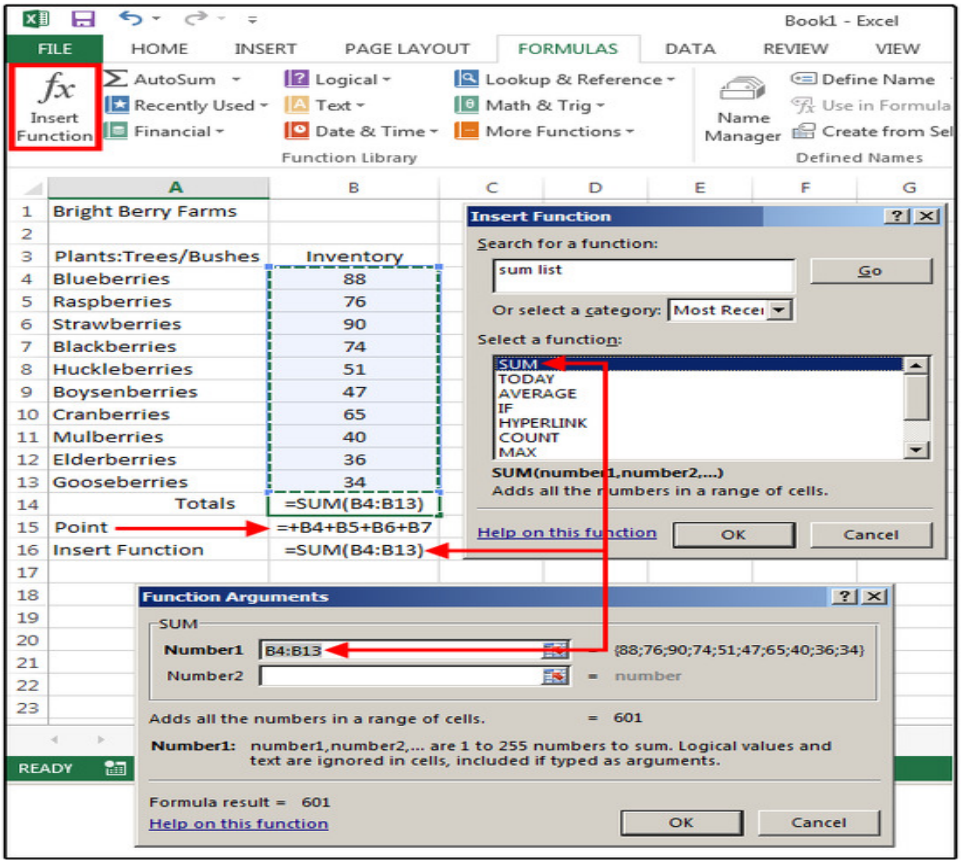


Fig 4.25 formulas to perform basic calculations,

2. Click the Insert Function button

Use the Insert Function button under the Formulas tab to select a function from Excel's menu list:

=COUNT (B4:B13) Counts the numbers in a range (ignores blank/empty cells).

=COUNTA (B3:B13) Counts all characters in a range (also ignores blank/empty cells).

3. Select a function from a group (Formulas tab)

Narrow your search a bit and choose a formula subset for Financial, Logical, or Date/Time, month and hour, for example.

=TODAY () Inserts today's date.

=

4. The Recently Used button

Select the Recently Used button to show functions you've used recently. It's a welcome timesaver, especially when working with an extra spreadsheet.

=AVERAGE (B4:B13) adds the list, divides by the number of values, then provides the average.

5. Auto functions under the AutoSum button

Auto functions are my editor's personal favorite, because they're so fast. Select a cell range and a function, and your result appears with no muss or fuss. Here are a few examples:

=MAX(B4:B13) returns the highest value in the list.

=MIN(B4:B13) returns the lowest value in the list.

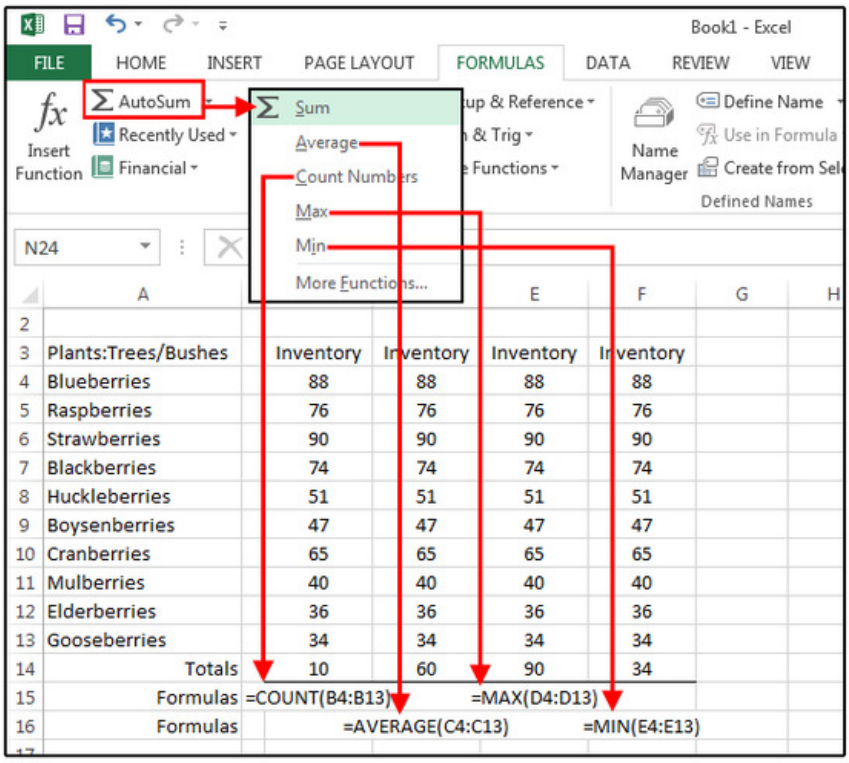


Fig 4.26 auto sum formulas

Use the AutoSum button to calculate basic formulas such as SUM, AVERAGE, COUNT, etc.

We have some pre-defined functions in Excel. In order to use that functions simply we have click on that function and we have to provide the parameters

=>Complete the Number 1 box with the first cell in the range that you want calculated

=>Complete the Number 2 box with the last cell in the range that you want calculated.

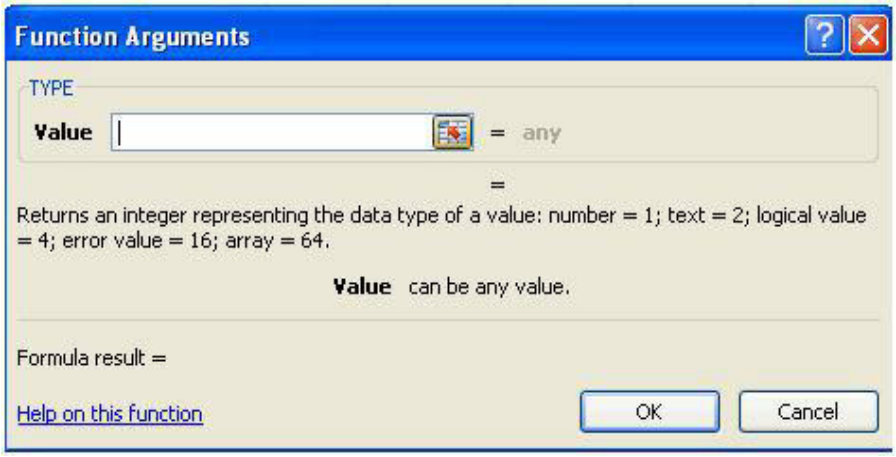


Fig. 4.15 Functions with Arguments
Fig 4.27function arguments

4.4 Editing cells and using commands and functions

In Excel we have so many editing features such as undo, redo, find a particular word and replace that word with another word, go to ,spell check etc..

Undo and Redo:

For example, if you have committed any action accidentally in your document then don't worry there is an option called**UNDO ,**which will remove the last action which you had performed in your document

And similarly if you had deleted the content or any other accidentally by undo then we use **REDO** option which will give you the last deleted data in your document

- On the **Quick Access Toolbar**
- Click **Undo** or **Redo**

Fig. 4.28 Undo and Redo

Note: Shortcut key for undo is **ctrl+z**and for redo is**ctrl+y**

Auto Fill:

The Auto Fill feature fills cell with data or series of data in a worksheet into a selected range of cells. If you want the same data in all the cells then only you have to enter that data in one cell and you have to first select that cell and drag to the no.of cells in which you want that data. If you want to have a series of data in immediate cells (for example, days of the week) fill in the first two cells in the series and then use the auto fill feature.

- **Click** the **Fill Handle**
- **Drag** the **Fill Handle** to complete the cells

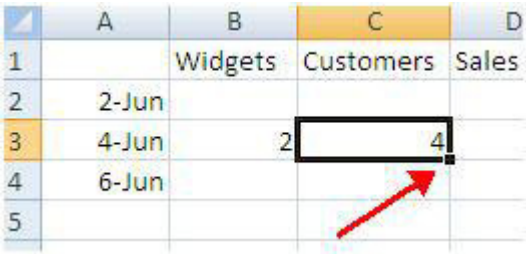


Fig. 4.29 Fill Handle

Find and Replace

For example, Assume that you are typing a document and accidentally you have entered the name of a person as Murali but actually his name in Krishna, then simply you can use this feature **Find and Replace**

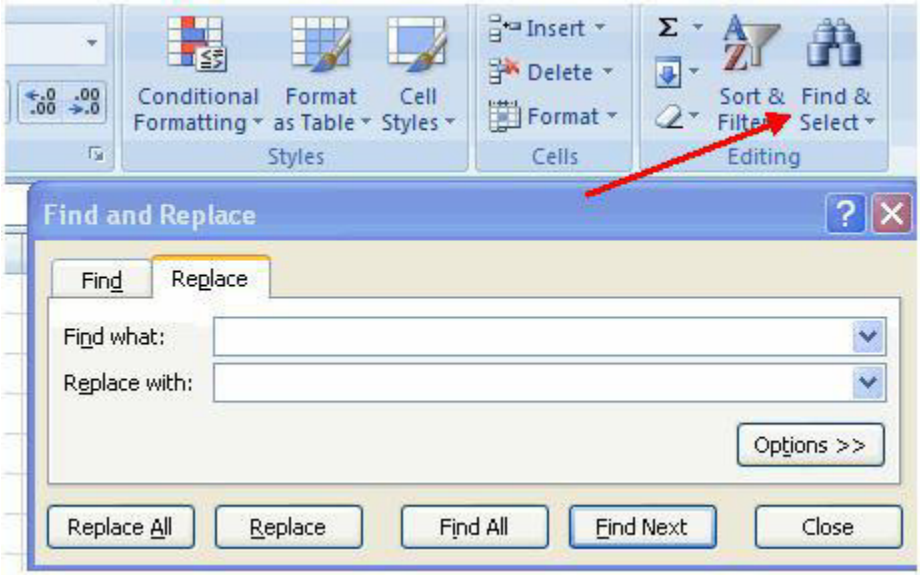


Fig. 4.30 Find and Replace

Enter the name Murali in the Find what field and enter Krishna in Replace with field, then all the Murali words in your present working worksheet will replace with the word Krishna

- Click the **Find & Select** button on the **Editing** group of the **Home** tab
- Choose **Find** or **Replace**
- Complete the **Find What** text box
- Click on **Options** for more search options

Go To Command:

The Go To command will takes you to a specific cell either by cell reference (the Column Number and the Row Number) or by cell name.

- Click the **Find & Select** button on the **Editing** group of the **Home** tab
- Click **Go To**

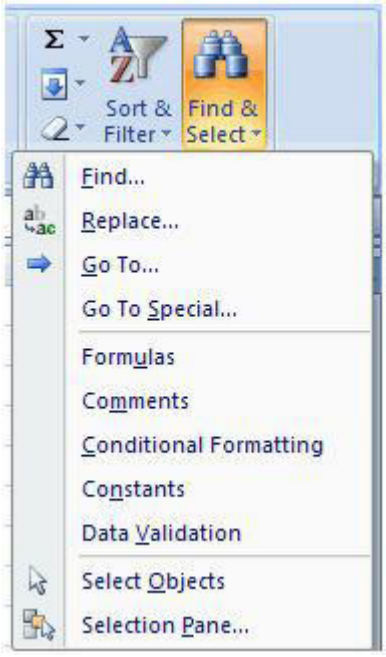


Fig. 4.31 Goto Function

Spell Check

This option is used to Check the Spelling within the Current working worksheet

To check the spelling:

On the **Review** tab click the **Spelling** button

Fig. 4.32 Spell Check

Split the screen

Split the window into multiple resizable panes containing views of your worksheet. By this feature you can view distant parts of your worksheet at once.

It is in the view tab, select on the split as shown below

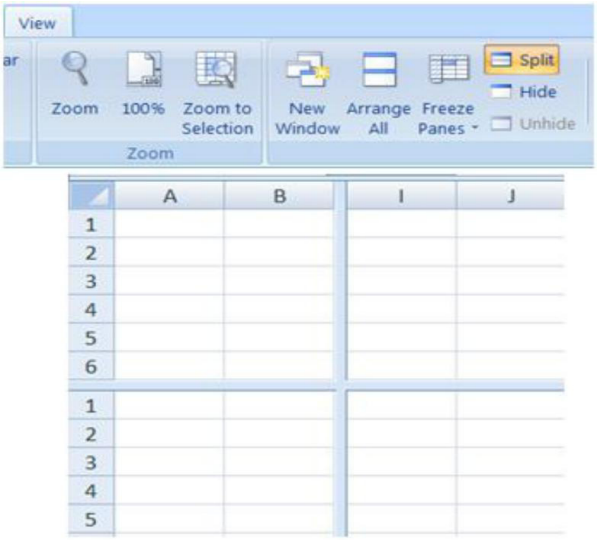


Fig. 4.33 Split Screen

Calculate with Functions:

A function is a built in formula in Excel. A function consists of two fields namely Function name and arguments (the mathematical function) in parentheses. Here we give a sample worksheet. Let us understand the concept of functions by using this figure

	A	B	C	D	E	F
1						
2	3	5	4	6	2	
3						
4	12		8	RAMA	4	
5						

Fig. 4.34 Calculate with Functions

Mathematical functions

1.POWER: Used to find the results of a number raised to a power and returns the result

Syntax

POWER(number,power)

Here,
Number is any real number.

Power is the exponent to which the base number is raised.
Example:

POWER(C2,E2) gives result 25 because ($4^2 = 16$)

2.FACT: Used to calculate the factorial of a number.

Syntax:

FACT(number)

Here,
Number is the non-negative number for which you want the factorial. Ifnumber is not an integer, it is truncated.

Example

FACT(C2) gives 24 because B2 in Figure 4.23 contains 4 i.e (1 x 2 x 3 x 4 = 24).

3.**SQRT**: Finds the square root of a value in the cell.

Syntax

SQRT(number)

Number is the number for which you want to find the square root.

Remark

If number is negative, SQRT returns the #NUM! error value.

Example

SQRT(C2) gives 2 because square root of 4 is 2.

4. SUM

The **SUM** function adds all the numbers that you specify as arguments (argument: A value that provides information to an action, an event, a method, a property, a function, or a procedure.). Each argument can be a range (range: Two or more cells on a sheet. The cells in a range can be adjacent or nonadjacent.), a cell reference (cell reference: The set of coordinates that a cell occupies on a worksheet. For example, the reference of the cell that appears at the intersection of column B and row 3 is B3.), an array (array: Used to build single formulas that produce multiple results or that operate on a group of arguments that are arranged in rows and columns. An array range shares a common formula; an array constant is a group of constants used as an argument.), a constant (constant: A value that is not calculated. For example, the number 210 and the text "Quarterly Earnings" are constants. An expression, or a value resulting from an expression, is not a constant.), a formula (formula: A sequence of values, cell references, names, functions, or operators in a cell that together produce a new value. A formula always begins with an equal sign (=).), or the result from another function. For example, **SUM(A1:A5)** adds all the numbers that are contained in cells A1 through A5. For another example, **SUM(A1, A3,A5)** adds the numbers that are contained in cells A1, A3, and A5.

Syntax

SUM(number1, [number2],[number3],[number4],…)

The **SUM** function syntax has the following arguments:

number1 Required

number2, number3 are optional

Example:

SUM(A2:E2) Gives the result 20 because(3 + 5 +4 + 6 + 2 = 20)

5. SUMIF

You use the **SUMIF** function to sum the values in a range that meet criteria that you specify. It will check the condition if the condition is true then only it will return the value

SYNTAX:

SUMIF(RANGE , CRITERIA)

Example:

SUMIF(A2:E2,">4") Gives result 11 because (5 + 6).

6.MOD

Returns the remainder as the result after number is divided by divisor. The sign of the result is same as the sign as divisor.

Syntax

MOD(**number**,**divisor**)

Number is the number for which you want to find the remainder.

Divisor is the number by which you want to divide number.

Ex1: MOD(B2,A2) gives result 2 because remainder is 2 when 5 is divided by 3.

Statistical functions

1. Average: Returns average(arithmetic mean) of the arguments

The **AVERAGE** function syntax has the following arguments

Number1 Required. The first number, cell reference (cellreference: Theset of coordinates that a cell occupies on a worksheet. For example, the reference of the cell that appears at the intersection of column B and row 3 is B3.), or range for which you want the average.

Syntax: average(number1,number2,..)
Example:

Average(a2:e2) gives result 4 because (3+5+4+6+2)/5 = 4

2. Count

The **COUNT** function is used to count the number of cells that contain numbers and counts numbers within the list of arguments. Use the **COUNT** function to get the number of entries in a number field that is in a range or array of numbers.

Syntax

Count(value1,[value2] ,...)

The COUNT function syntax has these arguments. They are

value1(Required) The first item, cell reference, or range within which youwant to count numbers.

value2,(Optional) Up to 255 additional items, cell references, or rangeswithin which you want to count numbers.

Example
Count(a4:e4) gives result 3 because (12,8,4 are 3 values)

3. Count A

The **COUNTA** function counts the number of cells that are not empty in a range
Syntax

COUNTA(value1, [value2], ...)

The **COUNTA** function syntax has the following arguments (argument: A value that provides information to an action, an event, a method, a property, a function, or a procedure.):

value1 (Required) The first argument representing the values that you wantto count of.

value2(Optional)
Ex: counta(A4:E4) gives the result 4 because the range contains 4 values.
Count Blank

Returns the count of no.of empty cells present in a specific range.

Syntax

COUNTBLANK(range)

Range is the range from which you want to count the blank cells.

Example:

Countblank(A4:E4) gives result 1 because the range contains one blank.

5.Count If

The **COUNTIF** function counts the number of cells within a range that meet a single condition that you specify. For example, you can count all the cells that start with a

certain letter, or you can count all the cells that contain a number that is larger or smaller than a number you specify.

Syntax:

COUNTIF(range, criteria)

The **COUNTIF** function syntax has the following arguments

=>range (Required) One or more cells to count, including numbers or names,arrays, or references that contain numbers. Blank and text values are ignored.

=>Condition(Required) Anumber, expression, cell reference, or text string thatdefines which cells will be counted. For example, criteria can be expressed as 32, ">32", B4, "apples", or "32".

Ex:

Countif(A4:E4,">10") gives result 1 because the range contains only one value that is greater than 10.

6.MAX:

Returns the maximum value in the range

Syntax:

MAX(**number1**,number2,...)

Number1, number2, ...are 1 to 255 numbers for which you want to findthe maximum value.

Ex : max(A2:E2) gives result 6 because 6 is the maximum value in that range.

7.MIN: Returns the minimum value in the range

Syntax:

MIN(**number1**,number2,...)

Number1, number2, ...are 1 to 255 numbers for which you want to findthe minimum value.

Ex : max(A2:E2) gives result 2 because 6 is the minimum value in that range

4.5 Moving and copying, inserting and deleting Rows and Columns:

Excel allows you to perform some operations on the cells like moving a cell, copying a cell, and paste cell and we can perform **cut and paste operation** as well as **copy and paste** operation on the data present in the cells. In order to perform the cut and paste , copy and paste operations first we have to select the data on which we want to perform those operations.

Select Data

To select a cell or data:

Click the **cell**

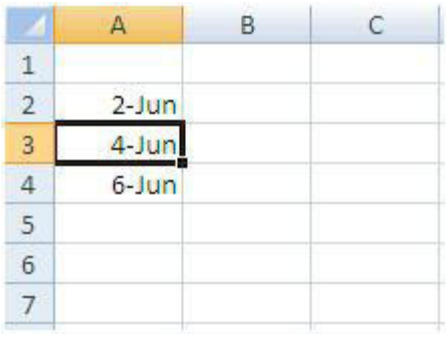


Fig. 4.35 copy one cell

To select multiple cells just click and drag the cursor.

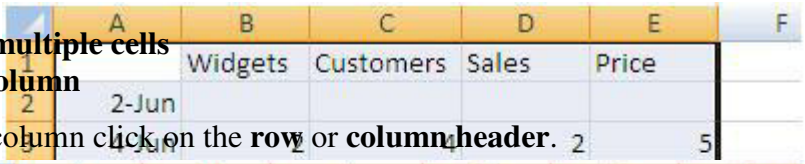


Fig. 4.36 copying multiple cells

Select a Row or Column

To select a row or column click on the **row** or **column header**.

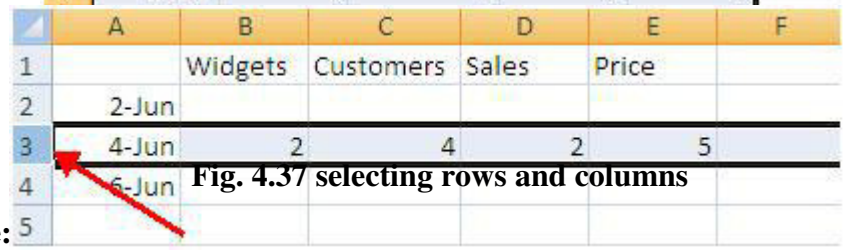


Fig. 4.37 selecting rows and columns

Copy and Paste:

To copy and paste data:

- Select the cell(s) that you wish to copy
- On the **Clipboard** group of the **Home** tab, click **Copy**

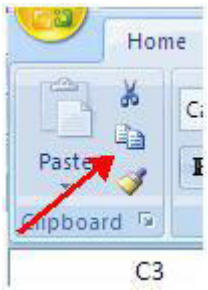


Fig. 4.38 Copy and Paste Buttons

- Select the cell(s) that you wish to copy
- On the **Clipboard** group of the **Home** tab, click **Paste**

Cut and Paste:

To cut and paste data:

- Select the cell(s) that you wish to cut
- On the **Clipboard** group of the **Home** tab, click **Cut**

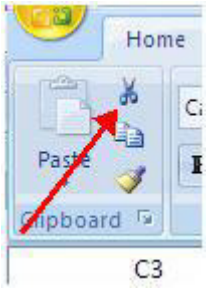


Fig. 4.39 Cut Buttons

- Select the cell(s) that you wish to paste
- On the **Clipboard** group of the **Home** tab, click **Paste**

Inserting Rows or Columns:

Place the cursor in the row below where you want to insert the new row, or in the column to the left of where you want to insert the new column

- Click the **Insert** button on the **Cells** group of the **Home** tab
- Click the appropriate choice: **Cell, Row, or Column**

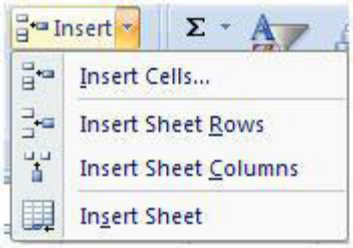
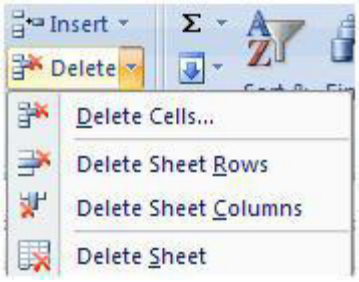


Fig. 4.40 Insert Commands

Delete Cells, Rows and Columns:

You can also delete some unwanted cells from your worksheet. To delete cells, rows, and columns:

- Place the cursor in the cell, row, or column that you want to delete
- Click the **Delete** button on the **Cells** group of the **Home** tab
- Click the appropriate choice: **Cell, Row, or Column**



`

Fig. 4.41 Delete Cells and Rows

4.6 Formatting a Worksheet:

Formatting the worksheet contains six options numbers, alignment, font, border, fill and protection to the work sheet.

Changing fonts in Excel will allow you to emphasize titles and headings. To modify a font:

- Select the cell or cells that you would like to apply the font
- Go to the **Font** group on the **Home** tab, choose the font type, size, bold(**ctrl+b**), italics(**ctrl+i**), underline(**ctrl+u**), or color

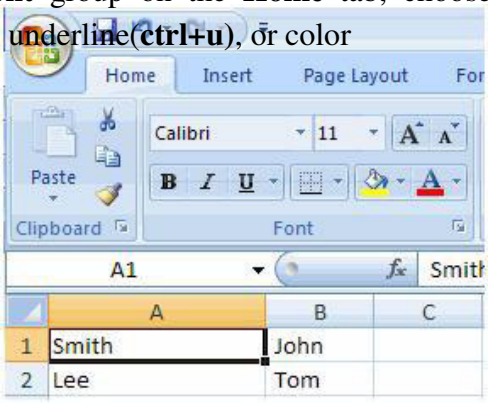


Fig. 4.42 Modifying Fonts

In Excel, you can also apply specific formatting to a cell. Process of applying formatting to a cell or group of cells:

- Select the cell or cells that will have the formatting
- Click the **Dialog Box** arrow on the **Alignment** group of the **Home** tab

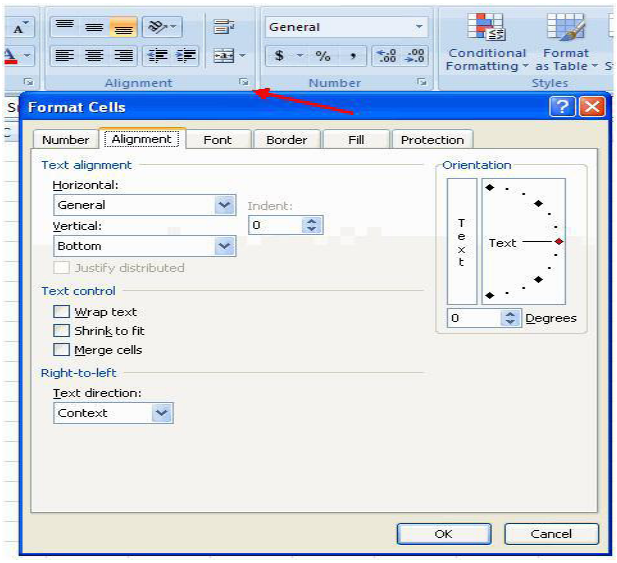


Fig. 4.43 Formatting Cells

There are several tabs on this dialog box that allow you to change properties of the cell or cells.

Number : Allows for the display of different types of numbers and decimalplaces

Alignment: Allows for the horizontal and vertical alignment(arrangement) of text,wrap text, shrink text, merge cells and the direction of the text.

Font : Allows for control of font, font style, size, color, and additionalfeatures

Border : Border styles and colors

Fill : Cell fill colors and styles

4.6.1 Add Borders and Colors to Cells

Borders and colors can be added to cells manually or through the use of styles. To add borders manually:

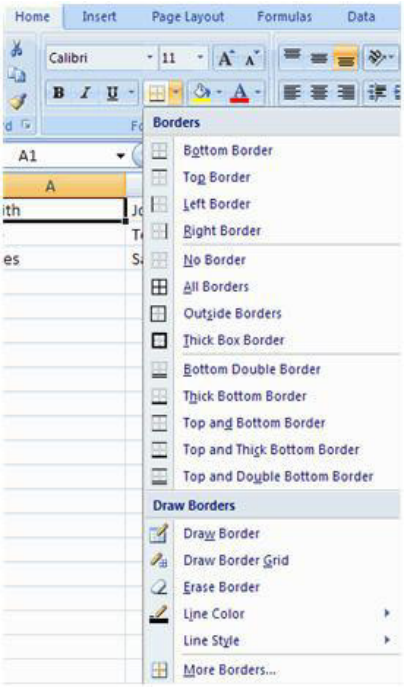


Fig. 4.44 Adding Borders to Cells

Click the **Borders** drop down menu on the **Font** group of the **Home** tab

=>Choose the appropriate border

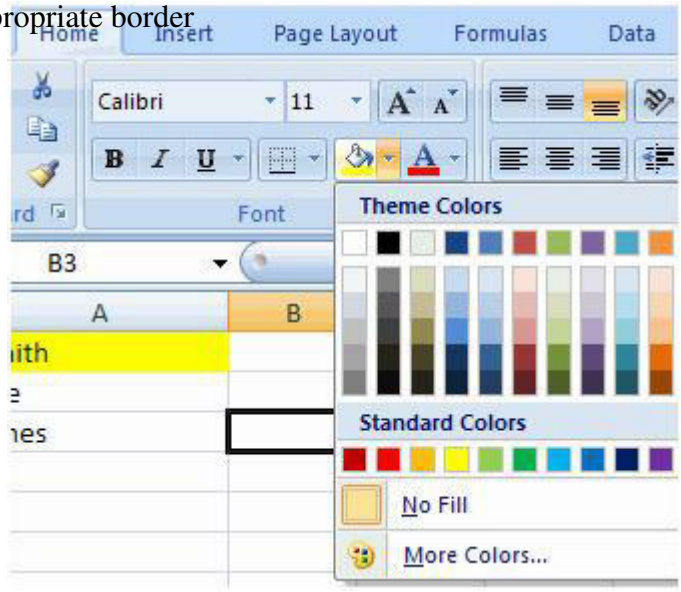


Fig. 4.45 Adding Colors

To apply borders and colors using styles:

Fig. 4.46 Applying Borders and Color

- Click **Cell** Styles on the **Home** tab
- Choose a style or click **New Cell Style**

4.6.2 Change Column Width and Row Height:

To change the width of a column or the height of a row:

- Select the **Format** button on the **Cells** group of the **Home** tab
- Manually adjust the height and width by clicking **Row Height** or **ColumnWidth**

If you want to use **AutoFit** click **AutoFit Row Height** or **AutoFit Column Width**

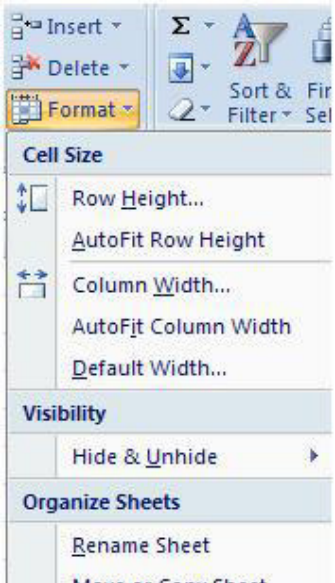


Fig. 4.47 Changing Column Width and Row

4.6.3 Hide or Unhide Rows or Columns:

To hide or unhide rows or columns:

- Select the row or column you wish to hide or unhide
- Select the **Format** button on the **Cells** group of the **Home** tab
- Select **Hide or Unhide**

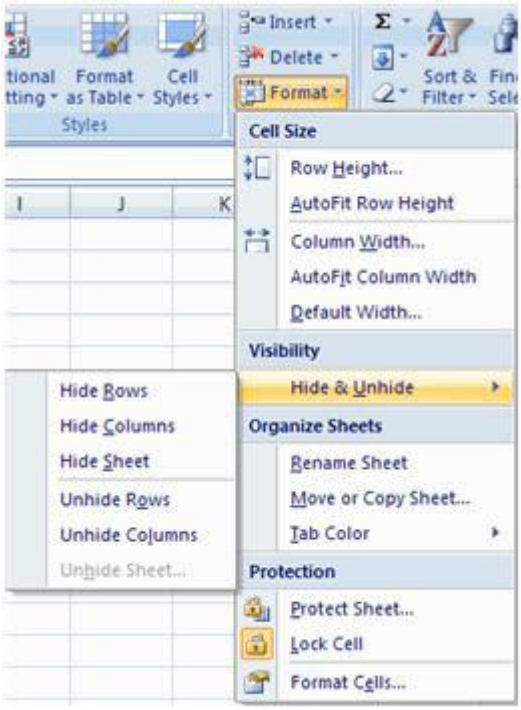


Fig. 4.48 Hide and Unhide Rows and Columns

4.6.4 Merge Cells:

In order to merge the cells firstly you have to select the cells to merge and click the **Merge &Center** button on the **Alignment** group of the **Home** tab. The four choices formerging cells are:

- **Merge & Center**: Combines the cells and centers the contents in the new,larger cell
- **Merge Across**: Combines the cells across columns without centering data
- **Merge Cells**: Combines the cells in a range without centering
- **Unmerge Cells**: Splits the cell that has been merged

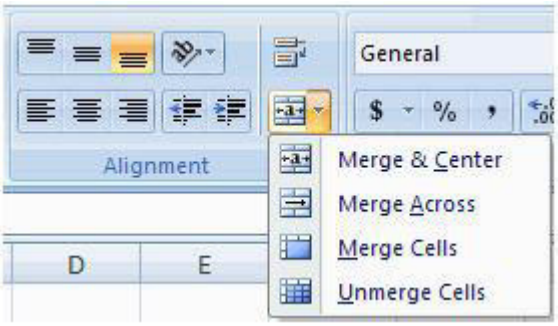


Fig. 4.49 Merge and Unmerge Cells

4.6.5 Align Cell Contents

To align cell contents, Select the cell or cells you want to align and click on the options within the **Alignment** group on the **Home** tab. There are several options for alignment of cell contents:

- **Top Align**: Aligns text to the top of the cell
- **Middle Align**: Aligns text between the top and bottom of the cell
- **Bottom Align**: Aligns text to the bottomof the cell
- **Align Text Left**: Aligns text to the left of the cell
- **Center**: Centers the text from left to right in the cell
- **Align Text Right**: Aligns text to the right of the cell
- **Decrease Indent**: Decreases the indent between the left border and thetext
- **Increase Indent**: Increase the indent between the left border and the text
- **Orientation**: Rotate the text diagonally or vertically

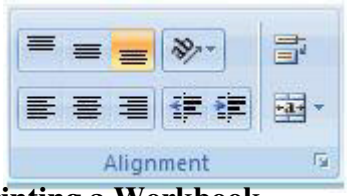


Fig. 4.50 Alignments

4.7 Opening, Saving and Printing a Workbook

The work sheet that you have worked so far has been stored in RAM (Random Access Memory) of your system. The RAM is volatile. i.e., it loses its contents ,if the power is switched off to system. Therefore you must save the work sheet for future reference. You can also change the name of file and location of file by using “save as” .

When you save a workbook, you have two choices: **Save** or **Save As**.

To save a document:

- Click the **Microsoft Office Button**
- Click **Save option**

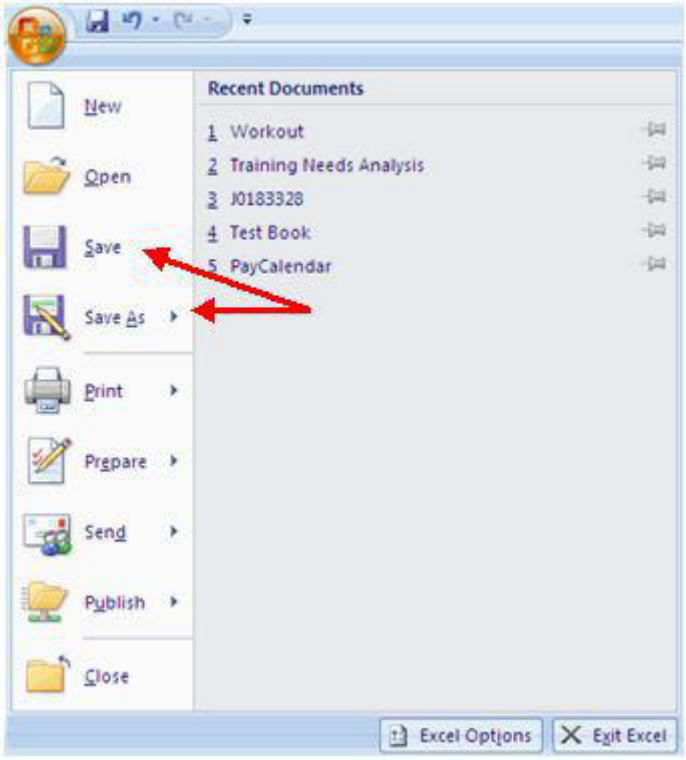


Fig. 4.51 Saving a File

You have to use the **Save As** feature when you have to save a workbook under a different name or to save it in another location. Remember that older versions of Excel will not be able to open an Excel 2007 worksheet unless you save it as an Excel 97-2003 Format. Inorder to use the **Save As** feature:

- Click the **Microsoft Office Button**
- Click **Save As**
- Type in the name for the Workbook
- In the **Save as Type** box, choose **Excel 97-2003 Workbook**

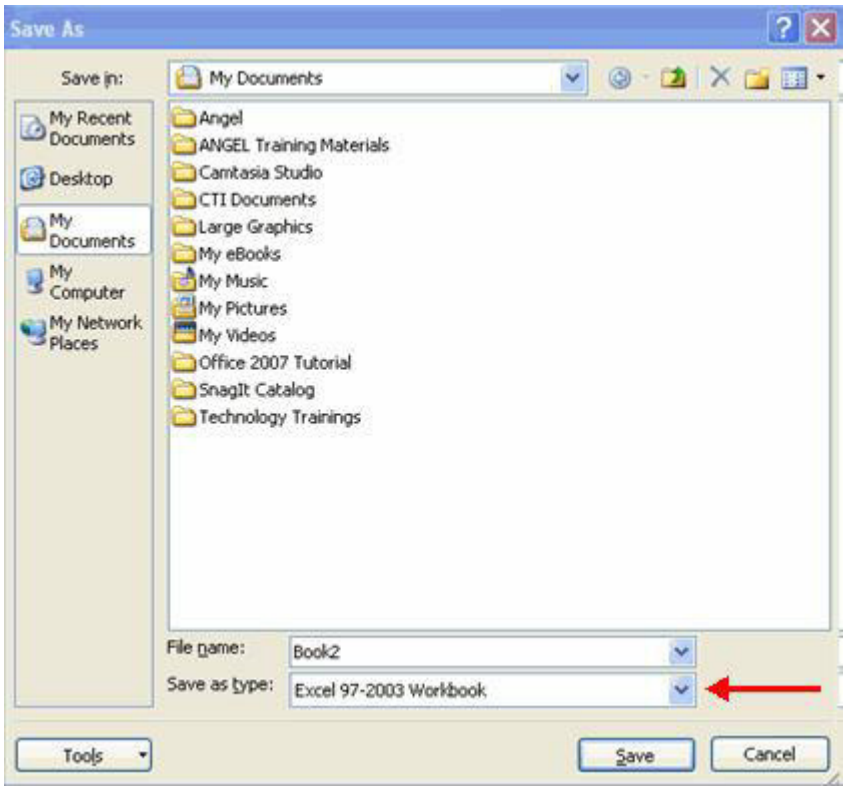


Fig. 4.52 Saving A File

Open a Workbook

To open an existing workbook:

- Click the **Microsoft Office Button**
- Click **Open**
- Browse to the workbook
- Click the title of the workbook
- Click **Open**

Print a worksheet or workbook:

You can print entire or partial worksheets or workbooks, one at a time, or several at once.

You can also print a workbook to a file instead of to a printer. This is useful when you need to print the workbook on a different type of printer from the one that you originally used to print it.

Print a workbook to a file

1.Click**Microsoft Office Button** , and then click **Print**.

Keyboard shortcut You can also press CTRL+P.

2. In the **Name** box, select the printer on which you want to print the file.

3.Select the **Print to file** check box, and then click **OK**.

4.In the **Print to File** dialog box, under **Output File Name**, type a name for the file that you want to print.

4.8 Working with Charts

A **chart** is a tool you can use in Excel to **communicate data graphically**. Often a work sheet contains so much numeric data that is becomes difficult to accurately analyse it and to take a correct decision. In such cases , the facility to represent data in the form of charts(graphs) comes very useful. Because charts convey the message clearly and quickly without any effort, they play important role in the business world. Excel offers many types of charts including: Column, Line, Pie, Bar, Area, Scatter and more. To view the charts available select the Insert Tab on the Ribbon.

Suppose there is a table of a company containing area wise sales details as shown below. For this to draw a simple chart , select the range B4 : E7,click insert tab, click on charts in the columns group . if you select 2D , then chart has to be displayed as follows.

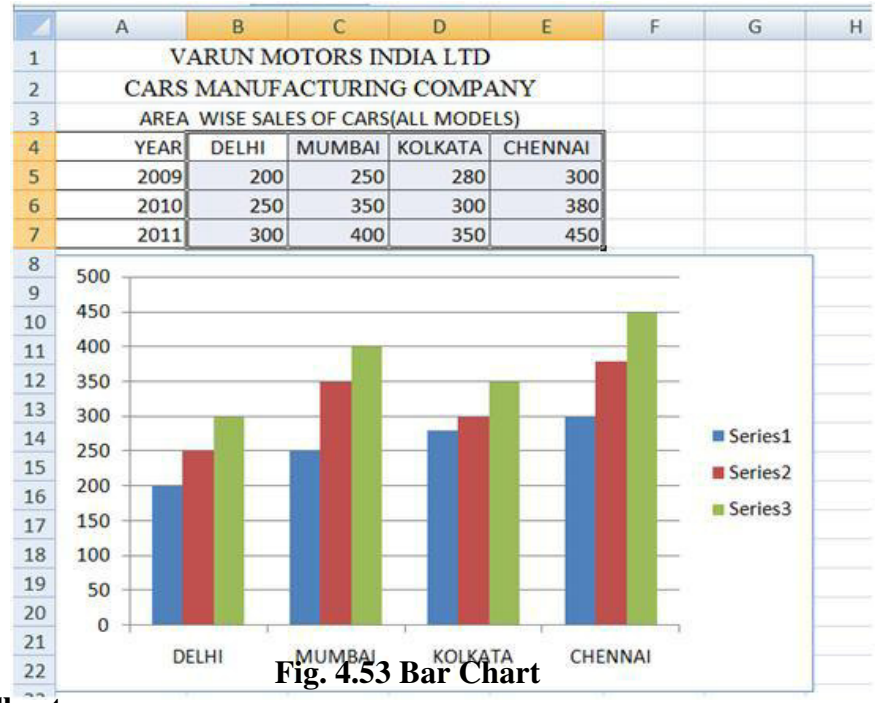


Fig. 4.53 Bar Chart

4.8.1 Create a Chart

In order to create a chart:

- First you have to select the **cells** that contain the data you want to use in the chart
- Click the **Insert** tab on the Ribbon
- Click the type of **Chart** you want to create

Fig. 4.54 Creating Chart

4.8.2 Modify a Chart

Once you have created a chart you can do several things to modify the chart.

To move the chart:

- Click the **Chart** and **Drag** it another location on the same worksheet, or
- Click the **Move Chart** button on the **Design** tab
- Choose the desired location (either a new sheet or a current sheet in the workbook)

Fig. 4.55 Modifying a Chart

To change the data included in the chart:

- Click the **Chart**
- Click the **Select Data** button on the **Design** tab

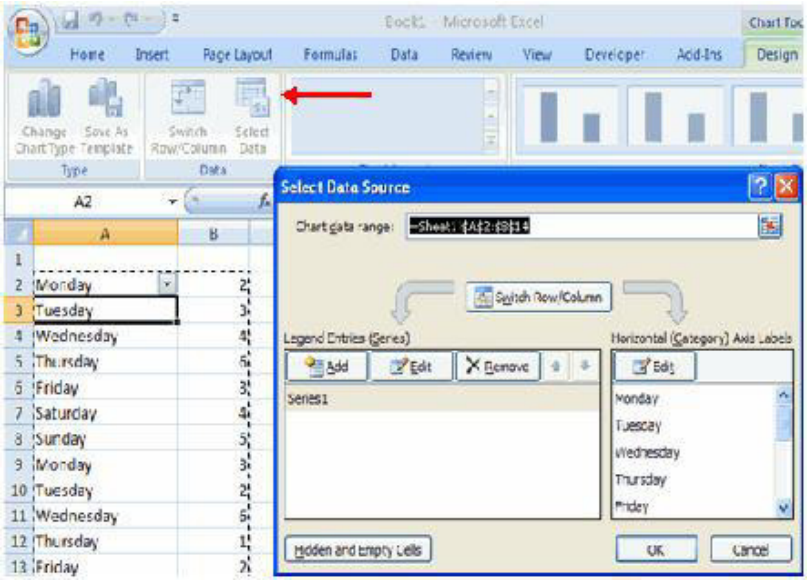


Fig. 4.56 Selecting a Data Source

To reverse data are displayed in the rows and columns:

- Click the **Chart**
- Click the **Switch Row/Column** button on the **Design** tab

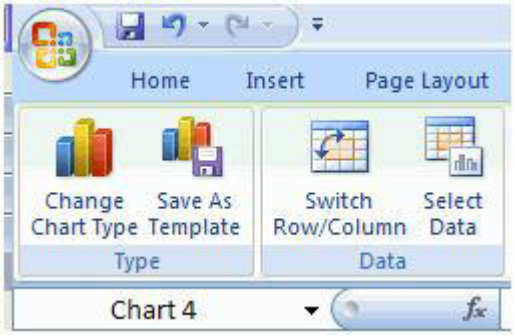


Fig. 4.57 Reverseing the data chart

To modify the labels and titles:

- Click the **Chart**
- On the **Layout** tab, click the **Chart Title** or the **Data Labels** button
- Change the **Title** and click **Enter**

4.8.3 Chart Tools

The Chart Tools appear on the Ribbon when you click on the chart. The tools are located on three different tabs: Design, Layout, and Format.

Within the **Design** tab you can control the chart type, layout, styles, and location.

Fig. 4.58 Chart Tools

Within the **Layout** tab we have so many features like we can control inserting pictures, shapes and text boxes, labels, axes, background, and analysis.

Within the **Format** tab you can modify shape styles, word styles and size of the chart.

Fig. 4.59 Format Tab

Copy a Chart to Word

- Select the **chart**
- Click **Copy** on the **Home** tab
- Go to the **Word** document where you want the chart located Select

  Paste on the **Home** tab

4.9 Macros

The macro is a useful feature of excel that helps to automatic key strokes (commands) required to execute any command or task. Macros can be used for numeric tasks such as

- Formatting of ranges
- Printing a worksheet range
- Creating charts
- Accepting data from the user and putting that in a database

Macros are advanced features in Excel that can speed up editing or formatting operations you may perform. They record sequences of menu selections that you choose so that a series of actions can be completed in one step.

Recording a Macro

Inorder to record a Macro we have to do the following:

- Click the **View** tab on the Ribbon
- Click **Macros**
- Select **Record Macro**
- Enter a name (without spaces)
- Enter a **Shortcut Key**
- Enter a **Description**

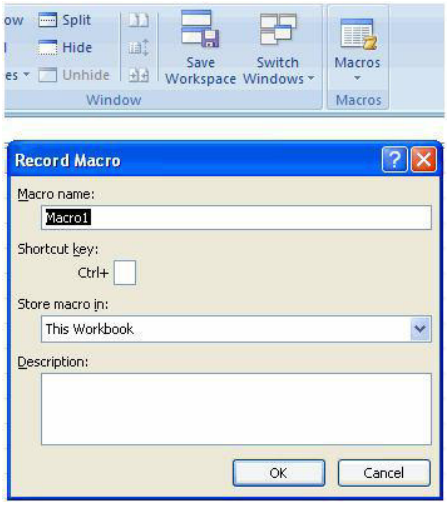


Fig. 4.60 Recording a Macro

- Perform the **Macro**
- Click **Macros**
- Select **Stop Recording**

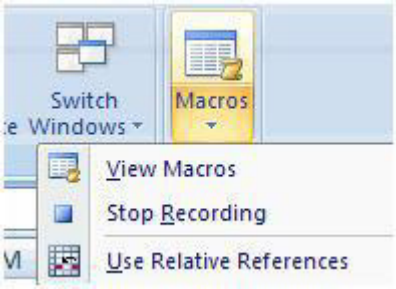


Fig. 4.61 Stoping a Macro

Running a Macro

In order to run a Macro from your Keyboard shortcut, simply **press the keys** that you have programmed to run the Macro. Or you can view all macros and run by:

- Click **Macros**
- Click **View Macros**
- Choose the **Macro** and click **Run**

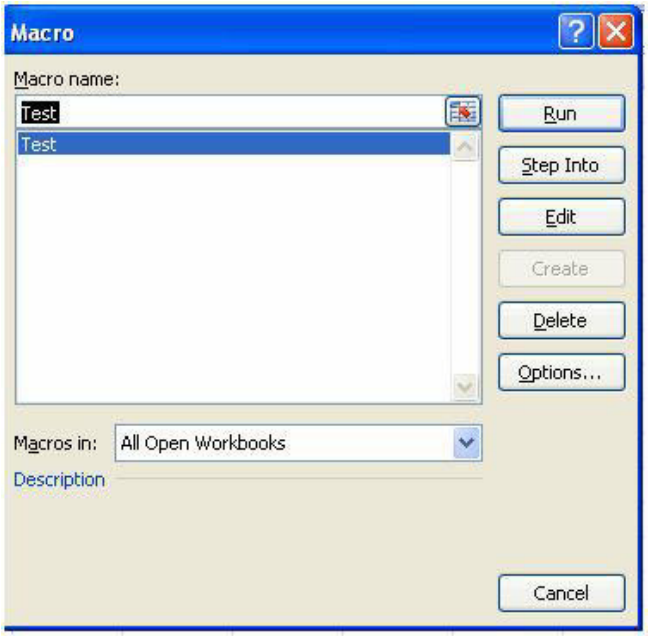


Fig. 4.62 Saving a Macro

4.10 Tables and Pivot Tables

4.10.1 Tables

The data can be shown in the form of tables as shown below. It is an example table for a student marks details. Table contains rows and columns.

STUDENT MARKS

student name	maths	science	social
reesha	100	100	100
varun	100	100	100
sohan	100	100	100

Create a Table

There are two ways to create a table. You can insert a table in the default table style or you can format your data as a table in a style that you select.

Insert a table

On a worksheet, choose the range of cells that you need to include in the table. The cells can be empty or can contain data.

- On the **Insert** tab, in the **Tables** group, click **Table**.

Fig. 4.63 Inserting a Table

Keyboard shortcut you can also press CTRL+L or CTRL+T.

1. If the choose range contains data that you need to display as table headers, choose the **My table has headers** check box.

Table headers display default names if you do not choose the **My table hasheaders** check box. You can modify the default names by typing the text thatyou need.
Dissimilar lists in Office Excel 2003, a table does not have a special row (marked with *) for fast adding new rows. For more details about how to add or insert rows in a table, see Add or delete table rows and columns in an Excel table.

Format data as a table

1. On the worksheet, choose a range of empty cells or cells that hold the data that you need to quickly format as a table.
2. On the **Home** tab, in the **Styles** group, click **Format as Table**.

Fig. 4.64 Formatting data as table

When you use **Format as Table**, Office Excel automatically inserts a table.

1. Under **Light**, **Medium**, or **Dark**, click the table style that you want to use.

Note: Custom table styles are offered under **Custom** after you createone or more of them. For details about how to create a custom table style, view Format an Excel table.

Convert a table to a range of data

1. Click anywhere in the table.
Tip : This displays the **Table Tools**, adding the **Design** tab.
2. On the **Design** tab, in the **Tools** group, click **Convert to Range**.

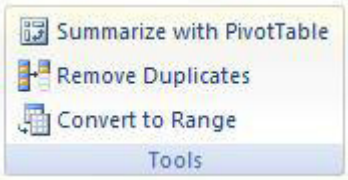


Fig. 4.65 Coverting a Table

Note Table features are no longer available after you convert the tableback to a range. For instance, the row headers no longer contain the sort and filter arrows, and structured references (references that use table names) that were used in formulas turn into regular cell references.

Delete a table

- On a worksheet, select a table.

- Press DELETE.

4.10.2 PivotTables

PivotTables are used to looking at data in several dimensions; For instance, sales by region, sales by sales representatives, sales by product category, and sales by month, etc. Such capability is provided in numerous decision support applications under several function names. For instance, in a spread sheet , a pivot table provides these views and enables quick switching among them.

A PivotTable report is an interactive way to quickly summarize large amounts of data. Use a PivotTable report to analyse numerical data in detail and to answer unanticipated questions about your data. A PivotTable report is especially designed for:

- Querying large amounts of data in many user-friendly ways.
- Subtotalling and aggregating numeric data, summarizing data by categories and subcategories, and creating custom calculations and formulas.
- Expanding and collapsing levels of data to focus your results, and drilling down to details from the summary data for areas of interest to you.
- Moving rows to columns or columns to rows (or "pivoting") to see different summaries of the source data.
- Filtering, sorting, grouping, and conditionally formatting the most useful and interesting subset of data to enable you to focus on the information that you want.
- Presenting concise, attractive, and annotated online or printed reports.

You often use a PivotTable report when you want to analyse related totals, especially when you have a long list of figures to sum and you want to compare several facts about each figure. In the PivotTable report illustrated below, you can easily see how the third-quarter golf sales in cell F3 compare to sales for another sport, or quarter, or to the total sales.

Fig. 4.66 Graph showing Figures

1. Source data, in this case, from a worksheet

2. The source values for Qtr3 Golf summary in the PivotTable report
3. The entire PivotTable report
4. The summary of the source values in C2 and C8 from the source data
In the above pivotTable grand total for golf and qtr3 is $7,930($1500+$6430).

In a PivotTable report, each column or field in your source data becomes a PivotTable field that summarizes multiple rows of information. In the preceding example , the Sport column becomes the Sport field, and each record for Golf is summarized in a single Golf item.

A value field, such as Sum of Sales, provides the values to be summarized. Cell F3 in the preceding report contains the sum of the Sales value from every row in the source data for which the Sport column contains Golf and the Quarter column contains Qtr3. By default, data in the Values area summarize the underlying source data in the PivotChart report in the following way: numeric values use the SUM function, and text values use the COUNT function.

To create a PivotTable report, you must define its source data, specify a location in the workbook, and lay out the fields.

For more information, see Create or delete a PivotTable or PivotChart report and Create and modify the field layout in a PivotTable report.

Ways to work with a PivotTable report

After you create the initial PivotTable report by defining the data source, arranging fields in the PivotTable field List, and choosing an initial layout, you can perform the following tasks as you work with a PivotTable report:

Explore the data by doing the following:

- Expand and collapse data, and show the underlying details that pertain to the values.
- Sort, filter, and group fields and items.
- Modify summary functions, and add custom calculations and formulas.

Modify the form layout and field arrangement by doing the following:

- Modify the PivotTable report form: compact, outline, or tabular.
- Add, rearrange, and remove fields.
- Modify the order of fields or items.

Modify the layout of columns, rows, and subtotals by doing the following:

- Turn column and row field headers on or off, or display or hide blank lines.
- Display subtotals above or below their rows.
- Adjust column widths on refresh.
- Move a column field to the row area or a row field to the column area.
- Merge or unmerge cells for outer row and column items.

Modify the display of blanks and errors by doing the following:

- Modify how errors and empty cells are displayed.
- Modify how items and labels without data are shown.

- Display or hide blank lines

Modify the Format by doing the following:

Manually and conditionally format cells and ranges.

- Modify the overall PivotTable format style.
- Modify the number format for fields.
- Include OLAP Server formatting.
- You can automatically create a PivotChart report when you first create a PivotTable report, or you can create a PivotChart report from an existing PivotTable report.

Summary

Whenever userenters some data in the tabular form such asrow wise and column wise, the work sheet is very much applicable because it provides automatic recalculations of all formulae, several built in functions, formatting work sheetetc. It provides professional look to the worksheet and avails with graph formats and others.

A worksheet is nothing but a single spreadsheet page but a workbook is a collection of all the worksheets belongs to a single file. A book contains pages similarly a workbook contains worksheets. A workbook consists of one or more worksheets. On opening a work book it contains 3 work sheets by default. The number of worksheets can be increased and they can be named and renamed as well. One can know the maximum no of rows (ctrl + down arrow) and maximum no of columns (ctrl + right arrow) in excel 2007.

On entering a formula, it automatically shows the list of the formulaethose which match the characters of the formula which we have entered. Thus it is very easy to enter the formula and the parameters required. While working on a work sheet, if you want to cancel the last action you have done, you can use the undo command in the quick access tool bar (one clear the mistakes done accidentally). It provides 2 features namely find and replace with which we canfind the words required and can replace them if needed. If there is any spelling mistake, we can also correct them using spell check. The functions are very helpful for calculations in the worksheets.

Excel allows you to copy a cell or collection of cells to any location either within the work sheet or to another work sheet. In the same way you can move a cell or collection of cells to any part of any work sheet. For copy and paste you can use commands or buttons. We can insert and delete rows and columns as we require and can also number them. Your worksheet can be given professional look by giving variations using formatting commands. Some of the commonly used styles are bold, italic and underline. They can be applied by clicking the respective buttons on the formatting toolbar. Alternatively press the keyboard shortcut keys to apply same these styles.

e.gCtrl+B for Bold, Ctrl+I for Italic and Ctrl+U for underline.

Save is used to store the file with same name but save as is used to store with another name and also can be stored in another location. If you print a workbook to a file so that you can later print the file on a different type of printer from the one that was originally used to print the document, the page breaks and font spacing may change.

To give professional look to the chart, titles can also be added as well as axes. Titles can also be formatted by different styles of fonts, sizes etc. The macro is useful feature to automate common tasks. Once a macro has been created either by recording or writing, we can run it any number of times. To run a macro, we can press its shortcut keys or select its name from a list of macros. In the Tables grand totals can be known row wise or column wise very easily but, to know the totals of subfields we have to use Pivot tables.

Short Answer Type Questions

1. What is a spread sheet?
2. What is a Ribbon?
3. What is mini toolbar?
4. How many rows and columns in excel 2007?
5. What is the difference between workbook and worksheet?
6. How the columns and rows are represented in a work sheet?
7. What is a formula?
8. What is undo and redo?
9. What is auto fill ?
10. What is find and replace?
11. What is Go To command?
12. What is spell check?
13. What is split screen?
14. What is the difference between copy and move?
15. What are the six options in format cells ?
16. What are the alignments?
17. What are merge cells?
18. What are the shortcut keys for bold, italic and underline?
19. What is the importance of saving a worksheet?
20. What is the difference between save and save as ?
21. What is the importance of charts?
22. What are the different types of charts?
23. What is a macro?
24. What is a table?
25. What is a PivotTable?

Long Answer Type Questions

1. Write the 7 tabs in excel and write the groups in each tab.
2. Write and explain any six functions.
3. Write and explain any five mathematical functions.
4. Write and explain any five statistical functions.
5. Explain copy and move the range of cells with an example.
6. Write the procedure to open, save and print a worksheet.
7. Write about charts.
8. Write about macros.
9. Write about tables in excel.
10. Write about PivotTables in excel.

5 MS-Excel

5.1 **Creating Presentations using AutoContent Wizard, Template and Blank Presentation**

5.1.1 Auto-content Wizard
5.1.2 Template
5.1.3 Creating Presentation using Blank Presentation

5.2 working with Master's Slide, title handout and Notes

5.2.1 Hand-outs
5.2.2 Speaker notes
5.2.3 The Slide Master

5.3 **Viewing presentation**

5.3.1 slide views
5.3.2 Slide Sorter view
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5.3.4 The slide show menu
5.3.5 Menu icon
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5.4 Drawing Objects and Inserting OLE

5.4.1 Drawing Objects
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5.5 **Drawing Freeform Shapes**

5.5.1 draw a freeform shape
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5.6 Rotating Objects

5.6.1 Aligning objects
5.6.2 Ordering and rotating objects
5.6.3 Grouping objects

5.7 Animation in Slides/Objects Create a Chart

5.7.1 Animating text and objects
5.7.2 Apply an animation to an object
5.7.3 Effect options
5.7.4 Working with Animations
5.7.5 preview animations
5.7.6 Animation pane

UNIT - V
MS-Power Point

Introduction

In this era of competitive business environment, the companies will have minimum expectation of the professional skills of their employees which involves making a presentation to clients, colleagues, superiors that requires presentation skills, communication skills and knowledge of presentation software. The days where using whiteboard and marker pens or overhead projectors for giving presentations is over. Today, a number of software packages designed for the users to conceive, create and deliver visually stunning and dazzling presentations. These applications differs based on the the level of technical skills required to create a presentation.

There are three main features that should be kept in mind while working with PowerPoint 2007: The Microsoft Office Button, The Quick Access Toolbar, and The Ribbon. The function of these features is clearly explored below.

5.1 Creating Presentations using AutoContent Wizard, Template and Blank Presentation

A presentation is a collection of data and information that is to be delivered to a specific group of people. A PowerPoint presentation is a collection of electronic slides which can have text, pictures, graphics, tables, sound and video. This collection can run automatically or can be (manual)controlled by a presenter.

Microsoft Office Button

The Microsoft Office Button performs many functions as that of File menu of older versions of PowerPoint. This button allows you to create a new presentation, Open an existing presentation, save and save as, print, send, or close.

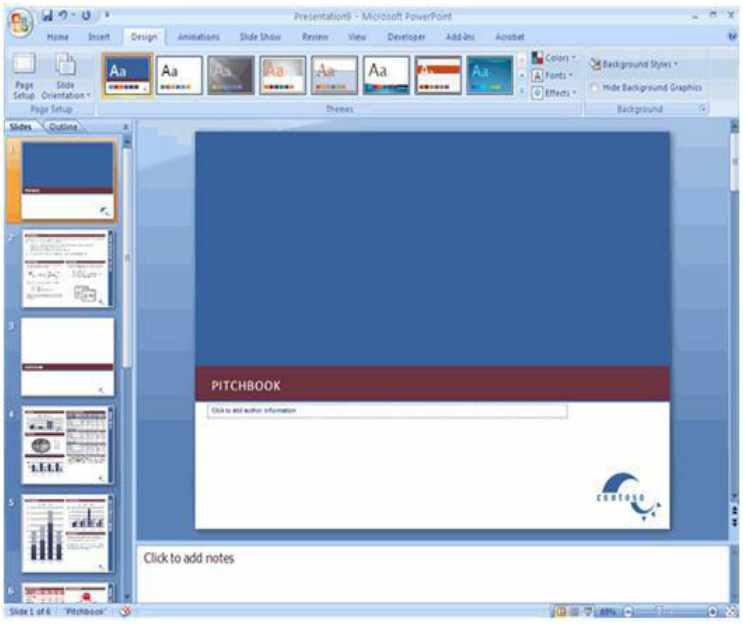


Fig 5.1 Power point page

Ribbon

The ribbon is the panel located at the top of the document. It has seven tabs: Home, Insert, Design, Animations, Slide Show, Review and View. Each tab is divided into groups which have their respective tasks.

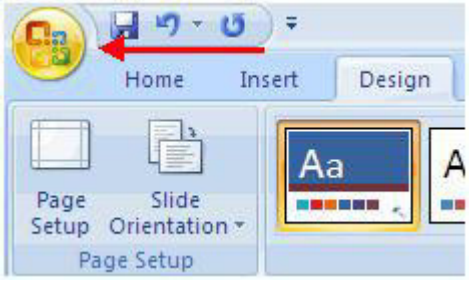


Fig 5.2 Microsoft office button

Fig 5.3 Ribbon

The groups are collections of features that are designed to perform functions that will allow you to develop or edit your PowerPoint slides. Only commonly utilized features are displayed on the Ribbon. To view additional features within each group, select the arrow at the bottom right corner of each group.

Home: Clipboard, Slides, Font, Paragraph, Drawing, and Editing

Insert: Tables, Illustrations, Links, Text, and Media Clips

Design: Page Setup, Themes, Background

Animations: Preview, Animations, Transition to this Slide

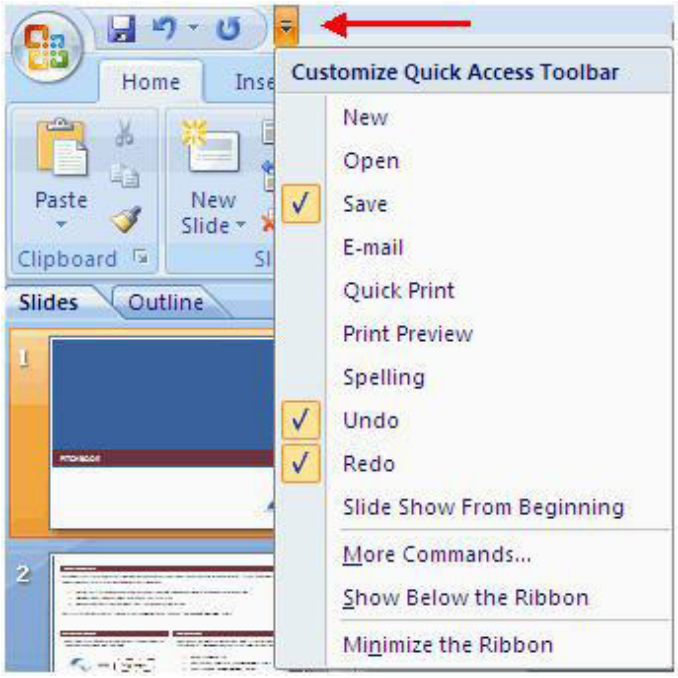
Slide Show: Start Slide Show, Set Up, Monitors

Review: Proofing, Comments, Protect

View: Presentation Views, Show/Hide, Zoom, Window, Macros

Quick Access Toolbar

The **quick access toolbar** is a customizable toolbar that contains commands that may allow you to use. The quick access toolbar can be placed above or below the ribbon. To change the position of the quick access toolbar, click on the arrow at the end of the toolbar and click **Show Below the Ribbon**.



5.4 Quick Access Toolbar

New items can also be added to the quick access toolbar. Right click on any item in the Office Button or the Ribbon and click Add to Quick Access Toolbar and a shortcut will be added.

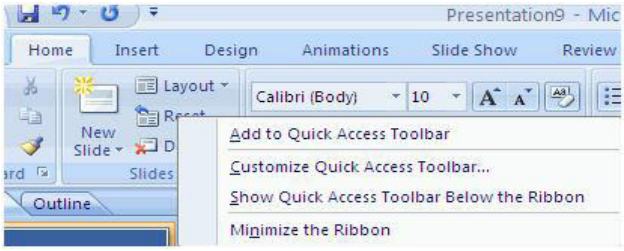


Fig 5.5 cutomize quick access toolbar

Mini Toolbar

A new feature in Office 2007 is the Mini Toolbar. This is a floating toolbar that is displayed when you select text or right-click text. It displays basic formatting tools,
such as Bold, Italics, Fonts, Font Size Color and Alignment.

Fig 5.6 Mini Toolbar

Navigation

Navigation through the slides can be done through the Slide Navigation menu on the left side of the screen. Also, an outline appears from materials that have been entered in the presentation. To access the outline, click on the outline tab.

Fig 5.7 Navigation

Slide Views

Presentations can be viewed in different ways. On the View tab, the group Presentation Views allows you to view the slides as Normal, Slide Sorter, Notes Page, Slide Show, Slide Master, Handout Master, and Notes Master.

Fig 5.8 Slide Views

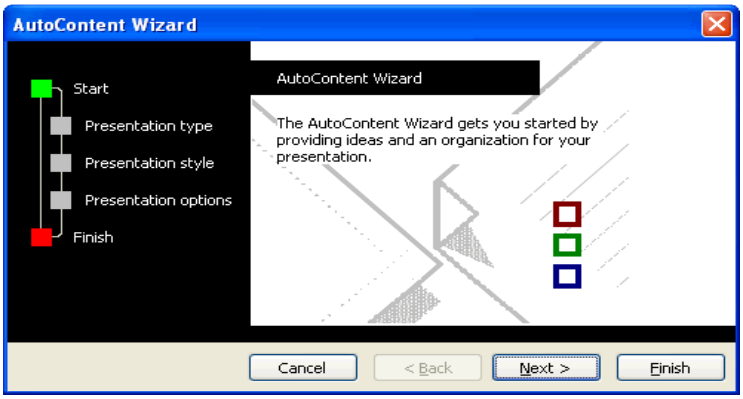
5.1.1 Auto-content Wizard

AutoContent Wizard to help you create a presentation. This wizard provides several slides with different contents. Presentation guides are available in several fields, that includes general, corporate, and sales and marketing

.

Use Auto-content Wizard

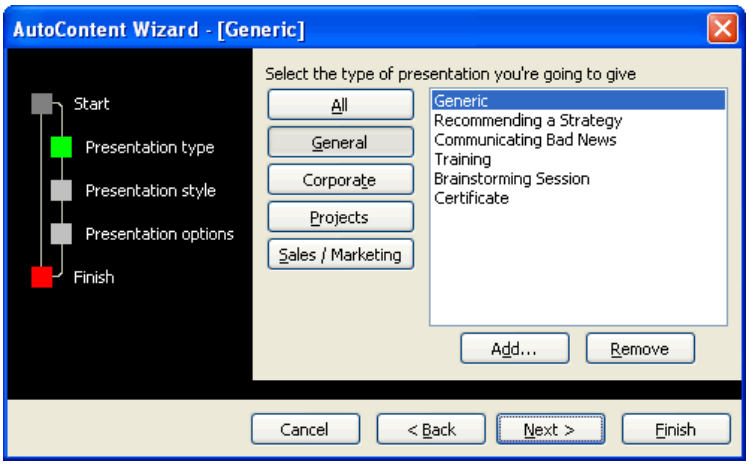
- In the **task pane** under **New Presentation**, choose **From AutoContent Wizard.**
- Click **Next** to see the various presentation options that are available.



Choosing a presentation type

As you continue working in the wizard, think about what you presentation type suits your need. If you're not sure with the type, try **General - Generic**.

- Click **Next** after you have chosen a presentation type.



Making changes to content

When you use the AutoContent Wizard, the slides that result are a guide for your actual content. Make the necessary changes that suits your presentation.

For example, if you are working on a **General - Generic** presentation about your organization and how it helps the community, your first slide might look like this:

You can add or delete some of the slides based on your content or add a different design or color scheme based on your choice.

5.1.2 Template

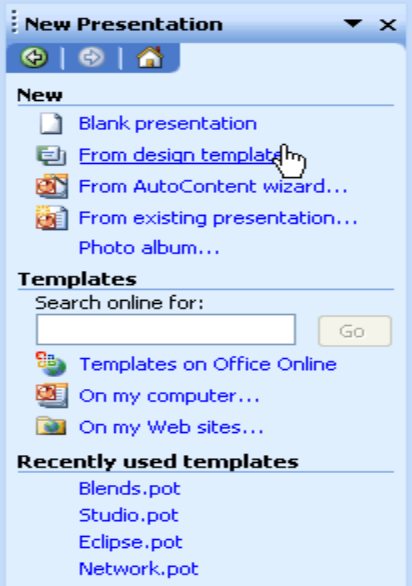
Template is a pattern or blueprint of a slide or group of slides. Templates can contain layouts, theme colors, theme fonts, theme effects, background styles, and even content.

Applying a design template

PowerPoint offers design templates readily to make it easy to create an attractive presentation. These templates are of variouscolors and styles. You can apply a design to existing slides or a new presentation can be started with a template.

To begin a new presentation with a design template:

- Open PowerPoint.
- In the **task pane** under **New**, click **From Design Template**.



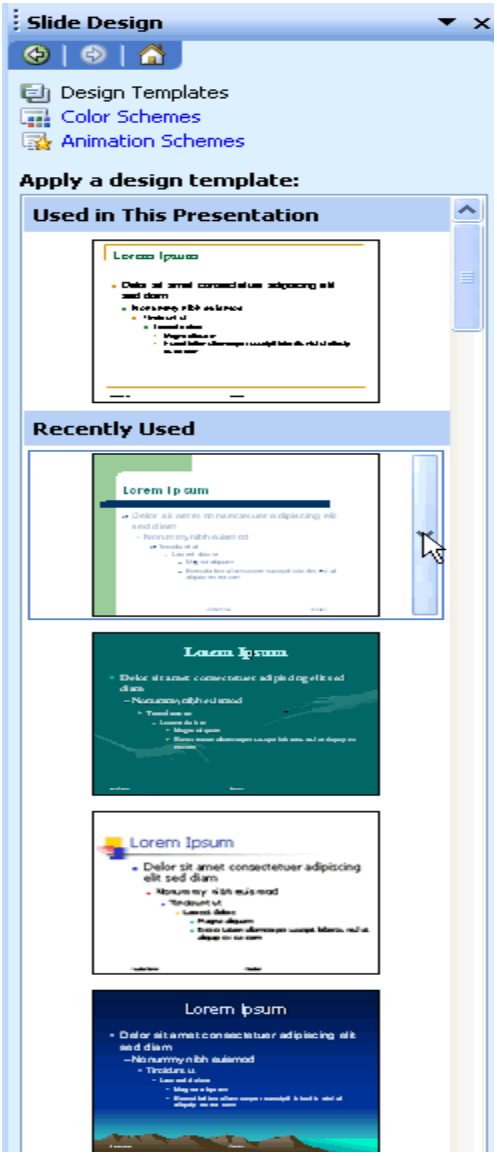
- A list of templates appears.
- Move your mouse pointer through the different designs, or use the scroll bar.
- Click the down-pointing arrow in the gray box next to the template you like.
- Choose **Apply to All Slides**(based on your need).

Adding a design to an existing presentation PowerPoint makes it easy to enhance your existing slides with a design template.

To apply a design to an existing presentation:

- Open PowerPoint.
- In the **Getting Started task pane**, under **Open**, click the presentation you want or select **More...** to browse through the files.

- Click the down-pointing arrow in the **Getting Started pane**, and choose **Slide Design - Design Templates**.
- A list of templates appears.



- Move your mouse pointer through the different designs, or use the scroll bar.
- Click the down-pointing arrow in the gray box next to the template you like.
- Choose **Apply to All Slides**.

5.1.3 Creating Presentation using Blank Presentation

you would get to know creation ,saving and preview of presentation using blank.

New Presentation

A new presentation can be started from a blank slide, a template, existing presentations, or a Word outline. To create a new presentation from a blank slide:

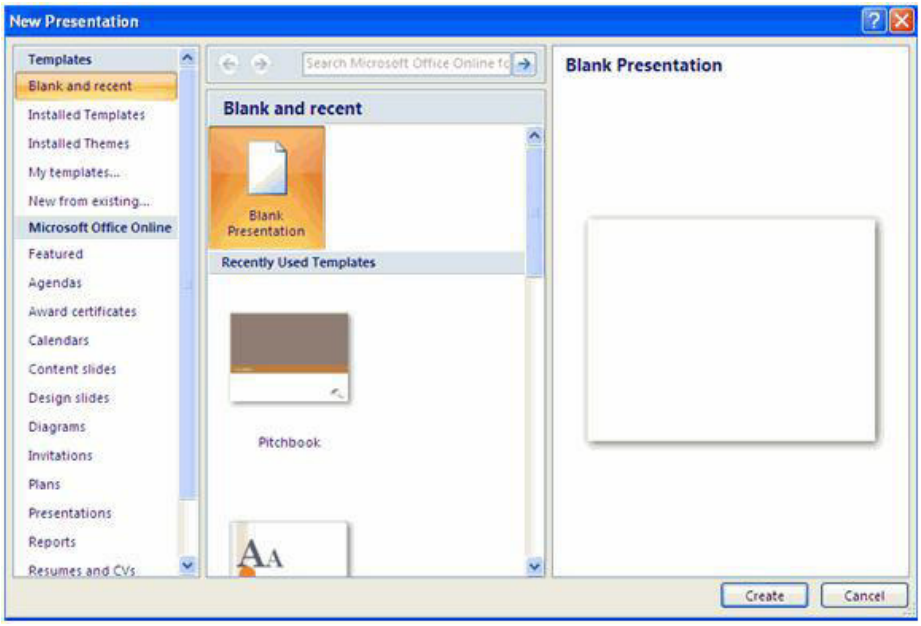


Fig 5.9 New Presentation

- Click on the **Microsoft Office Button**
- Click on **New**
- Click on **Blank Presentation**

To create a new presentation from an existing presentation:

- Click on the **Microsoft Office Button**
- Click on **New**
- Click on **New from Existing**

Browse to and click the presentation

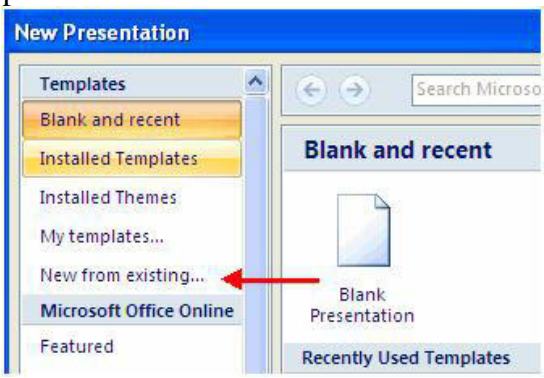


Fig 5.11 Blank presentation

To create a new presentation from a Word outline:

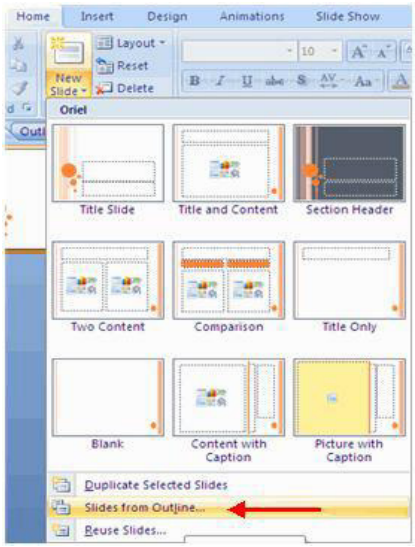


Fig 5.1
2 Slides from outline

- Click on the slide where you would like the outline to begin
- Click on **New Slide** on the **Home** tab
- Click on **Slides from Outline**
- Browse and select the Word Document that contains the outline

Save a Presentation

When you save a presentation, you have two choices: **Save** or **Save As**. To save a document:

- Click on the **Microsoft Office Button**
- Click on **Save**

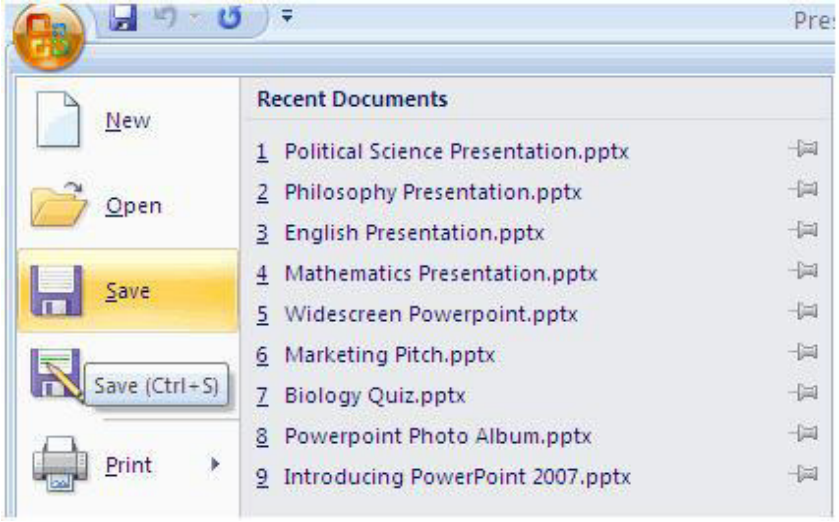


Fig 5.13 Save a presentation

You may need to use the **Save As** option when you need to save a presentation under a different name.

To use the **Save As** feature:

- Click on the **Microsoft Office Button**
- Click on **Save As**
- Type in the name for the Presentation
- In the **Save as Type** box, choose **Excel 97-2003 Presentation**

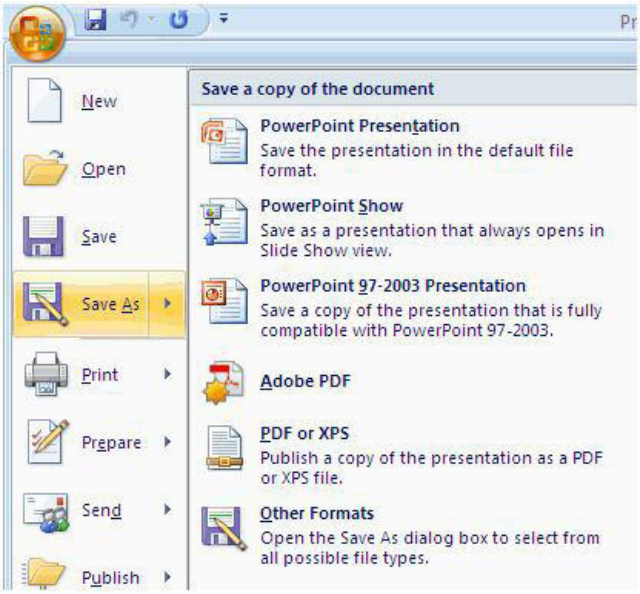


Fig 5.14 Save As a presentation

Add Slides

Slides can be added to an existing presentation wherever necessary. There are several ways to add a new slide to the presentation: Office Themes, Duplicate Selected Slide, or Reuse Slides.

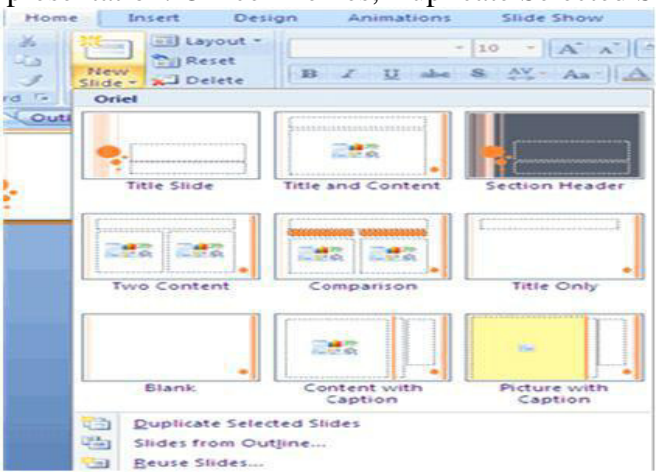


Fig 5.15 Adding of slides

To create a new slide from Office Themes:

- Select the slide immediately **BEFORE** where you want the new slide
- Click on the **New Slide** button on the **Home** tab
- Click on the slide choice that fits your material

To create a slide as a duplicate of a slide in the presentation:

- Select the slide to duplicate
- Click on the **New Slide** button on the **Home** tab
- Click on **Duplicate Selected Slides**

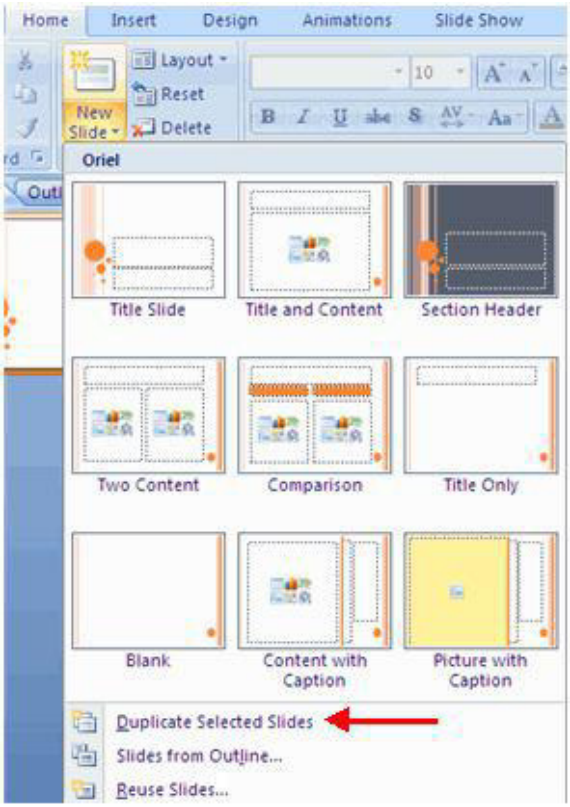


Fig 5.16 Duplicate selected slides

To create a new slide from another presentation:

- Select the slide immediately BEFORE where you want the new slide.
- Click on the **New Slide** button on the Home tab

- Click on **Reuse Slides**
- Click on **Browse**
- Click on **Browse File**

Locate the slide show and click on the slide to import

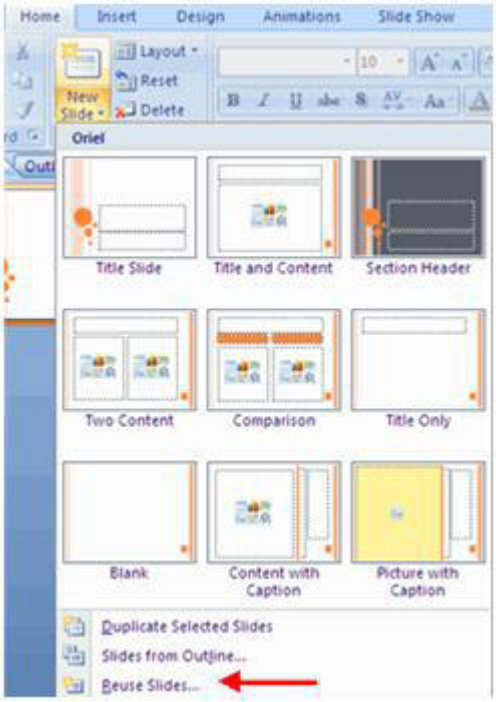


Fig 5.17 Reuse of slides

Themes

Themes are design templates that can be applied to an entire presentation that allows for consistency throughout the presentation. To add a theme to a presentation:

- Click on the **Design** tab
- Choose one of the displayed **Themes** or click the **Galleries** button

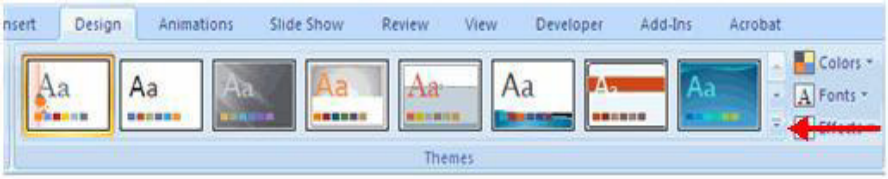


Fig 5.18 Themes

To apply new colours to a theme:

- Click on the **Colours** drop down arrow
- select a colour set or click **Create New Theme Colours**

Fig 5.19 Create new theme

To change the background style of a theme

- Click the **Background Styles** button on the D**esign** tab

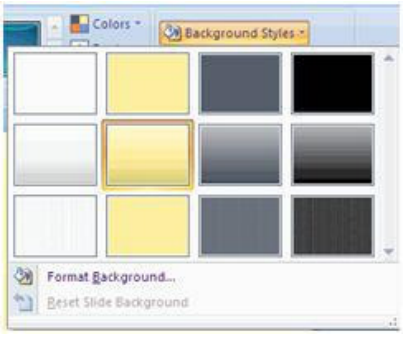


Fig 5.20 Background styles

Working with Content

Editing the presentation by means of entering text, copy and move a text, and also check the spellings by spell check.

Enter Text

To enter text:

- Select the **slide** where you want the text
- Click in a **Textbox** to add text

Fig 5.21 Content

To add a text box:

- Select the **slide** where you want to place the text box
- On the **Insert** tab, click **Text Box**
- Click on the slide and drag the cursor to expand the text box
- Type in the text

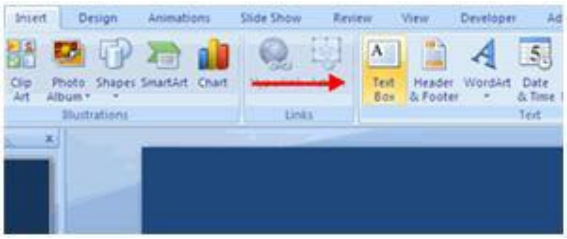


Fig 5.22 Text box

Select Text

To select the text:

- Highlight the text

Fig 5.23 Select Text

Copy and Paste

To copy and paste data:

- Select the item(s) that you wish to copy
- On the **ClipboardGroup** ofthe **Home Tab**, click **Copy**
- Select the item(s) where you would like to copy the data
- On the **ClipboardGroup** ofthe **Home Tab**, click **Paste.**

Fig 5.24 Copy and paste

Cut and Paste

To cut and paste data:

- Select the item(s) that you wish to copy
- On the **Clipboard Group** of the **Home Tab**, click **Cut**
- Select the items(s) where you would like to copy the data
- On the **Clipboard Group** of the **Home Tab**, click **Paste**

Fig 5.25 Cut and paste

Undo and Redo

To undo or redo your most recent actions:

- On the **Quick Access Toolbar**
- Click **Undo** or **Redo**

Fig 5.26 Undo and Redo

Spell Check

To check the spelling in a presentation:

- Click the **Review** tab
- Click the **Spelling** button.

5.2 working with Master's Slide, title handout and Notes

Introduction

Away from slides, PowerPoint provides both Handouts and Notes that can be seen, edited or printed along with a presentation. For various PowerPoint users, both Handouts and Notes are unused features. That in itself is very unfortunate, for the reason that both these elements can make the entire presentation experience more complete and enriched.

5.2.1 Handouts

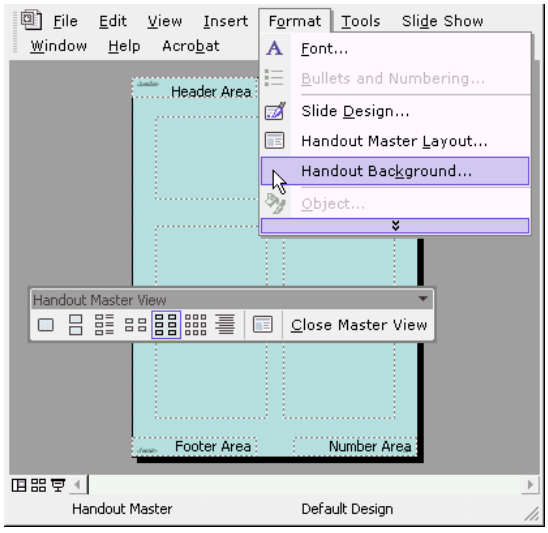
The Handout Master

Masters are an assistant to create patterns. Everything is duplicated based on elements existing in the master. Unlike slides, Handouts are almost always proposed for print and title..etc. so it better to edit the Handout Master based on that assumption. You want to be sure of using content that prints well to both black and white and coloured output.

To edit the Handout Master,

- go to View
- click on Master
- Select Handout Master.

Within the Handout edit area you'll find 4 editable regions on the four corners of the page. These are header, footer, number and date. All these four regions can be edited as mandatory and since all edits are being done on the Handout Master.



many users are not awake of is that you can even edit the main handout page area - for example, you can insert the company logo as a watermark behind the slide thumbnails or even modify the background colour of the whole handout area. The screenshot above shows the Handout Master with a teal background to do that, follow these steps:

1. While in Handout Master View
    - Click on view

- choose View
- choose Master
- choose Handout Master
- choose Format
- Handout Background.

2. In the resultant Handout Background dialog box, choose any of the background options.

Formatting Handout Pages

Handout pages are smaller, printed versions of your slides. They can consist of two, three, four, six, or nine slides per page. Before printing, you may need to add titles, page numbers, or borders. You can do all of these tasks on the Handout Master.

To format handout pages:

1. Choose View -> Master -> Handout Master or hold down Shift as you click the Slide Sorter View button.
2. The Handout Master appears

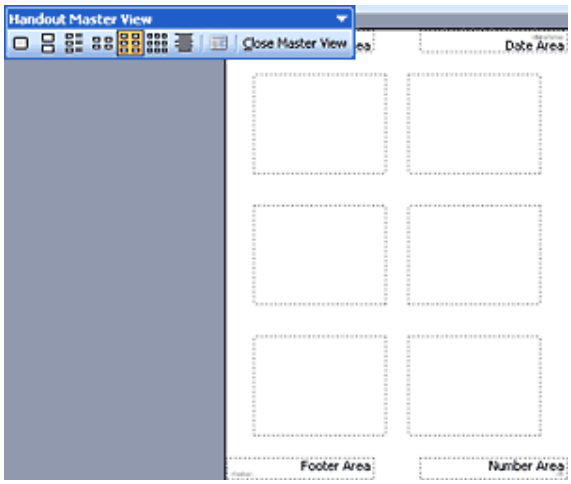


Figure To format and lay out your handout pages, edit the Handout Master.

3. On the Handout Master View toolbar, choose the icon that represents the number of slides you want to appear on each handout page.
4. Make any of the following changes:
   - To add text that you want to appear on each page (such as the presentation title or page number), choose the View > Header and Footer command.
   - Add any desired background graphics.
5. When you are finished, click Close on the Handout Master View toolbar.

5.2.2 Speaker notes

By using two monitors, you can view your notes, or run other programs that your audience will not see while giving your presentation and you can do this by using Presenter view.

Create Speaker Notes

speaker Notes can be added to allow you to create notes for each slide. To add speaker notes:

- Select the slide

- Click on View
- Click on Note Pages
- Click the Click to add Notes section of the screen
- Type in the Notes for that slide.

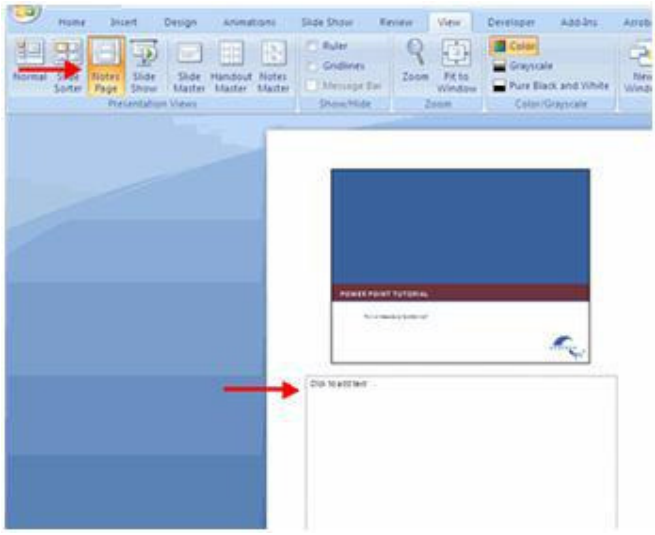


Fig 5.63 Speaker Notes

5.2.3 The Slide Master

Master slide is the one where we can set the default "look" for each slide. Editing done in the slide master will affect every slide in the presentation. The slide master is used to add default content (which can include background pictures) to your presentation whereas theme is used to add a default art style to your presentation.

•All objects that you place on the master slide will be placed on each and every slide.

•The master slide contains placeholders that can be modified.

•Attributes for the text (Size, Weight, Font), background images and background colour can be set. In order to access the slide master, go to the View tab and select "Slide Master".

Using Slide Master View

Some of the most common uses are :

- Modify Backgrounds
- Re-arrange place holders
- Customize text formatting
- Create unique slide layouts and many other

All these changes will be affected to every slide in the presentation.

5.3 Viewing a Presentat

After finishing the creation of all slides, you may want to **view** your presentation to see that all of them appear as needed. PowerPoint gives you the ability to view the presentation in 4 ways, depending on which task you are completing. For example, if you are using your

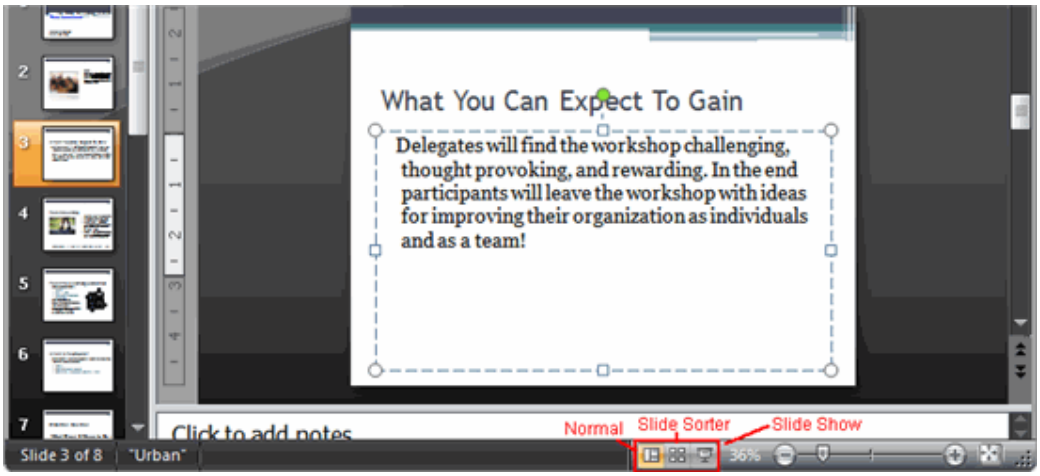
presentation to talk to an audience—which is how PowerPoint is often used—you may need to practice your presentation and view your slides in Slide Show view.

5.3.1 Slide views

It's important for you to be able to access the different PowerPoint slide views in order to use them for various tasks. **In all the four views, three** are visible from the Normal default view.

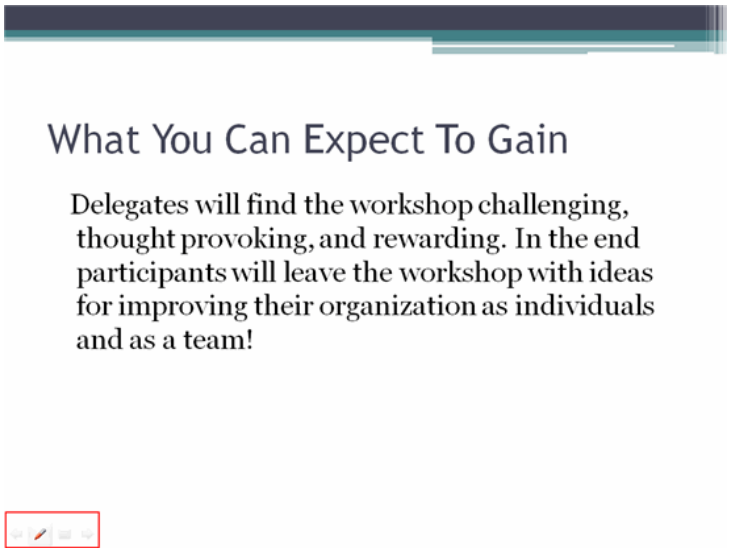
The **slide view commands** are situated on the bottom-right side of the PowerPoint window in Normal view. Click a view command to switch to that view.

Normal view: Creation and editing of slides is done in this view. You can also move slides in the Slides tab on the task pane on the left.



5.3.2 Slide Sorter view: customized slides(miniature) are arranged on the screen in this view. You can drag and drop slides easily to rearrange them, and you can see more than one slides at one time. This view is useful to confirm that you have all the necessary slides and that none have been deleted.

5.3.3 Slide Show view: This view fills the entire screen with a slide and is what the audience will see when they view the presentation. The Slide Show view has an additional menu that allows you to navigate the slides, as well as other features you can use while giving a presentation.

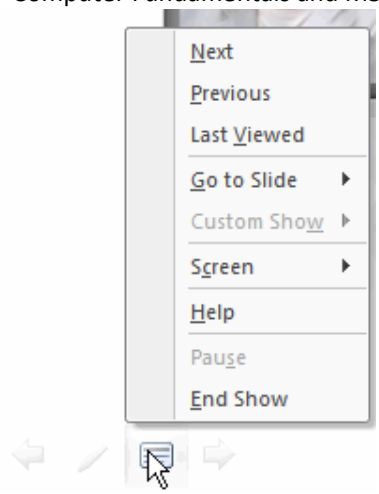


The additional menu includes the arrow keys, Page Up and Page Down keys, spacebar, and Enter key to move through the slides in Slide Show view. Press the Esc key to end a slide show.

5.3.4 The slide show menu

Arrows: The forward arrow takes you to the next slide, while the back arrow takes you to the previous slide.

5.3.5 Menu icon: Click the menu icon, and a menu appears that gives you the option to move to the next or previous slide, jump to a specific slide, change your screen options, or end the show.

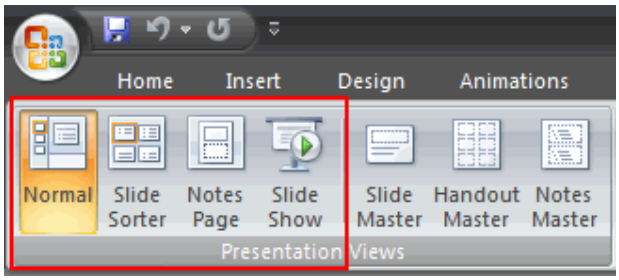


5.3.6 Notes Page view

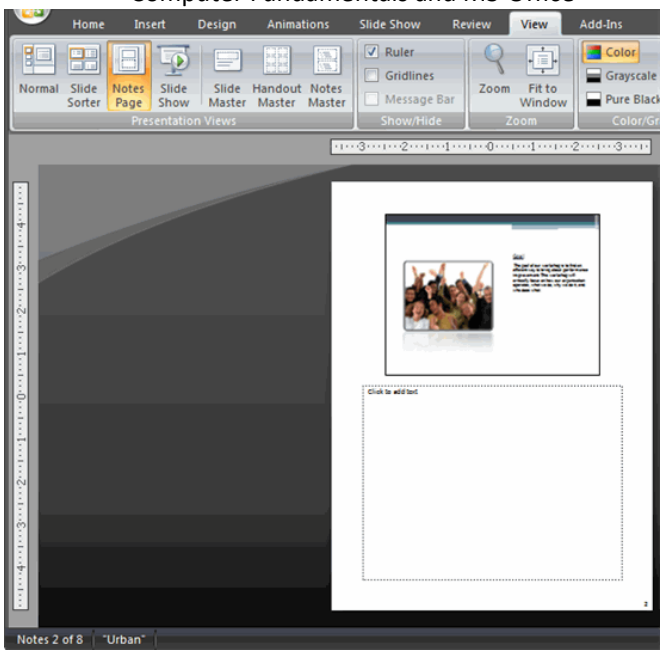
It is not one of the view commands included at the bottom of Normal view; however, it can be selected from the View tab. This view provides a space for presentation notes, which are often called speaker notes. The notes can be added to the presentation from this view. You can enter your speaker notes directly into the text placeholder in Notes Page view, or while in Normal view you can enter your notes in the area below the slide.

To change to Notes Page view:

- Select the **View** tab.
- Locate the **four view commands** on the left side of the Presentation Views group.



- Click **Notes Page view**.



5.4 Drawing Objects and Inserting OLE

5.4.1 Drawing Objects:

Power point provides different shapes for various uses which allows you to enhance your presentation. These objects can be accessed from the DRAWING subgroup in the ribbon present at the top of homepage.These objects are used for drawing flowcharts in your presentation and many other purposes.

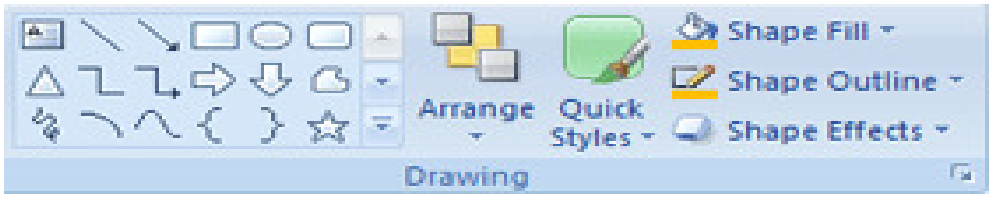


Fig object to draw flow chart

Also these objects can be accessed from insert tab.

- To access built-in shapes, go to the Insert tab and under the Illustrations group click on the Shapes button to see the list.
- Click on your desired shape.
- On the slide, click and drag your mouse to create your shape.
- Once your shape is in place you can move it around, use the handles to adjust the size and rotation, and edit it as you would any other object.

Several categories of shapes including lines, basic shapes, block arrows, flowchart elements etc are provided.

Fig objects to draw different shapes

5.4.2 Inserting OLE- Object Linking and Embedding

You can use hyperlinks to move from one slide to another, to a network or Internet location, or even to another file or program altogether.

- Select the text that you want to click to activate the hyperlink. Alternatively, you can select an object (a piece of clip art, for example, or a SmartArt graphic)
- On the **Insert** tab, in the **Links** group, click **Hyperlink**.
- In the **Insert Hyperlink** dialog box, click the appropriate button in the **My Places** box for the target of your link (that is, the place where the link takesyou).
- To go to another slide in your presentation, for example, click **Place inThis Document**.
- Find and click the target location, make any changes that you want in the **Text to display** and **Address** boxes, and then click **OK**.

Preview your presentation as a slide show

To view your presentation on your computer screen exactly the way that it will look to your audience when you are presenting, do the following:

1. On the **Slide Show** tab, in the **Start Slide Show** group, do one of the following:

To start with the first slide in the presentation, click **From Beginning**.

▪To start with the slide that currently appears in the **Slide** pane, click **From Current Slide**. The presentation opens in Slide Show view.

2. Click to advance to the next slide.

5.5 Drawing Freeform Shape

You can draw different shapes in **PowerPoint 2010** by the help of **freeform Shape** and **Scribble** tools.

5.5.1 To draw a freeform shape:

1. Go to the **Insert** tab select the **Illustrations** group and click on the **Shapes** option.
2. To draw a shape that has both curved and straight segments, click **Freeform**.
3. To draw a shape that looks like it was drawn with a pen by hand, or to create smooth curves, click **Scribble** and click anywhere in the document, and then drag to draw.
4. To draw a straight segment with the **freeform** tool, click one location, move your pointer to a different location, and then click again; to draw a curved segment, keep your mouse button pressed as you drag to draw.

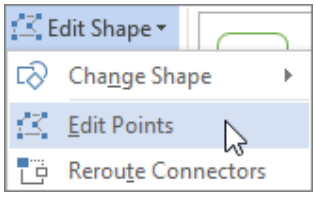
To finish drawing the shape, do one of the following

- To leave the shape open, double-click at any time.
- To close the shape, click near its starting point.

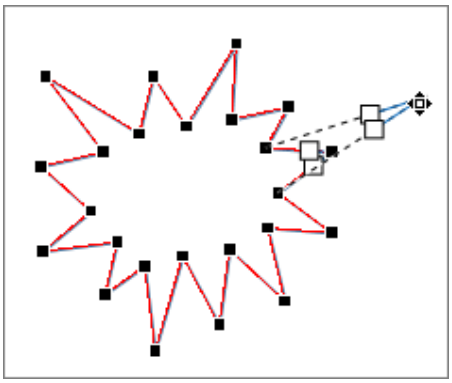
Edit points in a shape

You can edit the points of most shapes. For example, you edit points when you need to lean a triangle over to the right.

1. Select the shape that you want to edit and go to the **Format** tab, click **Edit Shape**, and then select **Edit Points**.



2. Drag one of the vertexes that outline the shape. A vertex is the point, indicated by a black dot, where a curve ends or the point where two line segments meet in a freeform shape.



5.5.2 Working with editing points

1. To add a point, click the shape outline while pressing **Ctrl**.
2. To delete a point, click the point while pressing **Ctrl**.
3. To have the point treated as a smooth point, press **Shift** while dragging either of the handles attached to the point. Once you stop dragging, the point will be changed to a smooth point. A smooth point joins two line segments of equal length.
4. To have the point treated as a straight point, press **Ctrl** while dragging either of the handles attached to the point. Once you stop dragging the point will be changed to a straight point. A straight point joins two line segments of different lengths.
5. To have the point treated as a corner point, press **Alt** while dragging either of the handles attached to the point. Once you stop dragging the point will be changed to a

corner point. A corner point joins two line segments with one segment going off in a different direction.

6. To cancel the change to the point and line segments, press **Esc** before releasing the mouse button.
7. To open Edit Points mode with keyboard shortcuts, select the shape and then press **Alt + JD, E, E**.

5.5.3 Delete shapes

1. Select the shape that you want to delete, and then press **Delete**.
2. If you want to delete multiple shapes, select the first shape, press and hold **Ctrl** while you select the other shapes, and then press **Delete**.

5.5.4 How to Draw a Pentagon Shape

A pentagon may be simple or self-intersecting. The sum of the internal angles in a simple pentagon is 540°. In PowerPoint 2010 you can easily draw a simple pentagon shape using the shape tool.

Here follow the following example to know how to draw a **pentagon in PowerPoint 2010**. To insert a **pentagon in PowerPoint** slide, go to **Insert** menu and then select on **Shapes** to open the collection of shapes. Then look under Basic Shapes to find the Regular Pentagon shape as shown below:

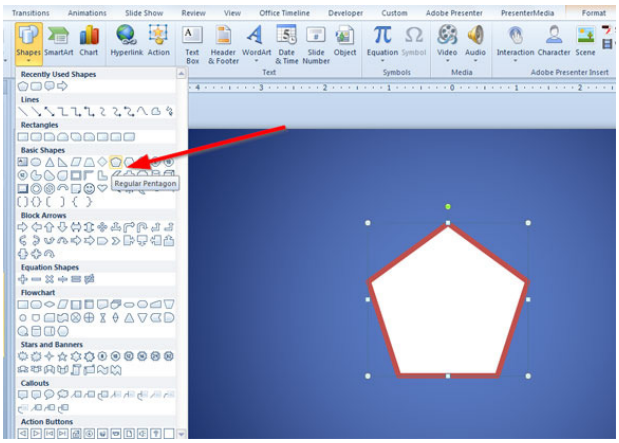


Fig drawing pentagon shape using freeform

You can easily insert this **pentagon** into the current slide. You can use this **pentagon** shape to prepare to make concept slides for your presentations, since you can use this kind of shapes or other shapes to embed pictures inside the shape. Also you can edit the text inside the **pentagon** by right clicking over the shape.

5.6 Rotating Objects

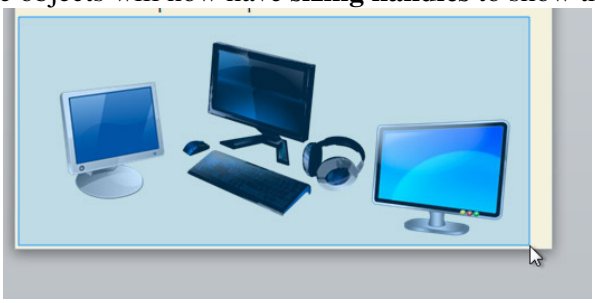
In PowerPoint, every slide may have different items, such as pictures, shapes, and text boxes. PowerPoint lets you arrange the objects the way you want by aligning, grouping, rotating, and ordering them in multiple ways. Here, you will learn how to align objects across the slide, group multiple objects into one object and order objects from front to back.After adding objects to a slide, it is necessary to arrange them so the objects appear the way you want. You can **align**, **group**, **rotate**, and **order** objects to create the desired arrangement.

5.6.1 Aligning objects

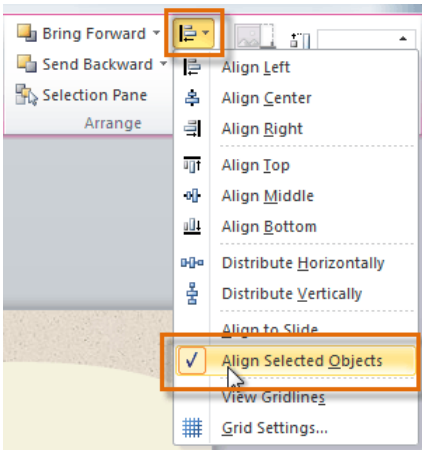
You can **select** and **drag objects** to align them manually, but guesswork will never give you the best result. And also, aligning objects in this way can take a great deal of time. Luckily, PowerPoint provides you with various commands that allow you to **arrange** and position **objects** easily.

To align two or more objects:

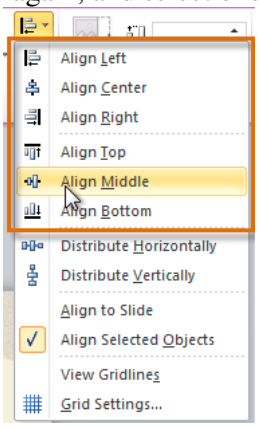
1. Click and drag the mouse to form a **selection box** around the objects you want to align. All of the objects will now have **sizing handles** to show that they are selected.



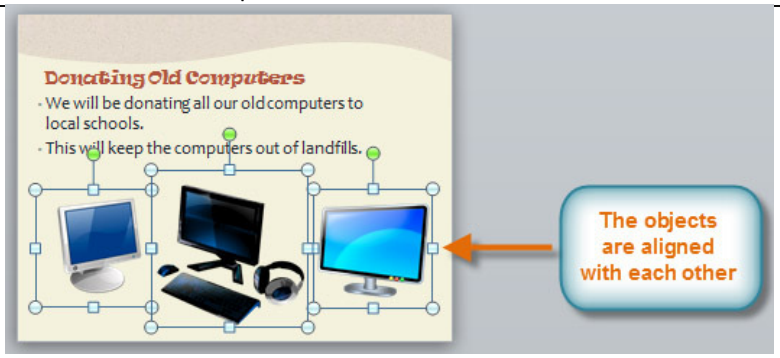
2. From the **Format** tab, select the **Align** command, and then select **Align Selected Objects**.



3. Click on the **Align** command again, and select one of the six **alignment options**.



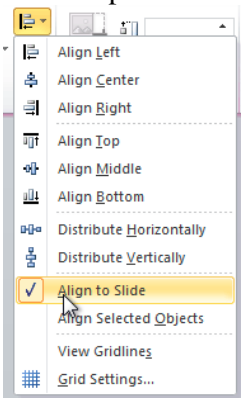
4. The objects will align to each other based on the selected option.



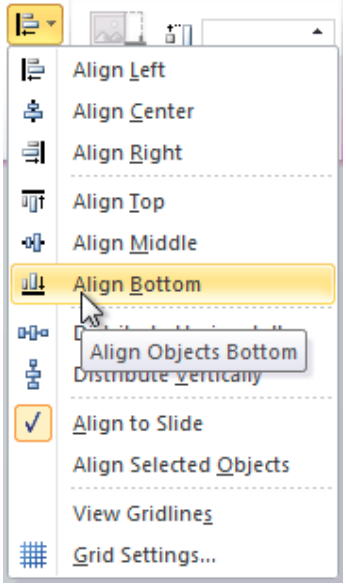
To align objects to the slide:

Sometimes you may want to align one or more objects to a **specific location within the slide**, such as the top or bottom. In such cases you can select the **Align to Slide** option before you align the objects.

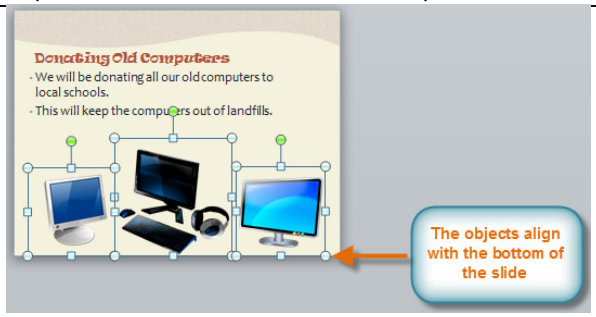
1. Click and drag the mouse to form a **selection box** around the objects you want to align. All of the objects will now have **sizing handles** to show that they are selected.
2. Go to the **Format** tab, select the **Align** command, and then select **Align to Slide** option.



3. Select the **Align** command again, and then select one from the six **alignment options**.



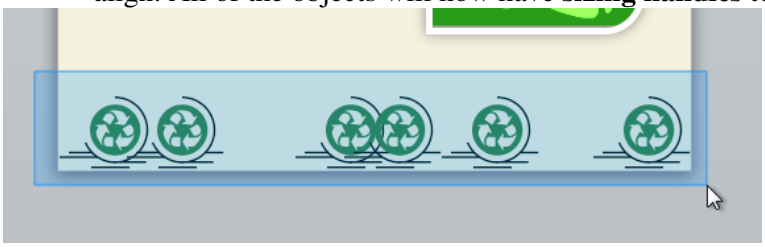
4. The objects will align to the slide based on the option you have selected.



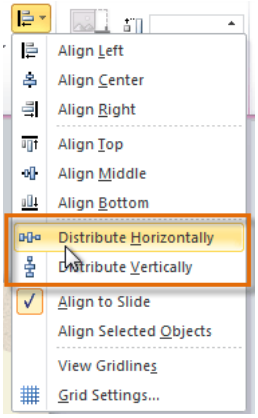
To distribute objects evenly:

If you have arranged objects in a row or column, you may want them to be in an **equal distance** from one another for a well-organized appearance. You can do this by **distributing the objects** horizontally or vertically.

1. Click and drag the mouse to form a **selection box** around the objects you want to align. All of the objects will now have **sizing handles** to show that they are selected.



2. Go to the **Format** tab, click on the **Align** command.
3. From the menu, select **Distribute Horizontally** or **Distribute Vertically** option.



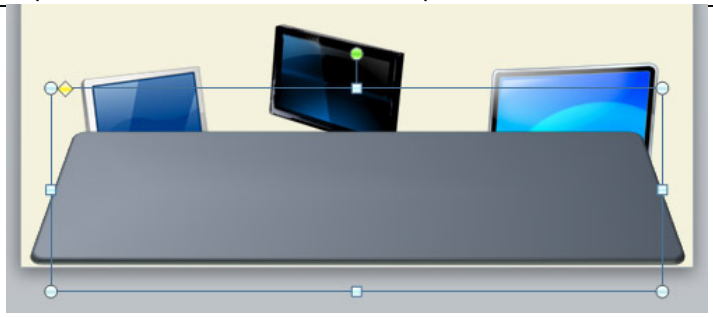
4. The objects will be distributed evenly.

5.6.2 Ordering and rotating objects

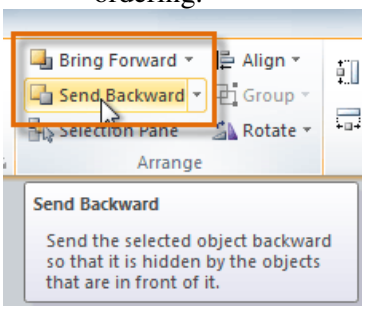
In addition to aligning and grouping objects, PowerPoint gives you the ability to **arrange objects** in a **specific order**. In case when two or more objects **overlap ordering** is important because it will determine which objects are in the **front** or **back**.

To change the ordering by one level:

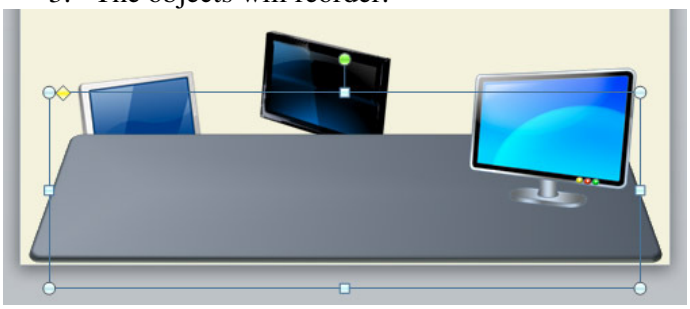
1. Select an object. The Format tab will appear.



2. From the **Format** tab, select the **Bring Forward** or **Send Backward** command to change the object's ordering by **one level**. If the object overlaps with more than one other object, you need to select the command **several times** to achieve the desired ordering.



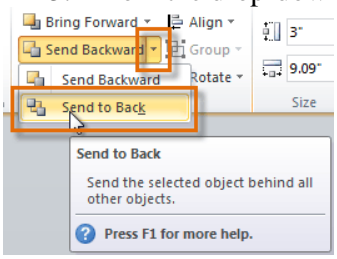
3. The objects will reorder.



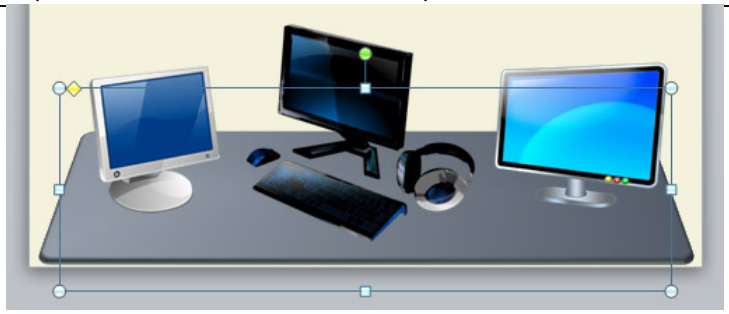
To bring an object to the front or back:

If you want to send an object behind or in front of several objects, it's usually faster to **bring it to front** or **send it to back** rather than clicking the ordering commands several times.

1. Select an object. The Format tab will appear.
2. From the **Format** tab, select the **Bring Forward** or **Send Backward** drop-down box.
3. From the drop-down list, select **Bring to Front** or **Send to Back**option.

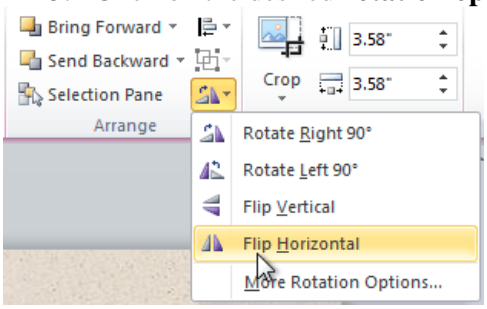


4. The objects will reorder.



To rotate an object:

1. Select an object. The Format tab will appear.
2. From the **Format** tab, select the **Rotate** command. A drop-down list will appear.
3. Click on the desired **rotation option**.



4. The object in the slide will rotate.

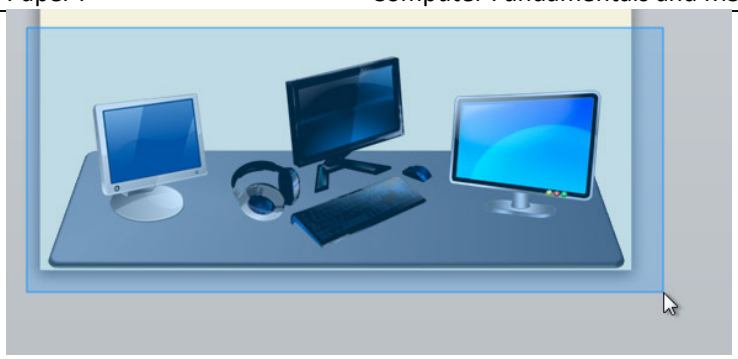
5.6.3 Grouping objects

Sometimes you may need to **group** multiple objects into **one object** so that they will stay together if they are moved. Often, this is easier than selecting all the objects every time you want to move them.

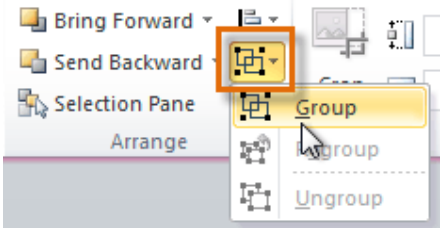
Pictures, shapes, clip art, and text boxes can be grouped together, but **placeholders** cannot be grouped. Therefore, make sure not to insert the pictures into placeholders if you will be grouping the pictures.

To group objects:

1. Click and drag your mouse to form a **selection box** around the objects you want to align. All of the objects will now have **sizing handles** to show that they are selected.



2. Go to the **Format**tab, Select the **Group** command, then select **Group**.

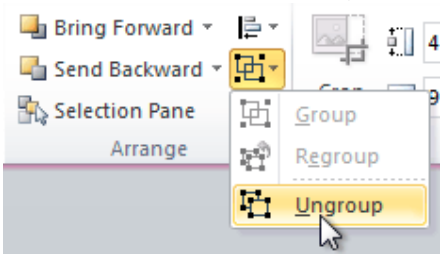


3. The selected objects will now be grouped. There will be a **single box with sizing handles** around the entire group to show they all are one object.

If you select the objects and if the **Group** command is disabled, it may be because one of the objects is inside a **placeholder**. If this happens, try to **reinserting** the images or **cutting** and **pasting** them into the same slide outside of any placeholders.

To ungroup objects:

1. Select the grouped object you want to ungroup.
2. Go to the **Format**tab, select the **Group** command, then select **Ungroup**.



3. The objects will be ungrouped.

5.7 Animation in Slides/Objects

In PowerPoint you have an option called animate which is used to animate the text and objects such as clip art, shapes, and pictures. Animation or movement of text or an object on the slide can be used to **draw** the **viewer's attention** to that particular content.

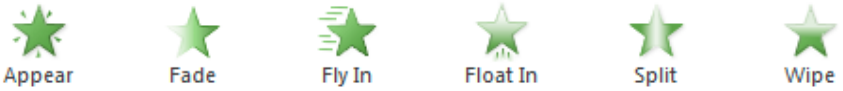
5.7.1 Animating text and objects

In PowerPoint we have variety of **animations** which are used to enhance your presentation. In order to create customized animation you can use **motion paths**.

The four types of animations

We have different animation effects and they are organized into four types:

- **Entrance:** By this Entrance you can control how the object enters the slide. For example, if you want the text to enter into the slide with the **Bounce** animation, then the object will drop onto the slide and then bounce many times.



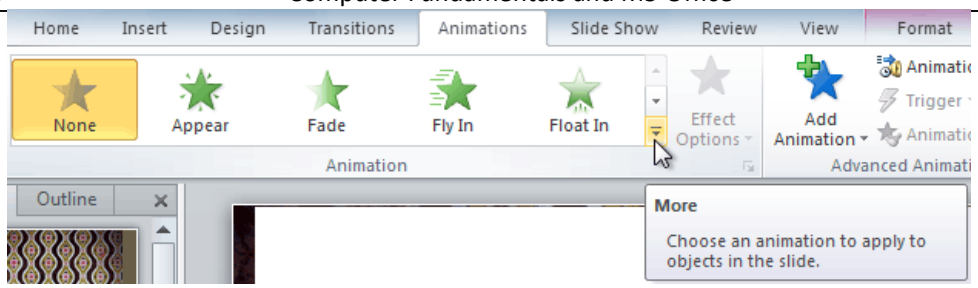
- **Emphasis:** These animations occur while the object is on the slide and are often clicked by the **mouse**. For example, you can set an object to **Spin** by the mouse click.

- **Exit:** This exit option controls how the object exits the slide. For example, with the **Fade** animation, the object will simply fade away.

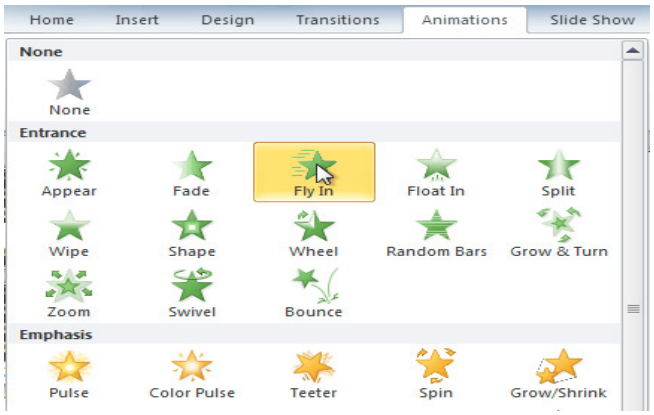
- **Motion Paths:** This Motion Path option is similar to **Emphasis** effects, except the object moves within the slide along a predetermined path, like a **circle**.

5.7.2 To apply an animation to an object:

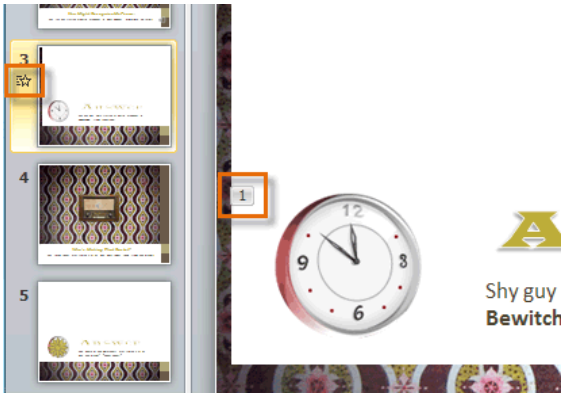
1. Select an object.
2. Select the **Animations** tab.
3. In the **Animation** group, press the **More** drop-down arrow to view all the available animations.



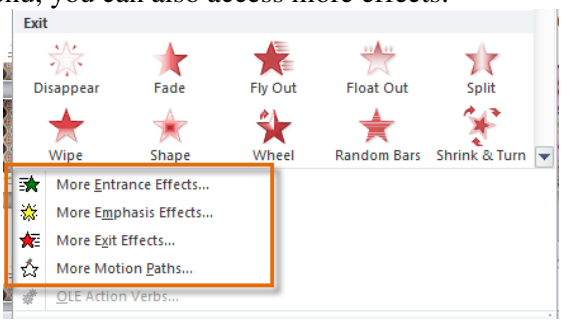
4. Select the desired animation effect.



5. The object will now have a small **number** next to it which indicates that the object is animated. Also, in the Slide pane, the slide will now have a **star** below the number of that slide..

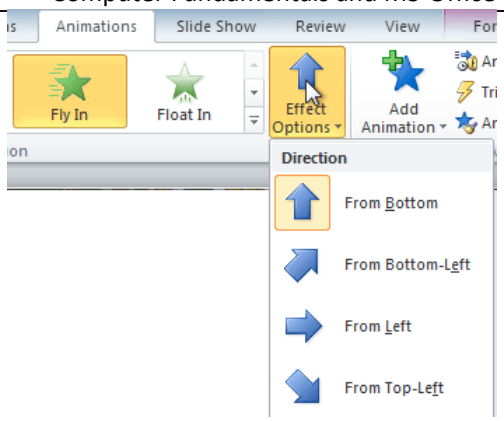


At the bottom of the menu, you can also access more effects.



5.7.3 Effect options

Some effects will have **options** which you can change. For example, with the **Fly In** effect, you can control from **which direction** the object or text have to comes from. You can use these options from the **Effect Options** command in the Animation group.

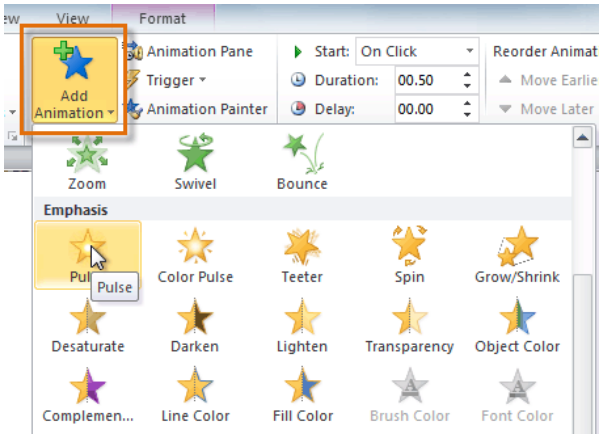


5.7.4 Working with animations

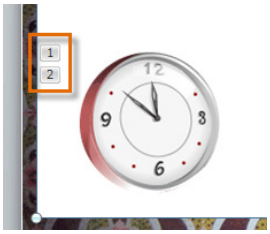
To add multiple animations to an object:

If you select a new animation for an object from the menu in the Animation group, it will replace the object's current animation. However, if you want to place more than one animation on an object, you have to use the command Add Animation, which will allow you to keep your current animations while adding new ones.

1. Select the object.
2. Press the Animations tab.
3. In the Advanced Animation group, select the Add Animation command to view the available animations.
4. Choose the desired animation effect.



5. If an object has more than one effect on it then it will have a different **number** for each and every effect. The numbers indicate the **order** in which the effects have to occur on the slide.



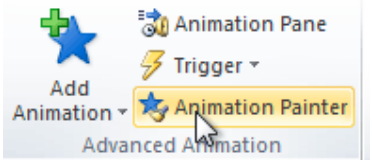
It's important to consider how you want your animations to appear in your slide show.

To copy animations with the Animation Painter:

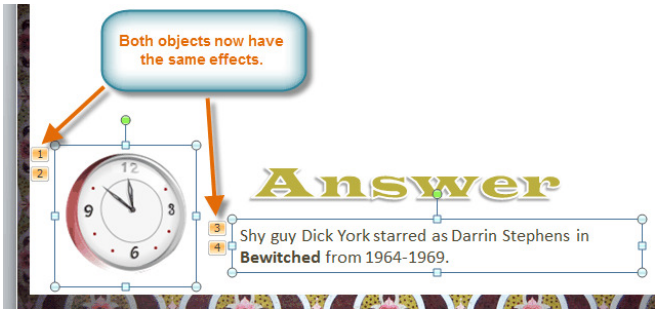
Sometimes if you want to apply the same effect to more than one object then you can do this by **copying** the effects from one object to another by using the **Animation Painter**.

1. Select the object that has the effects you want to copy.

2. From the **Animations** tab, Select the **Animation Painter** command.



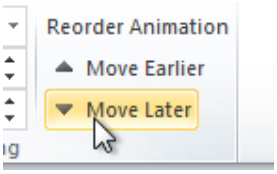
3. Click the object to which you want to copy the effects. The effects will be applied to the object.



To reorder the animations:

1. Choose the **number** of the effect you want to change.

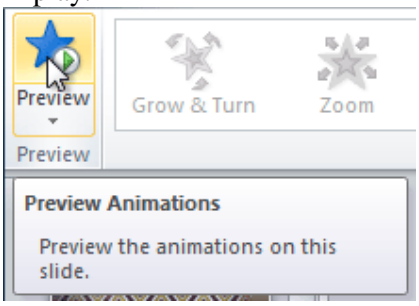
2. From the **Animations** tab, choose the **Move Earlier** or **Move Later** commands to change the order of occurance.



5.7.5 To preview animations:

All the animation effects you have applied to the presentation will be shown up when you play the slide show. However, you can also quickly **preview** the animations of a particular slide without viewing the slide show.

1. Navigate to the **slide** you want to preview the animation effects.
2. From the **Animations** tab, select the **Preview** command. Then the animation effects for the current slide will play.

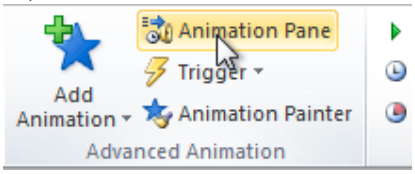


5.7.6 The Animation pane

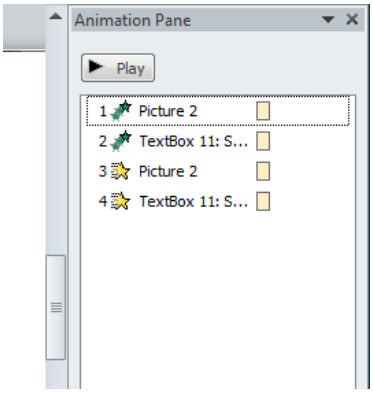
The **Animation pane** allows you to view and manage all the effects that are on the current slide. You can **modify** and **reorder** them directly from the Animation pane, which is mainly useful when you have several effects.

Procedure to open the Animation pane:

1. Fromthe**Animations** tab, choose the **Animation Pane** command.

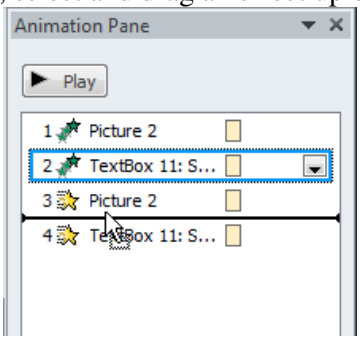


2. You will have the animation pane window open on the right side of the main window. It will show all of the effects of the current slide in the order .



To reorder effects from the Animation pane:

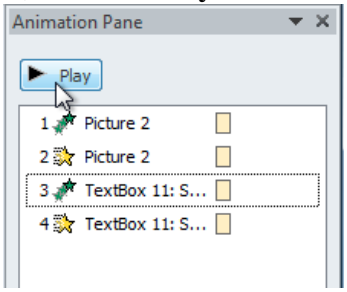
1. On the **Animation pane**, select and drag an effect up or down.



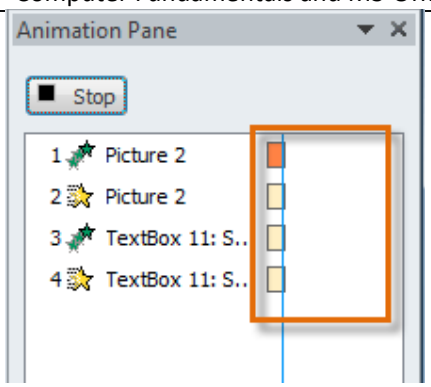
2. The effects will reorder.

To preview effects from the Animation pane:

1. From the **Animation pane**, select the **Play** button.



2. The effects for the current slide will play. On the right side of the Animation pane, you can see a **timeline** that shows the progress of each effect.

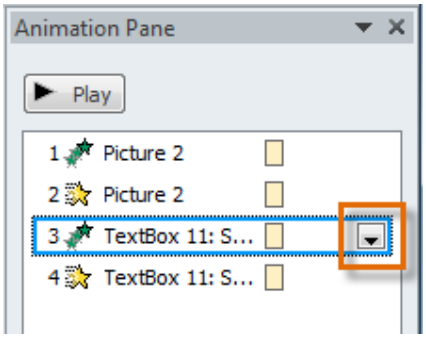


If the timeline is not visible, press the drop-down arrow for an effect, then select **Show Advanced Timeline**.

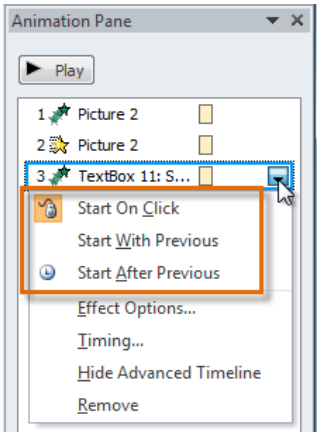
To change an effect's start option:

By default, an effect begins by a mouse click during the slide show. If you have multiple effects, you have to click the mouse multiple times to start each effect individually. By changing the **start option** for each effect, you will have effects that automatically play **one after the other** or **at the same time**.

1. From the **Animation pane**, choose an effect. A drop-down arrow will appear next to the effect.



2. Select the drop-down arrow. You will have three **start options**:
   - **Start on Click:** By this option you can start the effect when the mouse is clicked.
   - **Start With Previous:** This option is used to start the effect at the same time as the previous effect.
   - **Start After Previous:** This option will start the effect after completing the previous effect.



3. Choose the desired start option.

When you **preview** the animations, all of the effects will play automatically. To test effects that are set to **Start on Click**, you will need to play the slide show.

Summary

The Ribbon and remaining groups are not same as we used in word or excel. So you must observe the differences in the ribbons and groups of particular component such as word or excel of ms office. One more thing to remember that PowerPoint 2007 has many similar features to previous versions. You will also notice that there are many new features that you'll be able to utilize.

The difference between themes and PowerPoint design templates

Beginning with Office PowerPoint 2007, templates are "starter" documents, just like those in Office Word 2007 and Office Excel 2007, and can contain starting content or boilerplate text. Themes replace the PowerPoint slide designs and contain one or more slide masters.

A slide master isn't actually a slide and it doesn't store theme information. The slide master is a separate layer that only looks like a slide. It is where you can set the master layout and design elements, such as slide background appearance and graphics that all slide layouts follow by default. For example, you can specify a slide background, the layout of content placeholders, and add your company logo on a slide master to have all of those elements apply by default to all slide layouts that are attached to that slide master.

You can undo and redo up to 100 actions in Microsoft Office programs, such as Microsoft Office Word 2007, Microsoft Office PowerPoint 2007, Microsoft Office Excel 2007, and Microsoft Office Access 2007. You can repeat actions as many times as you want.

We can also make tighten or lose the text , that is the required space can be provided between the characters . Strike through and shadow facilities can also be applied to the text.

When you insert a sound on a slide, an icon that represents the sound file appears. To play the sound while you give your presentation, you can set the sound to start automatically when the slide is displayed, start on a mouse-click, start automatically but with a time delay, or play as part of an animation sequence. You can also play music from a CD or add narration to your presentation. You can add sounds from files on your computer, a network, or Microsoft Clip Organizer. You can also record your own sounds to add to a presentation or use music from a CD.

Movies are desktop video files with formats such as AVI (Audio Video Interleave)or MPEG(Moving Picture Experts Group) and file extensions such as .avi, .mpg, and .mpeg. A typical movie can include a speaker talking, such as an executive who cannot attend the actual presentation. You can use a movie to train others or to perform a demonstration.

You can add one shape to your presentation or combine multiple shapes to make a drawing or a more complex shape. Available shapes include lines, basic geometric shapes, arrows, equation shapes, flowchart shapes, stars, banners, and callouts.

Slide transitions are the animation-like effects that occur in Slide Show view when you move from one slide to the next during an on-screen presentation. You can control the speed of each slide transition effect, and you can also add sound.

Animate: To add a special visual or sound effect to text or an object. For example, you can have your text bullet points fly in from the left, one word at a time, or hear the sound of applause when a picture is uncovered.) the text or objects (object: Atable, chart, graphic, equation, or other form of information. Objects created in one application, for example spreadsheets, and linked or embedded in another application are OLE objects.) in your presentation to give them sound effects or visual effects, including movement. You can use animation to focus on important points, to control the flow of information, and to increase viewer interest in your presentation.

You can print your entire presentation — the slides, outline, notes pages, and audience handouts — in color, grayscale (grayscale: A series of shades from white to black used in displaying or printing text and graphics.), or pure black and white. Most often, however, you will probably choose to print in either black and white or grayscale.

Before printing handouts or slides, consider placing the presentation in a shared location. Just prior to the delivery time, advice viewers of the location and those who require hard copies, can print and bring them to the presentation delivery meeting. This can help to conserve paper and printer ink.

Model Question

Short Answer Type Question

1. What is power point presentation?
2. What is Microsoft office button?
3. What are the seven tabs in Ribbon in power point?
4. What is quick access toolbar?
5. What is mini toolbar?
6. What are the seven slide views in presentation views group in view tab?
7. What are the themes?
8. What is a template?
9. Expand and write the concept of OLE.
10. What is meant by copy and move a text?
11. What is meant by undo and redo?
12. What is spell check?
13. What is word art?
14. What are the four alignments?
15. What is indentation?

16. What are text directions
17. Expand AVI AND MPEG
18. What is clip art?
19. What is Smart Art?
20. What is Photo album?
21. What is a slide transition?
22. What is a slide animation?
23. What is speaker's note?

Long Answer Type Question

1. Write the groups in each tab of a ribbon in power point.
2. Write the steps to create, save and preview a presentation.
3. Write about formatting a text in power point.
4. What are the steps to add video and audio to the presentation?
5. Write about graphics in power point.
6. Write the steps for animation of slides.
7. What are handout and notes page?
8. Write about the printing of a presentation.
9. Discuss about animation of objects.
10. Discuss the concept of drawing freeform shapes
11. Explain the concept of OLE
12. Write the steps for rotating objects.

COMPUTER SCIENCE & ENGINEERING

Paper - II

PROGRAMMING IN 'C'

INDEX

UNIT - 1

Introduction to Problem Solving Techniques

Structure

1.0. Introduction
1.1. Procedure problem solving techniques.
1.2. Algorithm
1.3. Flow chart
1.4. Symbols used in flow – chart.
1.5. Pseudo code

INTRODUCTION

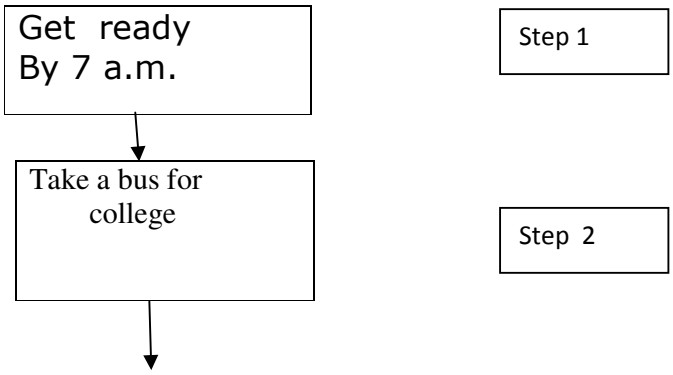
"I hear, I forget"
"I see, I remember"
"I do, I understand"

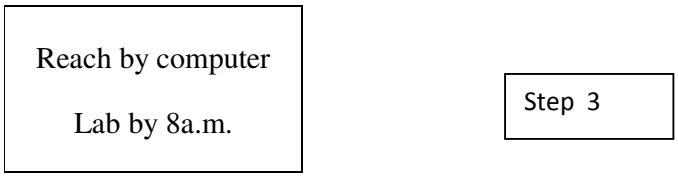
You can solve different types of problems on a computer. Problem can be a business problem or a scientific problem. All you have to do is to analyse the problem and Write a step by step solution and translate it in a language understandable by a computer.

Problem Definition :

Suppose you want to reach college computer laboratory at 8 A.M. You would lay out a plan to get ready by 7 A.m. then take a bus/ rikshaw and reach at the gate of our college. Then climb up the stairs to arrive in the lab. For all this movements, you will note the time taken for each activity, due to some reason, you are unable to get ready by 7 A.M. and you know that it takes one hour to reach from house to school lab by bus/ rikshaw, so you will take some faster means of transport. You may take an auto rikshaw or taxi. Thus, a very simple problem of reaching to the computer lab by 8 A.M. will need several steps for solution. Each step needs to be accurately defined so that guessing the next activity to be done. You can thus represent the solution of this problem in three steps shown in Fig. 1.0

In Fig 1.0, steps 1,2 and 3 appear to be very simple. In actual practice when you have to give instruction to a student, who is going for the first time, it may not be so easy. For example, you have to define the word "READY" precisely so that he knows





Feg 1.0

Exactly what he has to do by 7 A.M. to get1 READY in step 1, Similarly in step 2, you may have to clearly specify the bus route number, the bus stop to board the bus, the place to get down from the bus etc. you may also like to tell that a bus, is not to be boarded. if it is over crowded. the word "overcrowded" needs to be properly defined. Finally, step 3 needs further elaborations about the room number and floor number where the computer lab is located and how to reach there.

You can explain all this to a person who does not know anything about the computer lab, provided you know it correctly. In the same way, you can solve a problem on a computer, if you know exactly what it is and how you can solve it manually.

1.1 PROCEDURE :

A fixed, step by step sequence of activities are course of action (with definite start and end points) that must be followed in the same order to correctly perform a task.

1.2 PROBLEM SOLVING AND TECHNIQUES :

Problems that can be solved through the computer may range in size and complexity. Since the computer does not possess any commonsense and cannot make any unplanned decisions, the problem, whether it is simple or compile, has to be broken into a well-defined set of solution step. It should be remembered that computers do not solve problems; rather they are used to implement the solutions to problems.

In an attempt to solve problems on a computer, one has to the steps for the solutions in terms of simple conceptual instruction and operations and then obtain the result. They may be number of ways to solve a given problem and the solution methods may have from person to person, depending on one's logic. But the basic steps would be:

(i) Formulating the problem and deciding the input data if any
(ii) Identifying the various steps of computation that are must for the solution.

(iii) Identifying the points of decision i.e. under what circumstances a particular
operation is to performed and when it is not be performed.
(iv) Knowing the expected result and when to obtain the output.

Besides these, the programmer has to various types of variables that should be used to solve the problem.

The basic elements of problem solving are as follows:

1. Understanding the problem in terms of input data available and output results required
2. Analysing the problem in terms of known and unknown parameters and constants.
3. Computing the various methods of solutions possible and selecting the best one.
4. Preparing a logical and concise list of procedures required for the selected method of solution.
5. Solving the problem and examining the results.

1.3.0 ALGORITHM

In programming algorithms are the set of well defined instruction in a sequence to solve a program. An algorithm should always have a clear stopping point.

1.3.1 Qualities of a good algorithms:

1. Input and output should be defined precisely.
2. Each steps in algorithm should be clear and unambiguous.
3. Algorithm should be most effective among many different ways to solve a problem
4. An algorithm should be most effective among many different ways to solve a
problem.
5. An algorithm shouldn't have computer code. Instead, the algorithm should be
written in such a way that, it can be used in similar programming languages.

1.3.2 Algorithm - Definition:

The sequence of instructions for solving a particular problem is known as algorithm.

1. A sequential solution of any program that written in human language, called algorithm.
2. Algorithm is first step of the solution process, after the analysis of problem, programmer write the algorithm of that problem.

1.3.3 Example of Algorithms:

Q1. Write a algorithm to find out number is odd or even?

Ans. step 1 : start
step 2 : input number
step 3 : rem=number mod 2
step 4 : if (rem=0) then
print "number even"
else
print "number odd"
endif
step 5 : stop

Q2.Wite an algorithm to add two given numbers.

Ans. step 1 : start
step 2 : declare variables num1, num2 and sum
step 3 : read values num1 and num2
step 4 : add num1 and num2 and assign the add value to sum
sum = num1 + num2
step 5 : display sum
step 6 : stop.

Q3. Write an algorithm to find the largest among three different numbers.

Ans. step 1 : start
step 2 : declare variables a,b and c
step 3 : read variables a,b and c
step 4 : if (a>b)
if (a>c)
display a is the largest number
else
display c is the largest number
else if (b>c)
display b is the largest number

else
display c is the largest number

Q4.Write an algorithm to find all roots of a quadratic equation

$ax^2 + bx+c= 0$

Ans. step 1 : start
step 2 : declare variables a, b, c, D, R1, R2, rp and ip;
step 3 : calculate discriminate
step 4 : if D>=0
r1-(-b+ D)/2a
r2-(-b+ D)/2a
display r1 and r2 as roots
else

calculate real part and imaginary part
rp - b/2a
ip - (-D) / 2a
display rp+j (ip) and rp - j (ip) as roots
step 5 : stop

Q5. Write an algorithm to find the factorial of a number entered by user.

Ans. step 1 : start
step 2 : declare variables n, factorial and i.
step 3 : initialize variables
factorial - 1
f - 1
step 4 : read value of n
step 5 : repeat the steps until i =n
5.1 : factorial - factorial *i
5.2 : i-i+1
step 6 : display factorial
step 7 : stop

Q6. Write an algorithm to check whether a number entered by user is prime or not.

Ans. step 1 : start
step 2 : declare the variables n, i, flag
step 3 : initialize variables
flag - 1
i - 2
step 4 : read n from user
step 5 : repeat the steps until i <(n/2)
5.1 : if remainder of n / i equals to 0
flag - 0

go to step 6
5.2 : i-i+1
step 6 : if flag =0
display n is not prime
else
display n is prime
step 7 : stop

Q7. Write an algorithm to find the Fibonacci series till <= 1000
Ans. step 1 : start
step 2 : declare the variables first_term, second_term and temp
step 3 : initialize variables first_term-0 second-term-1
step 4 : display first_term and second_term
step 5 : repeat the steps until second_term<=1000
5.1 : temp - second_term
5.2 : second_term-second_term+first_term
5.3 : first_term-temp
5.4 : display second_term
step 6 : stop

Q8. Write an algorithm to find out the greater of given two numbers.
Ans. Step 1 : read the values of A and B
Step 2 : compare the values to determine if A is greater or B
Step 3 : if A is greater than B then
Out put value of A
else (Otherwise)

Step 4 : output value of B
Step 5 : stop

Q9. Write an algorithm to find the sum of 1 to n positive numbers.
Ans. Step 1 : start
Step 2 : input the value of 'N'
Step 3 : assign 1 to I
Step 4 : print I
Step 5 : Ist the value of 'I' equal to the value of N
Step 6 : (a) yes ---- goto step 6
(b) No ----- Increase I by 1
`
goto step 4
Step 7 : stop

Q10. Write an algorithm to calculate the simple interest using where P is the principle
amount, N is the number of years and R is the rate of interest.
Ans. Step 1 : start
Step 2 : input the values for P,N,R;

Step 3 : calculate the simple interest with the principle
SI = P *N*R/100;
Step 4 : print the simple interest (SI)
Step 5 : stop

1.4 FLOW – CHART :

The **flowchart** is a means to visually present the flow of data through an **information processing systems**, the operations performed within the system and the sequence in which they are performed. In this lesson, we shall concern ourselves with the program flowchart, which describes what operations (and in what sequence) are required to solve a given problem. The program flowchart can be likened to the blueprint of a building. As we know, a designer draws a blueprint before starting to construct a building. Similarly, a programmer prefers to draw a flowchart prior to writing a computer program. As in the case of the drawing of a blueprint, the flowchart is drawn according to defined rules and using standard flowchart symbols prescribed by the American National Standard Institute.

Meaning of a Flow Chart :

A flowchart is a diagrammatic representation that illustrates the sequence of operations to be performed to get the solution of a problem. Flowcharts are generally drawn in the early stages of formulating computer solutions. Flowcharts facilitate communication between programmers and business people. These flowcharts play a vital role in the programming of a problem and are quite helpful in understanding the logic of complicated and lengthy problems. Once the flowchart is drawn, it becomes easy to write the program in any high level language. Often we see how flowcharts are helpful in explaining the program to others. Hence, it is correct to say that a flowchart is a must for the better documentation of a complex program.

Flow is a representation of a series of logic operations to satisfy specific requirements. A flow exists naturally. It can be irregular, unfixed or full of problems. For this reason, it may apparently be absent in some situations. Lately, members of a team were assigned to investigate the flow of a business process, and I was told that there were some deficiencies in the flow. The reply from the person who was in charge of the team was that no flow was shown in part of the business process. As a matter of fact, it is impossible for a business carried out without a flow. It may be a flow in an unfixed form, or, may be the person himself whom you investigated does not have a clear sense about the flow.

Chart, or diagram, is a presentation or a written description of some regular and common parts of the flow. A chart is conducive to

communication and concentration and offers references for process reengineering.

Flow chart can be seen from the definition that a flow accompanies always with business or transaction. Not all of the flows, however, are appropriate to be expressed by flowcharts. Flows that can be expressed by charts follow some fixed routines, and the key links of flows won't be changed constantly.

1.4.1 When to Use Flow Chart :

A flowchart helps to clarify how things are currently working and how they could be improved. It also assists in finding the key elements of a process, while drawing clear lines between where one process ends and the next one starts. Developing a flowchart stimulates communication among participants and establishes a common understanding about the process.

Flowcharts also uncover steps that are redundant or misplaced. In addition, flowcharts are used to identify appropriate team members, to identify who provides inputs or resources to whom, to establish important areas for monitoring or data collection, to identify areas for improvement or increased efficiency, and to generate hypotheses about causes. Flowcharts can be used to examine processes for the flow of patients, information, materials, clinical care, or combinations of these processes. It is recommended that flowcharts be created through group discussion, as individuals rarely know the entire process and the communication contributes to improvement.

The computer world is nothing, but a reflection of the real world. That's why in most programming languages we use different data types to represent the information.

1.4.2 What is a Process Flowchart?

Also called: process flowchart, process flow diagram.

Variations: macro flowchart, top-down flowchart, detailed flowchart (also called process map, micro map, service map, or symbolic flowchart), deployment flowchart (also called down-across or cross-functional flowchart), several-leveled flowchart.

A flowchart is a picture of the separate steps of a process in sequential order.

Elements that may be included are: sequence of actions, materials or services entering or leaving the process (inputs and outputs), decisions that must be made, people who become involved, time involved at each step and/or process measurements.

The process described can be anything: a manufacturing process, an administrative or service process, a project plan. This is a generic tool that can be adapted for a wide variety of purposes.

1.4.3 Advantages of Flow charts :

The basic concepts associated with flowcharting has been presented in this chapter. Though the following have been mostly used to help the programmer develop the programs logic and to serve as documentation for a completed program, but its advantages are many, which may be summarized as follows.

- It convenient method of communication
- It indicates very clearly just what is being done, where as a program has logically complexities.
- It is a key correct programming.
- It is an important tool for planning and designing a new system.
- It clearly indicates the role played at each level.
- It saves the conveniences in further and serves the purpose of documentation for a system.
- It provides an over- view of the system and also demonstrates the relationship between various steps.
- It facilitates trouble shooting
- It promotes logical accuracy.
- It makes sure that sure no logical path is left in complete without any action being taken.

1.4.4 Flowchart Basic Procedure :

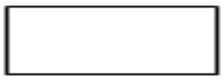
Materials needed: sticky notes or cards, a large piece of flipchart paper or newsprint, marking pens.

1. Define the process to be diagrammed. Write its title at the top of the work surface.
2. Discuss and decide on the boundaries of your process: Where or when does the process start? Where or when does it end? Discuss and decide on the level of detail to be included in the diagram.
3. Brainstorm the activities that take place. Write each on a card or sticky note. Sequence is not important at this point, although thinking in sequence may help people remember all the steps.

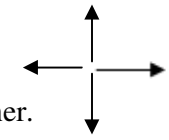
4. Arrange the activities in proper sequence.
5. When all activities are included and everyone agrees that the sequence is correct, draw arrows to show the flow of the process.
6. Review the flowchart with others involved in the process (workers, supervisors, suppliers, customers) to see if they agree that the process is drawn accurately.

1.4.5 Commonly Used Symbols in Detailed Flowcharts:

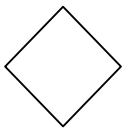
One step in the process; the step is written inside the box. Usually, only one arrow goes out of the box.



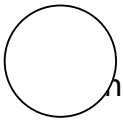
The rectangle box is used to assume the values and calculate procedure



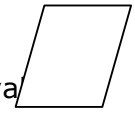
Direction of flow from one step or decision to another.



This diamond shap is used to decision based on a question. The question is written in the diamond. More than one arrow goes out of the diamond, each one showing the direction the process takes for a given answer to the question. (Often the answers are " yes" and " no.")

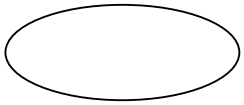


Link to another page or another flowchart. The same symbol on the other page indicates that the flow continues there.



The parallelogram box is used to read input / output the va

This symbol is used to print the document.



The oval shaped symbol represents the START operation. This symbol is also used for start and end points

1.4.5 Difference between flow – chart and algorithm :

Algorithm	Flow – chart
A method of representing the step by step logical procedure for solving of problem	A flow – chart is diagrammatic representation of an algorithm. It is constructed using different types of boxes and symbols.
It contain step by step description in English, each step representing a particular operation leading to solution of problem	The flow – chart has series of blocks and arrows, each of which represents a particular step in an algorithm
These are particularly useful for small problems	These are useful for detailed representations of complicated programs.
For example programs algorithms prove to be inadequate	For complex programming flow-charts prove to be adequate.
These are particularly useful for small problems	These are useful for detailed represented of complicated programs
It is written in user friendly language like English	It drawn according to international standard organization (ISO) symbols.

1.4.6 Flow Chart Example 1:

1) Draw a flow – chart to print first N positive integers

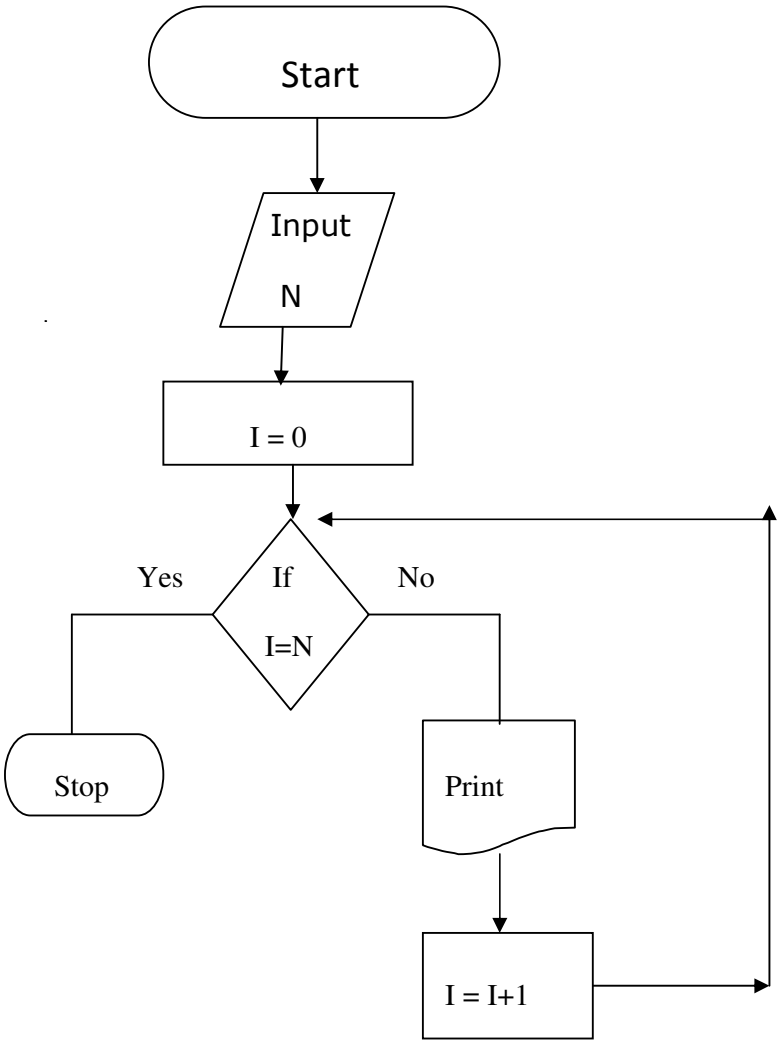


Fig. 1.4.1

2) Draw a flowchart to adding 1 to n natural numbers.

Answer:

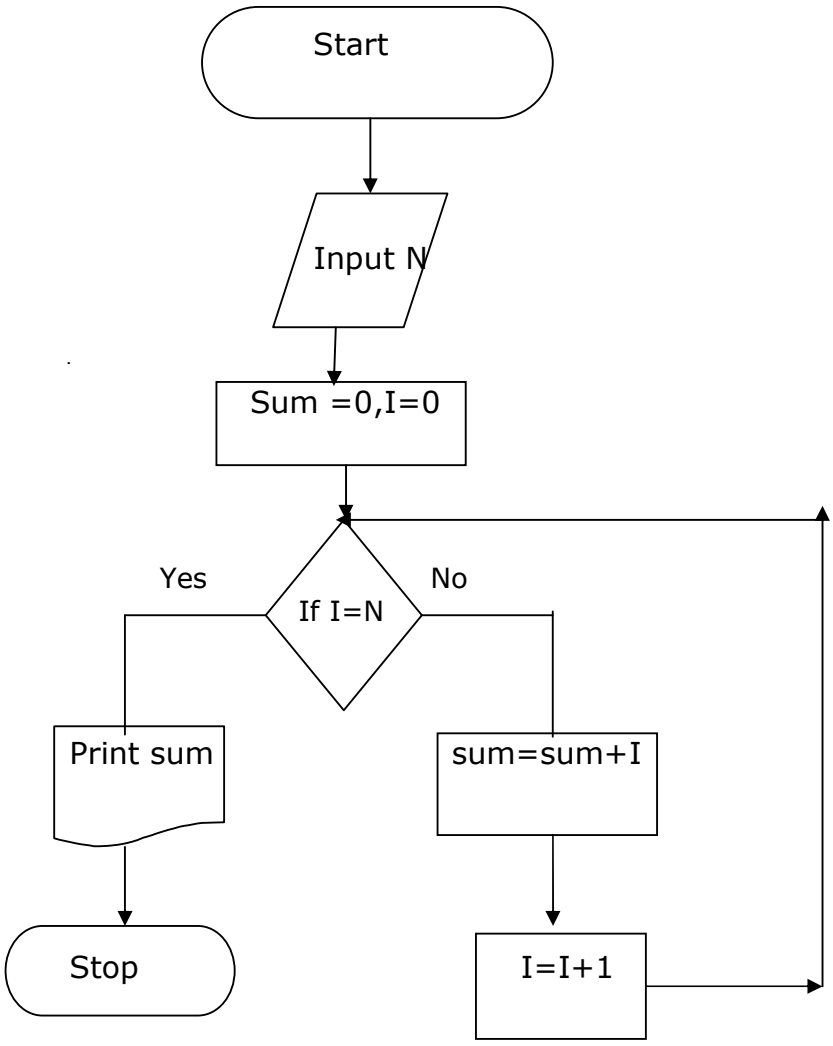


Fig 1.4.2

3) Draw a flow-chart for the sum of the first 50 natural numbers

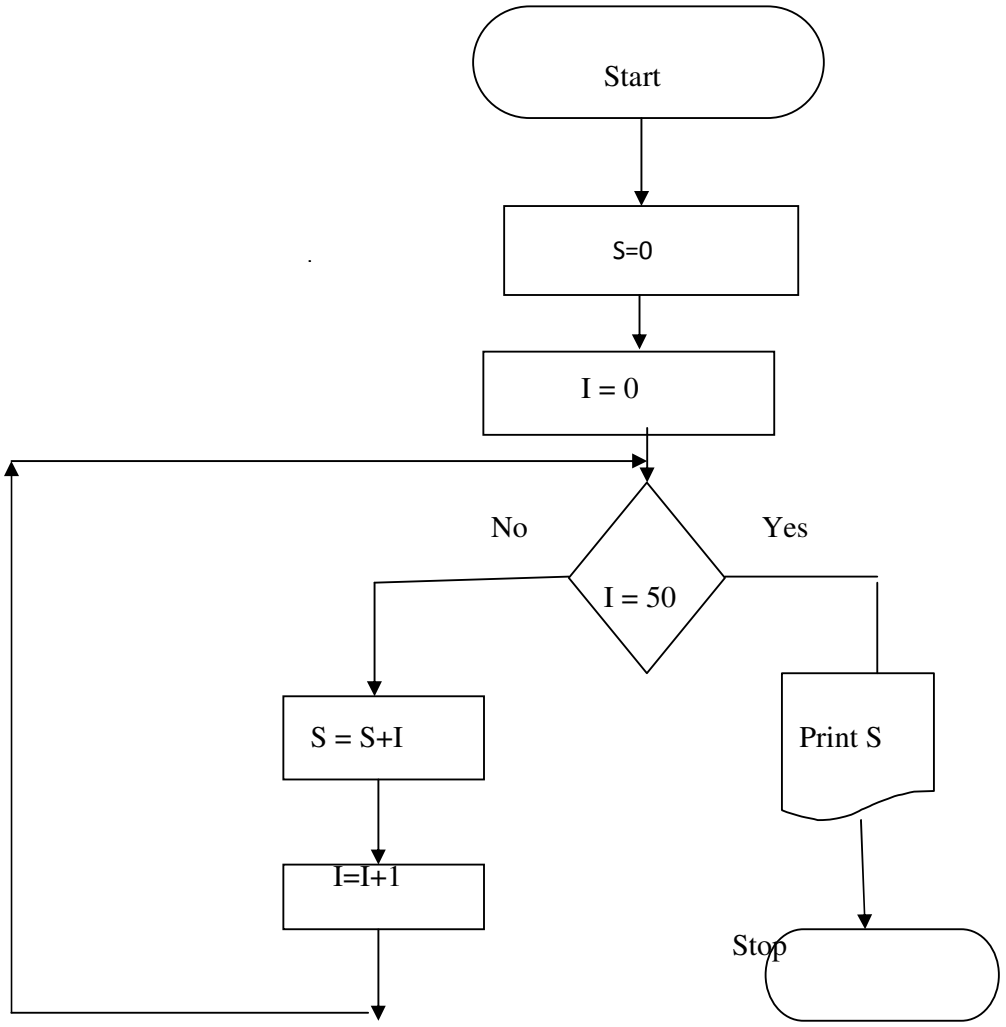


Fig 1.4.3

4) Draw a flowchart to find the largest of three numbers A, B, and C.

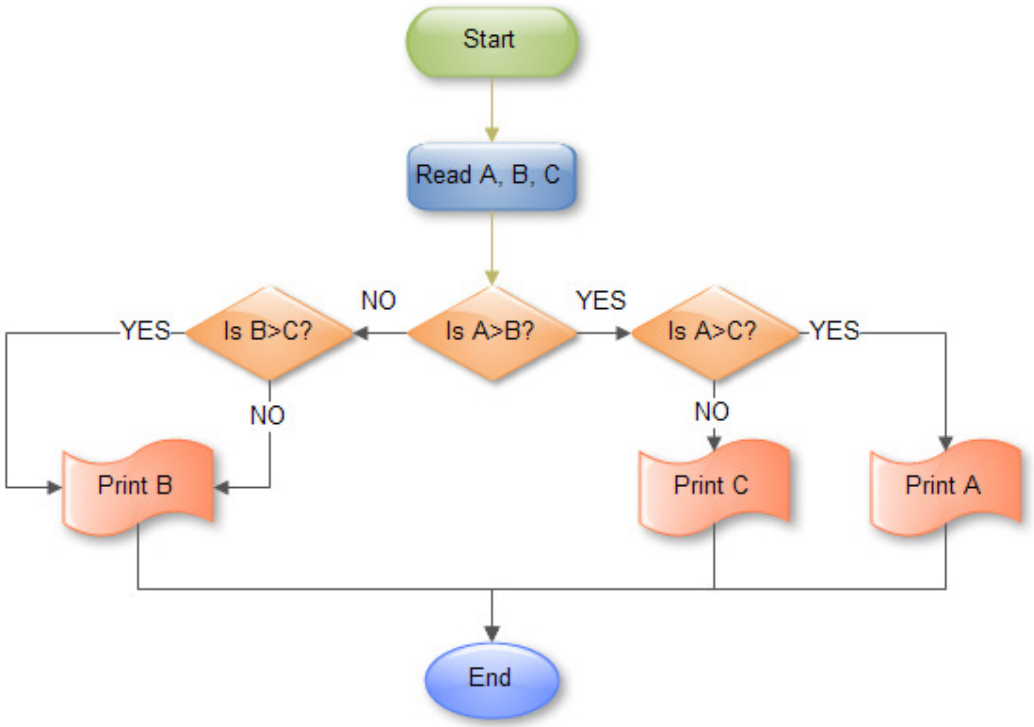


Fig 1.4.4

5) Draw a flowchart for computing factorial N (N!) Where N! = 1?2?3?....N .

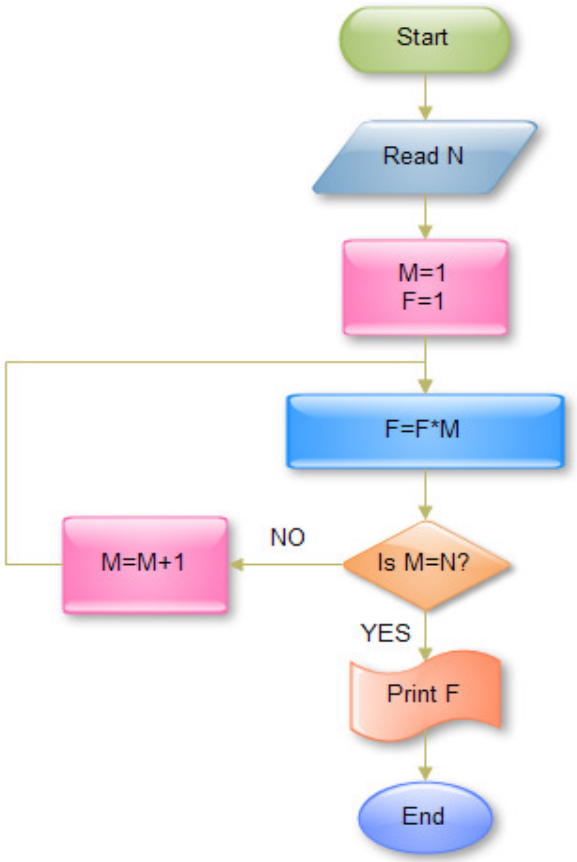


Fig 1.4.5

1.5 PSEUDO CODE : Pseudo code is a detailed yet readable description of what a computer program or algorithm must do, expressed in a formally - styled natural languages like English, rather than in a programming language.

Pseudo code is sometimes used as a detailed step in the process of developing a program. It allows designers or lead programs to express the design in detailed and provides programmers a detailed **template** for the next step writing code in a specific programming language.

```
Ex;  Read  A,B ;
       sum = A+B;
       mult = A*B;
       div = A/B;
       diff = A-B;
      Print sum, mult, div, diff
       End .
```

Review Questions and Answers.

Short Answer type Question ---2 marks.

1. What is procedure?
2. Define an algorithm?
3. Write an algorithm to print the biggest of given two integer number?
4. Define flow – chart?
5. What are the flow – chart symbols?
6. Draw a flow – chart to calculate the simple interest using (SI = P* N* R /100)?
7. Draw a flow – chart to find the remainder value of given two numbers?
8. Draw a flow – chart to find the biggest value of given two integer numbers?
9. Draw a flow – chart to calculate product of given two numbers?
10. What is pseudo code?

Long Questions --- 6 marks.

1. What are the advantages of flow - chart?
2. What are the differences between algorithm and flow – chart?
3. Write an algorithm to find smallest value in given three integer numbers?
4. Write an algorithm to find the whether the given number in prime or not?
5. Write an algorithm to find the reverser value of given 4 digit number?
6. Draw a flow – chart to find the biggest value of a given three number?
7. Draw a flow – chart o find pass or failed of a student of a given 5 subject marks each subject maximum marks are 50. If total mark ≥ 180 result is pass or fail?
8. Draw a flow - chart to find the average of 5 given numbers?
9. Draw a flow – chart to find the sum of 1 to natural numbers?
10. Draw a flow – chart to find sum o 1 to n even numbers?

2 . marks

1. Define algorithm
2. What is flow-chart?
3. What is pseudo code?
4. What are the symbols of flow-chart?
5. Write an algorithm to print biggest of given two numbers?
6. Write flow- chart to print sum of two given numbers?

6 MARKS QUESTIONS :

1. Draw a flow – chart to find the biggest / greatest of given three numbers.
2. Draw a flow – chart to find the whether the given number is even or odd.
3. Write an algorithm to check whether the given number palindrome or not.
4. Differentiate between algorithm and flow – chart.

More practice on related flow – charts
1) Conversion of temperature in Celsius to Fahrenheit
2) Factorial of a number
3) Fibonacci sequence
4) Area of a triangle, given its sides.
5) Finding GCD, HCF of two numbers
6) Addicting N terms of the series S = $\frac{1}{2!}+\frac{2}{3!}+\frac{3}{4!}+\cdots n$

UNIT - 2

Features of "C"

Features

Introduction to C language.

2.1. Character set of C language.
2.2. Structure of 'C' program.
2.3. Constant variable and keywords identifiers
2.4. Data types in 'C'.
2.5. Operators in 'C'.
2.6. Input and output statements
Scanf ( )
get ( )
getchar ( )
printf ( )
put ( )
putchar ( )
2.7. Control statements
Simple if statement
If - else statement
nested if statement
else if ladder statement

2.8. Loops in 'C'
While loop
For loop
Do – while loop

2.9. Branching statements
Switch statement
Break statement
Continue statement
Unconditional branching statements
Goto statement

2.10. programs covering this unit.

2.0 Introduction to 'C' :

In any programming languages, experienced programmers often simplify a difficult task by breaking the problems into several smaller, more manageable ones. This process is often refer to as "divide and Conquer".

In "C" we call smaller tasks functions. By combining functions, we create problems. A major benefit of separating a large program with functions in that several programmers can work on different aspects of the problem at the same time, later combining their functions to complete the final program. In addition once you have created a function, you can use the routine in other programs without having to lode for example, break a big problem in to several smaller tasks and the implement these tasks as functions in "C". This chapter introduces you to the structural organization of "C" program. Upon completion of this chapter, you should understand the frame work of a C program and also recognize how comments are represented within the programs.

"C" language is one of the high level languages and it is a general purpose computer language. It supports mathematical, scientific, engineering and commercial applications. 'C' language was developed at Bell laboratories in the early 1970's by "Dennis Ritchie". The UNIX operating system was written in 'C' language.

2.1Features of C language :

1) It is structured language

2) It is simple, versatile, high level language.

3) It has very big and rich operators.

4) The execution of programs in 'C' is very fast and efficient.

5) In C language very efficiency data types.

6) It is supported a separate compilation of function and such function can

be called by value and called by reference.

7) 'C' language can be used in developing operating system, design of compiler and

Interpreters, network design, text – editors, develop to data base design languages.

2.2 STRUCTURE OF C PROGRAM:

C program have the following structure

(1) Documentation section
(2) Linkage section
(3) Define section
(4) Global declaration section
(5) main()
    (a) declaration part
    (b) executable part
(6) Sub programming section

1.DOCUMENTATION SECTION:

All user comments and documentation names user name, program name are written in this section. All are enclosed or written in /*-------*/. We write comments, name of the program or any comments.

2.LINKAGE SYSTEM:

It is used for C supplied reader files and user created file in this section begin with # symbol and without space write 'include' (include is a reserve word) and then write name of the header enclose within the less than (<) symbol and greater then (>) symbol. We do not put any special character at the end of the linkage section.

Ex: #include <stdio.h>
#include <math.h>

3. DEFENITION SECTION:

It is pre processor statements. It defines all symbolic constants. They are called preprocessor directives.

Ex : #define max-marks 100.

For defining symbolic constant maximum marks =100.

It is begin with # symbol and without spaces and write define (define is a reserve word) don't put any special character at the end of the sections.

4. GLOBAL DECLARATION SECTION:

There are some variables and are declared in the" global declaration section", that is outside of all the functions. This section also declares all the user defined section. Variables or functions whose.

Ex: since it known in the main () function and other user defined functions are called global variables or functions and their declarations. Their declaration should be made before main ().

5. MAIN () FUNCTION SECTION:

Every C program must have one main () function section. This section contains two parts 1) declaration part and 2) Executable part. The declarations part declares all the variables used in the executable part. There is at least one statement in the executable part. These two parts must appear between the opening ({) and closing braces(}). The program execution begins at the opening brace ({) and ends (}),the closing brace of the main functions section in the logical end of the program. All statements in the declaration and executive parts end with a semicolon (;). No C program is executed without main () function. It should be written in lowercase letters and should not be terminated by a semicolon. It calls other library functions and user defined functions. There must be one and only on main () function in every C program.

(a) **Declaration:-** It is part of C program. When all the variables, arrays, functions etc. used in the C program are declared and may be initialized with their basic data types.

(b) **Executive statements:-** these are instruction to the specific operators. They may be input, output statements asthmatic statements control statements and other statements. They are also including comments.

(c) **Sub-programming section:-** The sub-programming sections contains all the user defined functions that are called in the main function. User defined functions are generally placed immediately after main function, although they may appear in any order. These are subprograms. Generally a subprogram is a function and then contain a set statements to perform a specific task. These are written by the user, hence name in user_ defined it define after the main () function.

```
Documentation section.
Link section.
Definition section.
Global Declaration Section.
main ()
        {
                Declaration Part.
                Executable Part.
         }
Sub program section.
      Function -1.
```

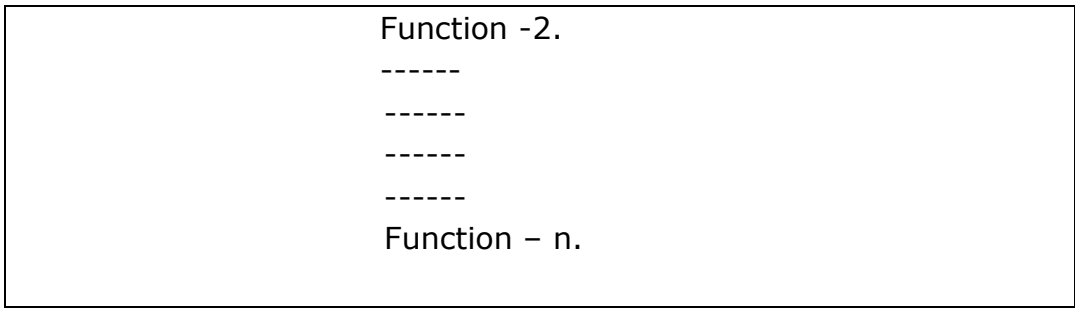


Fig - Structure Of C Program. 2.0

2.3 Constant and types of constants & variable and types of variable:

A programming language designed to help process certain kinds of data consisting of numbers, characters and string and to provide useful output known as information.

The task of processing of data is accomplished by executing a sequence of precise instruction called a program. This instructions are formed using certain symbols and words according to some reside rules as syntax rules. Every program instruction must confirm precisely to the syntax rules of the language. C has its own vocabulary and syntax rules. In this chapter, we will discuss the concept of constants and variables and other types as they related to C programs.

2.3.0. CHARACTER SET:

The characters set can be used to form words, numbers and expressions depend up on the computers on which the program is run. However, a subset of characters is available that they can be used on most of the computers. The characters in C are grouped in to the following types.

1. Alphabets A to Z (or) a to z
2. Digits (numbers 0 to 9)
3. Special characters , ; : . > < ! = # * etc.
4. White spaces.

The compiler ignores white spaces they are a part of string constant. White spaces may be used to separate the words, but are prohibited between the characters of keywords and identifiers.

2.3.1 Tokens in C:

In C some words are used as reserved to do specific tasks intended for them and called keywords or reserve words. The list reserve words are

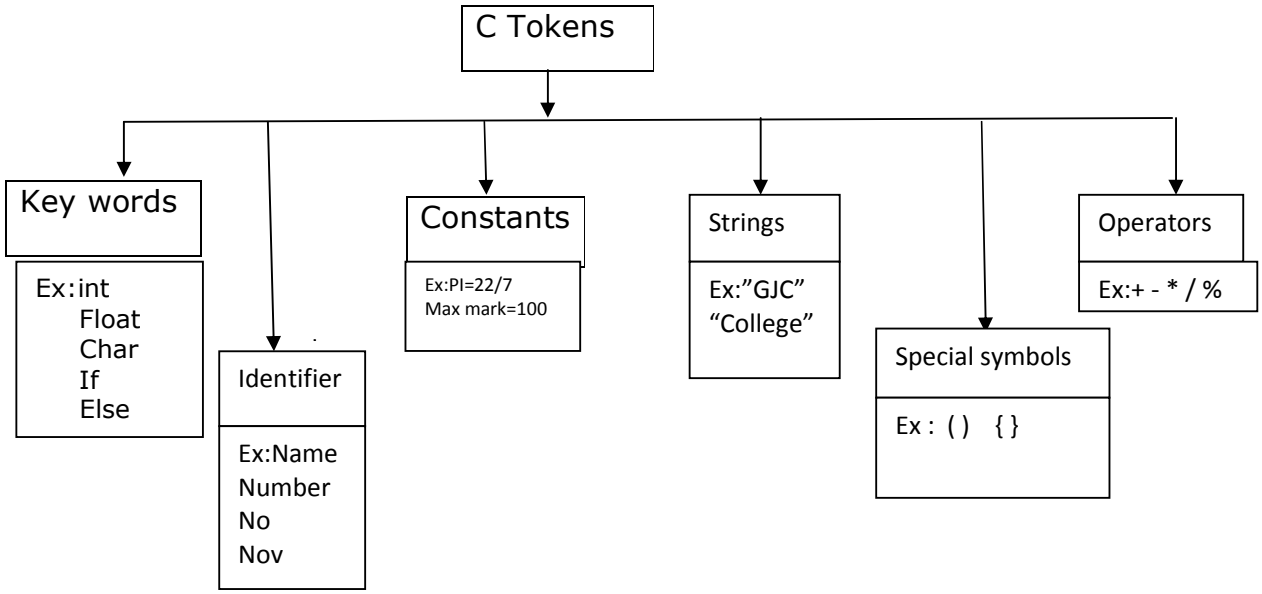


Fig : 2.3.1

2.3.1.0 KEY WORDS:

In 'C' words is a combination alphabets and digits. The words in C are classified in to

(a) Key word
(b) Identifier

All key words have fixed meaning these meanings cannot be changed. Key words serve as buildings of blocks for program statements. The list of all keywords in ANSIC are listed the table. All key words are written in lower case.

Here in C some words are used as reserved to do specific tasks intended for them and called key words or reserve words. The list reserve words are

auto	if	void
break	int	while
case	long	
char	register	
continue	return	
default	short size of	
do	static	

double	struct
else enum	switch
exter	typedif
float	union
for	unsigned
goto	

2.3.1.1 IDENTIFIERS :

Identifiers are the names of the objects, whose values can be changed during the execution of the program. The identifiers are named with description that transmits the value it holds. Identifiers refers name of the variables, functions and arrays. These are user-defined names and consist of a sequence of letters and digits with a letter as a first character. Both upper_ case and lower _ case letters are permitted. Although lower_ case letters are preferable.

2.3.1.2 CONSTANTS:

A constant contains a value that cannot be changed during execution of a program. If you are writing a program that uses a value that never varies. It is wise define it as a constant. Constants increase the readability of code and in addition cannot be effected by program errors. C supports several types of constants.

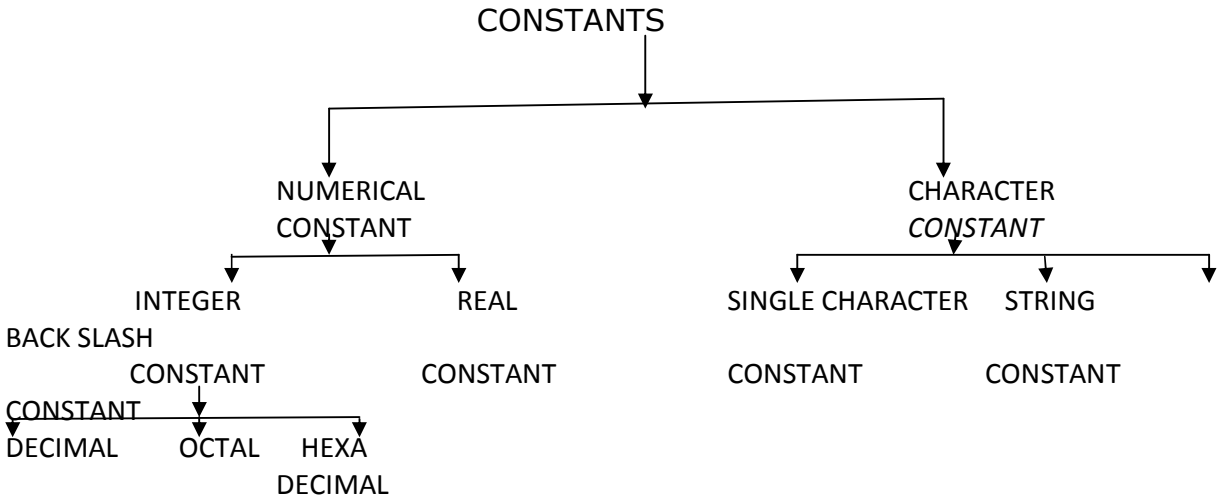


Fig 2.3.2 Constant types

(a) NUMERICAL CONSTANT :

It can be any of decimal integers (base 10) consists one or more digits 0-9

(b)INTEGER CONSTANTS :

An integer constants refers to a sequence of digits. These are three types, namely (i) decimal (ii) octal (iii) hexa decimal

(i) Decimal integer : The decimal integer constants consists of a set of digits 0 (zero) to 9, preceded by an optional + or - sign

Example : 521
-521
64537
+72

In the formation of integer constants do not maintain spaces between digits don't put an special character between digits like comma (,) Semicolon(;) and non_ digits characters are not permitted between digits.

Example to invalid integer constant:

23,265 (not valued) commas are not allowed between integer constant
23 265 (not valued) blank spaces are not allowed between integer constant
Rs. 500 (not valued) special symbols are not allowed between integer constant

The above examples are illegal numbers.

(ii) Octal:

An octal integer constant consists of any combination of digits from 0 (zero) to 7 with a leading 0 (zero).

Example : 0212
0393
0123
0

The + or – sign may have optional. In the absence of sign, the constant is assumed to be positive. Special characters like , (commas) and blank spaces are not permitted do not put the period (.) in between digits.

The in valued octal integers are

05.56	decimal point is not permitted
07,89	commas are not permitted
X023	X is a special symbol is not permitted
523	5 is not a permissible symbol as first character.

(iii) Hexadecimal integer :

A sequence of digits preceded by OX. The letters A,B,C,D,E,F (lower case or upper case) represent A or a is equal to 10, B or b is equal to 11, C or c is equal to 12 and D or d is equal to 13, E or e equal to 14 an F or f equal to 15.

Example :		
	0X2	0X2
	0X8C	0X8C
	0Xabc	0Xabc
	0X24	0XEF
		0X24

We rarely use hexadecimal numbers in C programming. The following rules are required to form a hexadecimal number.

- It is a sequence of one or more symbols. (0 to 9 and A to F) the symbols of Hexadecimal number system
- It may have an optional + or – sign in the absence of sign, the constant is assumed be positive.
- It should start with the symbols OX or ox
- Commas and blanks spaces are not permitted.
- It should not have a period (.) as a part of it.

Some examples for **invalid** hexadecimal integer constants.

- OX.421 (.) Dot is not permitted.
- -0X512 - sign is not permitted.
- -056.A . the symbols in between the digits.

(c) REAL CONSTANTS :

Integers, numbers containing fraction parts, some numbers are called real (or) floating point.

Example : 0.0282
-2.321
+523.12
5.2351

These numbers are shown in decimal notation having a whole number followed by a decimal point and the fractions part. It is possible to omit digits before the decimal point, digits after the decimal point that is

315 . 6
. 62
- . 71
+ .5

The above are all valid real numbers. A real numbers may also be expressed in exponential notation. For example, the value 315.25 may be written 3.1525e2 in exponential notation e2 means multiply by 102. The general form is

Montissa e exponent:
The mantissa is either a real number expressed in decimal notation or an integer. The exponent is an integer number with an optional plus or minus sign. The letter 'e' separating the mantissa and exponent can be written in either lower_ case(e) or upper case(E).

(d)CHARACTER CONSTANTS :

(a) A single character constants :
A single character constant contains a single character enclosed with in pair of single quotation mark.

Example : 'A', '5', ',' '*'
Note that the character constants 5 is not same as integer value of '5'. '5' is the value ASCII is a 'blank space'.

(b) String constant :
A string constant is a sequence of character enclosed in double quotes (""). The characters may be letters, numbers, special characters and blank space..

Examples : "GJC"
"college"
"5+6"
"xyz"
"A"

In the above examples "A" is not equal to 'A'. "A" is a double string constants, 'A' is a single string constant. Further a single string constant does not have an equivalent integer while a character constant has integer value. i.e. (ASCII value), character strings are often used in programs to build meaningful programs.

(c). BACK SLASH CHARACTERS :
'C' supports some special characters constants that are used in output function. For example, the symbol '\n' stands for new line character. Some backslash character constants are shows in Fig 2.2.3.0.

TABLE

Back slash Constant	Meaning

"\a"	Bell
"\b"	Back space
"\f"	Form feed
"\n"	New line
"\r"	Carriage return
"\t"	Horizontal tab
"\v"	Vertical tab
"\0"	Null

Fig 2.2.3.0

2.3.2 Delimiters :

These symbols have syntactic meaning and has not significance. These will not specify any operated to result in a value. The following shows delimiters list .

Hash
, Comma
; Colon
: Semi colon
() Parenthesis
{} Curly braces
[] Square braces

2.3.3 VARIABLES:

A variable is a data name that may be used to store a data value. During execution of a program the values are change is called **variable**. The variable may take different values at different times during execution.

For instance, we used the variable Total as Tot is 40 to store the value of total marks. A variable name can be chosen by the programmer in a meaningful way so as to reflect its function or nature in the program.

Example : Avg (Average)
Ht (height)
Tot((Total)
Tot _ stu(Total students)

- If you want write to compound words as variable name. You can put the underscore (_) character only.
- The length of variable not exceed 31 characters.
- The variable name should not be a keyword.
- White spaces are not allowed.

Invalid variable names :

Example: 521, 4abc, / ram, 26^{th} etc.

Table – Invalid and valued Examples of variables names

Variable name	Valid / not valid	Remarks
First name	Valid	
Int	Not valid	Int is a key word
Rs. Rate	Not valid	Rs sign is illegal
Average marks	Not valid	Blank space is not allowed
Type def	Not valid	It is a reserve word.
No	Valued	-
Na	Valued	-
Name	Valued	-
Number	Valued	-
My_name	Valued	-

Fig 2.3.3

After assigning variable names we must declare to the compiler. The variable does two things.

(i)It specifies the compiler what the variable name is

(ii) It specifies what type of data the variable will hold.

The declaration of variables must be done before. They are used in program.

Variable declaration :

A variable can be used to store a value of any data type. This is the name has nothing to do with its types.

Syntax : Data type var1, var2, var3…….var n;

Var1, var2, var3……..var n are the name of variable. Variables are separated by commas. Variable declaration statement must end with a semicolon(;).

Examples:
```
int a;
Int no; marks
Float avg – marks;
Char name[20];
Double ratio;
```

In the above example int, float, char, double are data types, a, no, avg marks are numbers. Name or ratio are variable names with character data value and double data value respectively.

Assign the values to variable:

Variable are declared for use in programming statements such as

Interest = PXNXR/100;

Values can be assigned to variable using the assignment operator "=" as follows.

Variable – name = constant or variable or expression

An assignment implies that the value of the variable on the left of the equal sign ("=")right side of equal sign"=".

2.3.4 Identifier :

An identifier is a string of alpha numeric characters that begins with alphabetic character or an underscore character that are used in represent various programming elements such as variables, functions, arrays, structures, unions and soon. Actually an identifier is a user – defined word. Identifier or symbols are the names user supply for variables, types, functions and labels in your program. Identifier names must differ in spelling and case from any keyword. You cannot use keywords as identifiers, they are reserved for special use.

2.3.5 Expression:

In programming, an expression in any legal combination of symbol that represents a value. Each programming language and application has its own rules for what is legal and illegal. For example in the 'C' language a+5 is an expression, as is the character string "girl". An expression is a combination of variables, constants and operators written according to the syntax of C language. In every 'C' expression evaluate a value, i.e. every expression results in some value of a certain type that can be assigned to a variable. Some expressions of C are shown below.

A= a+b;
A=bXc/2;
(ab/c)
aXb/c etc..

2.3.6 Declaration of storage class :

Variables in C can have not only data type but also storage class that provides information about their location and visibility in memory. The storage class decides the part of a program with in which the variables are recognized. The storage classes are classified into auto, static, extern,register.

2.4 DATA TYPES IN 'C' :

2.4.0. Data types characteristics:

Each data has its own specifics. While a type can be very good for a given situation it could not work well in another. So it is good to know the different options that we have - their characteristics, advantages and disadvantages. Before looking deeper into each of them we will see their parameters: purpose, size, range, signed, precision.

Purpose

Obviously the numeric types are there to represent numbers. Depending on the size they may vary from vary small to very big range. There are also types to represent only integer numbers and others – for real numbers. Other data types represent a single character, a sequence of characters, a boolean(truth) value.

Size

Varying on the application different data requires different size to be stored on. Usually we measure it in bytes or shortly "B". Note that this is a capital B. The lowercase abbreviation "b" means "bits". One bit is the smallest portion of information that a computer can handle. 8 bits form one byte and this is the measure that we use – byte (B).

Range

(Only for numeric types) Depending on the size the types could work with numbers from different ranges. If you try to store number, which is out of the range, an overflow will occur and data will be lost. It is good to optimize your programs. If you don't need to use a big size(range) type, you should use the smaller(shorter) version. Of course if you are unsure if the type is big enough – take the bigger range. It is better to take several bytes more than lose information, because of an overflow.

Signed or Unsigned

When signed, the type can represent both positive and negative numbers. Unsigned types work only with positive numbers and they can hold numbers twice bigger than signed. This applies to numeric types and could depend on the programming language. Some languages (like Java) don't support unsigned numbers. Other languages (like C) have both signed and unsigned types. This allows better optimization.

From computer side the difference is in the meaning of the most significant bit(MSB). With signed numbers it is the sign. MSB=1 means a negative number (- minus sign) and MSB=0 means a positive(+ plus sign). If the type is unsigned the sign is fixed to plus and the MSB is just a part of the saved value.

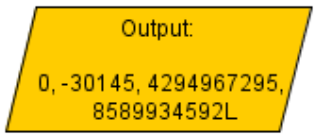
Precision

The precision applies only to real numeric types. This is the number of digits after the decimal sign that could be remembered.

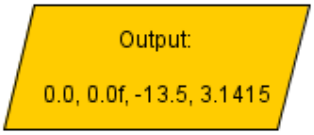
What is a literal? - It is a source code, representing a given value. It sounds more complicated than it is ;). In the blocks below you will see different examples of literals for each type. **The blocks for array, pointer and user defined are not clearly literals, they are just examples.*

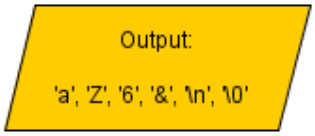
Some of the most used data types are:

- **Integer** – contains integer numbers. There are several integer types with different size and range. By default they are signed. We use them to store information like quantities, sizes, period of time etc.



- **Real** – Also called "floating point numbers", contain real numbers with some precision. It depends on the type we use. By default is signed. You can use these to save price, salaries and others.

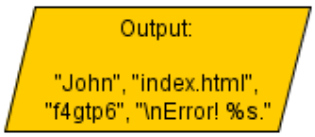




- **Character** – Saves a single symbol. It is represented with a code. Languages like C, C++ use one byte code, and others like Java, C# use two bytes code.

Character values are enclosed by apostrophes - 'character'. A character type can be used when reading the input from the keyboard symbol by symbol.

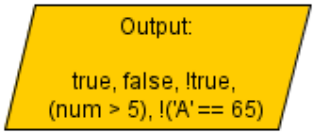
There are special characters called escape sequences. They begin with a backslash '\'. Such symbols are new line('\n'), null('\0') and others.

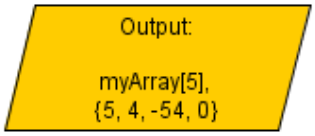


- **String** – It represents a sequence of characters. It does not have a fixed range. Usually it takes as many bytes as needed to save the information.

String values are enclosed by quotation marks - "string". Use this to store names, words or any other sequence of characters. It can also contain escape sequences (see character data type above).

- **Boolean** – Stores a truth value. It can contain only "true" or "false". It is in use when we want to save the result of a logical(Boolean) calculation.

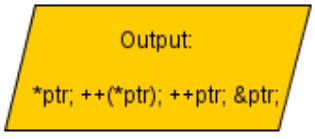


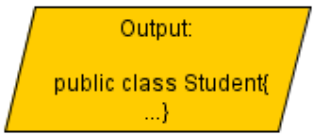


- **Array-** An array is not really a new type. It is a sequence of many values of the same type. They are called elements. Each element has an unique index number. The first element has index=0, the second 1...

To access an element from the array use the name of the array and the element index(the third element of array "my Array" is : my Array[2]). Arrays are useful when dealing with many records of similar information. For instance it is convenient if you want to save the names for a given number of people.

- **Pointers** – This also is not really a type, but instead a data pointing where a certain information is stored. Pointers are extremely powerful, but it can be very hard to master them. If you plan learning C, you will work with pointers very often.





- **User defined** – When solving a complex task it is often useful to define our own data type. For instance : you want to save information about students. It will be much more convenient if there is a "student" type and all information for one student is kept in one place and accessed with one variable. For this reason most of the computer languages offer this functionality. In C these are structures and unions. In object oriented languages this is done with classes.

- ***Void*** **-** "void" means "no data type". Usually this is used with sub-programs(methods) that don't return a result. Other usage are void pointers.

2.4.1. Data types :

C language is very big in its data types. Storage representation and machine instructions to handle constants differ from computer to computer. The variety of data types available allow the programmer select the type appropriate to the needs to the application as well as the computer.

Type	Size in bits	Range
Char	8	-128 to 127
Signed char	8	-128 to 127
Unsigned char	8	0 to 255
int	16	-32, 768 to 32767
Unsigned int	16	0 to 65.535
Short int	8	-128 to 127
Signed short int	8	- 128 to 127
Unsigned short int	8	0 – 255
Long int	32	-2,147,483,648 to 2,147,483,647
Signed longint	32	-2,147,483,648 to 2,147,483,647
Unsigned long int	32	0 to 4,294,967,295
Unsigned long int	32	0 to 4,294,967,295
Float	32	3.4 E.38 to 3.4 E + 38
Double	64	1.7E – 308 to 1.7E + 308
Long double	80	3.4E – 4932 to 1.1E + 4932.

Fig 2.5

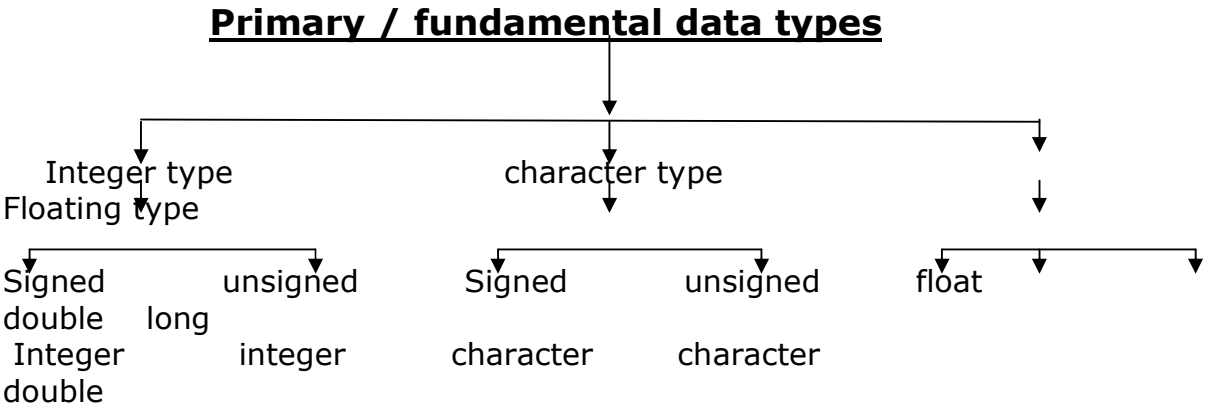
In C the data types mainly are :
1. Primary (Fundamental data types)
2. User defined data types
3. Derived data types
4. Empty data set.data type.

1.Primary data types :

Actually, C support 4 fundamental (or) primary data types. Namely
(a) Int
(b) Char
(c) Float
(d) Double

Size and range of Basic Data types of Primary data types :

Int	-32768 to 32.767
Char	- 128 to 127
Float	3.4e 38 to 3.4e + 38
Double	1.7e – 308 to 1.7e +308



1.Integer types :

Integers are which numbers with a range of values supported by a computer. Integer occupy one word of storage, and since the word sizes of computer vary 16 or 32 bits the size of an integer that can be stored depends on the computer. If you use a 16 bit word length. The size of the integer value is limited to the range - 32768 to +32767

A signed integer uses one bit for sign and 15 bits for the number. Similarly a 32 bit word length can store an integer ranging from -2.147,483, 648 to 2.47,483,647
C has three classes of integer storage namely short int, int and long int in both signed and unsigned forms

For example :

- Short int represents small integer values
- The sign and unsigned integers use all the bits, these are always positive numbers.
- A 16 bit machine, the range of unsigned integer number will form from 0 to 65.535.

We declare long and unsigned integers to increase the range of values. The use of qualifier signed an integer is optional, because the default declaration assumes a signed number.

(2)Float data type:

The float data types are classified to as (a) float (b) double (c) long double.

(a) Float:

The real numbers or float numbers are stored in 32 bits, with 6 digits of precision. Float numbers are defined by "float". When the accuracy provided by a float numbers is not sufficient, the type double can be used.

(b) Double:

A double data type number used 64 bits giving a precision of 14 digits.

(c)Long double:

The precision requires with greater precision, to extend the precision may be long double which uses 80 bits.

(3) Character data type : A single character can be defined as a character data type(char) data type. Characters are usually stored in 8 bits (one byte) of integer storage. The character data type is also using signed and unsigned. While unsigned characters have values from -128 to 127.

3. USER DEFINED DATA TYPES:

User defined data types are defined by users programs. They may be typedif, sizeif, enim, empty or null data types are used function. Enum is a another used defined data types in enumerated data types

Syntax : enum identifier { value 1, value2, value 3……..value n}

Example : enum months { jan =1, feb=2, march =3…….dec = 12}

4. Derived or secondary data types:

Derived data types are defined by the primary data types. They are array, pointers, functions, structures and files.

5. Empty data types:

Void is an empty data type normally used as a return type in C. the another use of void to declare the pointer in C. When it is not sure that what data type will be addressed by the pointer.

2.5 OPERATORS

An operator is a symbol that tells the computer to perform certain mathematical or logical manipulations. Operators are used in program to manipulate data and variables. The data items that operators act upon are called "Operators".

C operators can be classified into a number of categories. They include.

1. Arithmetic operators
2. Relational operators
3. Logical operators
4. Assignment operators
5. Increment and decrement operators
6. Conditional operators
7. Bitwise operators
8. Special operators

2.5.1. Arithmetic Operators:

C provided all arithmetic operators. The operators are +, -, *, / and %. These can operate a any built-in data type allowed in C.

Operator	Meaning of operator
+	Addition of two values.
-	Subtraction of two values
\	Division of two values.
%	Modular division.

Integer Arithmetic :

When both operands in single addition expression such as a + b one integer the expression is called an integer addition expression, and the operation is called integer arithmetic. Integer arithmetic always yields as integer value.

Example:- if A and B are integers, and A=25 B= 15 the result is :

A+B = 40
A-B = 10
A * B = 375
A / B = 1(decimal part truncated)
A % B = 10 (remainder value)

Integer division truncates any fractional part. The modulo division. During integer division, if both the operands are of the produce the remain of an, integer division. Same sign, the result is truncated towards zero. That is 5/2=0

-5/-7=0

But -5/7 may be zero or -1.

During modulo division to sign of the result is always the sign of the first operand that is -15%4 = -3

-15%-4 -3
.15% -4 =3

The following program shown the use of integer to convert given number of days into months and days it is only 30 days months only.

Month = days / 30

Assign to the remainder part of division the days. Thus to given number of days is converted into an equivalent number of months and days and the result is printed.

Program:-

```
main ( )
{
        int  M, D;
        \ * M means month and D means days */
        printf (" enter any 3 digit number \n ");
        scanf ("%d",& D);
        M = d/30;
        D= d % 30;
        printf (" month = %d days -- %d , M , D );
}
enter any 3 digit number.
325
Months =  10       days = 25
enter any 3 digit number
```

125
Months = 4 days = 5.

2.5.2.Relational operators :

Operator	Meaning
>	Is greater than
>=	Is greater than or equal to
<	Is less than
<=	Is less than or equal to
==	Is equal to
\=	Is not equal to

The relation expression used as the operand1 and operand2 may be variable or constant.

Example:-

125 > 120 TRUE
12.5 ≥ -12.5 TRUE
-125 > 120 FALSE
10 < 6 + 5 FALSE

If A = 25

A > 10 TRUE
100 < A FALSE

When Arithmetic expressions are used on either side of a relational operator, to arithmetic expression will be evaluated first and then the result compared. The relational expression are used in decision statements such as if, while, do etc, to decide to course of action of a running program.

2.5.3. LOGICAL OPERATORS:

C has the following three logical operators.

1. && (logical AND)
2. ¦¦ (logical OR)
3. ! (logical NOT)

These logical operator are used where result more than one condition Fr NOT it requires one expression only.

Example:- 1. If (A > B) && (A >C)

Big = A

2. If (A > B)¦¦ (B<A)

In the above example the first expression A>B is true and second expressive is also true. An expression of this kind which combines two or more relational expression is termed as logical expression or a compound relatives expression. The result of logical operator yields the result value either one (1) or zero (0) if the result is 1, it is True.

Logical AND:-

Syntax :

if (Expression1) && (Expression 2)

The expression1 and expression 2 are true only reset I true.

Example;- If (Expression-1) && (expression 2)

True True ——— result is 1 or True

Truth table for logical AND

(Expression 1	&&	Expression-2)	Result
True	&&	True	True
True	&&	False	False
False	&&	True	False
False	&&	False	False

If a= 20, b=5, c=15

1. If (A>B) && (A>C) = True
2. If (A>B) && (A<C) = False
3. If (A<B) && (A>C) = False
4. If (A<B) && (A<C)= False

Logical OR (¦¦):-

The logical OR Operator_is (¦¦). It is used where the expression -1 or expression -2 is true result is true. It mean either expression is true result will be true.

Truth Table

(Expression 1	Operator	Expression-2)	Result
True	||	True	False
True	||	False	True
False	||	True	True
False	||	False	False

Example:-

A=25, b=50, C=30

1. If (A<B) ¦¦ (A<C) = False
2. If (A<B) ¦¦ (A>C) = True
3. If (A>B) ¦¦ (A<C) = True
4. If (A>B) ¦¦ (A>C)= False

Program

To print given character in consonant or vowel using logical operator OR.

A.
```
main()
{
        char alpha;
        clrscr();
        printf("Enter any alpha \n:");
        scanf("%c",&alpha)

if(alpha=='a'||alpha=='e'||alpha=='I'||alpha=='o'||alpha=='u')
        printf("%c is vowel" ,alpha);
        else
        printf("%c is consonant", alpha);
}
```

Input:-Enter an alpha: a

Output:-a is vowel

Input:- Enter an alpha: z

Output:-z is consonant

Logical NOT !

The logical NOT operator is !. in logical NOT we are using one on expression. If the expression is true result is false and if the expression is false the result is true is called negative.

(Expression	Operator	Result
True	!	False
False	!	True

Example :

if A=10, B=25, C=50.

(A>B) ! False ⟶ Result is True here 10>25 is false but negative result is True

(A<B) ! True ⟶ Result is false here 10 <25 is True but negative result is False

(A<C) ! True ⟶ Result is false here 10 <50 is True but negative result is False

(A>C) ! False ⟶ Result is True here 10>50 is false but negative result is True

2.5.4. Assignment operators:

An assignment operator is used to assign a value to a variable the assignment operator is "=".

Syntax:- Identified = Expression / variable / Constant

Where the value of expression, variable and constant is assign identify, the operator is "=".

Ex:- A = B;
A = 10 + 5;
A = (10+5) * B
A = 100;

If two operands in an assignment expression one of different data type, then the value of the expression on the right will automatically be

converted to the type of the identifier on the left side. 'C' is also support short hand operator like + = , - = *=, /=, etc.

The shorthand operator + means add the value of left to right side of "=" assignment operators.

Examples:-

Assignment operator	Use short and operator
a=a+1	a+=1
a=a -1	a - =1
a = a * (K+1)	a * = K+1
a= a/ (K+1)	a/ = K+1
a = a%b	a%=b

The use of shorthand assignment operators has three advantages.
What appears on the left hand side need not be repeated and therefore it becomes easier to write.
The statement is more concise and easier to read. The statement is more efficient.

Program an assignment operator:

```
main ( )
    {
        int i, n;
        i = 0; s = 0;
        printf (" enter any two digit value "\n");
        scanf (" %d", n);
        while ( i < n)
        {
            printf ("%d \n",i);
            i + = i;
        }
    }
```

Output:
```
enter any two digit value  10
1
2
3
4
```

5
6
7
8
9

2.5.5. Increment and decrement operators:

The increment / decrement operators act upon a single operand and produce a new value is also called as " unary operator". The increment operator + + adds 1 to operand and decrement operator - - subtract 1 from operand.

Syntax: unary operator operand

Ex: + + i is equal to i = i + 1

- - i is equal to i = i -1

Mostly we use the increment and decrement operator in loops.

While + + i and i++ mean the same thing when they form statement independently, they behave differently when there are used in expression on the right hand side of an assignment statement consider the following:

```
i = 5;
s = + + i;
```

in this case, the value of S and I would be 6. Suppose, if we rewrite the above statement as

```
i= 5;
s = i+ +;
```

Then the value of S would be 5 and i would be 6. A prefix operator first adds 1 to the operand and then the result is assigned to the variable on left.

On the other hand, a postfix operator first assigns the value to the variable on left side then increments the operand.

2.5.6. Conditional operators :

The conditional operator is also called ternary operator, the conditional operators are "(?) (:)". The Ternary operator works like if else statement.

Syntax: (Expression 1 ? Expression 2 : Expression 3);
Where – expression1 is evaluated first. If it true, then the expression2 is evaluated and becomes the value of expression. If expression1 is false the expression3 is evaluated and its value becomes the value of the expression. Note that only one of the expression2 either expression2 or expression3 is evaluated.

```
Ex:- X = 100;
     X = 150;
     A = (X > Y) ? X: Y;
```

In the above example A will be assigned the value of Y. This can be achieved using to if else statements as follows.

```
     if ( X > Y)
     A = X;
     else
     A = X;
```

Program:

Write a C program to find smallest of given two integer using conditional operators.

A.
```
#include<stdio.h>
#include<conio.h>
 void main()
  {
    int a,b,t;
    clrscr();
    printf("Enter the values for a,b);
    scanf("%d,%d",&a,&b);
    t=(a<b)?a:b;
    printf("Smallest value is %d",t);
   getch();
   }
```

Input:-Enter the values for a,b: 456 876
Output: Smallest value is 456

2.5.7. BITWISE OPERATORS:-

A bitwise operator operators on each bit (bit means binary digit) of data it may 0 or 1 only. The bit wise operator.

Bitwise operator	Meaning

&	Bitwise AND
|	Bitwise OR
^	Bitwise exclusive OR
<<	Shift left
>>	Shift right
~	One's complement

The operations are carried out independently on each pair of corresponding bits within the operands thus the LSB (Least Significant bit) i.e right most side bits within the two operands will be compared until all bits have been compared. The result of these comparisons are:

Bitwise AND:- This expression will be returns 1, if both bits have a value of 1. Otherwise, it will return a value of 0.

Truth Table

A	B	Result
0	0	0
0	1	0
1	0	0
1	1	1

Truth table of Bitwise AND

Bitwise OR:- This expression will be returns 1, if one or more of the bits have a value of 1. Otherwise, it will return a value of 0.

Truth Table

A	B	Result
0	0	0
0	1	1
1	0	1
1	1	1

Bitwise Exclusive OR:- This expression will be returns a1, if one of the bits have a value of 1 and Otherwise, it will return a value of 0.

Truth Table

A	B	Result
0	0	0
0	1	1
1	0	1
1	1	0

Truth table of Bitwise OR

Bitwise left shift operator(<<):-

It work as the represent the bit pattern to be shifted. Bitwise right operator (>>). It is an unsigned integer that indicates the number of displacements.

One's complement (~):-

Bitwise complement operator "~" switches all to bits binary pattern, that is all the
"0" s (zeros) becomes all 1 (ones) becomes 0 s (zeros).

8.Special operators:-

C support some special operators of such as comma operator, size of operator, pointer operators * and member selection operators. (dot) and —>.

The comma operator:-

The comma operator can be used to link related together. A coma operator link list of expression is evaluated left to right and the value of right – most expression is the value the combined expression.

Example:- int a,b,c,d;

a=5, b=10, c=20;

First assigns the value 5 to a, then 10 assign to b, and 20 assign to c.

The comma operator has the lowest precedence of all operators.

The size of operator:-

The size of is a complie time operator. When used with an operand, it returns the number of bytes the operand occupies. The operand may be a variable, or a constant or a data type qualifier.

Example:- m = sizeof (S)

n = sizeof (int)

k = sizeof (325L);

The size operator is normally used to determine the length of arrays and structures. When sizes are not known to the programmer. It is also used to allocate memory space dynamically to variable during execution of program.

2.6. INPUT – OUT PUT STATEMENTS :

In computer programs, reading, processing and writing of data are essential. This is simply doing by programs takes some data as input and output / display and then processing data. The input data given to the program by two ways. One method is the assign values to variable through the assignment statements such as A=10, B=A, X=0 and so on. Another method is to use the input function scanf() which can read data from a input device. We have used both the methods is most of our earlier programs.

All input/output operations are carried out through function calls such as printf()and scanf(). These functions are collectively known as the standard input or output library. It may be recalled that included a statement.

include <stdio.h>

This is to instruct the compiler to fetch the function scanf() and printf()from stdio.h library. Stdio.h is an abbreviation for standard input – output header file. The instruction # include <stdio.h> tells the compiler to search for a file named stdio.h and place its contents at this point in to program. The contents of the header file become part of source code when it is compiled.

Input – output statements another way of giving values to variables.

Is to input data though key board using scanf( ) function. And get the result through VDU using printf( ) function.

In a they are two types of input/output statements.

1. Formatted input statements.
2. Unformatted input stated.
3. Formatted output statements
4. Unformatted output statement

An input / output function can be accessed from where within a program simply by writing the function name followed by a list of arguments enclosed in parentheses"( )". The arguments represent data item. They are sent tot the function . Some input/output function do not require arguments through the empty parentheses.

s**canf ( )**: function is a example for formatted input statement, is the unformatted input functions are getchar( ),gets().

printf(): printf() function is a example for formatted output function. The unformatted output functions are putchar(),puts()

Input statements are

Formatted	Input Statement
Formatted Input statement Unformatted Input Statements	scanf ( ) getchar(), gets()

Output statements

Formatted Output statement	printf ( )
Unformatted Output statements	putchar ( ), puts.

2.6.0.Conservation Characters

Character	Meaning
%c	Data value is a single character
%d	Data value is a signed decimal integer
%f	Data value is a signal floating point value with E not him.
%e	Data value is a signal floating point value.
%g	Data value signed value in %e or %f format whichever is shorten.
%i	Signed decimal integer
%o	Unsigned octal (base 8) integer
%s	String of text.
%x	Unsigned hexadecimal base (10) integer
%n	For short integer
%l	For long integer
%L	For long double.

Fig : 2.6.0

2.6.1.scanf ( ):- scanf ( ) is a input function. It can be used to send data into the memory from standered input devices. This function can be used to enter any combination of numerical values, character values and string values. The function retires number of data items.

Syntax:-scanf (" control strings", & var1, &var2, & var);

Where control string refers to string containing certain required formatting information and var1, var2, var3,…, var n are variables that represent the individual input data value.

Use of scanf() function:

Field specification consisting of the conversion character % a data type character and an optional number for specifying the and blanks, tabs, and new lines. The blank spaces, tabs and newlines the optional the data types character indicates the types of data that is to be assigned to the variable associated with the corresponding variables. The field width specifies is optional

The ampersand symbol (&) before each variables. Science the control string %d. Specifies that an integer value is to be read from to input device, we have to type in the value in integer form. Since the number is typed in the "enter key" is pressed, the computer then proceeds to the next statement.

The control string is a sequence one or more groups, Each character group is combination of % symbol and one o the conversion character. The control string specific variable. The control string specific variables. The control string specifies the field format in which direct the interpretation of input data. It may include:

Input- Integer numbers:

The field specification for reading an integer number is %d. The percent sign(%) indicates that a conversion specification an integer that is also specifies that field with of the number to be input and "d" known as data type character, indicates that the number to be read in integer mode.

The value 100 assigned to n and the value 2561 assigned to n1.

When the scanf( ) reads a particular value, reading of the value will terminate as soon as the number of characters specified by the field reached or until a character

The following examples refers to various input formatting options.

The scanf( ) request input data for 3 integer values a ,b, c and accordingly 3 values 5,10,15 are given. The specification %*d the value 5 has been skipped and 10 is assigned to the value b, c contains 15.

The second scanf( ) function specifies the formed %2d and %4d for M,N respectively. Whenever we specify field width for reading integer numbers, the input numbers should not contain more digits than the specified size. The extra digits on the right hand side will be truncated and assigned to the next variable in the list. Suppose we declare x as 6785 and y as 6542 it assigned 87 to m and 85 to N. The value 6542 has assigned to the next first variables in the immediately sacnf( ) statement p.

```
main( )
{
        int a,b,c, M,N,P;
        int p,q,r;
        printf ("enter 3 integer value",\n");
        scanf ("%d %d %d",&a, &b, &c);
        printf ("%d %d  \n"a,b,c);
        printf ("enter two 4 digit numbers",\n");
        scanf ("%2d,%4d",&M, &n);
        printf ("%d %d,\n,\n" M,N);
        printf ("enter a two digit  integer,\n");
        scanf ("%d %d",&a, &M);
        printf ("%d, %d",&a,&M);
        printf ("enter a 9 digit number",\n);
        scanf ("%3d,%4d%3d",&p,q,r);
        printf ("%d%d%d\n\n\n",p,q,r);
        printf ("enter two 3 digit number \n");
        scanf ("%d%d",&m,n);
```

}**Output:-**

Enter three integer number.
5 10 15

Output:- 5,10 – 3657 (C contains garbage).

Enter two 4 digit numbers.
8765, 6542.

Output:- 87 65

Enter two digit integerr

Output:- 6542, 44

Enter a nine digit number

Output:- 651234567

Enter two 3 digit number
523 657
523 523

Output:- 89 523.

Inputing Real Numbers:-

scanf reads real values using to simple specification %f for both the contains namely, decimal point notation and exponential notions.

Example:- Scanf ("%f %f %f", &A,&B,&C);
With values 123.45 , 67.85, 900
Values will assign with 123.45 to A 67.85 to B, and 900.00 to C.
If the number to be read f double type, than the specifications should be %if instead of simple if.

Example:-

```
main( )
{
    float A,B;
    double C,D;
    printf ("values of A,B");
    scanf ("%f%e",&A, &B);
    printf (" \n");
    printf ("A=%f/n Y=%f\n",A,B);
    printf ("values for C,D");
    scanf ("%f %f,&C,&D");
```

```
        printf ("\nC=%f\n D= %e,"C,D);
        printf ("\n\n A=%12 \f \n B=%123", C,D);
    }
```

Output:-

```
        Values of A B
        12.3456,    12.5e-2
        A= 12.345600
        B= 0.125000
        Values for C and D
        1.2345678987654321, 56789123567890
        C=    1.2345676543,
        D=    5.678912356789 e+001.
```

Character Reading:-

A single character can be read from terminal using to getchar ( ) function.

A scanf ( ) function can input strings containing more than one character. The following to specification for reading character strings.

%Wc or %WS.

The corresponding argument should be a pointer to a character array. However, %C may be used to read singe character when the argument in a pointer to a char variable.

Getchar( ):- Single character can be entered into the computer using in C library function getchar ( ). It return a single character from a slandered input device. The function.

Syntax:- Character variable = getchar ( );

Example Reading of string using %WC and %WS:

The use of various field specification for reading string1. When we use %d WC for reading a string to system will wait until W to character is keys. The specification %S terminates reading as the encounter of blank space. Reference name has read only to first part **Andhra** and the second part **Pradesh** is assigned to named during the second run the string Andhra is correctly to name%.

%C[character] and % [character]

The specification %c [character] means that only characters specified within the brackets are permissible in to input string.

Gets ( ):- The function gets ( ) receives the string from the standard input device.

Syntax:- gets (< string _type variable).

2.6.2.Output functions :

The printf statement provide certain features that can be use effectively to control the assignment and spaces of print-outs on the terminals. The printf( ) is used to print the data from memory onto a output devices. This function can be used to output any combination of values like integer, float, single character and string.

Syntax;- printf ("Control String", var1, var2, var3,…, var n);

In the above syntax the control string consists of three types of items.

- Character that will be printed on the screen as they appear.
- Format specification that define the output format for display of each item.
- Escape sequence characters such \n,\t and \b.

The control string indicates how many arguments follow and what their data types. The variables var1, var2, var3,… var n are the variables whose values are formatted and printed according to the specifications of the control string. The variables should match in number, order and type with the format specifications.

Example:-

```
printf (" c programs");
printf ("/n");
printf ("%d",A);
printf (" ");
printf (" A=%f \n b=%f ", A,B);
printf ("\n \n \n");
```

printf never supplies a new line automatically and therefore printf statement may be used to build one line of output. A new line can be introduced by to help of a character "\n", printf ( ) of integer

numbers. The format specification for printing an integer number is %Wd.

Where W indicate **field width** for output. Where **d** specifies that the value to be printed is an integer. The number is written right – justified in the given field width heading blanks will appear as necessary.

Examples:-

printf ( ) format	Output
printf ("%d", 1234)	1 2 3 4
printf ("%5d", 1234)	1 2 3 4
printf ("%5d", 1234)	1 2 3 4 5
printf ("%-5d", 1234)	1 2 3 4
printf ("%05d", 1234)	0 1 2 3 4

It is also possible to force printing the text to left justified by placing a minus (-) sign directly after the % character as shown in the forth example above. It is also possible to put with zeros in leading blanks by placing 0 (zero) before field width specifier as shown in the 5th example. The long integers may be printed by specifying "ld" in place of "d" in the format specification.

The program for various formats of integer value.

```
main( )
{     int A=12345;
      long N=567890;
      printf ("%d  \n", A);
      printf ("10d \n",A);
      printf (" %010d\n",A);
      printf ("%-10d\n",A);
      printf ("%10ld \n", N);
      printf ("%10ld \n"/-N");
```

```
}
```

Output:-

```
12345
    1 2 3 4 5
0 0 0 1 2 3 4 5
1 2 3 4 5
  567890
 -567890
```

Output real or floating numbers: The output of a real number by displaying decimal notation using the following format specification.

%W.P.f

The 'W' indicates the number of position that are to be used for display of the value and the 'P' indicates number digits to be displayed after the decimal point (Precision). The value, when displayed is rounded to 'P' decimal places and printed right-justified in the field of 'W' columns. The negative numbers will be printed with the minus sign specification (-).The following example to output of the A=12.3456 under different format specification.

Printf real numbers format	Output
Printf ("%7.4, A");	1 2 . 3 4 5 6
Printf (" %7.2,A");	1 2 . 3 4
Printf ("%-7.2f"A);	1 2 . 3 4
printf ("%f",A);	1 2 . 3 4 5 6
printf ("/0.2e",A);	1 \ 2 2 e + 0 1

The program for printing real numbers:

```
main( )
{     floa t A=12.3456;
      printf ("%7.4f", A);
      printf ("%f \n",A);
```

```
        printf (" %7.2f\n",A);
        printf ("%-7.2f\n",A);
        printf ("07.2f \n", A);
        printf ("10.2e \n"/A");
        printf ("12.4e \n",- A);
        printf ("0.-10.2e \n",y);
        printf (" %e\n",y);
}
```

Output:-

12.3456	1.22e + 001
12.345606	1.2345e + 001
12.34	1.23e + 001
12.34	123456.e + 001

Printing a Single Character:

A single character can be displayed in a desired position using the format.

% WC

The character will be displayed right justified in the field of a columns we can make the display left by placing a minus (-) sign before 'W'. The default value for W is 1.

Putchar ( ):-

Single characters can be displayed using function putchar ( ). It returns a single character to a standard output device. It must be expressed as an argument to the function.

Syntax:- putchar (< character _ variable>);

Printing Strings :

The format specification for out putting string is similar to that real numbers.

% W P S.

Where W specified to field width for display and P instruct that the first P character of the string one to be displayed. The display is right – justified.

Example:- S= ANDHRA PRADESH

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
%S →	A	N	D	H	R	A		P	R	A	D	E	S	H	\0					A
%20 S	→	D	H	R	A		P	R	A	D	E	S	H	\0						
%6S	→					A	N	D	H	R	A		P	R	A	D	E	S	H	\0
%5S →					A	N	D	H	R	A		P	R	A	D	E	S	H	\0	

Printf Format Codes :

Code	Meaning
%c	Print a single character
%d	Print a decimal integer
%e	Print floating point value with exponent
%f	Print floating point without exponent
%g	Print floats point either e-type or float
%i	Print signed decimal integer
%o	Print octal integer
%S	Print string
%u	Unsigned decimal integer
%x	

	Hexa decimal integer without leading o

Puts ( ):- The function puts ( ) outputs the sing to the standard ouput device

Syntax:- puts (s);

Where S is a string that was real with gets ( )

Expression:-

An Arithmetic expression is a combination of variables, constants and operators arranged. Expressions are evaluated using an assignment statement of the form.

Syntax : variable = expression

Variable is any valid C variable name, when the statement is encountered , the expressions is evaluated first and the result the replaces the previous value of the variable on left hand side. All variables used in the expression must be assigned values before evaluation is attempted.

Example:- A = B+ C

I = I +1

I≤ 20.

2.7 CONTROL STATEMENTS:

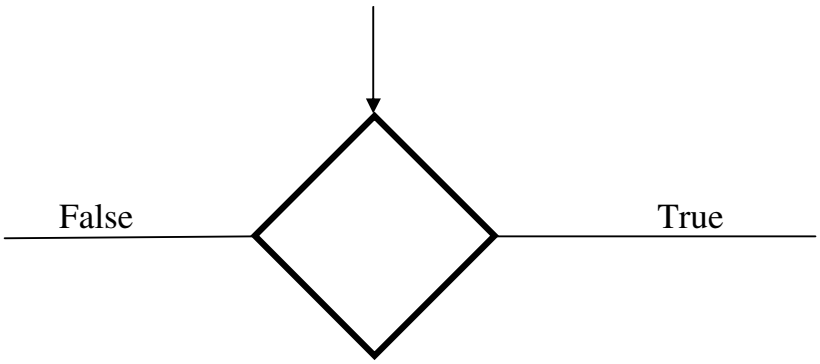
When the execute a program, the instruction can be performed sequentially, respectively or selectively based on a condition. The if and if_ else statement provide a means of performing a series of instruction based on a condition. Flow of control specifies the sequences in which the instruction are executed.

Decision making with if statement:

The if statement is a powerful decision making statement and is used to control the flow of execution of statements. It is basically two ways decision statements and is used in conjunction with an expression.

It allows the computer to evaluate the expression first and then, depending upon whether the value of the expression is True or False, it transfers the control to a particular statement. The point of program has

two parts to follows one for the **true** condition and the other for the **false** condition.



Example:-

if total marks ≥ 75
You are select
else
You are not select.

C support 4 types of conditional statement

1. Simple if statement
2. If--- else statement
3. Nested if --- else statement
4. Else – if ladder

2.7.0.Simple if statement:-

Syntax:-

```
if (test _ condition)
{
        statement_ block;
}
        statement _ X;
```

In the above simple if syntax, the statement - block may be a single or group of statements. If the test _ condition is true. The statement – block will be executed, otherwise the statement will be skipped and execution will jump to the statement _ X. Remember, When the condition is true, both the statement_ block and statement _ X will be executed.

Flow-chart of simple if:-

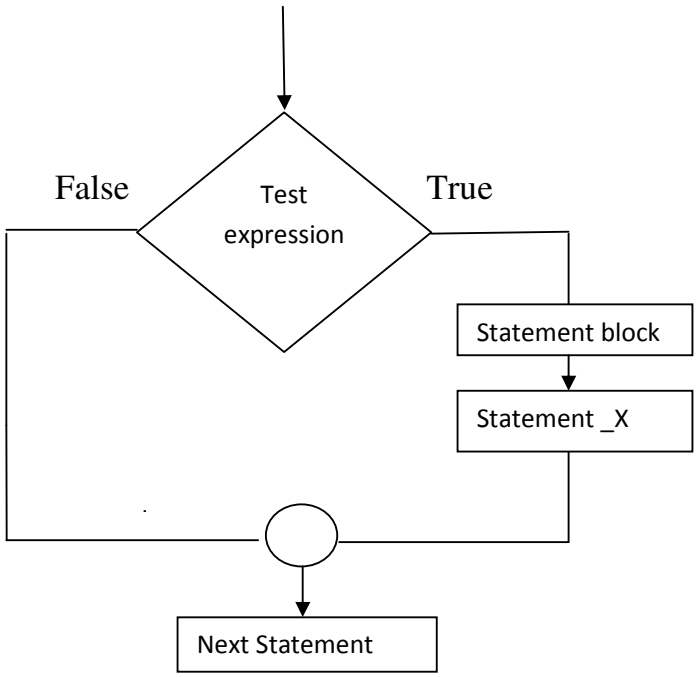


Fig : Flow chart of simple if

Example:-
```
if ( total marks >= 400)
{
        total_ marks + bonus _ marks;
}
        printf ("%d", total marks);
```
In the above example the total marks of the student is >=400, then additional
Bonus marks are added to his marks before they are printed total _ marks. Otherwise if total marks < 400 the bonus- marks are not added. The actual given total_marks only printed.

Program:-
```
main ( )
{
    int TM, Sno;
    printf ("enter the student number \n");
    scanf ("%d", &sno);
    printf ("enter the student total marks \n");
    scanf ("%d", & TM);
    if (TM ≥ 400)
    {
        TM  = TM + 10;
    }
```

```
        printf ("student No is %d\n", sno);
        printf ("Total marks %d\n", TM);
}
```

Program to simple if statement

2.7.1.If ------ else statement:

The if – else statement is used to execute true or false.

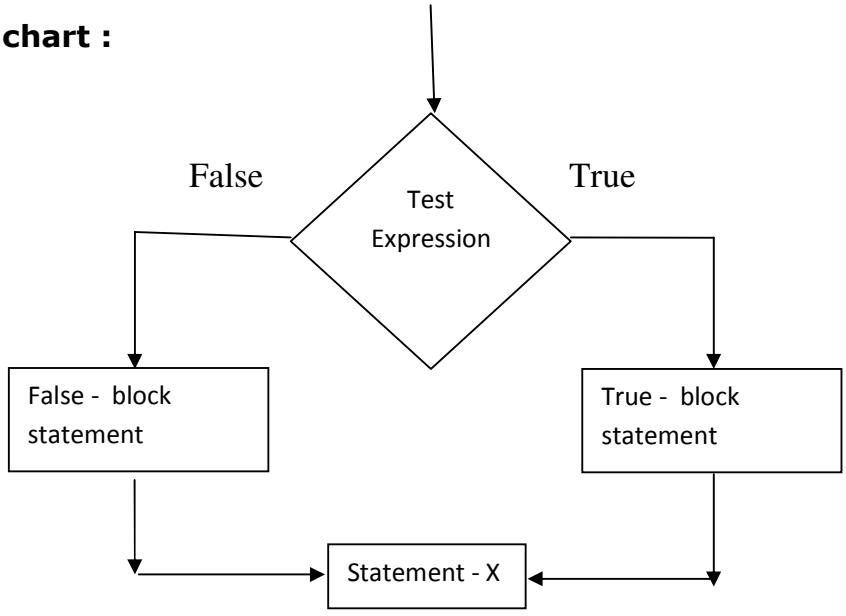
Syntax:-

```
if (test _ expression)
{
 true _ block statements;
}
else
{
false_ block statement;
}

statement _ X;
```

If the test_expression is **true** , then the true_block statements are executed true_ block may have one or more statements if the test_expression is false (else) the false_block statements are executed. In either case, either true_block or false_block will be executed, not both.

flow chart :



Example:-

In a class we want count the student of boys and girls. We use code for 'B' for boys and 'G' for girls.

```
if( student _ code == B)
{
Boys = boys + 1;
}
else
{
Girls = girls + 1;
}
```

In the above example the first test_condition is **true**. The number of boys is incremented by one. If the test_ condition false the girls are increment by one. Then the control reaches the statement _X.

Program:-

```
main ( )
{
int a,b, big = 0;
printf );("enter the value for a\n");
scanf ("%d", &a);
printf ("enter the value for b\n");
scanf (" %d", &b);
if (a > b)
{
big =a;
}
else
{
big = b;
}
printf ("the big value is %d", big)
}
```

Program to if-else statement

2.7.2.Nested if statement:-

When a series of decision are involved, we may have to use more than one if else statement in nested form.

Syntax:-

```
if ( test _ condition _ 1)
{
        if (test _condition _2)
        {
                statement _ 1;
```

```
        }
else
        {
                statement _2;
        }
else
        {
                statement _ 3;
        }
                statement _ n;
```

The execution of nested if is, if the condition _1 is, false statement _3 will be executed, otherwise it continued and perform the test condition _ 2 if it also true the statement will be executed. If means to the statement _1 will be executed only when condition _1 and condition _2 is not true i.e false, it mean the 1st condition _1 is true but test_ condition _2 is false. Then the statement _2 will be executed, and then the control is transferred to the statement _ X.

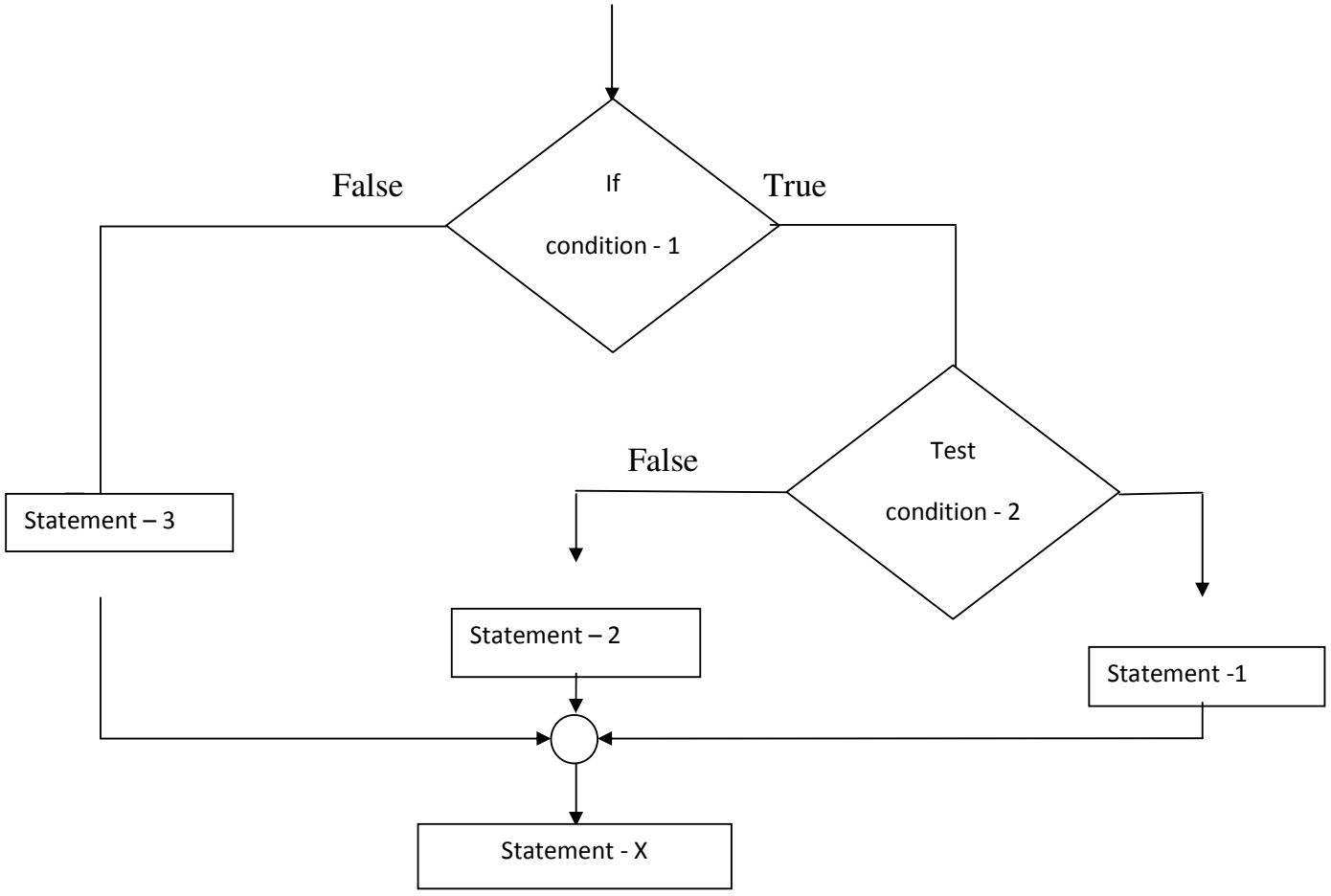


Fig : Flow chart of Nested – if Statement

Example:-

A bank has introduced an in continue interest to give giving bonus interest all senior citizen holders who deposit more than 50,000. The bonus interest is 3%. If the deposit holder is not to senior citizen.

```
if ( customer _ code = senior citizen )
{
        if ( deposit _ amount > 50000)
{       interest = interest rate  + 0.05
}
        else
        interest = interest  + 0.02;
}
        else
        interest = interest + 0.00;
}
        amount = interest + bonus interest.
```

In the above example, if the condition _code == Senior citizen and the deposit amount is >= 50,000 the interest is calculated as actual interest plus 0.05 Bonus interest. i.e. interest = interest rate + 0.05.

If the customer code = senior citizen and the deposit amount is < 50,000 the interest is calculated as actual interest plus 0.02 Bonus interest. i.e. interest = interest rate + 0.02

If the customer code is not = senior citizen and the actual interest is paid only. There is no Bonus interest. i.e. interest = interest rate + 0.00

2.Write a C program to find the biggest value of given three integer numbers using nested if statements

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,c ;
clrscr();
 printf("Enter the values a,b,c:");
scanf("%d,%d,%d",&a,&b,&c);
 if(a>b)
        {
                if(a>c)
        {
         printf("%d is biggest",a);
        }
else
        {
        printf("%d is biggest",c);
        }
        }
else
        {
                 if(b>c)
        {
         printf("%d is biggest",b);
        }
else
        {
        printf("%d is biggest ",c);
        }
        }
        getch();
}
```

Input:-

Enter the values a,b,c: 567 764 345

Output:-

345 is biggest

2.7.3.The else - if ladder:

Another way of using if's together when multipath are involved. A multipath decision is a chain of **ifs** in which the statement associated with each else is an if.

Syntax:-

```
if (condition_1)
 statement _1;
else if ( condition _2)
    statement _ 2;
else if ( condition _3)
    statement _ 3;
       -----
       ------
else
       default _statement;
       statement_ X;
```

This construction is known as else if ladder. The conditions are evaluated from top to bottom. As soon as a true condition is found the statement associated with it executed the control is transferred to statement _ X. It is simple skipped the rest of the statement when all conditions becomes false, then the final else containing the default – statement will be executed.

Flow – chart – to else if ladder statement:

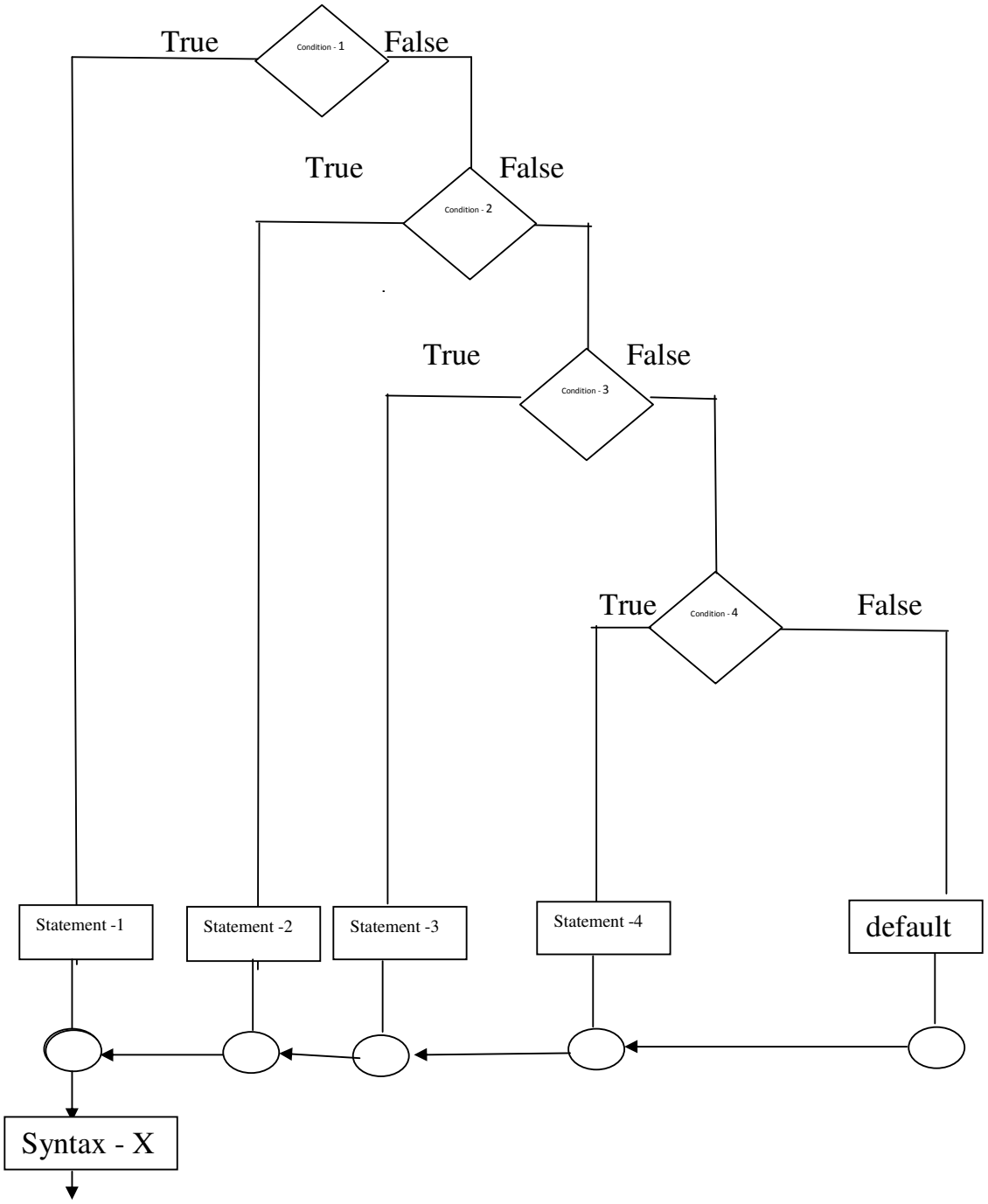


Fig : 2.7.0.Flowchart - Else if ladder Statement

Example:- If you give grading the students in your college. The grading is done according to the following marks out of 100.

Marks	Grade
80 – 100	A
60 – 79	B
50 – 59	C
40 – 49	D
Below - 40	Fail

```
If ( marks > 79 )
        Grade = "A"
elseif (marks > 59)
        Grade  = "B"
elseif ( marks = 49)
        Grade = "C"
else
        Grade = "Fail"
printf("%S", grade);
```

Program:

Write a C program to find the grade of the student to following condition using else if statement.

Avg marks	Grade
>=80	distinction
<=80 and >=60	1st division
<60 and >=50	2nd division
<50 and >=40	3rd division
<40	Fail.

A.
```
void main()
{
        int m1,m2,m3,m4,m5,avg;
         clrscr();
         printf("Enter the values for m1,m2,m3,m4,m5:");
        scanf("%d,%d,%d,%d,%d",&m1,&m2,&m3,&m4,&m5);
        avg=(m1+m2+m3+m4+m5)/5;
        if(avg>=80)
        {
        printf("Distinction");
        }
else
         if(avg>=60)
        {
        printf("1st grade");
        }
 else
         if(avg>=50)
        {
        printf("2nd grade");
        }
else
        if(avg>=40)
        {
         printf("3rd grade");
        }
else
        {
        printf("fail");
        }
        getch();
        }
```

Input:-

Enter the values for m1,m2,m3,m4,m5: 87
54
65
98
87

Output:- 1st grade

2.8. LOOPS:

We have seen in the previous chapter that is possible to execute a segment of a program repeatedly by introducing a counter and later testing it using the if statement. While this method is quietly satisfactory for all practical purpose we need to initialize and increment and test its value at an appreciate place in the program for the completion of the loop.

Loop statements are used to execute the statements p repeatedly as long as an expression is **true**. When the expression becomes **false** then the control transferred out of the loop.

In looping a sequence of statements are executed until the condition is **true**, A looping process consists two segments, one is known as **body of the loop** the other known as the **control statements.** The control statement tests certain conditions and then directs the repeated execution of the statement contained in the body of the loop.

Depending upon the position of the control statements in the loop, a control structure may be, classified either the "**entry_ controlled loop**" or as the "**exit controlled loop".**

In entry controlled loop, the conditions one tested before to start of the loop execution. If the conditions are not true, then the body of the loop will not be executed.

In exit- controlled loop to test condition is performed at the end of the body of the loop and therefore the body is executed at least one time without condition for the first time.

a).Flow chart to entry:

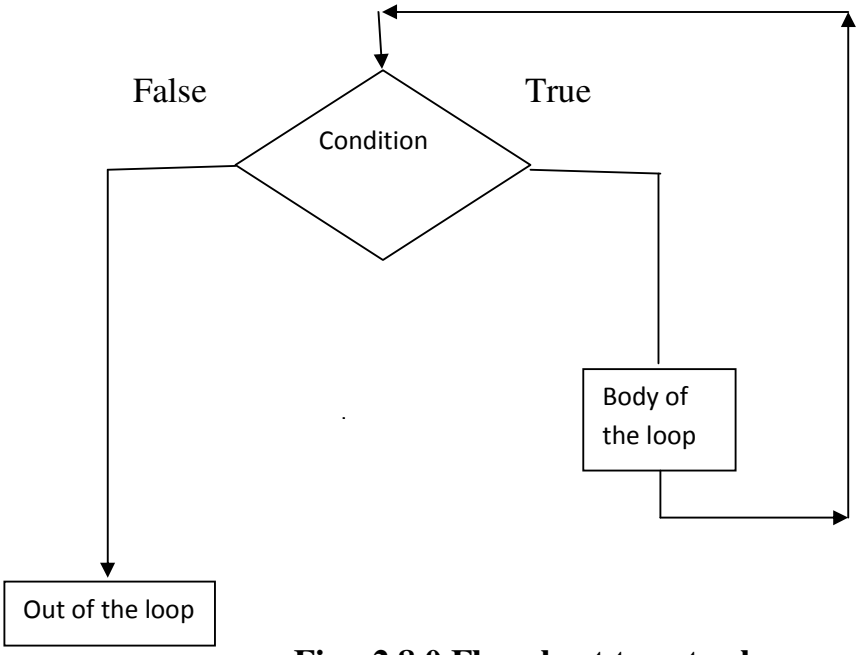


Fig : 2.8.0.Flowchart to entry loop

b) Flow chart to exit loop:-

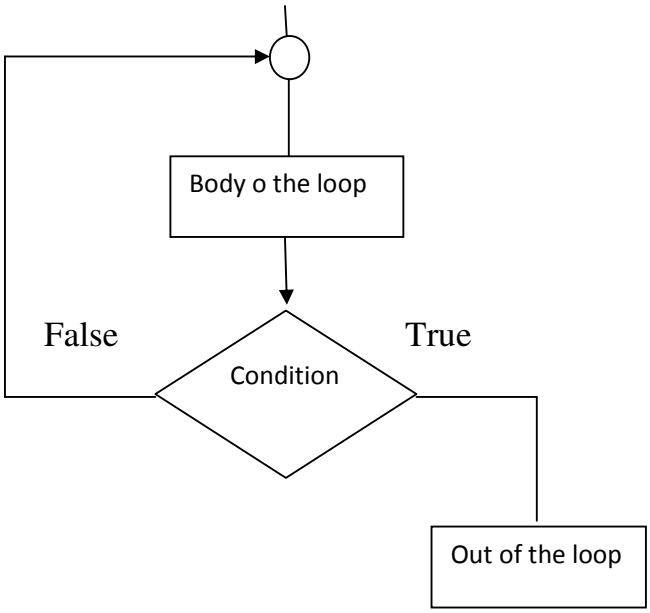


Fig : Flowchart to exit loop

The test condition should be carefully stated in order to perform the desired of loop executions. It assumed that the test_ condition will

eventually transfer the control out of the loop. In case, due to some reason it does not do so, the control setup an infinite loop and the body is executed over again the looping process would include the following steps.

1. Setting and initialization of a counter.
2. Execution of the statements in the loop.
3. Test for a specified condition for execution of the loop.
4. Incrementing the counter.

The test may be either to determine whether the loop has been repeated the specified number of times or to determine whether a particular condition has been met.

C language provided for three loop constructs for performing loop operations. They are.

1. The while statement
2. The for statement
3. Do statement

2.7.1 THE WHILE STATEMENT:

Syntax:- while (condition)

```
{
Body of the loop;
}
```

The while statement in an entry controlled loop statement . The condition is evaluated first and if condition is true, then the body of the loop is executed. After execution of the body the test condition is once again tested. Evaluated and I it is true, the body is executed once again. Evaluated once again. This process of repeated execution of the body continues until the condition finally becomes false and control is transferred out of the loop. One on exit, the program continues until the with the statement immediately after the body of the loop. The body of the loop may have one or more statements. The braces ({ }) are needed only if the body contains to or more statements. However it is a good practice to use the braces even if the body has only one has only one statement.

Example:-

```
s = 0;
```

```
        i = 0;
        while (i ≤ 10)
        {
        s = s+i;
        i= i+1;
        }
printf ("sum = 5d \n", s);
```

The body of the loop is executed 10 times from 1 to 10 each time increment by 1 value of i in inside loop. The condition may also be written I <11, the result would be the same.

Program:- **To calculate sum of 1 to n natural numbers.**

```
main ( )
        {       int i, n, s;
                printf ("enter the value to n \n");
                scanf ("%d", &n);
                s=0;
                i=1;
                while (i ≤ n)
                {
                        s= s+i;
                        i=i+1;
                }
                printf ("\n the sum value of 1 to n natural no' s is %d
\n", s);
        }
```

Programme for while statement

Program 2

. Write a C program to print first 'n' odd numbers series.

A.
```
#include<stdio.h>
#include<conio.h>
 void main()
 {
    int n,c;
    clrscr();
   printf("Enter values for n:");
   scanf("%d",&n);
   c=1;
  printf("odd numbers series n:");
  while(c<=n)
  {
    printf("%d \n",c);
    c=c+2;
  }
  getch();
}
```

Input:- Enter values for n:10

Output:- odd numbers series n: 1 3 5 7 9

2.8.2.for statement:

The **for** is another entry controlled loop statement that provides a more concise loop control structure.

The syntax of the for loop is:

```
for (initial – value; final value; increment  value )
        { body of the loop;
        }
```

Example:-

```
s=0;
printf ("enter the value to N \n");
scanf ("%d", &n);
for (i=1; i≤n; i++)
{       s= s+i;
}
printf ("the sum is %d ", s);
```

The execution of the control variables is done first in the above example **I** is the control variable. The value of control variable is tested using the condition (final, value). The condition is a relational expression such as <, >, ≤, ≥, !, etc. i≤ 10 that determines when the loop will exit. If the condition is true, the body of the loop is executed, otherwise, the loop is terminated from body of the loop will exit and execution continue with the statement that immediately follows the loop.

When the body of the loop is executed, the control is transferred back to the for statement after evaluated the last statement in the loop. Now, the control variable in incremented using an assignment statement. Such as i=i+1 and the new value of the control variable is again tested to see whether it satisfies the loop condition. If condition is satisfied the body of

the loop is again executed. This process continues till the value of the control fails to satisfy the condition.

Example:- for (i=0, i<=10, i++)

```
{
Printf("%d\n",i);
}
```

The for loop is executed 10 times and print 10 digits 0 to 9. The three sections enclosed within the parenthesis must be separated by semicolons. Note that there is no semicolon at the end of the loop.

The for statement allow for negative increments i.e decrement the control variable.

Example:- for (i = 9; i>=0;i--)

```
Printf ("%d", i);
```

This loop is also executed 10 times, but the output would be from 9 to 0 instead of 0 to 9. Science the conditional test is always performed at the beginning of the loop the body of the loop may not be executed at all. If the condition fails at the start.

Program:

Write a C program to find sum of 1 to n odd numbers using 'for' loop.

A.
```
#include<stdio.h>
#include<conio.h>
void main()
{
  int n,i;
 clrscr();
 printf("Enter the value for n:");
 scanf("%d",&n);
 printf("Odd numbers series in \n");
 for(i=1;i<=n;i++)
  {
        printf("%d",i);
  }
 getch();
}
```

Input:-

Enter the values for n:8
Output:-
Odd numbers series in 1
3
5
7
9
11
13
15

Program : 2.8.2. to for statement

2.8.3. do STATEMENT:-

The do statement is an exit controlled loop statement. The do statement the program proceeds to evaluate the body of loop first. At the end of the loop, the condition is in the while statement if the condition is **true** the program continues to evaluate the body of the loop once again. This process continues as long as the condition is true. When the condition becomes **false**, the loop will be terminated and the control goes to the statement that appears immediately after the while statement.

Syntax:-
```
do
 {
      Body of the loop;
}
While (condition);
```

Example:-

```
i=0
s=0
do
{ s=s+i;
  i=i+1;
}
While (I ≤ 10);
```

In the above example it reads the 1 to 10 natural numbers the loop to be executed as long as the number keyboard is lies between 0 to 10.

Nesting of loops:-

Nesting of loop, that is one for statement within another for statement , is allowed in C. For example.

```
for (i=0; i≤m; i++)
{
for (j=0; i≤n; i++)
{
body of loop;
}
Statement – n;
```

The loops should be properly indented so as to enable the reader to easily determine which statements are contained within each for statement.

Nested for statement as follows.

```
for (i=0; i≤m; i++)s
{
        for (j=0; j≤m; j++)
        {
                scanf ("%d", a(i) (j));
        }
}
```

Nesting can be defined as the method emending one control structure with in another control structure.

While making control structure to be reside one with in another, the inner loop and outer loop control structures may be of the same type or may not be of same type. But it is essential for us to unsure that one control structure completely embedded with another.

Program:

Write a C program to print the following format using nested for loop.

```
1
2  2
3  3  3
4  4  4  4
5  5  5  5  5
```

```
#include<stdio.h>
#include<conio.h
          main( )
         {
              int i,j,n;
             clrscr( );
             printf("Enter the value for n:");
             scanf("%d",&n);
             printf("format is\n ");
            for(i=1;i<=n;i++)
             {
               for(j=1;j<=i;j++)
                {
                  printf("%d",i);
                 }
                printf("\n");
             }
            getch();
        }
```

Input:-Enter the values for n:2

Output:- 1
2 2
3 3 3

2.9.BRANCHING:

THE SWITCH STATEMENT:-

C has a built - in – multiway decisions statement known as a switch. The switch statement tests to value of value of a given variable against a list of **case values** and when a match is found, a block of statements associated with that **case** is executed.

Syntax:

```
switch (Expression)
{
    Case Constant-value _1:
        Statement - block _1;
        Break;

    Case Constant-value _2:
        Statement block _2;
        Break;
```

```
        Case Constant-value _3:
                Statement  block _3;
               Break;

        Case Constant-value _4:
                Statement  block _4;
                Break;

         Case Constant-value _5;
                Statement  block _5;
                Break;
        Default:
               default – statements block;
               break;
    }
                Statements – X;
```

The above syntax the expression is an integer expression or character. Constant – values are constants or constants expressions and are known as case labels. Each of these values should be unique within the switch statement. The statement blocks may contains zero or more statements. There no need to put braces around these statement blocks. Note that case label end with : colon. When switch is executed, the value of the expression is successively compared against the constant value 1, constant value 2. ……. Constant value_n. If a case found whose value matches with the value of the expression, then the block of statements that follows the case are executed. The break statement at the end of each block signals the end of a particular case and causes an exit from the switch statement, transferring the control to the statement - x following the switch . The default is an optional case, When present, it will be executed if the value of the expression does not match with any of the case values. If not present, no action takes place if all matches fail and the control goes to the statement – x.

Example:-

If you want declare a grade to the student in class see maximum total marks is 100. With the following conditions.

```
Total marks      80 to 100   grade   =  A+
Total marks      70  -  60   grade   =  A
Total marks     >50  - <59   grade   =  B
Total marks     >40  - <49   grade   =  C
Total marks     <40          grade   =  "Fail".

switch (Total marks)
{
  Case 100:
```

```
        Case   90:
        Case   80:
              Grade = "A+";
              Break;

        Case   70:
        Case   60:
              Grade = "A";
              Break;
        Case   50:
              Grade = "B";
              Break;
        Case   40:
              Grade = "C";
              Break;
       Default:
              Grade = "Fail";
       }
Printf ("%s", grade) ;
```

2. Write a C program to find the given alphabet in vowel or consonant using in switch case.

A.
```
main()
  {
    char alp;
    clrscr();
    printf("Enter the value alp:");
    scanf("%c",&alp);
   switch(alp)
   {
    case'a':
    case'e':
    case'I':
    case'o':
    case'u':
    printf("%c is vowel",alp);
    break;
   default:
```

```
    printf("%c is consonant",alp);
  }
 getch();
}
```

Input:-Enter the value alph: i

Output:- i is vowel

Input:- Enter the value alph:t

Output:- t is consonant

Program : 2.9. to switch statement

2.9.2.Break – Statement:

When the break statement is encountered inside a loop, the loop is immediately exited and the program continues with the statement immediately following the loop. When the loops are nested, the break would only exit from the loop containing it. That is, the break will exit only a single loop.

Syntax:-

```
Break;
```

Example:

```
main ()
{

int I,N,S;
printf ("enter value for n/n");
scanf ("%d", &N);
S=0;
for (i=1; i≤N; ;++)
{
if (N<0)
break;
S=S+I;
}
printf ("she sum f 1 to n numbers is %d \n",S);
}
```

Program : 2.9.2 to using break statement

2.9.3.continue – Statement:

C support another similar statement called continue statement . However , the break which causes the loop to be terminated, the **continue** as the name implies. Causes the loop to be continued with the next iteration

after skipping any statement in between . The continue statement tell to complier "SKIP THE FOLLOWING STATEMENTS AND CONTINUE WITH THE NEXT ITERATION".

Syntax:- continue;

The use of continue statements in loops causes to continue the iteration process. Into case of 'for' loop the increment part of the loop is executed the text-condition is evaluated.

2.9.4.Unconditional Branching Statements:-

goto statement

C supports the 'goto' statement to branch unconditionally from one place to another in the program. Although it may be essential to use to 'goto' statement in a highly structured languages.

The goto requires a **Lablename** in order to identify the place where the branch is to be made. A 'lable' is any valid variable name, and must be followed by a colon (:). The label name is placed immediately before the statement where the control is to be transferred. There are two types of 'goto' statements used as forward JUMP**. forward jump** and **backward jump**. The forward jump is as **goto…… lable** name:. The **backward jump** is as **label name**:

Syntax forward jump :

```
goto lable_name;
        statement -1;
        statement -2;
        statement -3;
    ------
    ------
    ------
    ------
        label name:
        statement -X;
```

Syntax:- (backward jump)

```
label- name:
        statement -1;
        statement -2;
        statement -3;
          -------
          -------
        goto label-name;
```

The lable-name any ware in the program either before or after to **goto** if we use the lablename after 'goto' statement is called forward jump. If you use the lablename before **goto** is called backward jump.

The lablename can be anywhere inthe program either before after the **goto** labelname; is met in a program, to flow of control will jump to the immediately following labelname begin. This happens unconditionally.

If the label-name in before the statement **goto,** a loop will be formed and some statements will be executed repeatedly. Such as jump is called backward jump. Due to unconditional **goto** statement at his end. to control is always transferred back to the input statement. In fact, the program puts to computer is a permanent loop known as an infinite loop. The computer goes round and round until we take some special steps to terminate to loop. So infinite loops should be avoided.

Example:-

```
main()
{
 int A,B,I;
        I=1;
printf ("enter any 5 values \n");
Next_ value;
scanf("%d",&A);
if (n<0)
printf ("given number in negative \n", I);
else
{
printf ("the given values %d", A);
}
I=I+1;
if (I<=5)
goto Next_ value;
printf ("stop");
}
```

Output :

Enter any 5 values

15

23

29

16

25

Program : 2.9.4. goto – statement – program.

UNIT – 1

- Practice more problem solved by algorithm
- Practice more problems solved by draw a flowcharts.2 marks questions.
  1. Define algorithm.
  2. What is a flow chart.
  3. What is meaning of pseudo code
  4. What are the standard symbols using to draw a flow chart
  5. Write an algorithm calculate the simple internet using (PNR/100)
  6. Draw a flow chart to find the biggest of given two numbers
  7. Draw a flow chart to find the sum of given two numbers
  8. Draw a flow chart to find the remainder of given two numbers

  Long answers questions – 6 marks.
  1. Write an algorithm to find to smallest given three numbers.
  2. Write an algorithm to print the whenever given numbers is even odd.
  3. Draw a flow chart to find small less value of given three numbers
  4. Draw flow chart to find the sum of 4 given numbers
  5. What are the difference between algorithm a flowchart.

UNIT-2

Review Questions:2 marks:

1.Who develop C program.
2.Write the structure of C program
3.What is a Constant
4. What is a numeric constant
5. What is a string constant
6. What is a single string constant
7.What is a Variable
8. What is a String variable
9. What is a numeric Variable
10.Fundamental data types
11. Logical operators
12. Conditional operators
13. Bil-mix operators
14.Get char ()
15. Putchar ()
16.Gets ()

17. Puts ()
18. Simple if statement
19. What is a break statement
20. What is a continue statement
21. Goto statement
22. Nested loop statement

6 marks:

1. What are input and output statement
2. What are the control statement in 'C',
3. Explain if else, nested if attents in C
4. Explain if else statement with example
5. What are loops in C explain them
6. What are the difference between while and do while statement
7. Explain the nested loop with example
8. Write a problem to find factories of given numbers
9. Write a C program to find Fibonacci series up to given numbers
10. Write a C program whenever
11. Given numbers in plain done or not
12. Write a C program to find the sum of 4 digits number
13. Write a C program biggest value of given three numbers
14. Write a C program to find smallest of given three numbers

Short Questions covered in this Unit 2 marks

1. Who invented the 'C' language.
2. Write structure of 'C' program.
3. What is character set write the character which used in 'C' language .
4. What is a constant.
5. What an types of constants.
6. What is numeric constant
7. What is sting constant.
8. What is variable.
9. What are the string variable.
10. What is a single string constant.
11. What are the fundamental data type in C.
12. What are the arithmetical operators.
13. What are the bit wise operators.
14. What are the conditional operators.
15. What are input and output statements.
16. What is syntax of pritnf ( ) statement.
17. What is a getchar ( ) function in C.
18. Write about simpleif statement.
19. Write a syntax for if – else statement.
20. How many types of loops available in C.
21. What is use of break statement.

22. What is use of continue statement.
23. What is syntax of switch ( ) statement.
24. What is goto statement.

Long Question --- 6 marks.

1. What are constant in C? Explain with examples.
2. What is variable? Explain the types of variable in C with example.
3. What are the data types in 'C'. Explain them?
4. What are the operators in C? explain them.
5. What are the relational operators in 'C' explain with suitable examples.
6. What are the logical operators in C explain with examples.
7. What are input and output statements in explain them.
8. What are the conditional statements in C? explain them.
9. What are the differences between break – statement and conditional statement. What are the loops in C explain with suitable examples.
10. Write C program to find the biggest value of a given 3 integer numbers.
11. Write C program to fin the given in vowel or alphabet character using switch statement.
12. What are the loops in 'C' explain them.
13. Write a C program sum of 1 to n natural number. Using while loop.
14. Write C program to find the sum of 4 digit number using do… while loop.
15. Write C program to find the given number palindrome or not.
16. Write a C program to find the factorial of given number using recursion method.

UNIT – 3

ARRAYS IN 'C'

3.0 Introduction to Array.

3.1. Define an Array.

Types of Arrays.

Sing dimensional Arrays
Double dimensional Arrays
Multi dimensional Arrays

3.3. Program on Arrays.

3.0.ARRAYS in 'C' :

The ability to use a single name to represent a collection of items and the refer to an item by specifying in the item number enables us to develop concise and efficient programs. For example a loop with the subscript as the control variable can be used the entire data through 'Array' perform calculation and print out the result.

An array is a group of related data items that share a common name; the individual values are called items. Arrays can be of any variable type. For instance we can define an array name **student** to represent a set of marks of a group of students. A particular value in indicated by writing a number called index number of subscript in brackets after array name.

Ex:- student [10];

It represents the marks of 10 students. While complete set values is referred to as an Array.

Few key notes on Array

- Array have 0 as the first index not 1. In the above example start with student [0]
- If the size of an array is n to access the last element i.e.(n-1) index is used, in the above example student [9].
- Suppose the starting address of student [0] is 1004 (address allocated by computer), then the next address of student [1]

will be 1008(allocated by computer), address of student[2] will be 1012(allocate by computer)and so on. It's because the size of float is 4 bits.

3.1 DEFINITION OF ARRAY:-

Array can be defined as a collection of data items which are stored in consecutive memory locations with a common array name. The individual data values present in an array called elements or subscripted -variable of array. The array elements can be values or variables also.

The array can divide into 3 types.

1. One dimensional Arrays.
2. Two dimensional Arrays
3. Multi dimensional Arrays

3.1.0 Declaration of arrays:-

Like any other variable array must be declared before they are used. We can initialize the elements of arrays in the same way as ordinary form of utilization of array is :

Data_type array_name[size];

Syntax to one dimensional array:

Data _type Array _ name [size];

Ex:- int A [10];

Syntax to two- dimensional array:

Data-type Array-name [row-size] [column-size];

Ex:- int A [10] [10];

Syntax to Multi dimensional Array:

Data-type Array-name [size] [row-size] [column size]

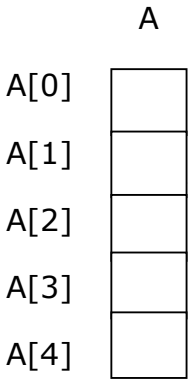
Ex:- int A [10] [10] [10];

The above syntax the data type specifies to type of elements that will be contained in an Array such as int, float, char. The size indicates the maximum number of elements that can be stored inside Arrays. The size must be enclosed in square brackets ([ ]). Only the two dimensional Array

declare row-size and column size, the multidimensional arrays declared with number of arrays (size) and row size and column size.

3.1.1.One Dimensional Array:-

A list of items can be given one variable name using only one subscripted variable is called one dimensional array. For example if we want to represent a set of five numbers, say (10, 17, 22, -3 . 19) by an array variable 'A', then we may declare the variable 'A' as follows.



The values to the array elements can be assigned as follows.

A[0] = 10

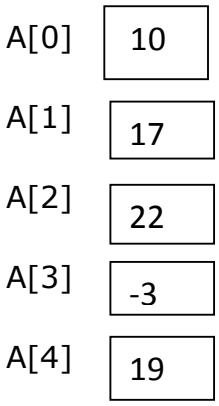
A[1] = 17

A[2] = 22

A[3] = -3

A[4] = 19

The array 'A' to store the value as.



The subscript of an array can be integer constants integer variables or expressions that yield integer. C performs no bounds checking and

therefore care should be exercised to ensure that array indicates are within the declared limits.

Example to one dimensional arrays:

```
main( )
 {
      int  I, a[10], N, sum;
      printf ("enter size of array\n");
      scanf ("%d", &N);
      printf ("enter the values for array\n");
            for (i=0, i≤ N; i++);
            {
                  scanf ("d",& a (i));
            }
            for (i=0; i< N; i++);
            {
                  sum=sum +a(i);
            }
            for (i=0; i<N; i++)

            {
                  printf ("sum value is %d\n", sum);
            }
      }
```

Output:-

```
Enter any n integer value
5
      20
      35
      50
      30
      20
sum value is 155.
```

Program : Read and print an array of n elements

```
main()
{
      int a[20],i,n;
      clrscr();
      printf("enter the size of array\n");
      scanf("%d",&n);
```

```
        printf("enter the values in array\n");
              for (i=0; i<n;i++)
                  {
                     scanf("%d",&a[i]);
                   }
        printf("the given values of an array\n");
               for (i=0; i<n;i++)
                  {
                     printf("%d\n",a[i]);
                   }
        getch();
  }
```

Output:

```
        enter the size of array
        5
        enter the values in array
        45
        67
        23
        89
        34
        the given values of an array
        45
        67
        23
        89
        34
```

3.1.2.Two dimensional arrays:

The two dimensional array has a list of variable-name using two subscripts, we know already that a one-dimensional array can store rows of elements only, but in two dimensional array **rows of values** and **columns of values**.

Syntax:- data_type Array_name [row-size] [columns-size];

Where data type refers to any valid data_type, and array_name refers to any valid C identifier, row_size indicates the number of rows and column_size indicates the number of elements in each column. The row_size and column_size should be integer constants. The maximum values are stored in matrices is equal (row-size * column size). Each element in a two dimensional array is identified by the array name followed by a pair square brackets enclosing its row number and column number.

Example:- int a [5] [5];

In the above syntax is declared to be array have of two dimensions and of data type integer (int), row-size and column size. It stores 25 values will be store.

The two dimensional arrays are stored in memory.

	Coloumn0	Coloumn1	Coloumn2	Coloumn3
Row0	5	15	25	14
Row1	8	12	05	12
Row2	3	-5	12	17
Row3	4	14	19	25

Each dimension array is indeed from zero. The first index selects the row and second index selects the column within that row.

Two – dimensional array:-

Where a table of values will have to be student show to value of the marks of 3 statements.

Student no marks	Subject marks	Subject 2 marks	Subject 3
1	25	21	35
2	40	32	38
3	25	43	39

The above table contains 12 values there in each time. We can think of this table as matrix consisting of 3 rows and 3 columns. Each row represents the values of marks obtained by a each student and each column represent the value of marks in different subjects.

Example the two dimensional arrays:-

```
main ( )
       {
int  i,j a[10] [10],b[10][10],m,n;
              printf ("enter the row size of array \n");
              scanf("%d",&m);
              printf("enter the column size of array \n");
              scanf ("%d", &n);
              printf ("enter the values of A matrices \n");
                     for (i=0; i<m; i++);
                     {
for (j=0; j<n; j++);
                            {
                                   scanf("%d",& a[i] [j]);
                            }
                     }
printf("enter the value for B matrices  \n");
                     for (i=0; i<m; i++);
                            {
                            for (j=0; j<n; j++);
                                 {
                                       scanf("%d",&b[i][j]);
                                  }
                            }
              printf  ("the values to A matrices are "\n);
                     for (i=0; i<m; i++);
                            {
 for (j=0; j<n; j++);
                                  {
    printf ("%5d", a[i] [j]);
                                   }
                                          printf ("\n");
                            }
printf  ("the values to B matrices are"\n);
                     for (i=0; i<m; i++);
                            {
 for (j=0; j<n; j++);
                                  {
    printf ("%5d", b[i] [j]);
```

```
                    }
                        printf ("\n");
                }
}
```

Output :

```
enter the row size of array
3
enter the column size of array
3
enter the values of A matrices
2
4
6
7
4
9
1
3
8
enter the value for B matrices
4
6
7
8
9
4
5
6
3
the values to A matrices are
2   4   6
7   4   9
1   3   8
the values to B matrices are
4    6   7
8    9   4
5    6   3
```

3.1.3.Multi dimensional arrays:-

C allows arrays of three or more dimensions. The exact limit is determined by the compiler.

Syntax:- data-type array-name [size] [row size] [col size];

Exam:- int A [5] [5] [5];

In the first index refers to number matrices, the second index refers to row size and the third index refers to columns size of given matrices.

String handling in array:-

A string is an array of characters, any set of characters defined between double quotation marks is a constant string.

Example:- " My College name is GJC".

"My name is MURTHY".

Character strings are after used to build meaningful and readable programs. The common operations performed on character strings are also called string.

DECLARATION AND INITILIZING STRING VARIABLES.

A string variables is any valued variable and is always declared as an array. The syntax of declaration of a string variable is.

char string – variable- name [size];

The size determines the number of character in the string- name. Some examples are.

char Town [10];

char stu-name [10];

char father-name [20];

When complier assigns a character string a character array automatically supplies a null character (**\0**) at the end of string. Therefore, the size should be equal to the maximum of character in the string plus one. Character arrays may be initialized when they are declared. 'C' permits a character array to be initialized in either of the following examples.

static char town [10] = "CHIRALA";

static char town [10] = { 'C','H','I','R','A','L','A', \O'};

static char town [ ] = {'R','A','J','Y','A','L','A','K','S','H','M','I'',\0};

Actually, the town variable has to be eight (80 elements long i.e is s that the string "CHIRALA" contains 7 characters and one element space is provided for the null terminator. The name variable has not indicate the size, **C** permits us to initialize a character array without specifying the number of elements. In such cases, the size of the array will be determined automatically.

Reading words:-

The input function scaṇf can be used with% s format specification to read in a string of character

Example:- char student – name [20];

scanf ("%s", student-name);

The problem with the scanf function is that it terminates its input on the first white space it finds. (while space, include blanks, tabs, carriage return, has line). Therefore if the following line of text in the terminal.

Read a line of text:- In many processing application we need to read an entire line text from to terminal. It is not possible to use scanf function to read a line containing more one word. This is because the scanf terminates reading as soon as space is encountered in input. To read a single character from the terminal, using function

getchar(): We can use this function repeatedly, to read successive single characters from the input and place then into a character array. Thus, an entire line of text can be read and stored in an array, reading is terminated when the newline character ("\n") is entered and the null character is then inserted at the end of the string.

Example:-

```
# include <stdio.h>
main ( )
{ char  L (50), ch;
 int I;
 I = 0;
```

```
printf ("enter text \n");
do
{ ch= getchar ( );
  L[i] = ch;
     I++;
 }
 c= c – 1; L (c) ='\0';
 printf ("\n %s \n ",L);
  }
```

Output:-

Enter text:
Govt jr.college
Govt jr.college
enter the text:
GJC chirala
GJC chirala

Writing strings to screen:-

We have used extensively the printf function with %s specification to print strings to the string. The specification %s can be used to display an array of character that is terminate by the null character(\0).

Example:- printf ("%S", student_ name");

*Can be used to display the entire contents of the array **student-name**.
*We can also specify the precision with which the array is displayed.

Example:- A string program using for loop to the following output.

```
C
CO
COL
COLL
COLLE
COLLEG
COLLEGE
COLLEGE
COLLEG
COLLE
COLL
COL
CO
C
```

```
main ( )
{
```

```
1 int  i, d;
 char string [ ] = "COLLEGE";
 printf ("\n \n");
for (i=0; i≤ 8; i++)
{
      d=i+1;
      printf  ("% -8 *s \n ",d, string);
}
      printf ( "          \n");
       for (i=8; i>=0; i--)
      {
            d=c+1;
            printf("%-8 *s \n", d, string);
      }
}
```

Output:-

```
C
CO
COL
COLL
COLLE
COLLEG
COLLEGE
COLLEGE
COLLEG
COLLE
COLL
COL
CO
C
```

In the above program the variable specification %8.*s, *%, *S are the variable field width and precision specification.

*****

PROGRAMS AN ARRAY

1. Write a C program to read and print an array of elements

A.
```
main()
    {
        int a[20],i,n;
        clrscr();
        printf("Enter the value for n:");
        scanf("%d",&n);
        printf("Enter the element of array \n:");
        for(i=0;i<n;i++)
            {
                scanf("%d",&a[i]);
            }

        printf("Element of an array:");
        for(i=0;i<n;i++)
        printf("%d \n",a[i]);
        getch();
    }
```

Input:-

Enter the values for n: 5
Enter the elements of array: 7 3 8 3 6

Output:-

Elements of array:
7
3
8
3
6

2. Write a C program to read and print the reverse of an array element

A.
```
main()
{
    int a[20],i,n;
    clrscr();
    printf("Enter the value for n:");
    scanf("%d",&n);
    printf("Enter the element of array \n:");
    for(i=0;i<n;i++)
    {
        scanf("%d",&a[i]);
    }
    printf("Element of an array:");
    for(i=n-1;i>=0;i--)
    printf("%d \n",a[i]);
    getch();
}
```

Input:- Enter the values for n: 5
Enter the elements of array: 7 13 8 3 6

Output:- Elements of array: 6
3
8
13
7

3.Write a C program to find the sum and average given array of elements

A.
```
main()
{
    int i,n,s=0,avg,a[10];
    clrscr();
    printf("Enter the elements of n:");
    scanf("%d",&n);
    printf("Enter the elements of array:");
    for(i=0;i<=n;i++)
    scanf("%d",&a[i]);
    printf("Elements of an array:");
    for(i=0;i<n;i++)
    {
        s=s+a[i];
    }
    avg=s/n;
```

```
            printf("Sum of an array is %d",s);
            printf("Average of an array is %d",avg);
            getch();
        }
```

Input:-

```
        Enter the elements of n:        5
        Enter the elements of array:    8
                                        4
                                        8
                                        2
                                        4
```

Output:-

```
        Sum of an array is              24
        Average of an array is          5
```

4. Write a C program to search an element in the given list of given array of elements

```
A.  main()
    {
        int n,i,f,sr,a[10];
        clrscr();
        printf("Enter the values for n:");
        scanf("%d",&n);
        printf("Enter the elements of an array:");
        for(i=0;i<=n;i++)
        scanf("%d",&a[i]);
        printf("Enter the search element \n:");
        scanf("%d",&sr);
        for(i=0i<n;i++)
        if(a[i]==sr)
            {
                printf("Elements %d is found in place of %d \n
:");
                f=1;
            }
        if(f!=1)
        printf("Elements are not found");
        getch();
    }
```

Input:-

```
        Enter the values for n:             3
        Enter the elements of an array:     1
```

9
7

Enter the search element: 9

Output:-

Elements 9 is found in place of 2

5. Write a C program to arrange given array of elements in sorted order

A.
```
main()
{
    int a[20],i,n,j,t;
    clrscr();
    printf("Enter the values for n:");
    sacnf("%d",&n);
    printf("Enter the elements of array \n:");
    {
        for(i=0i<n;i++)
        sacnf("%d",&a[i]);
        for(i=0;i<n;i++)
        for(j=0;j<n;j++)
        {
            if(a[i]>a[j])
            {
                t=a[i];
                a[i]=a[j];
                a[j]=t;
            }
        }
        printf("The sorted order \n :");
        for(i=0;i<n;i++)
        printf("%d",a[i]);
        getch();
    }
}
```

Input:-

Enter the value for n: 51
Enter the elements of array : 4
5
18

3
71

Output:-

The sorted order : 3
4
18
51
71

6. Write a C program to find smallest elements of given array of elements

A.
```
main()
{
    int a[20],i,n,sm;
    clrscr();
    printf("Enter the values of n:");
    scanf("%d",&n);
    printf("Enter the elements of array: \n");
    {
        for(i=0;i<n;i++)
        scanf("%d",&a[i]);
        sm=a[0];
        for(i=1;i<n;i++)
         if(sm>a[i])
        {
            sm=a[i];
        }
        printf("The smallest element is %d",sm);
        getch();
    }
}
```

Input:-

Enter the values for n: 31
Enter the elements of array: 2
52
84

Output:-

The smallest elements is 2

7. Write a C program to the greatest elements of given array of elements

A.
```
main()
{
    int i,n,big,a[20];
    clrscr();
    printf("Enter values for n:");
    scanf("%d",&n);
    printf("Enter the elements of an array: \n");
    for(i=0;i<n;i++)
    scanf("%d",&a[i]);
    big=a[0];
    for(i=1;i<n;i++)
    if(big<a[i])
        {
            big=a[i];
        }
     printf("The biggest element is %d ",big);
     getch();
}
```

Input:-

Enter values for n: 4

Enter the elements of an array: 66
87
41

Output:-

The biggest elements is 87

8. Write a C program read and a Matrix

A.
```
main()
    {
        int m,n,i,j,a[10][10];
        clrscr();
```

```
 printf("Enter the values for n:");
scanf("%d %d",&m,&n);
for(i=0;i<m;i++)
for(j=0;j<n;j++)
printf("Enter the elements of matrix:");
scanf("%d",&a[i][j]);
printf("Matrix is  \n:");
for(i=0;i<m;i++)
        {
                for(j=0;j<n;j++)
                {
                        printf("%5d",a[i][j]);
                }
                printf("\n\n ");
        }
 getch();
}
```

Input: -

Enter the values for n: 2
2

Enter the elements of matrix: 1
2
3
4

Output:- Matrix is: 1 2

3 4

9. Write a C program to find the number of characters in length of string

A.
```
#include<string.h>
main()
    {
        char str[20];
        int l;
        clrscr();
        printf("Enter the string:\n");
        scanf("%s",str);
        l=str len(str);
        printf("Size of string is%d:",l);
        getch();
    }
```

Input:-

Enter the string: **Tejaswini**

Output:-

Size of string is 9

10. Write a C program to convert string from upper case and lower case and vice versa

A.
```
#include<stdio.h>
#include<string.h>
 void main()
    {
        char a[20];
        printf("Enter lower case string to convert \n :");
        scanf("%s",a);
        printf("lower case string= %s",a);
        printf("upper case string =%s",strupr(a));
        getch();
        printf("Enter upper case string to convert \n:");
        scanf("%s",a);
        printf("upper case string= %s",a);
        printf("lower case string= %s",strlwr(a));
        getch();
    }
```

Input:-

Enter lower case string to convert: pavani

Output:-

lower case string= **pavani**
upper case string= **PAVANI**

Input:-

Enter upper case string to convert: **SASI**

Output:-

upper case string= **SASI**
lower case string = **sasi**

11. Write a C program to find string is Palindrome or not

A. #include<string.h>

```
main()
    {
        char str[20],str1[20];
        int L=0,i,c=0;
        clrscr();
        printf("Enter the values in text:");
        gets(Line);
       scanf("%s",str);
       while(str[L]!='/0')
            {
                L++;
            }
       for(i=L-1;i>=0;i++)
       {
            str1[c]=str[i];
            c++;
       }
       str1[c]='/0';
       if(stremp(str,str1)==0)
       printf("String is Palindrome");
       else
       printf("String is not Palindrome");
       getch();
    }
```

Input:-

Enter the values in text: **madam**

Output:-

String is Palindrome

Input:-

Enter the values in text: **teja**

Output:-

String is not Palindrome

12. Write a C program to find the Adding of two matrix

A.
```
#include<stdio.h>
    void main()
        {
           int a[10][10],b[10][10],c[10][10],i,j,n,m,;
        clrscr();
        printf("Enter the values of m,n");
        scanf("%d %d",&m,&n);
        printf("Enter the elements of the matrix a :\n");
        for(i=0;i<m;i++)
        for(j=0;j<n;j++)
        scanf("%d",&a[i][j]);
        printf("Enter an elements of  the matrix b : \n");
        for(i=0;i<m;i++)
        for(j=0;j<n;j++)
        scanf("%d",&b[i][j]);
        printf(" Addition of two matrix is \n: ");
        for(i=0;i<m;i++)
        for(j=0;j<n;j++)
        c[i][j]=a[i][j]+b[i][j];
               {
                      printf("%d",c[i][j]);
                       printf("\n");
               }
        getch();
}
```

Input:- Enter the values of m,n: 2
2

Enter the elements of the matrix a: 1

2
3
4
Enter the elements of the matrix b: 3
4
1
2
Output:- Adding of two matrix is: 4 6
4 6

13. Write a C program to find Subtration of given two matrix

A.
```
#include<stdio.h>
   void main()
{
   int i,j,,m,n,a[10][10],b[10][10],c[10][10];
   clrscr();
   printf("Enter values for m ,n \n:");
   scanf("%d %d",&m,&m);
   printf("Enter the elements of the matrix a:");
   for(i=0;i<m;i++)
   for(j=0;j<n;j++)
   scanf("%d",&a[i][j]);
   printf("Enter the elements of the matrix b:");
   for(i=0;i<m;i++)
   for(j=0;j<n;j++)
   scanf("%d",&b[i][j]);
   printf("Subtraction of two matrix is \n:");
   for(i=0;i<m;i++)
         {
               for(j=0;j<n;j++)
               {
                     c[i][j]=a[i][j]-b[i][j];
                     printf("%d",c[i][j]);
               }
               printf("\n");
         }
   getch();
}
```

Input:- Enter the values of m,n: 2,2
Enter the elements of the matrix a: 4

3
7
5
Enter the elements of the matrix b: 1
2
5
1

Output:- Subtraction of two matrix is: 3 1
2 4

14. Write a C program to find the Multiplication of two matrix

A.
```
#include<stdio.h>
    void main()
      {
            int a[10][10],b[10][10],c[10][10],i,j,k,m1,m,n,n1;
            clrscr();
            printf("Enter the size of matrix a:");
            scanf("%d %d",&n,&m);
            printf("Enter the size of matrix b:");
            scanf("%d %d",&n1,&m1);
            printf("Enter the values of matrix a:");
            for(i=0;i<n;i++)
            {
                  for(j=0;j<m;j++)
                  {
                        scanf("%d",&a[i][j]);'
                  }
            }
            printf("Enter the values for matrix b:");
            for(i=0;i<n1;i++)
                  {
                        for(j=0;j<m1;j++)
                        {
                              scanf("%d",&b[i][j]);
                        }
                  }
                  if(n==m1)
                        {
                              for(i=0;i<n;i++)
                              for(j=0;j<m1;j++)
```

```
                    {
                        c[i][j]=0;
                        for(k=0;k<n;k++)
                        c[i][j]=a[i][k]*b[k][j]+c[i][j];
                    }
                    printf("Result an c matrix is:");
                    for(i=0;i<n;i++)
                    for(j=0;j<m1;j++)
                    printf("%5d",c[i][j]);
                    printf("\n");
                }
                else
                printf("Multiplication is not possible");
                getch();

        }
```

Input:- Enter the size of a: 2
2
Enter the values of matrix a: 4
6
2
8
Enter the values of matrix b: 3
2
1
4

Output:- Result an c matrix is: 18 32
14 36

UNIT – 4
FUNCTIONS

4.0. What is a function.
4.1. Differences between function and procedure.
4.2. Advantages of Functions
4.3. User defined and library functions
Main ( ) function
Return

4.4. Concepts of associated with functions – Recursion of scope of function.

Definition of function
Recursion.
Scope of a function.

4.3. Extent of variable.

Global and local variable.

4.4. Explain the factorial and GCD using recursion functions.

4.5. Use of various categories of built in function.
Arithmetical functions
Mathematical function.
String handling functions.

4. FUNCTIONS

4.0.INTRODUCTION:

C language is that C functions are easy to define and use we have used functions in every program. Those are main ( ), scanf ( ), printf( ) etc. In this unit we will consider in detail now a function is designed, how two or more functions are put together and how communicate with one another. C functions can be classified into two catageries, namely, library functions and user-defined functions main is an example of user-defined functions. Printf ( ) and scanf ( ) belong to the category of birary functions we have also used other library functions such as sin, cos, strcat, strlen, squrt etc. the main difference between these two types is that the library functions are not require to be written by us where as user-defined function has to be developed by the user at the time of writing a program. The use defined function can become a part of the program.

Function Definition:

A function is a self-contained block of code that perform a particular task. Once a function has been designed and placed, it can be treated as a "Function Box" that tasks some data from the main program and return value. The inner details of operations are invisible to the rest of the program. All that the program knows about a function is: What goes in and what comes out. Every C program can be designed using a collection of these "Function Box".

Example:-

```
line()
{
 int i;
 for(i=0;i<=20;i++)
{
 printf("-");
  printf("\n");
}
}
```

The above set of statements defined a function is called **line()** which could print line of 20 "-"characters length if you used in a program.

Program:

```
      main()
  {
      line()
      printf("It is for function");
      line()
  }
       line()
  {
      int i;
      for(i=1;i<=20;i++)
  }
      printf("-");
       printf("\n");
}
```

Output:-

```
--------------------
It  is for function
--------------------
```

The above program contains two users defined functions.

1. main()
2. line()

We know the program execution always being with the **main** function, during the execution of the **main** the first statement encountered is function line(); which indicates that the function line() is to be executed at this point the program control transferred to the function line() after executing the line() function which output's a line of 20 characters length, the control is transferred back to the **main**. Now, the execution continues at the print where the function call was executed. After executing the printf() statement, the control is again transferred to the line() function for printing the line once again. Three main function calls the user defined line() function two times and the library function printf() once. We may understand that the line() function itself calls the library function printf() repeatedly. Any function can call any other function. In fact it can call itself. A "Call function" can also called another function , A function can be called more than once. In fact this is one of main feature of using functions, the flow of control in multifunction program

Need for user-defined functions:-

Every C program must have a main ( ) function to indicate where the program has to begin its execution. While it is possible to code any program utilizing only main( ) function. It leads to a number of problems. The problem may become too large and complex and as a result the task debugging, testing and maintaining becomes difficult. If a program is dividing into functional parts, then each part may be independently coded and later combined into a single part. These subprograms called functions are much easier to understand, debug and test. They are some type of operation is repeated at many times throughout a program. For instance we must use the factorial of a number at several times in the program. In such situations we may repeat the program statements. Where they are needed. Another approach is to design a function. We may repeat the program statements whenever they are needed. Another approach is to design a function that can be called and used whenever required. This saves both time and space.

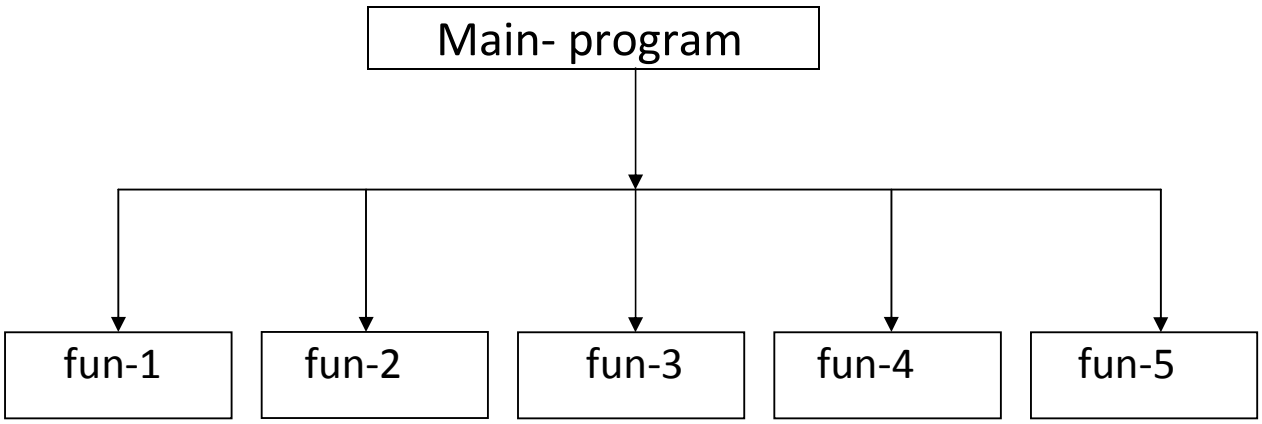
4.1 Differences between the a function and a Procedure.

Procedure	Function
Procedure can have bots input / output parameters.	Functions can have only Input functions.
We cannot stored procedure in select statement.	In functions we can use in select statement.
Stored procedures can return zero (0) or n values maximum (1024)	The function can return only 1 value which is mandatory.
We can use transaction in stored procedure.	Function can returns values.
Procedure are collection of statements that defines Parameterized computation (parameterized)	Functions are structurally resemble procedure but are semantically moldered on mathematical function.
Procedure cannot return value	Function can returns value.
Procedure cannot be called from Function.	Function can be called from Procedure.
Procedure is a subprogram which Is included with in main program	Functions is sub program which is Intended for specific taste.

Procedure cannot be called again and again.	Functions once defined can be called anywhere and any number of times.
Global variables cannot be used In procedure.	In function both local and global Variables can be used.
Procedure can be written only in Procedure programming such as Pascal, dbase etc.	Function can be written in Sub programming such as C, C++.

4.2.This sub programming function approach clearly result in a number of advantages of the function.

1. It facilitates top- down modular programming. In this programming style the high level logic of the overall problem is solved first while the details of each lower level function are addressed later.



2.The length of a source program can be reduce by using function at appropriate places.

3.The function is easy to locate and isolate, function release the function for further development of programs.

4.A function can be used by many programs.

5.A function can be easy to read and debugging a function.

6.A function can be to maintain of modify easily.

7.The function can be called any number of times in any place with different parameters.

PARAMETERS OR ARGUMENTS:

Function parameters are the means of communication between the calling and the called function. A parameter is a place holder. When a function is invoked, you pass a value to the parameters this value is returned to as actual parameters or arguments. The parameter list return to the type, order, a number of the parameters and number of the parameters of a function parameters are optional, that is a function may contain no parameters.

4.3.USER DEFINED AND LIBRARY FUNCTIONS, MAIN FUNCTION, RETURN()

C functions can be classified in to two types namely **library functions** and **user defined functions.**

Library functions:-These functions are not required to be written by programs where as users defined function has to be developed by the programmer at the timer writing in a program. The printf(), scanf(), squrt(),cos(),strcmp(),strcat(),strlen() etc..,belong to category of library functions.

Userdefined functions:-The user defined functions are written by programmer has to be developed by the user at the time of writing a program. **main** is a specially recognized as user defined functions. Every "C" program must have a **main** function to indicate where the program has to begin is execution. While it as possible to code any program utilizing only **main** function; it leads to a number of problems. The problem may become too large and complex and as a result to task of debugging, testing and maintaining becomes difficult. If a program is divided into functional parts, then each part may be independently coded and later combined into a single program. These sub programs called functions. These are much easier to understand, debug, and test .In sum situation, when some type of operation or calculation is repeated at many points throughout a program .For example we might use the factorial of a number at several points in the program. In such situation, we may repeated the program statement whenever there are needed. Another approach is to design a function that can be called and used whenever required. The saves both time and space.

MAIN () FUNCTION SECTION:

Every C program must have one main () function section. This section contains two parts 1) declaration part and 2) Executable part. The declarations part declares all the variables used in the executable part. There is at least one statement in the executable part. These two parts must appear between the opening ({) and closing braces(}). The program execution begins at the opening brace ({) and ends (}),the closing brace of the main functions section in the logical end of the program. All statements in the declaration and executive parts end with a semicolon (;). No C program is executed without main () function. It should be written in lowercase letters and should not be terminated by a semicolon. It calls others library functions user defined functions. These must be one and only on main () function in every C program.

return : A function may return a value the "return type" in the data type of the value the function returns some functions perform to desired operations without returning a value. In the case, the return type is the keyword void

4.4. Concepts associated with functions – Recursion, Scope of Function

4.4.0.Definding a function:-The general form of a function definition in C programming language is as follows:

Syntax:-

```
return type function name(parameters list)
argument declaration
{
 local variable declaration
execute statement1
execute statement2
execute statement3
……
}
```

A function definition in C program consist of a function header and a function body. Here all are the part of a function.

- **Return type**:- A function may return a value the "return type" in the data type of the value the function returns some functions perform to desired operations without returning a value. In the case, the return type is the keyword void.
- **Function -name**:-This is the actual name of the function. The function name and parameter list together constitute the function signature.
- **Parameters**:-A parameter is a place holder. When a function is invoked, you pass a value to the parameters this value is returned to as actual parameters or arguments. The parameter list return to the type, order, a number of the parameters and number of the parameters of a function parameters are optional, that is a function may contain no parameters.
- **Function Body**:-The function body contain a collection of statements that define the function does:

Example:

Given below is the source code for a function called max m().This function takes two parameters N1,N2 and return the maximum value between the two parameters.

```
int max m(int N1,int N2)
{
 int max;
 if(N1>N2)
max=N1;
 else
 max=N2;
 return(max);
}
```

Program : to find the sum of given two integer numbers using functions

```
main()
{
        int a,b;
        clrscr();
        printf("value for A\n");
        scanf("%d",&a);
```

```
        printf("value for B\n");
        scanf("%d",&b);
        sum(a,b);
        getch();
}
sum(int x, int y);
{
printf("sum is  %d", x+y);
}
```

Output : value for A
10
value for B
15
sum is 25

4.4.1.Recursion:- One of the special features of C language is its support to recursion. Very few computer languages will support this feature. The recursion can be defines as the process of a function by which it can calls itself. The function which calls itself again and again either directly or indirectly is called "recursion". In this technique is repeatedly executed unit the condition is satisfied. The normal function called by "main ( )" function by means of its name. But, the recursive function will be called by itself depending on the condition satisfaction. When function is called within the same function is known as recursion. In C the function which cause the same function is known as recursive function. A function calls itself and does not perform any task after function call is known as tail recursion. In tail recursion we generally call the same function with return statement

When called function in turn calls another function is process of changing occurs. Recursion is a special case of this process, when a function calls itself.

Example:-

Example of recursion is the evaluation of given number. The factories of a number it is expressed as a series of respective multiplications shown below.

Factorial of n = n(n-1) (n-2) ---------- 1.

Factorial of 5 = 5* 4* 3 *2 *1 = 120.

A function to evaluate factorial of "n" is as

```
fact ( n)
 int n;
{
int f;
 if (n = =1)
return (1)
else
f = n* fact (n-1);
return (f);
}
```

Let us use how the recursion works= 5* fact (4) Assume n= 5, since the value of n is not 1 will be executed with n=5. That is

F = 5 * fact (4)

Will be executed. The expression on the right hand side includes a call a fact with n=4. The all will return the following value.

4*fact (1).

Once again **fact** is called up to 1. This time function return 1. The sequence of operations can be summarized we can understand the above program of recursive method call by the given below as follows:

```
Return  5* fact (4) = 120
return  4  * fact (3)= 24
    return 3 * fact (2) = 6
        return2 * fact (1)= 2
            return 1*fact(0) = 1
```

1 * 2* 3 * 4 * 5 = 120

Recursive function can be effectively used to solve problems w here the solution is expressed in terms of successively applying the same solution to subsets of the problem. When we write recursive call being executed. Otherwise, the function will never return program. To find factorial of given number using recursion.

```
# include <stdio.h>
```

```
main ()
{
int  n, f;
printf(" \n enter any value \n");
sacnf("%d", &n);
f= fact (n);
printf(" factorial of %d is", n, f);
getch ( );
}
fact (int n)
        {
         if     (n==1)
        return (1)
        else
        return (n* fact (n-1));
        }
```

4.4.2.RETURN VALUES AND THEIR TYPES:-

A function may or may not send back any value to the calling function. If it does, it is done through the "return" statement. While is possible to pass to the called function any number of values the called function can only return value per call. The "return" statement can take one of the following forms.

```
return();

or

return(expression);
```

The first return statement without expression means it does not return value ,it acts as the calling function. An example of the use of a "return" is :

```
if(total marks=90)

return();
```

The second type of "return" with an expression return the value of the expression.

Example:-

```
add(a,b)
        int x,y;
        {
```

```
int s;
s=a+b;
return(s);
}
```

It returns the 's' which is the sum of values of A and B. The last two statements can be combined into one statements as follows.

```
return(a+b);
```

A function may have more than one "return" statements. This can be happen when the value is returned is based on the condition only.

Example:-

```
if(a >=b)
    return(0);
else
    return(1);
```

All functions by default to **int** data type. But what happens if a function must return some other type? We can force a function to return a particular type of data by using a type specified in the function leader.

Example:-

```
float sum(a,b);
float sqrt(N);
```

When a value is return it is automatically **cast** to the function data type if function that do computation using float, yet return int, the returned value will be truncated to an integer.

Calling a function:-

A function can be called by simply using the function name in a statement.

Example:-

```
main()
{
  int S;
  S=(a+25.5)
```

```
    printf("%d",S);
}
```

When the complier encounters a function call, the control is transferred the function s(a,b), this function then executed line by line as described and a value is returned when a **return** statements is encountered. The value of "s" is assigned.

A function which return a value can be used in exception like any other variable. Each of the following statement is valued.

```
printf("%d", add(a,b));

A=sum(a,b)/(c+d);

if add(a,b>sum);

printf("Big");
```

However, a function cannot be used on the right side of an assignment for example Add(a,b)=50; in valid.

A function that does not return any value may not be used in exception, but can be called to perform certain task specified in the function. The function line() discussed above belongs to this category such functions may be called in by simply their names as independent statement.

Example:-

```
main()
{
  line();
}
```

4.4.3.Category of functions:-A function depending on whether arguments are present or not and whether a value is returned or not, may belong to one of the following types.

- Functions with no arguments and no returns value.
- Functions with arguments and no return value.
- Function with argument and return value.

Function with no arguments and no return value

When a function has no argument, it does not receive any data from the calling function. Similarly when it does not return a value, the calling

function does not receive any data from the called- function. It means there is no data transfer between the calling function and the called function. A function does not return any value cannot be used in expression. It can only be used as an independent statement. The nature of data communication between calling function and the called function with example to using no arguments and no return values.

```
# include <stdio.h>
main ( )
{       int a,b;
        printf ("enter two values");
        scanf ("%d %d", &a, &b);
        add (a,b);
        getch ( );
}
        add (int a , int b);
         {
                int c;
                c=a+b;
                printf("addition of  %d,%d is %d", a,b,c);
        }
```

Functions with arguments and no return value. This type of functions passes some formal arguments to a function but the function does not return back any value to the calling function. It is one way data communication between a calling portion of the program and the function part.

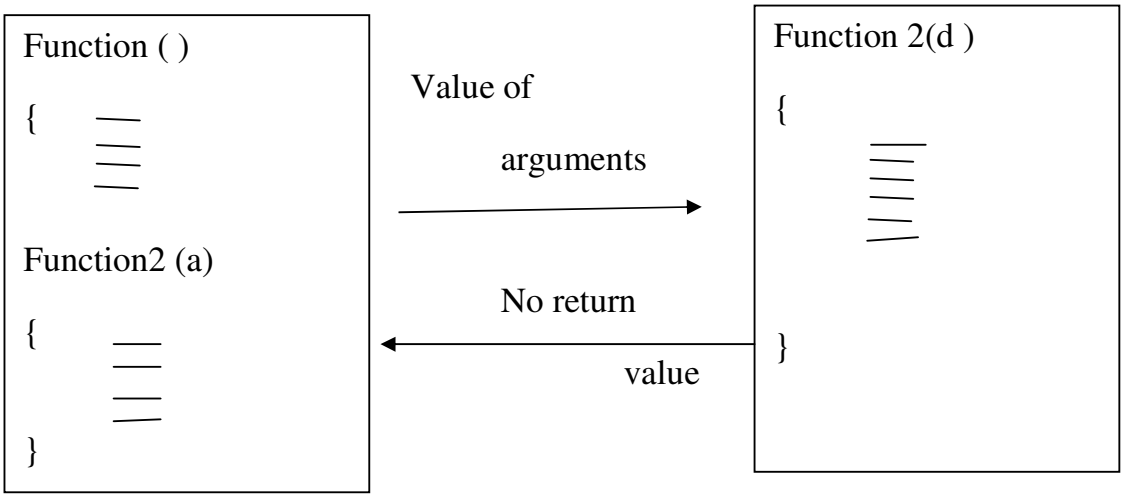


Fig : One way data communication

In the above program A, B, C are called the formed arguments. The calling function can now send values to these arguments using function calls containing appreciate arguments. Example, The function call.

Program :

```
# include <stdio.h>
 Main()
{
        Int a,b;
        Printf("Enter any two values");
        Scanf("%d%d", &a,&b);
        Add(a,b);
        Getch();
}
        Add (int a, int b)
{
        Int c;
        C = a + b;
        Printf("Addition of %d + %d is %d\n", a,b,c);
}
```

Output:

If you want addition of given values : Add (20, 30)

Would send the values 20 and 30 to the function. Add (a,b) assign 20 to 'a' and 30 to b. The sum 20, 30 are the actual arguments which become the values formed arguments inside the called function. The actual and formal arguments should match in number, type, and order. The values of actual arguments are assigned to the formal arguments on one to one basis. A example for arguments matching between the function call and the called function.

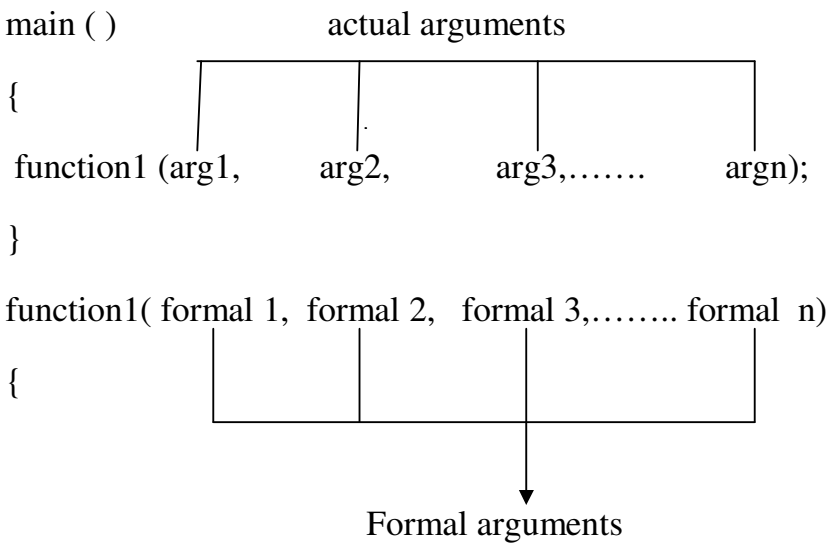


Fig : Arguments matching between the function call and called function

We should ensure that the function call has matching arguments, in case, the actual arguments are more than the formal arguments, the extra actual arguments are discarded. On the other hand, if the actual arguments are less than formed arguments, the unmatched formed arguments are initialized to some "garbage values". Any mismatch in data type may also result in passing of garbage value. Remember, no error message will be generated. While the formal arguments must be variable names, the actual arguments may be variable names, expression or constants. The variables used in actual arguments must be assigned values before the function call is made. Remember that, when a function call is made, only a copy of the values of actual arguments is passed into the called function. When occurs inside the function will have no effect on the variables used in the arguments list.

The variables declared inside a function are known as local variables and therefore their values are local to the function and cannot be accessed by any other function.

In above program the function "add" addition of 'a' and 'b' the sum value for given period and prints the result as before, control is transferred back or reaching the closing brace (}) of the function. Note that the function (add) does not return any value.

Arguments with return values:-

The third type of function passes some formal arguments to a function from a calling portion of the program and computer value is transfer back to the calling function. Data are communicated between the calling portion and the function black.

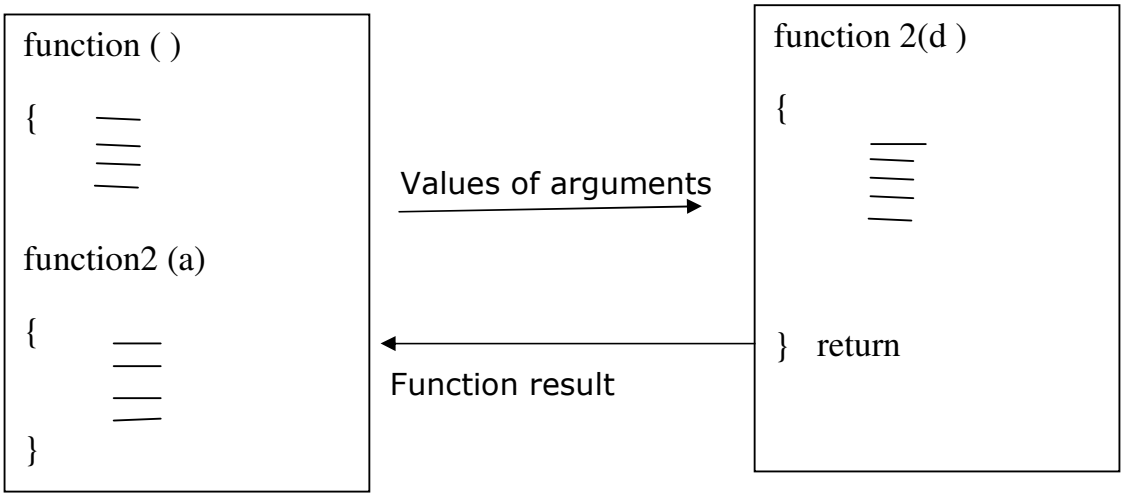


Fig : Two – way data communication between functions.

Program:- Function with arguments

```
#include <stdio.h>
main( )
{
int a,b,c;
printf ("enter any two values");
scanf ("%d %d", &a,&b);
c= add (a,b);
printf ("addition of two values is %d" C);
getch( );
}
```

```
add (int a, int b);
{
return (a+b);
 }
```

Program to arguments with return value

4.4.4. VOID :

The keyword "VOID" can be used as a type specifies when defining a function that does not return anything or when defining a function that does not return anything or when to function definition does not include any arguments. The presence of this keyword is not mandatory but it is good programming practice to make use of this feature.

4.4.5.Scope of Functions :

Variables in c different behavior from those in most other languages. It all depends on "storage" classes a variable may assume. C can have any one of the four storage classes

1. Automatic Variable
2. External variable
3. Static variable
4. Register Variable

   The scope of variable determine over what parts of the program a variable is actually for use (active) and alive, so long has a direct effect on the utility of a given variable. The variables may also be broadly categorized depending on the place of declaration. Internal (local) or External (global). The internal variable are more declared within the particular function. The external variables are declared outside the function.

   1. **Automatic Variable** : These variables are declared inside the function in which they are to be utilized. They are created when function is called and destroyed automatically. When the function is existed.

      Ex : auto int no;
   2. **External Variables** : These variables that are both alive and active through out the entire program. There also know as global variables. Unlike the local variables, global variables can be accessed by any function in the program. These variables are declared outside of the function.

      Ex : **extern** int a;

```
main()
```

```
{
 …….
 ……..
}
 fuction1()
 {
   int a = 10
     ---------;

 }

 function2()
 {
 int a = 15
   ------------;
   ------------;
 }
```

Example : Program

```
int x;
main ()
{
        x = 10;
        printf (" x = "%d\n", x);
        printf (" x = "%d\n", fun1());
        printf (" x = "%d\n", fun2());
        printf (" x = "%d\n", fun3());
}
        fun1()
        {
                x = x + 10;
                return (x);
        }
        fun2()
        {
                int x;
                x = 1;
                return (x);
        }
        fun3()
        {
                x = x + 10;
                return (x);
        }
```

Output :

X = 10
X = 20
X = 1
X = 30

Program to External variable

Static Variable :

As the name suggests, the value of static variable persists until the end of the program. A variable can be declared static using the keyword **static** like.

File1.c

```
int m;\*global variable*\
main()
{
        int i;
        ……..
        ……..
}
function1()
{
        int j;
        ……
        ……
}
```

file2.c

```
extern int m;

function2()
{
        int i;
        ……..
        ……..
}
Function3()
{
        Int count;
        ……
        ……
}
```

Fig. Another version of a multifile program

static int x;
static float y;

A static variable may be either an internal type or an external type, depending on the place of declaration.

Internal static variables are those which are declared inside a function. The scope of internal static variables extend up to the end of the function in which they are defined. Therefore, internal **static** variables are similar to **auto** variables, except that they remain in existence(alive) throughout the remainder of the program. Therefore, internal **static** variables can be used to retain values between function calls. For example, it can be used to count the number of calls made to a function.

Example:

Write a program to illustrate the properties of a static variable.

The program in fig. explains the behaviour of a static variable.

```
Program
/***********************************************/
/*          ILLUSTRATION OF STATIC VARIABLE          */
/***********************************************/
      main()
      {
      int I;
      for(i=1;i<=3;i++)
            stat();
      }
      stat()
      {
            static int x =0;
            x=x+1;
            printf("x=%d\n",x);
      }
      Output:
      x=1
      x=2
      x=3
```

Fig: Illustration of static variable

A static variable is initialized only once. When the program is compiled. It is never initialized again. During the first call to **stat, x** is incremented to 1. Because x is static, this value persists and therefore, the next call adds another 1 to **x** giving it a value of 2. The value of x becomes three when the third call is made.

Had we declared **x** as an **auto** variable, the output would have been:

x=1
x=1
x=1

This is because each time **stat** is called, the auto variable **x** is initialized to zero. When the function terminates, its value of 1 is lost.

An external **static** variable is declared outside of all functions and is available to all the functions in that program. The difference between a **static** external variable and a simple external variable is that the **static** external variable is available only within the file where it is defined while the simple external variable can be accessed by other files.

It is also possible to control the scope of a function. For example, we would like a particular function accessible only to the functions in the file in which it is defined, and not to any function in other files. This can e accomplished by defining 'that' function with the storage class **static.**

Register Variables:

We can tell the compiler that a variable should be kept in one of the machine's registers, instead of keeping in the memory (where normal variable are stored). Since a register access is much faster than a memory access, keeping the frequently accessed variable (e.g. loop control variables) in the register will lead to faster execution of programs. This is done as follows:

register int count;

Although, ANSI standard does not restrict its application to any particular data type, most compilers allow only **int** or **char** variables to be placed in the register.

Since only a few variables can be placed in the register, it is important to carefully select the variables for this purpose. However, C will automatically convert **register** variables into non register variables once the limit is reached.

Table summarizes the information on the visibility and lifetime of variables in functions and files.

Scope and Life time of Declarations

Storage class	Where declared	Visibility (Active)	Life time (Active)
None	Before all functions in a file (may be initialized)	Entire file plus other files where variable is declared with extern.	Entire program (Global)
extern	Before all functions in a file (can not be initialized)	Entire file plus other files where variable is declared extern and the file where originally declared as global.	Global
static	Before all functions in a file.	Only in that file	Global
None or **auto**	Inside a function(or a block)	Only in that function or block	Until end of function or block
register	Inside a function or	Only in that	Until end of

	block	function or block	function or block
static	Inside a function	Only in that function	Global

4.5. Extent of variable (Global and local)

Actual and formal parameters or arguments

The parameters maybe classified two types:-

1. formal parameters
2. Actual parameters

1.**Formal parameters:** The formal parameters are the parameters given in function declaration and function definition. When the function is invoked, the formal parameters are replaced by the actual parameters.

2. **Actual parameters:-**The parameters appearing in the function call are referred to as actual parameters. The actual arguments may be expressed as constants, single variable or more complex expression. Each actual parameters must be of the same data type as its corresponding formal parameters.

Local and Global variables:

The variable may be classified local or global variables.

Local variables :

The variables defined can be accessed by only within the block of function in which they are declared. These variables are called local variables. All the variables are used within the function block must be either defined at the beginning of the block or before using the statement. Local variables are referred only the particular part of a block of a function.

Global variables:

Global variables are defined outside of main function block. Global variables are not contained to a single function. Global variable that are

recognized in two or more functions. Their scope from the point of the definition through the reminder of the program.

*The main differences b/w Global and Local variables are:

1.The global variables are defined outside of the function, where as the local variables are defined inside the function.

2. Global variables are created at the time of program beginning and reside until the end of the program. The local variables are created at the time of function called and destroyed when the function execution is over.

3.The global variables are accessible in entire program. These are alive, active and destroyed. The local variables are accessible only to the particular function.

4.6.Explain Factorial and GCD using recursion.

When called function in turn calls another function is process of changing occurs. Recursion is a special case of this process, when a function calls itself.

Example:-

Example of recursion is the evaluation of given number. The factories of a number it is expressed as a series of respective multiplications shown below.

Factorial of n = n(n-1) (n-2) ---------- 1.

Factorial of 5 = 5* 4* 3 *2 *1 = 120.

A function to evaluate factorial of "n" is as

```
fact ( n)
 int n;
{
int f;
 if (n = =1)
return (1)
else
f = n* fact (n-1);
return (f);
```

```
}
```

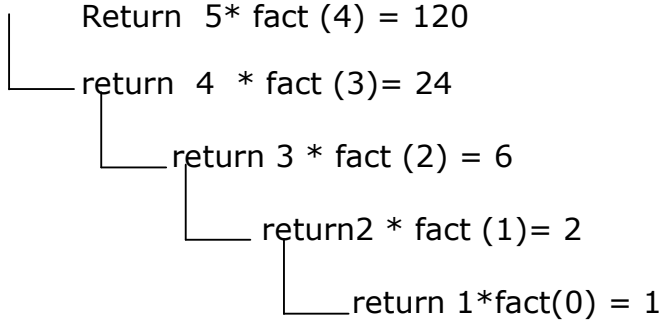
Let us use how the recursion works= 5* fact (4) Assume n= 5, since the value of n is not 1 will be executed with n=5. That is

F = 5 * fact (4)

Will be executed. The expression on the right hand side includes a call a fact with n=4. The all will return the following value.

4*fact (1).

Once again 'fact' is called up to 1. This time function return 1. The sequence of operations can be summarized we can understand the above program of recursive method call by the given below as follows:



1 * 2* 3 * 4 * 5 = 120

Recursive function can be effectively used to solve problems w here the solution is expressed in terms of successively applying the same solution to subsets of the problem. When we write recursive call being executed. Otherwise, the function will never return program.

To find factorial of given number using recursion.

```
# include <stdio.h>
main ()
{
int  n, f;
printf(" \n enter any value \n");
sacnf("%d", &n);
f= fact (n);
printf(" factorial of %d is", n, f);
getch ( );
}
fact (int n)
        {
         if     (n==1)
        return (1)
        else
```

```
        return (n* fact (n-1));
        }
```

Another example to recursion:-

To find the GCD / +/CF of two positive integers using recursion.

The GCD or HCF of two integers is the largest integer that can exactly divide both numbers (without remainder). The program takes two positive integers as input from the user and calculate GCD using recursion.

```
#include <stdio.h>
int gcd (int A, int B);
main ( )
{
        int A,B;
        printf("enter two positive integers");
        scanf("%d%d",&A,&B);
        printf("G.C.D. of %d and %d is %d",A,B, Gcd(A,B));
        return 0;
}
        int ged  (int A, int B);
        {
                if(b!=0)
                return Gcd (b,a%b);
        else
                return a;
        }
```

Output :

```
enter two positive integers
                366
                  60
G.C.D. of 366 and 60 is 6
```

4.7. CALL BY VALUE AND CALL BY REFERENCE WITH EXAMPLES:

Call by Value and Call by reference:

The arguments are send to the functions and their values are copied is the corresponding function. This is a sort of information inter change between the calling function and called function. This is known as parameter passing it is a mechanism through which arguments are passed to the called function for the required processing. These are two methods of parameter passing.

1. Call by value.
2. Call by reference

Call – by – value :-

When the values of arguments are passed from calling function to a called function, these values one copied into the called function. If any changes are made to these values in the called function, there are no effect the original values within calling function.

In this case, By default, C programming uses call–by- value to pass arguments. In general, it means the code with in a function cannot after the arguments used to call the function consider thee function swap ( ) definition as follows.

A program the call – by – value :-

```
#include <stdio.h>
    main ( )
      {
        int A, B,C;
        int call val ( );
              A= 10;
              B= 20;
        printf("before call by value A is %d", A);
        printf("\n before call by value B is %d", B);
        C= Callval (A,B);
        printf("After call by value A is %d", A);
        printf("Afetr call by value B is %d", B);
        printf("\n C= %d" \n",C);
    }
        Calval ( X.Y);
        int X, Y;
        {
              int sum;
              sum = (X + Y);
              X= X + 5;
              Y = X*Y;
              printf(" X= %d and Y= %d \n ", X, Y);
              return (sum)
        }
```

When the program is executed to output will be displays as

A = 10;
B = 20;
X = 15;
Y = 400;

Example 2

```
#include<stdio.h>
void  call by ref(int N1, int N2)
{
      int Temp;
      temp=N1;
      N1 = N2;
      N2 = Temp;
}
      main()
      {
            int A=50, B= 30;
            printf("\n number: %d \n",A);
            printf("\n number: %d \n",B);
            return(0);
      }
```

Output :-

```
N1 = 50
N2 = 30
```

Call – by - reference with example:-

Call – by – reference :- In this method, the actual values are not passed, instead their addresses are passed. There is no copying of values since their memory location are referenced. If any modification is made to the values in the called function, then the original values, get changed with in the calling function. Passing of address requires the knowledge of painters. To pass a value by reference, arguments pointers are passed to the function just like any other value. So accordingly you need to declare the function parameters as printer types as in the values of two integer variables pointed to, by their arguments.

```
# include <stdio.h>
      /* function declaration */
      valid callref (int **, *y);

      int main ( )
            {
              int a= 100;
               int b= 200;
            printf("before call the call ref  function A value is %d \n", a);
            printf("before call  the call ref function B value  is %d \n", b);
            call ref (&a, &b);
            printf("after call callref function  A value is %d \n", a);
            printf("after call  callref function B value  is %d \n", b);
                  Return 0;
            }
```

Let us put the above code is a single C file compile and execute it, to produce the following result.

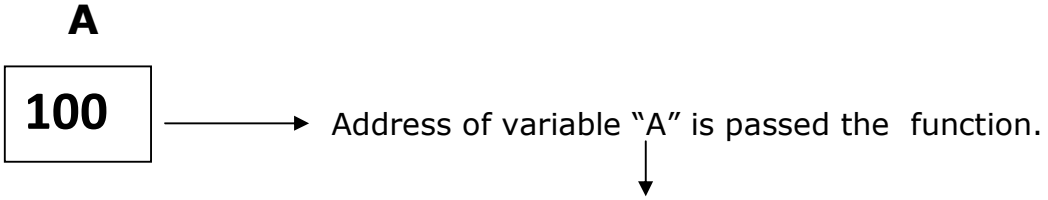
Output:-

before call callref function **a** value is 100.
before call callref function **b** value is 200.

after call callref function **a** value is 200.
after call callref function **b** value is 100.

It shows that the change has reflected. Outside the function as well, unlike call by value where the changes do not reflect outside the function.

1) While passing parameters using call by reference (address)scheme. We are passing
actual address of the variable to be called function.
2) Any address made inside the called function will modify the original copy, since we are directly modifying the content of the exact memory location.



Operations done on by taking value from address i.e. original copy.

Thus original value also gets updated.

Differences between call by value and call by reference in 'C'

Call by value	Call by reference
A copy of value is passed to the function.	An address of value passed to the function
Changes made inside the function is not reflected on other function.	Change made inside the function is reflected outside the function also
Actual and formed arguments will be created in different memory location.	Actual and formed arguments will be created in same memory location.

4.8.Use of various categories of builtin functions like mathematical and string functions :

use of various categories of built in functions:-

4.8.1.'C' – mathematical function.

The built in function in C. which are in **math.h** header file is also given below for your reference. ***"math.h"** header file supports all the mathematical related function in C language. All the arithmetic functions used in 'C' language are given below.

Floor () :- This function returns the nearest integer which is less than or equal to
the arguments passed to their function.
Ex : floor (9.2) is 9.0
Floor((-9.2) is - 10.0

round () :- This function returns the nearest integer value of the float / double
/long double argument passed to"1 to 5", it returns integer value less
Integer value greater the integer.
Ex : round(2.325) is 2.0

Ceil () :- This function returns nearest integer value which is greater than or
Equal argument passed to this function.
Ex : ceil (9.2) is 10.0
Ceil(-9.2) is -9.0

sin () :- This function is used to calculate sine value.
Ex : sin(0.0) is 0.0,1

cos () :- This function is used to calculate cosine.
Ex : cos(0.0) is 1.0

cosh () :- This function is used to calculate hyperbolic cosine.

exp () :- This function is used to calculate the exponential "e" to the X th power.
Ex : exp(1.0) is 2.718282, exp(4.0) is 54

tan () :- This function is used to calculate tangent.
Ex : tan(0.0) is 0.0

tan h( ) :- This function is used to calculate hyperbolic tangent.

log ( ) :- This function is used to calculate natural logarithm.
Ex : log(2.0) is 0.693147

squrt ( ) :- This function is used to find square root of the argument passed to this
Function.

pow ( ) :- This function is used to find the power of the given numbers.
Ex : pow(2,2) is 4.0

trunc( ) :- This function truncates the decimal value from floating point value and
Return integer value.

atof ( ) This function converts a floating point value found in string
Into a floating paint number which can be stored in a variable.
Ex:- [N=] a to f (string).

atoi ( ) It converts an integer value found in string into an integer

which can be stored in a variable.

Syntax :- X = atoi (string)

Ex :- Number = "1234";

No = atoi(Number);

4.8.2.Text I/O Function:-

1.getchar ( )

Syntax:- ch = getchar ( )

It reads a single character from the keyboard. The character is

Displayed and optionally, stored in the char variable ch.

2.gets ( )

Syntax :- gets (string type _ variable Array of char)

It reads a string of text from the keyboard terminated by the

Enter key the text is stored in the variable string.

3. printf ( )

Syntax :- printf("Data specification", var1, var2,var3-----var n);

Ex : printf("%s", Name);

It displays formatted text according to the format string optional

values or variables can be specified to match place holders or

conversion character in the format string.

4. putchar ( )

Syntax:- putchar (character variables)

It displays the character 'ch' on the screen, where 'ch' is a single

character or a escape code in single quotes or the name of a char

variable.

5. puts ( ) It displays the text string on the screen where string is a literal

String of text enclosed in double quotes or the name of the string variable.

6. scanf( )

Syntax : scanf ("Data specification", &var1, &var2,&var3-----var n);

Read the information from the keyboard according to the conversion

character in the format string. The information is then stored in the variable van, which must match the type of conversion character that's used (int, float, or char).

4.8.3.STRING HANDLEING FUNCTIONS:

The 'C' library supports a large number of string- handling functions that can be used to carry out many of the string manipulation functions.

The string handling functions are:

Function	Action
1. strcat ( )	Concatenates (add) two strings
2. strcmp ( )	Compares two strings
3. strcpy ( )	one string over another assign
4. strlen ( )	the length of string
5. struppr ( )	Convert lower case to uppercase
6. strlowr ( )	Convert uppercase to lower case

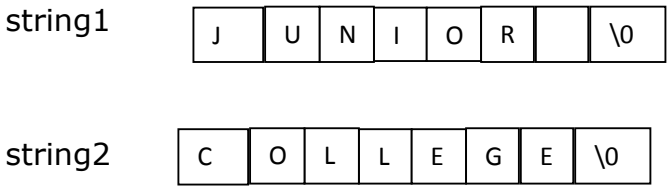
strcat function ():-

Syntax :

strcat (string1, string2);

strcat () function joins are character arrays, when the function "strcat" is executed string2 is appended to string1. It does so by removing the null character at the end of string1 and placing string2 from there. The string at string2 remains unchanged.

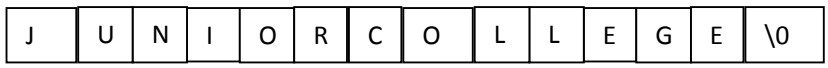
Example:-



Execute of the statement

strcat (string1, string2);

Will result in :



Program:

```
#include<string.h>
main()
{
        char str1[40],str2[20];
        clrscr();
        printf("enter the first string \n");
        scanf("%s",str1);
        printf("enter the second string \n");
        scanf("%s",str2);
        strcat(str1,str2);
        srintf(" after the merged the two strings are %s",str1);
        getch();
}
```

Output :

```
        enter the first string
        Kanaka
        enter the second string
        Durga
        after the merged the two strings are
        KanakaDurga
```

Strcmp ( ) function:-

The strcmp ( ) function compares ASCII value of character with string2 first character ASCCI value of character.

The strcmp ( ) function compares the ASCII code of sting1 first character with the ASCII code of strinng2 first character and the value 0 (zero), if there are equal. If there are not equal it has the numeric difference between the nonmatching characters in the strings.

Syntax:- strcmp (string1, string 2);

Example:- the string1 = "their"

The string2 = "there"

strcmp (string1, string2);

The output will return of -9, which is the numeric difference between ASCII "I" and "r" and ASCII "I" value is 105 and ASCII of r is 114 (105 – 114)= -9. So, the value is negative, string1 is alphabetically above string2.

- **Note we can see ASCII codes in ASCII table**

Program:

```
#include<string.h>
main()
{
char str1[40],str2[20];
clrscr();
printf("enter the first string \n");
scanf("%s",str1);
printf("enter the second string \n");
scanf("%s",str2);
        if (strcmp(str1,str2==0))
                {

                        printf("the given two strings are equal \n");
```

```
        }
            else
        {
            printf("the  given two strings are not equal\n");
        }
    getch();
    }
```

Output:

enter the first string

Kusuma

enter the second string

Kusuma

the given two strings are equal

enter the first string

their

enter the second string

there

the given two strings are not equal

strcpy ( ) function:-

The strcpy() function works likes a string assignment operator.

Syntax:- strcpy (string, string 2);

The contents of string2 will assign to string1.

Example:- strcpy ("TOWN", "CHIRALA");

It will assign the CHIRALA to the variable "TOWN".

Strlen ( ) function:-This function count and returns the number the number of characters in a string.

Syntax:- N= strlen (string)

Where 'N' is an integer variable which receives the value of the length of the string. The argument may be a string constant. It count the characters up to find the '\0' of given string.

Example:-

Int N; char S1= ["COLLEGE"];

N= strlen (S1);

The output is 8. the number of characters in "COLLEGE" is + , plus one character to null ('\0').

Type

Programs ⟶ on

1. Strcat
2. Strcmp
3. Strcpy
4. Strlen

Etc.

Program:

```
#include<string.h>
main()
{
char str1[40],str2[20];
clrscr();
printf("enter the first string \n");
scanf("%s",str1);
printf("enter the second string \n");
scanf("%s",str2);
      strcpy(str1,str2);
      printf("string1 = %s,string2  %s",str1,str2);
getch();
```

```
}
```

Output:

enter the first string

NAME

enter the second string

KUSUMA

NAME = KUSUMA

strupper() Function :

The is upper function checks whether the character is an upper alphabetic (A to Z).

Char isupper (string variable);

The function isupper() takes as an argument character is passed to the function. Internally the character is converted in to is ASCII for the check.

Example :

Char a[20] = ("kusuma");

strupper(a);

output : KUSUMA

strlower() Function :

the is lower function checks the whether the character is lower case alphabetic (a to z) or not. Function is lower takes () a single argument character is passed the function.

Example :

Char a[20] = ("KUSUMA");

strupper(a);

output : kusuma

1. Write a C program to convert string from upper case and lower case and vice versa

A.

```
#include<stdio.h>
#include<string.h>
 void main()
      {
            char a[20];
            printf("Enter lower case string to convert \n :");
            scanf("%s",a);
            printf("lower case string= %s",a);
            printf("upper case string =%s",strupr(a));
            getch();
            printf("Enter upper case string to convert \n:");
            scanf("%s",a);
            printf("upper case string= %s",a);
            printf("lower case string= %s",strlwr(a));
            getch();
      }
```

Input:-

Enter lower case string to convert: nagarajarao

Output:-

lower case string= nagarajarao
upper case string= **NAGARAJARAO**

Input:- Enter upper case string to convert: NAGARAJARAO

Output:-

upper case string= NAGARAJARAO
lower case string = **nagarajarao**

2 marks questions

1. What is a procedure.
2. Define a function.
3. What are the types of function.
4. What is the syntax of function? Give on example.
5. What are the advantages of function.
6. What is a global variable.
7. What is a local variable.
8. What are the parameters.
9. What is a main ( ) function.
10. What any 4 mathematical function with example.
11. What any 4 arithmetical function give example.
12. What is a global string.
13. What is a recursion.
14. What is use of return statement.
15. What is use of void function.
16. What are the string handling function in 'C' explain them.

Long Question 6 marks.

1. What are the differences between procedure and function.
2. What are library function ? explain with suitable examples.
3. What are the mathematical function explain with suitable example.
4. What are the differences between global variable and local variable.
5. Explain GCD procedure using recursion method.
6. What a program to find factorial of given number.
7. Explain call by value with suitable example.
8. Explain the call-by-reference with suitable example.
9. Explain the category of function in 'C'.
10. What are the differences between call- by- value and call by reference.

UNIT - 5

Structures in "C"

structures

5.1. Structure definition.
Structure declaration.
Structure creation.
Access Structure members.

5.2. Operation on Structure .
Structure initialization.
Array of Structure.
Array within Structure.
Nested structure.

5.3. Unions.

Definition of Union.

Union declaration.

Union creation.

5.4. Operation on union.

5.6. Difference between union and structure.

STRUCTURES IN C :

Structure is a user- defined data-type in C language which allows us to combine data of different types together. Structure helps to construct a complex data-type which is more meaningful. It is somewhat similar to an array. But an array holds data of similar type only. But structure on the other hand, can store data only. Any type, which practical more useful.

For example: If I have write a program to store student information, which will have students name, age, branch permanent address, father's name etc. which include string values, integer values etc; how can I use arrays for this values, I will require something which can hold data of different types together. In structure data stored in form of **records.**

Defining structure:- A structure can be defined to be a group of logically related data items. Which may out of different types stored in contiguous memory locations, sharing a common name but distinguished by its members. Hence a structure can be viewed as a heterogeneous user- defined to data type. It can used to create variable. Which can be manipulated in the same way as a variable of built in data types. **Struct** is used to define a structure. **Struct** defines a new data type which is a collection of primary and derived data types.

Syntax:-

```
Struct  structure_ name

        {       Datatype  member 1;

                Datatype  member 2;

                Datatype  member 3;
                      _____
                      _____

                Datatype  member n;

        }

                var1, var2, var3 ------ var n;
```

As you can see in the syntax above, we start with the **struct** keyword, then it's optional to provide your structure a name, we suggest you to give it a name, then inside the curly braces ({}), we have mention all the member variables,

which are nothing but normal **C** language variables of different types like **int, float, char, array** etc.

After the closing curly brace, we can specify one or more structure variables again this is optional. The closing curly brace in the structure type declaration must be followed by a semicolon (;).

Example:-

```
Struct student
{
        char name [20];
                int age;
        char class [20];
                int marks;
};
```

Here **struct student** declares a structure to hold the details of a student which consists of 4 data fields, namely name, age, class, marks. These fields are called **structure elements or member.**

Each member can have different data types like in this case **name** is an array of **char** type and **age** is of **int** type etc. **student** and is called as the **structure – name**.

Declaring structure variable:-

It is possible to declare variable of a **structure** either along with structure definition or after the structure is defined. **Structure** variable declaration is similar to the declaration of any normal variable of any data type. Structure variables can declared in following two ways.

1. **Declaring structure variable separately**.

```
Struct student
        {       char name [20];
                int age;
```

```
        char class [10];
        int marks;
};
struct student s1, s2;
```

2. Declaring structure variables with structure definition.

```
struct student
{       char name [20];
        Int age;
        char class [10];
                int marks;
};
        s1, s2;
```

Here s1 and s2 are variables of structure of student. However this approach is not much recommended.

Access structure members:-

Structure members can be accessed and assigned values in a number of ways **structure members** have no meaning individually without the structure. In order to assign a value to any structure member. The member name must be linked with the structure variable using a dot (.). Operator also called period or member access operator.

Example;-

```
# include <stdio.h>
# include <string.h>
struct student
{       char  name [20];
        int age;
        char class [10];
        char marks;
};
int main ( )
        {       struct student s1;
                        s1. Age =18;
```

```
        strcpy ( s1.name, "murthy");
    printf("Name of the student 1 is %s \n", s1.name);
    printf ("Age of the student %d \n", s1.age);
    return 0;
    }
```

output

name of student 1 : Murthy

A age of the student : 18.

We can also use **scanf ( )** to give values to **structure members** through terminal.

```
Scanf ("%s", s1.name);
Scanf ("%d", s1 . age );
```

Structure inlialization:-

Like a variable of any other data types structure variables can also be initialized at compile time.

```
Struct student
    {   float height;
        Int age;
        Int weight;
    };
    Struct student s1={ 178.26, 20, 48};
```

Or

```
    Struct student s1;
  S1 . height = 178.26
```

S1 . age = 20

S1 . weight = 48

Array of structure:-

We can also declare an array of **structure** variable in which each element of the array will represent a **structure** variable.

Example :-

Struct student [5];

The below program define an array of **student** of size 5. Each element of the array **stu** is of type.

Student:-

```
# include <stdio.h>
 Struct student
        {       char name [20];
                    Int marks;
        };
        Struct student stu [5];
        Int i,j;
        Valid st ( )
                {       for ( i=0; i<2; i++)
                {
                  Printf ("\n enter %dst student Information \n" student
i++);
                  Printf ("\n name \n");
                  scanf (" %s, stu[i]. name);
                  Printf ("\n enter age \n");
```

```
    scanf ("%d", & stu.age \n");
}
```

Array with in Structure :-

Struct data type can be hold an array type variable as its members. We can declare the member of a structure as array data type similar to int, float, char etc.

Ex:-

```
struct student
{   char stu- name [20];
    int  sno;
int marks;
};
```

In the above, the structure variable student contains character array type stuname as its member. The initialization of this can be done as usually.

```
struct stuname = { " Rajaya lakshmi", 900};
```

Structure of function arguments

We can pass a structure as a function arguments just like we pass any other variable or an array as a function arguments.

Ex:-

```
# include <stdio.h>
struct student
{   char name [20];
    int  no ;
};
valid output (struct student st);
void main ( )
{   struct student. Stu;
      printf ("\n enter student  Information \n" );
      printf ("\n student name \n");
```

```
        scanf (" % S",st.name);
        printf ("\n enter student      . no);
        output (stu);
}
valid output (struct student st);
      {
        printf ("\n  student name is %s" stu.name);
        printf ("\n no is %d", stu.no);
      }
  printf ("\n print  student information");
      for (i=0; i<2' i++)
      {
        printf ("\n student name is %S", stu [i]. name);
        printf ("\n Aage is %d stud [i].age");
      }
}
valid main ( )
      {
            st ( ):
      }
```

Program for structure with array

Nested structure

Nesting of structures, is also permitted in C language. Nested structure means that one structure has another as member variable.

Example:-

```
Struct student
{     char name [10];
      Int age;
      Struct address
      {
```

```
        Char  area [10];
        Char town [10];
        Int pincode;
    } add;
};
```

UNION:-

A union is a special data type available in 'C' that allows to store different data types in the some memory location. You can define a union with may members, but only one members can contain a value at any given time. unions provide an efficiency way using the same memory location for multiple – purpose.

Defining a union

To define a union you union you must use the union statement in the same way as you did while defining a structure. The union statement define a new data type with more than one member for your program. The format union statement is as follows.

```
Union – name
{     data – type          member1;
      data – type          member2;
      data – type          member3;
            ------
            ------
      data – type          membern;
}
```

The **union_ name** is optional and each member definition is a normal variable definition, such as int, float, char, array or any other valid variable definition. At the end of the union's definition before the final semicolon; you can specify or more union variables but it is optional. Here is the way you would define a union type named date having three members i, f , str.

```
Union data
```

```
{       int i;
        float a;
        char st [30];
} info;
```

Now a variable data type can store integer a floating point number or a string of characters. It means a single variable i.e same memory location, can be used to store multiple types of data. You can used any built – in or user defined data types inside a union based on your requirement. The memory occupied by a union will be large enough to hold the largest member of the union. For example in the above example data type will occupy 30 bytes of memory space which can be occupied by character string. The following example displays the total memory size occupied by the above union.

```
# include<stdio.h>
# include <string.h>
Union data
  {   int i;
      float a;
      Char st [30];
      }
      int main  ( )
            Union date st;
      printf ("memory size occupied data :%d \n", size of (data));
            Return 0;
      }
```

When the above code is compiled and executed it produce the following result.
Memory size occupied by data : 30.

Accessing union members

To access any member of a union, we use the member access operator (.). the member access variable is coded as a period between the union variable name and union member that we wish to access. You would use the keyword **union** to define variable of union_ type. The following example shows how to use union in a program.

```
# include <stdio.h>
# include <string.h>
Union data
{       int i;
        Float a;
        Char str [30];
};
int main ( )
  {     union data st;
        Data.i = 10;
        Data.f = 322.7;
        Strcpy (data .st," the union");
        Printf ("data.i %d \n", data.i);
        Printf ("data.a %f \n", data.f);
        Printf ("data.str: %S \n", data.str);
        Return 0;
        }
```

When the above code is compiled and executed it produce the following result

```
Data.i :        2352612.
Data.f :        625232542567892257625.00000
```

Data.str: the union.

Here we can see that the values of i and f members of **union** got corrupted because the final value assigned to the variable has occupied the memory location and this is the reason the value of **str** member is getting printed very well. Now let's look in to the same example once again where we will use one variable at a time. Which is the main purpose of having unions?

```
# include <stdio.h>
# include <string.h>
Union data
    {   int i;
        Float a;
        Char str [20];
    }
Main ( )
{   union data data
            Data.i = 10

Printf ("data .i : %d \n", data . i);
Data . a = 325.62
Printf ("data.a : %f  \n");
Strcpy (data.str," the union, data.a );
Printf ("data . str :%s \n", data . str);
Return 0
```

When the above code is complied and executed it produce the following result

Data. i = 10

Data. F= 325.62

Data . str : the union

Here all the members are getting printed very well because one number is being used at a time.

Differences between structure and union.

Structure	Union
The keyword struct is used to define a structure.	The keyword union is used the define union.
When a variable is associated with a union, the complier allocate the memory for each member. The size of structure is greater than or equal to the a sum of size of its members.	When a variable associated with a union, the compiler allocate the memory by considering the size of the largest memory. So size of union is equal to the size of largest member.
Altering the value of a member will not affect other member of the structure	Altering the value of any of the member with alter other member values.
Individual member can be accessed at a time.	Only one member can be accessed at a time.
Several members of a structure can initialize at once.	Several member of a structure can initialize at once.

Short answer type Question.

1. What is structure.
2. What is syntax of struct.
3. What are advantages of structure.
4. What is nested structure.
5. What is a advantages over an array.
6. What is a union.
7. What is the syntax of union.

Long Answer Questions.. 6 marks.

1. What is structure? Explain in detail.
2. How to access structure members? Explain with example.
3. Explain the array of structures.

"HARD WORK IS SECRET OF SUCCESS"

Note : I used Font Size is 12 name : Vardana

COMPUTER SCIENCE & ENGINEERING

Paper - III

ACCOUNTANCY & TALLY

INDEX

UNIT - 1
INTRODUCTION

INTRODUCTION

A systematic record of the daily events of a business leading to presentation of a complete financial picture is known as accounting or, in its elementary stages as book – keeping. Every business necessarily keeps a systematic record of what happens from day – to – day.

Every business constantly enters into transactions with outsiders. A transaction may be defined as the actions and reactions having monetary implications of one person or firm in relation to another person or firm. A transaction involves transfer of money or money's worth from one to another.

1.1 Book - Keeping

Book-keeping is the branch of knowledge that reveals how to keep a record of business transactions. Book - keeping is constructed to provide the preliminary information needed to create accounting records. Each transaction must be recorded in the books, and any and all changes must be updated on a continuous basis. Book - keeping involves the recording of financial transactions and other information related to the business on a day-to-day basis. It records and organises the financial transactions in a company.

Accourdingto R.N.Carter "***Book – keeping is the science and art of correctly recording in the books of account, all the business transactions that result in the transfer of money or money's worth".***

1.2 Accountancy

In ***India*** it has its origin as early as ***CHANAKYA'S (KOUTILYA)*** dynasty which was in around ***Third Centaury B.C.*** This can be identified from his famous book on ECONOMICS where in he emphasized the book keeping and maintenance of Accounting Records.

The modern system of Accounting owes its origin to ***Pacioli*** who lived in "Italy" in 15th century. In the late thirties only the study of theory of accounting has been taken up seriously even though it is practiced for a long.

A important part was played by "American Institute of Certified Public Accountants" in this task and it is defined the accounting as "**The art of recording , classifying and summarizing in a significant manner and in terms of money transactions and events which are, in part at least, of a financial character and interpreting the results thereof** ".

As per the definition of American Accounting Association (A.A.A.) "***Accounting is the process of identifying, measuring and communicating economic information to permit informed judgments and decisions by users of the information***".

Accountancy refers to systematic knowledge of accounting which covers rules, regulations, principles, concepts and conventions and standards that govern the accounting process. Accounting refers to the actual process of preparing and presenting the accounting information. Book – keeping is a part of accounting and is concerned with record keeping or maintenance of books of accounts. It is routine and clerical in nature.

Objectives Of Accounting

1. To maintain full and systematic records of business transactions.
2. To determine profit or loss of the business.
3. To show financial position of the business.
4. To provide accounting information to the interested parties.

1.3 Uses of Accountancy

1. To identify the Profit or Loss of a business for an accounting period.
2. To know the financial position of a business.
3. It maintains all the financial transactions of a business .

4. By maintaining the proper books of accounts, it supports the business to follow the legal Accounting rules and regulations.
5. It supports the business persons to take the proper decisions for future.
6. It identifies the expenditure incurred on the Goods and Services .
7. It helps to compare the efficiency of the firm with competitors and also with previous results.
8. It helps to calculate the taxes like Income Tax, G.S.T etc.,
9. It helps to utilize the business assets in efficient and effective manner.

1.4 Accounting Concepts

Accounting is the language of business. To make the language convey the same meaning to all people, as far as practicable, and to make it full of meaning, accountants have agreed on a number of concepts which they try to follow. These are given below:

1. Business Entity Concept
2. Money Measurement Concept
3. Cost Concept
4. Going Concern Concept
5. Dual – Aspect Concept
6. Realisation concept
7. Accural Concept
8. Matching Concept
9. Accounting Period Concept

1. **Business Entity Concept:** Accountants treat business as separate from the owner; then it becomes possible to record transactions of the business with the owner also. Without such differentiation, the affairs of the firm will all be mixed up with the private affairs of the owner and the true picture of the business will not be available.
2. **Money Measurement Concept:** Accounting records only those transactions which are expressed in terms of money, though inventory rerecords are also kept in some cases. It should be remembered that money allows various things of different nature to be added up together and dealt with. The use of a building and the use of clerical services can be added up only through money values and not otherwise.
3. **Cost Concept:** Transactions are entered in the books of account at the amounts actually involved. It prevents random values being put on transactions. This concept is used mainly in acquisition of assets. In other words, the amount to be recorded is objectively arrived at as a result of the mutual agreement of two parties involved.
4. **Going Concern Concept:** It is assumed that the business will exist for a long time and transactions are recorded from this point of view. This concept requires difference between expenditure as long term benefitting expenditure (Ex: pre paid insurance) and short term benefitting expenditure (Ex: Salaries).
5. **Dual – Aspect Concept:** Dual Aspect Concept is the core of the double-entry bookkeeping. It provides the very basis of recording business transactions in the books of accounts. Dual Aspect Concept assumes that every transaction has two-sided effects, i.e. it affects two

accounts in their respective opposite sides. Therefore, the transaction should be recorded at two places. It means, both the aspects of the transaction must be recorded in the books of accounts.

The concept of duality is commonly expressed in terms of fundamental accounting equation:

Assets = Liabilities + Capital

The above accounting equation states that the assets of a business are always equal to the claims of owner/owners and the outsiders this claim is also termed as **capital or owner's equity** and that of outsiders, as **liabilities or creditors' equity**. According to this concept for every debit, there is a correspondence credit and vice versa. Every transaction has two aspects. These two aspects may be:

1. An increase in asset and decrease in other assets
2. An increase in asset and simultaneously increase in liability
3. A decrease in asset and increase in another asset
4. A decrease in asset and decrease in liability

6. **Realisation concept:** Revenue should be accounted for only when it is actually realized or it has become certain that the revenue will be realized. This signifies that revenue should be recognized only when the services are rendered or the sale is affected. However, in order to recognize revenue, actual receipt of cash is not necessary, but the organization should be legally entitled to receive the amount for the services rendered or the sale affected.
7. **Accrual Concept:** The accrual concept in accounting means that expenses and revenues are recorded in the period they occur, whether or not cash is involved. The benefit of the accrual approach is that financial statements reflect all the expenses associated with the reported revenues for an accounting period.
8. **Matching Concept:** The matching concept is an accounting practice whereby firms recognize revenues and their related expenses in the same accounting period. Firms report revenues, that is, along with the expenses that brought them. The purpose of the matching concept is to avoid misstating earnings for a period.
9. **Accounting Period Concept:** An accounting period is the span of time covered by a set of financial statements. This period defines the time range over which business transactions are accumulated into financial statements, and is needed by investors so that they can compare the results of consecutive time periods.

1.5 Accounting Conventions

Accounting Conventions help in comparing accounting data of different business units or of the same unit for different periods. These have been developed over the years. The most important conventions which have been used for a long period are :

1. Convention of consistency
2. Convention of full disclosure.

3. Convention of materiality.
4. Convention of conservatism.

1. **Convention of consistency:** The convention of consistency means that same accounting principles should be used for preparing financial statements year after year. A meaningful conclusion can be drawn from financial statements of the same enterprise when there is comparison between them over a period of time. But this can be possible only when accounting policies and practices followed by the enterprise are uniform and consistent over a period of time.

2. **Convention of full disclosure:** The convention of full disclosure suggests that every financial statement should fully disclose all relevant information. Full disclosure means that there should be full, fair and adequate disclosure of accounting information. Adequate means sufficient set of information to be disclosed. Fair indicates an reasonable treatment of users. Full refers to complete and detailed presentation of information.

3. **Convention of materiality:** The convention of materiality states that, to make financial statement to be meaningful by reflecting the material fact. Material fact means the information of which will influence the decision of its user.

4. **Convention of conservatism:** This convention is based on the principle that "Anticipate no profit, but provide for all known losses". It provides guidance for recording transactions in the books of accounts. It is based on the policy of playing safe in regard to showing profit. The main objective of this convention is Profit should not be overstated.

1.6 Accounting Terminology

1. **Account:** An account is a summary of relevant business transactions at one place relating to a particular head.
2. **Transaction:** The accounting transaction is an activity of a business, which involves transfer of money or goods or services between two persons or two accounts.
3. **Entry:** Recording a financial transaction in the books of accounts.
4. **Accounting Period:** The period of time, for which the books of account maintained by a business.
5. **Entrepreneur / Proprietor:** The person who contributed capital to maintain a business to earn the profit.
6. **Capital:** The Amount of Money, Assets, Goods or Money's worth introduced by the owner to start or to maintain the business.
7. **Assets:** An asset is a property of every description belonging to the business. Assets can be classified into two types:
   a) **Tangible Assets:** The assets having physical existence, which we can touch and see. Ex: Buildings, Furniture, Plant and Machinery
   b) **Intangible Assets:** The assets does not having any physical existence, but their possession gives rise to some rights and benefits to the proprietor or owner.
   Ex: Royalty, Copy rights, Goodwill, Trademarks.

8. **Debtors:** A Person, Individual or Firm, who received a benefit without giving money or money's worth immediately, but liable to pay in future or in due course.
9. **Liabilities:** The financial obligations of the business are called liabilities. Ex: Loans, Bank Over Draft, Bills Payable.
10. **Creditors:** A person who provided benefit or service without receiving money or money's worth immediately, but eligible to receive money in future or in due course.
11. **Drawings:** The amount of Money, Goods or money's worth used by the proprietor or owner of the business for his personal purpose.
12. **Revenue:** The amount of money received or realised from the sale of good, provision of services and earnings from Interest, Dividend, Commission etc.,
13. **Income:** Income is money or money's worth that an individual or business receives in exchange of providing a Goods or Service or through Investment.
14. **Expenses:** The amount spent on production and sale of goods and services.
15. **Voucher:** A written document that supports a transaction has taken place for the value stated in the voucher on a particular date. Ex: Cash Receipt, Cash Memo, Invoice, Bank pay – in – slip etc.,
16. **Receipt:** It is an acknowledgement for monies in the form of cash or through bank. Ex: Cash Received, Cheques Received, D.D. Received.
17. **Stock:** Goods held with the firm as on specified date. They may include Raw Material, Finished Goods, Traded Goods or Work in progress.
18. **Purchases:** The amount of goods bought by a business for resale or for use in the production. Purchases are two types 1) Cash Purchases 2) Credit Purchases
19. **Sales:** The amount of goods sold that are already bought or manufactured. Sales are two types 1) Cash Sales 2) Credit Sales
20. **Debit:** A debit is an accounting entry that either increases an asset or expense account or decreases a liability or equity account.
21. **Credit:** A credit is an accounting entry that either increase a liability or equity account, or decreases an asset or expense account.

Short Answer type Questions

1. What is Book – Keeping?
2. What is Accountancy?
3. Define Debit and Credit.
4. Define Debtors and Creditors.
5. Define Capital.
6. What is Drawings?
7. What is Asset? Describe classification of Assets.

Long Answer Type Questions

1. Explain different Accounting Concepts in detail.
2. What are the Accounting Conventions and explain them.

UNIT - 2
DOUBLE ENTRY SYSTEM

2.1 Meaning and Theory of Double Entry System
2.2 Classification of Accounts
2.3 Advantages of Double Entry System

2.1 Meaning and Theory of Double Entry System

The fundamental rule under Double Entry system of Accounting is that, " for every debit there must be corresponding value of credit".

Due to numerous transactions which are to be recorded in a business concern, each transaction, reveals two important aspects: One aspect is Debit Aspect and another aspect is Credit Aspect. "Receiving aspect" or "incoming aspect" or "expenses / loss aspect" is termed as the "Debit Aspect" and on the other hand "giving aspect" or "outgoing aspect" or "income / profit aspect" is termed as the "Credit Aspect". These two aspects namely "Debit Aspect" and "Credit Aspect", forms the basis of Double Entry System.

According to J.R.Batliboi **"Every business transaction has two – fold effect and it affects two accounts in opposite directions and if a complete record were to be made of each such transaction, it would be necessary to debit one account and credit another account".** This recording of the two fold effect of every transaction has given rise to the term Double Entry System.

FEATURES OF DOUBLE ENTRY SYSTEM:

1. Every business transaction affects two accounts.
2. Each transaction has two aspects those are debit and credit.
3. It is based upon accounting assumptions, concepts and principles.
4. It helps in preparing trial balance which is a test of arithmetical accuracy in accounting.
5. Finally it helps in preparation of final accounts with the help of trial balance.

2.2 Classification of Accounts

Account:

Account is a summary of relevant transactions at one place relating to a particular head. An account will be represented in the form of " T ". Debit and Credit refer to left side and right side of the account respectively. To debit an account is to enter an amount on the left side of an account, and to credit an account is to enter an amount on the right side of an account.

Dr	Title of the account	Cr
Debit		Credit

The accounts in double entry system are classified into three categories:

1. Personal accounts
2. Real accounts
   a) Tangible accounts
   b) Intangible accounts
3. Nominal accounts

1. **Personal Accounts:** Personal accounts may be further classified into two categories:
   a) **Natural Personal Accounts**: An account related to any individual like Bheemesh, Sitharam, Prasad, or Suresh is called as a *Natural Personal Account*.
   b) **Artificial Personal Accounts**: An account related to any artificial person like M/s Siri Motors LLP, M/s TATA MOTORS Ltd, M/s Reliance Industries, etc., is called as an *Artificial Personal Account*.

   Rule: **Debit the Receiver**
   Credit the Giver

2. **Real Accounts:** Every Business has some assets and every asset has an account. Thus, asset account is called a real account. There are two type of assets:
   a) **Tangible** Assets are having physical existence, which we can touch and see. Ex: Buildings, Furniture, Plant and Machinery.
   b) **Intangible** assets does not have any physical existence, but their possession gives rise to some rights and benefits to the proprietor or owner.
   Ex: Royalty, Copy rights, Goodwill, Trademarks.

   Accounting treatment for both type of assets is same.

   Rule: **Debit what comes in**
   Credit what goes out

3. **Nominal Accounts:** These accounts are related to incomes and expenses or profits and losses of business concern. Ex: Salary Account, Rent Account, Electricity Account, Discount Account, Commission Account, Interest Account

   Rule: **Debit all Expenses and Losses**
   Credit all Incomes and Gains

2.3 Advantages of Double Entry System

Double entry system is acknowledged as the best method of accounting in the modern world. Following are the main **advantages of double entry system**:

1. **Complete Record of Transactions:** Under this method both the aspects of each and every transaction are recorded. So it is possible to keep complete account.

2. **Scientific System:** This is the only scientific system of recording business transactions. It helps to attain the objectives of accounting.

3. **Accuracy of Accounts:** It is possible to verify the arithmetical accuracy of the books of accounts by ascertaining whether the two sides (Dr. and Cr.) become equal or not through a process known as trial balance.

4. **Ascertainment of Profit or Loss:** Under this system profit and loss account can be prepared easily by taking together all the accounts relating to income or revenue and expenses or losses and thereby the result of the business can be ascertained.

5. **Ascertainment of the Financial Position:** A Balance Sheet can be prepared by taking together all the accounts relating to assets and liabilities and thereby the financial position of the business can be assessed.

6. **Prevents Errors and Frauds:** Under this system mistakes and defects can be detected by internal check, so that accurate information regarding business can be ascertained.

7. **Full Details of Control:** This system permits accounts to be kept in a very detailed form, and thereby provides sufficient information for the purpose of control.

8. **Helps in decision making:** Under this system necessary statistics are easily available so that the management can take appropriate decision and run the business efficiently.

9. **Comparative Study:** Profit and Loss accounts and Balance Sheets of different years as well as of different firms can be compared and the success or failure of the business can be measured.

Short Answer type Questions

1. Define Double Entry System of Account.
2. What is an Account?

Long Answer Type Questions

1. Define Double Entry System and Explain with it's features.
2. Explain the advantages of Double Entry System.
3. What is an Account? Explain different types of accounts with their rules.

UNIT – III
JOURNAL

3.1 Introduction
3.2 Journalizing of different concepts

3.1 Introduction

Meaning: Journal is called as book of Primary Entry or Book of Original Entry. Because, All business transactions are first entered in this book in chronological order. A journal is a book in which all the day to day accounting transactions were written in accounting terms in chronological order.

The process of recording the transactions in the journal is called **Journalizing** and the entry made in the journal is called **Journal Entry.**

Proforma:

Date	Particulars	L/F	Debit Amount Rs.	Credit Amount Rs.

Date Column: The date on which the transaction is taking place is written in this column.
Particulars Column: The name of the account to be debited is written in the first line Suffixed with Dr and the name of the account to be credited is written in the second line prefixed with ' To' and the brief explanation of the transaction for the which the entry is recorded is written in a pair of braces as narration in this column.
L.F. Column: L.F. indicates Ledger Folio number in which page, the entry is posted in the Ledger.
Debit Amount Column: The amount to be debited is written against the debit entry in this column.
Credit Amount Column: The amount to be credited is written against the credit entry in this column.

According to the principle of Double Entry System, the two aspects i.e. Debit as well as Credit of the transaction are recorded in the Journal.

3.2 Journalizing of different concepts

Illustration 1:

Jounalise the following transactions in the books of Mr. Venkat

Date

2017 June

1st Mr. Venkat started business with cash Rs. 1,00,000.

2nd Bought furniture for cash Rs. 5,000
3rd Purchased goods for Rs. 20,000
4th Sold goods worth Rs.15,000
5th Purchased computer for Rs. 30,000
10th Sold goods to Siva worth Rs. 5,000 for credit
11th Bought goods from Ganesh Rs.10,000
15th Paid Internet charges Rs. 500
18th Cash deposited into State Bank Rs. 10,000
20th Received Cheque from Siva Rs. 5,000
22nd Goods withdrawn for personal use worth Rs. 2,000
28th Issued cheque to Ganesh Rs. 10,000
30th Paid Rent Rs. 2,000
30th Paid Salaries Rs. 5,000
30th Withdrew from bank for personal use 5,000

Journal Entries in the books of Mr. Venkat as on 30-07-2017

Date	Particulars	L/F	Debit Amount Rs.	Credit Amount Rs.
June, 2017 1st	Cash A/c Dr To Capital A/c (Being Cash Brought in to start the business)		1,00,000	1,00,000
2	Furniture A/c Dr To Cash A/c (Being Furniture purchased for cash)		5,000	5,000
3	Purchase A/c Dr To Cash A/c (Being Goods purchased for cash)		20,000	20,000
4	Cash A/c Dr To Sales A/c (Being Goods sold for cash)		15,000	15,000
5	Computer A/c Dr To Cash A/c (Being Computer purchased for cash)		30,000	30,000
10	Siva A/c Dr To Sales A/c (Being sold goods to siva for credit)		5,000	5,000
11	Purchase A/c Dr To Ganesh A/c (Being Goods purchased from Ganesh for credit)		10,000	10,000
15	Internet Charges A/c Dr		500	

	To Cash A/c (Being Internet Charges paid)			500
18	State Bank A/c Dr To Cash A/c (Being Cash Deposited at bank)		10,000	10,000
20	Bank A/c Dr To Siva A/c (Being cheque received from siva)		5,000	5,000
22	Drawings A/c Dr To Purchase A/c (or) Goods A/c (Being Goods withdrawn for personal use)		2,000	2,000
28	Ganesh A/c Dr To Bank A/c (Being paid to Ganesh through cheque)		10,000	10,000
30	Rent A/c Dr To Cash A/c (Being Rent paid)		2,000	2,000
30	Salaries A/c Dr To Cash A/c (Being salaries paid)		5,000	5,000
30	Drawings A/c Dr To Bank A/c (Being cash withdrawn from bank for personal use)		5,000	5,000

Note: The purchases and Sales against persons will be treated as credit if the transaction is not mentioned as cash.

Illustration 2:

Jounalise the following transactions in the books of Mr. Ganesh

2017 Dec

1 Started business with cash Rs. 80,000 and Furniture Rs. 10,000
3 Goods purchased from Syamala 10,000
8 Goods purchased from Hasini for cash 3,000
10 Goods Sold to Mukharji 2,000 for cash
12 Cash deposited in to bank 40,000
15 Cash with drawn from bank for personal use 5,000
18 Cheque collected from mukharji worth Rs. 10,000
19 Commission paid by cheque Rs. 500
22 Cash with drawn from bank for office use Rs. 1,500
24 Commission received Rs. 1,000
30 Rent paid by cheque Rs. 1,000

Journal Entries in the books of Ganesh as on 31-12-2017

Date	Particulars	L/F	Debit Amount Rs.	Credit Amount Rs.
Dec, 2017 1st	Cash A/c Dr Furniture A/c Dr To Capital A/c (Being Cash and Furniture Brought in to start the business)		80,000 10,000	 90,000
3	Purchases A/c Dr To Syamala A/c (Being goods purchased from syamala for credit)		10,000	10,000
8	Purchase A/c Dr To Cash A/c (Being Goods purchased for cash)		3,000	3,000
10	Cash A/c Dr To Sales A/c (Being Goods sold for cash)		2,000	2,000
12	Bank A/c Dr To Cash A/c (Being cash deposited at bank)		40,000	40,000
15	Drawings A/c Dr To Bank A/c (Being cash withdrawn from bank for personal use)		5,000	5,000
18	Bank A/c Dr To Mukharji A/c (Being Cheque collected from mukharji)		10,000	10,000
19	Commission A/c Dr To Bank A/c (Being commission paid paid by cheque)		500	500
22	Cash A/c Dr To Bank A/c (Being Cash Withdrawn from bank)		1,500	1,500
24	Cash A/c Dr To Commission Received A/c (Being commission received)		1,000	1,000

30	Rent A/c Dr To Bank A/c (Being rent paid to through cheque)		1,000	1,000

Illustration 3:

Jounalise the following transactions in the books of Pallavi

2016 August

1 Pallavi started business with cash 30,000
2 Purchases Rs. 2,000
3 Goods purchased from Pavani Rs. 4,000
5 Cheque received from Manikanta Rs. 10,000
8 Machinery purchased and payment made by cheque Rs. 6,000
10 Internet bill paid Rs. 500
12 Fuel charges paid Rs. 200
15 Sales Rs. 5,000
16 Received Dividend through cheque Rs. 500
17 Commission received Rs. 1,000
22 Sold goods to Manikanta Rs. 4,000
25 Additional Capital Introduced Rs. 10,000
30 Salaries paid Rs. 8,000
Rent paid Rs. 1,000

Journal Entries in the books of Pallavi as on 31-08-2016

Date	Particulars	L/F	Debit Amount Rs.	Credit Amount Rs.
Aug, 2016 1st	Cash A/c Dr To Capital A/c (Being Cash Brought to start the business)		30,000	30,000
3	Purchases A/c Dr To Cash A/c (Being goods purchased for cash)		30,000	30,000
5	Bank A/c Dr To Manikanta A/c (Being Cheque received from Manikanta)		10,000	10,000
8	Machinery A/c Dr To Bank A/c (Being Machinery purchased and payment made through cheque)		6,000	6,000
10	Internet Bill A/c Dr To Cash A/c		500	500

	(Being Internet bill paid)			
12	Fuel A/c Dr To Cash A/c (Being Fuel charges paid)		200	200
15	Cash A/c Dr To Sales A/c (Being sold goods for cash)		5,000	5,000
16	Dividend A/c Dr To Bank A/c (Being dividend received through cheque)		500	500
17	Cash A/c Dr To Commission A/c (Being commission received)		1,000	1,000
22	Manikanta A/c Dr To Sales A/c (Being sold goods to manikanata for credit)		4,000	4,000
25	Cash A/c Dr To Capital A/c (Being Additional Capital introduced by the proprietor)		10,000	10,000
30	Salaries A/c Dr To Cash A/c (Being Salaries paid)		8,000	8,000
30	Rent A/c Dr To Cash A/c (Being rent paid)		1,000	1,000

Short Answer type Questions

1. Define Journal.
2. Define Journal Entry?

Exercises

1. Jounalise the following transactions in the books of Chandra Sekhar

2015 June

1 Started business with capital Rs. 1,00,000
2 Goods purchased for cash Rs. 10,000
5 Sold goods to Venu Rs. 8,000
6 Cash deposited at bank Rs. 40,000
7 Machinery purchased worth Rs. 10,000

9 Purchased goods from Harish Rs. 5,000
10 Sold goods to Devi Rs. 8,000
15 Cartage paid Rs. 200
25 Postal Charges paid 20
30 Paid rent by cheque 1,000

2. Jounalise the following transactions in the books of Prajapathi

2014, December

1 Started business with cash Rs. 50,000
2 Opened bank account with Rs. 20,000
4 Purchased goods worth Rs. 5,000
8 Sold goods Rs. 3,000
10 Travelling expenses paid Rs. 200
11 Goods sold to Nagalakshmi Rs. 2,000
15 Cartage paid Rs. 200
16 Goods Returned by Nagalakshmi Rs. 500
18 Commission paid Rs. 1,500
20 Rent received Rs. 800
24 Cash deposited at bank Rs. 5,000
30 Rent paid Rs.750

3. Jounalise the following transactions in the books of Shanmukh

2015, January

1 Started business with cash Rs. 10,000, Furniture Rs. 3,000 and Goods Rs. 1,000
2 Sold goods to Dhanalakshmi Enterprises Rs. 1,000
4 Purchased goods from Sindhu Rs. 5,000
5 Sold goods to Pavithra Rs. 2,000
6 Cheque issued to Sindhu Rs. 4,500
8 Cash received from pavithra Rs. 2,000
10 Goods returned to Sindhu Rs. 500
12 Cartage paid Rs. 150
15 Telephone bill paid Rs. 800
20 Stationery purchased Rs. 250
23 Freights paid Rs. 100
25 Commission received Rs. 200

28 Electricity charges paid Rs. 1,000
31 Salaries paid by cheque Rs. 5,000

4. Jounalise the following transactions in the books of Pathanjali

2018, March

1 Started business with Rs. 1,00,000
2 Purchased goods Rs. 15,000
4 Sold goods to Asha Rs. 10,000
6 Purchased goods from Ravi Rs. 15,000
8 Cheque received from Asha Rs. 9,500 and allowed a discount of Rs.500
15 Computer purchased worth Rs. 35,000 and payment made by cheque.
18 Cheque issued to Ravi 13,000 and received a discount of Rs. 1,000
20 Goods returned to Ravi Rs. 1,000
21 Goods taken for domestic use Rs. 2,000
22 Cash withdrawn for personal use 2,000
23 Rent paid 2,000
30 Telephone bill paid 1,000

5. Jounalise the following transactions in the books of Shankar

2014, July

1 Commenced business with cash Rs. 2,00,000
2 Bought goods from Sulochana Rs. 25,000
3 Sold goods to Sudha Rs. 10,000
4 Cash deposited with Andhra Bank Rs. 50,000
6 Sold goods to Hasini 10,000
8 Goods returned to Sulochana Rs. 1,000
10 Sale of old news papers Rs. 200
12 Heating expenses paid Rs. 300
15 Commission Paid Rs. 450
17 Advertisement Expenses Rs. 1,000
18 Furniture purchased Rs. 2,000
19 Sold Plant & Machinery 10,000
20 Paid for sundry expenses Rs.500
21 Goods taken by Shankar domestic use Rs. 2,000
25 Commission received through cheque Rs. 1,000
31 Tea & Tiffin expenses paid Rs. 500
31 Rent paid by cheque Rs. 1,200
31 Machinery purchases Rs. 25,000

UNIT - IV
LEDGER

4.1 **Meaning**
4.2 **Ledger Posting**
4.3 **Ledger of Balancing**
4.4 **Advantages of Ledger**

4.1 Meaning

Ledger is a main book which contains all the accounts in which the transactions recorded in the books of original entry are transferred. Ledger is also called the "***Book of Secondary Entry***", because the transactions are finally incorporated in the ledger.

Ledger is a book with various accounts like Real , Personal and Nominal Accounts and each account is shown on a separate page, that gives the details of the different transactions and its summary. Ledger is a book of account containing a classified summary of every transaction recorded in journal.

According to ***L.C. CROPPER,*** the book which contains a classified and permanent record of all the transactions of a business is called Ledger.

4.2 Ledger Posting

The process of grouping of all the transactions relating to a particular account at one place is called posting. Posting helps us to know the net effect of various transactions during a given period on a particular account. It is necessary to post all the journal entries into various accounts in the ledger.

Format

Dr Name of the account Cr

Date	Particulars	J.F.	Amount Rs.	Date	Particulars	J.F.	Amount Rs.
Year Month Date	To Name of credit Account in journal		xxxxx		By Name of debit Account in journal		xxxxx

Note:

1. The words Dr. and Cr. are used to denote Debit and Credit.
2. Name of the account is mentioned between Dr. and Cr. on the top middle portion of the account.
3. Each account is divided into two parts. Left hand side part of the account is called as "Debit Side" and Right hand side of the account is called as "Credit Side".
4. Date of the transaction is recorded in the "Date" column.

5. The word 'To' is used before the account which appear on the debit side of an account and the word 'By ' is used before the account which appear on the credit side of an account in the particulars column.
6. The name of the other account which is affected by the transaction is written either on the debit side or credit side in the particulars column.
7. The page number of the corresponding journal or subsidiary book from where that particular entry is transferred is entered in the Journal Folio (J.F.) column.
8. The amount pertaining to this account is entered in the amount column.

4.3Balancing of Ledger

Balancing is the process of finding the difference between total debits and the total credits of an account. The net result of such debits and credits in an account is called balance.

The writing of the difference between the amount columns of the two sides in the ledger is called "out standing balance " or "Balance carry forward". This amount will be carry forwarded to the statement of next period. The excess of debit total over credit total is called the debit balance where as, the excess of credit total over debit total is called the credit balance.

Procedure for Balancing:
While balancing the accounts the following steps are involved

To find the balance of an account, the amount columns of both Debit side and credit side total separately and then calculate the difference of both columns.

We insert it in the lesser side of the account, with the words 'Balance carried down' in the corresponding particulars column prefixed with ' To ' or ' By '.

Total again both the amount columns put the total on both sides and draw a line above and a line below the totals.

Enter the date of the beginning of the next period in the date column and bring down the balance on the corresponding side along with the words " **To Balance b/d"** or "**By Balance b/d"** in the particulars column.

4.4 Advantages of Ledger

1. It provides the complete accounting information regarding all the transactions of the business at a glace.
2. The amount has to be paid by us to the suppliers and also the amount has to be received from the customers was easily identified.
3. With the help of Nominal Accounts in the ledger we can easily calculate the main incomes and expenditures of the business.
4. With the help of Real Accounts in the ledger we can easily calculate the net worth of the business.

5. Easy to prepare Trial Balance, Profit & Loss Account and Balance Sheet with the help of ledger balances of the business.

Short Answer type Questions

1. What is Ledger?
2. What do you mean by posting?

Long Answer Type Questions

1. Write the procedure of ledger posting.
2. Explain different types of ledgers in details.
3. Write the advantages of Ledger in detail.
4. Explain the procedure of balancing the ledger.

Illustration 1:

From the following transactions, prepare ledger accounts in the books of Bhavya.

2016 April

1	Started business with Rs. 1,00,000
2	Sold goods to Rani for credit Rs. 40,000
4	Sold goods to Mukhesh for cash Rs. 20,000
6	Purchased goods from Anand Rs. 25,000 and received discount Rs. 2,000
7	Cash received from Rani Rs.10,000
8	Commission received Rs. 1,000
9	Received cheque from Rani Rs. 17,000 and allowed a discount of Rs. 3,000
10	Purchased Machinery worth Rs. 25,000
15	Purchased goods worth Rs. 15,000
16	Purchased stationery Rs. 250
18	Received interest Rs. 1,000
20	Received dividend through cheque Rs. 500
25	Wages Rs. 4,000
28	Electricity Expenses Rs. 1,500
30	Paid salaries Rs. 2,000

Journal Entries in the books of Bhavya as on 30th April, 2016.

Date	Particulars	L/F	Debit Amount Rs.	Credit Amount Rs.
April, 2016 1st	Cash A/c Dr To Capital A/c (Being Cash Brought in to start the business)		1,00,000	1,00,000
2	Rani A/c Dr To Sales A/c		40,000	40,000

	(Being sold goods to rani for credit)			
4	Cash A/c Dr To Sales A/c (Being Goods sold for cash)		20,000	20,000
6	Puchases A/c Dr Discount A/c Dr To Anand A/c (Being Goods sold for cash and allowed discount)		25,000 2,000	27,000
7	Cash A/c Dr To Rani A/c (Being Cash received from rani)		10,000	10,000
8	Cash A/c Dr To Commission A/c (Being Commission received)		1,000	1,000
9	Bank A/c Dr Discount A/c Dr To Rani A/c (Being cheque received and discount allowed to rani)		17,000 3,000	20,000
10	Machinery A/c Dr To Cash A/c (Being Machinery purchased)		25,000	25,000
15	Purchases A/c Dr To Cash A/c (Being goods purchased for cash)		15,000	15,000
16	Stationery A/c Dr To Cash A/c (Being stationery purchased)		250	250
18	Cash A/c Dr To Interest A/c (Being Interest received)		1,000	1,000
20	Dividend A/c Dr To Bank A/c (Being dividend received)		500	500
25	Wages A/c Dr To Cash A/c (Being wages paid)		4,000	4,000
28	Electricity Expenses A/c Dr To Cash A/c (Being Electricity expenses paid)		1,500	1,500

30	Salaries A/c Dr To Cash A/c (Being salaries paid)		2,000	2,000

Dr. Cash Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2016, APRIL				2016, APRIL			
1	To Capital A/c		1,00,000	10	By Machinery Account		25,000
4	To Sales A/c		20,000	15	By Purchases A/c		15,000
7	To Rani A/c		10,000	16	By Stationery A/c		250
8	To Commission A/c		1,000	25	By Wages A/c		4,000
18	To Interest A/c		1,000	28	By Electricity Expeses A/c		1,500
				30	By Salaries A/c		2,000
				30	By Balance c / d		84,250
			1,32,000				1,32,000
1st May	To Balance b/d		84,250				

Dr. **Sales Account** Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2016, APRIL				2016, APRIL			
				2	By Rani A/c		40,000
				4	By Cash A/c		20,000
30	To Balance c / d		60,000				
			60,000				60000
				1st May	By Balance b/d		60,000

Dr. Purchases Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2016, APRIL 6	To Anand A/c		25,000	2016, APRIL 30	By Balance c / d		40,000
15	To Cash A/c		15,000				
			40,000				40,000
1st May	To Balance b/d		40,000				

Dr. Rani Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2016, APRIL 2	To Sales A/c		40,000	2016, APRIL 7	By Cash A/c		10,000
				9	By Bank A/c		17,000
				9	By Discount A/c		3,000
				30	By Balance c / d		10,000
			40,000				40,000
1st May	To Balance b/d		10,000				

Dr. Commission Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2016, APRIL				2016, APRIL 8	By Cash A/c		1,000
30	To Balance c / d		1,000				
			1,000				1000
				1st May	By Balance b/d		1,000

Dr. Capital Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2016, APRIL				2016, APRIL 1	By Cash A/c		1,00,000
30	To Balance c / d		1,00,000				
			1,00,000				1,00,000
				1st May	By Balance b/d		1,00,000

Dr. Stationery Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2016, APRIL				2016, APRIL 1	By Cash A/c		250
30	To Balance c / d		250				
			250				250
				1st May	By Balance b/d		250

Dr. Interest Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2016, APRIL				2016, APRIL 18	By Cash A/c		1,000
30	To Balance c / d		1,000				
			1,000				1000
				1st May	By Balance b/d		1,000

Dr. Wages Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2016, APRIL 25	To Cash A/c		4,000	2016, APRIL 30	By Balance c / d		4,000
			4,000				4,000
1st May	To Balance b/d		4,000				

Dr. Electricity Expenses Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2016, APRIL 28	To Cash A/c		1,500	2016, APRIL 30	By Balance c / d		1,500
			1,500				1,500
1st May	To Balance b/d		1,500				

Dr. Salaries Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2016, APRIL 30	To Cash A/c		2,000	2016, APRIL 30	By Balance c / d		2,000
			2,000				2,000
1st May	To Balance b/d		2,000				

Illustration 2:

From the following transactions, prepare ledger accounts in the books of Vaaraahi

2015 September

1	Started business with cash	Rs. 1,00,000
	Furniture	Rs. 10,000
2	Cash deposited at bank	Rs. 40,000
3	Goods purchased from Sindhu	Rs.20,000
5	Goods sold to Ram	Rs. 5,000
7	Goods returned to Sindhu	Rs. 1,000
8	Cheque issued to Sindhu	Rs. 17,800
	and received a discount of	Rs. 1,200
10	Goods sold to Anil for cash	Rs. 10,000
11	Cheque received from Ram worth	Rs. 4,000
	and allowed a discount of	Rs. 500
12	Ram returned goods worth	Rs. 500
15	Purchased machinery and payment made by cheque	Rs. 5,000
20	Cash with drawn from bank personal use	Rs. 1,000
30	Salaries paid	Rs. 3,000

Journal Entries in the books of Vaaraahi as on 30th September, 2015

Date	Particulars	L/F	Debit Amount Rs.	Credit Amount Rs.
Sept, 2015 1st	CashA/c Dr		1,00,000	
	Furniture A/c		10,000	
	To Capital A/c			1,10,000
	(Being Cash and Furniture Brought in to start the business)			
2	Bank A/c Dr		40,000	
	To Cash A/c			40,000
	(Being Cash deposited at bank)			
3	Purchases A/c Dr		20,000	
	To Sindhu A/c			20,000

	(Being Goods purchased from sindhu for credit)			
5	Ram A/c Dr		5,000	
	To Sales A/c			5,000
	(Being goods sold to ram for credit)			
7	Sindhu A/c Dr		1,000	
	To Purchase returns A/c			1,000
	(Being goods returned to sindhu)			
8	Sindhu A/c Dr			
	To Bank A/c			
	To Discount Received A/c		19,000	
	(Being payment made by cheque and discount received from sindhu)			17,800
				1,200
10	Cash A/c Dr			
	To Sales A/c			
	(Being sold goods for cash)		10,000	
				10,000
11	Bank A/c Dr			
	Discount Allowed A/c			
	To Ram A/c		4,000	
	(Being Cheque received and Discount allowed to ram)		500	
				4,500
12	Sales Returns A/c Dr			
	To Ram A/c			
	(Being goods goods returned by ram)		500	
				500
15	Machinery A/c Dr			
	To Bank A/c		5,000	
	(Being Machinery purchased and payment made by cheque)			5,000
20	Drawings A/c Dr			
	To Bank A/c		1,000	
	(Being Cash with drawn from bank for proprietor personal use)			1,000
30	Salaries A/c Dr			
	To Cash A/c		3,000	
	(Being salaries paid)			3,000

Dr. Cash Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2015, Sept 1	To Capital A/c		1,00,000	2016, Sept 2	By Bank A/c		40,000
10	To sales A/c		10,000	30	By Salaries A/c		3,000
				30	By Balance c / d		67,000
			1,10,000				1,10,000
1st Oct	To Balance b/d		67,000				

Dr. Capital Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2015, Sept				2016, Sept 1	By Cash A/c		1,000,000
				1	By Furniture A/c		10,000
30	By Balance c / d		1,10,000				
			1,10,000				1,10,000
				1st Oct	By Balance b/d		1,10,000

Dr. Purchases Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2015, Sept 3	To Sindhu A/c		20,000	2016, Sept 30	By Balance c / d		20,000
			20,000				20,000
1st Oct	To Balance b/d		20,000				

Dr. Sales Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2015, Sept				2016, Sept 5	By Ram A/c		5,000
				10	By Cash A/c		10,000
30	To Balance c / d		15,000				
			15,000				15,000
				1st Oct	By Balance b/d		15,000

Dr. Purchase Returns Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2015, Sept				2016, Sept 7	By Sindhu A/c		1,000
30	To Balance c / d		1,000				
			1,000				1,000
				1st Oct	By Balance b/d		1,000

Dr. Sales Returns Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2015, Sept	To Ram A/c		500	2016, Sept			
				30	By Balance c / d		500
			500				500
1st Oct	To Balance b/d		500				

Dr. Sindhu Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2015, Sept 7	To Purchase Returns A/c		1,000	2016, Sept 3	By Purchases A/c		20,000
	To Bank A/c		17,800				
	To Discount received A/c		1,200				
			20,000				20,000

Dr. Drawings Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2015, Sept 20	To Bank A/c		1,000	2016, Sept 30	By Balance c / d		1,000
			1,000				1,000
1st Oct	By Balance b/d		1,000				

Dr. Machinery Account Cr.

Date	Particulars	J.F.	AMOUNT RS.	Date	Particulars	J.F.	AMOUNT RS.
2015, Sept 15	To Bank A/c		5,000	2016, Sept 30	By Balance c / d		5,000
			5,000				5,000
1st Oct	To Balance b/d		5,000				

Exercises

1. Write the journal entries and prepare proper ledger accounts from the following transactions.

2014 March

1	Goods sold to syamala	Rs. 14,000
2	Symala returned goods worth	Rs. 500
10	Received cash from Syamala	Rs. 10,000
14	Goods purchased from Ganesh & co	Rs. 16,000
16	Goods purchased for cash	Rs. 2,000
31	Cash paid to Ganesh & Co	Rs. 4,000

2. Write the journal entries and prepare proper ledger accounts from the following transactions.

2015 January

1	Ramarao started business with Cash	Rs. 40,000
5	Cash purchases from Amalesh	Rs. 10,000
6	Sold goods to Ramsingh	Rs. 5,000
8	Paid Wages	Rs. 1,000
16	Cash received from Ramsingh	Rs. 3,500
21	Furniture purchased and paid cash	Rs. 2,500

30	Received Commission	Rs. 500
30	Sold goods for cash	Rs. 4,000
30	Rent	Rs. 300

3. Prepare M/s Narasalakshmi account from the following

2014 March

1	Goods purchased from Narasalakshmi	Rs. 28,000
6	Cash paid to Narasa lakshmi	Rs. 5,000
8	Goods returned to Narasa lakshmi	Rs. 1,000
15	Paid to Narasa Lakshmi by Cheque	Rs. 10,000
18	Discount allowed by Narasa Lakshmi	Rs. 5,000
22	Goods purchased from Narasa Lakshmi for cash	Rs. 10,000
25	Discount given by Narasa Lakshmi	Rs. 1,000

4. Journalise the following transactions and post in the proper Ledger Accounts.

2011 April

1	Suman Started business with capital	Rs. 65,000
4	Goods purchased for cash	Rs. 16,000
5	Goods purchased from Hanoku	Rs. 6,000
9	Cash deposited at bank	Rs. 5,000
11	Goods sold to Gangadhar	Rs. 9,000
19	Cash paid to Hanoku	Rs. 2,000
24	Cash received from Gangadhar	Rs. 1,000
30	Salaries Paid	Rs. 15,000

5. Prepare Furniture account from the following Transactions

2012 June

1	Furniture purchased from J & P	Rs. 40,000
10	Goods purchased from Amaravathi furniture for cash	Rs. 5,000
14	Cash paid to J & P	Rs. 20,000
16	Sold old furniture worth Rs. 8,000 for Rs. 5,000	
30	Depreciation on furniture	Rs. 6,000
30	Goods purchased from Rajesh	Rs. 4,000

UNIT - V
SUBSIDIARY BOOKS

5.1 **Meaning and Significance**
5.2 **Different types of Subsidiary Books**
5.3 **Purchase Book**
5.4 **Sales Book**
5.5 **Purchase Return Book**
5.6 **Sales Return Book**
5.7 **Bills Receivable Book**
5.8 **Bills Payable Book**
5.9 **Treatment of Trade Discount**

5.1 Meaning and Significance

Due to the large number of transactions in big organizations it is difficult to maintain all transactions in one book. Hence, there is a need to sub divide journal into special journals. Each journal is meant for recording the transactions of separate category and of repetitive nature. These special journals are called '***Subsidiary Books***'.

5.2 Different types of Subsidiary Books

There are 8 types of subsidiary books used for different purposes. Those are:

1. Purchase Book
2. Purchase Returns Book
3. Sales Book
4. Sales Returns Book
5. Cash Book
6. Bills Receivable Book
7. Bills Payable Book
8. Journal Proper

5.3 Purchase Book

Goods purchased on credit are recorded in this book. The cash purchases of goods and Purchase of Assets (Furniture, Machinery etc.) are not recorded. The invoice or bills received from the supplier by the firm are the source documents for recording entries in this book.

Invoice: Invoice is a document received by the trader from the supplier along with the goods by stating that, the goods are supplied as per the order along with the price, discount offered, and other terms and conditions. This document is called as "Inward Invoice".

Purchase Book contains five columns. Those are Date, Particulars, Invoice No. , L.F.No and Amount.

1. Transaction Date is to be recorded in the Date column.
2. Name and address of the creditor is to be recorded in the particulars column.
3. Serial Number of the Invoice is to be recorded in the Invoice column.
4. Page Number of Creditor A/c is to be recorded in the L.F. Column.

5. Net Amount should be recorded in the Amount column.

Purchase Book

Date	Particulars	Inward Invoice No.	L.F.No	Amount Rs.

5.4 Purchase Returns Book

The goods returned to the supplier purchased on credit are recorded in this book. As the goods are going out from the firm, this book is also called as '***Returns Outward Book***". For every return a Debit Note is prepared and is sent to the supplier. Each debit note is serially numbered and dated.

Debit Note: Debit note is the document sent to the supplier while returning the goods purchased on credit from him, intimating that his account is debited to the extent of goods returned and the reasons for returning them. The debit note contains Name and Address of the supplier, the value of the goods returned, the value of the goods purchased, reasons for return of goods.

Purchase Returns Book contains five columns. Those are Date, Particulars, Debit Note No., L.F.No and Amount.

1. Date of goods returned is to be recorded in the Date column.
2. Name and address to whom the goods are returned is to be recorded in the particulars column.
3. Debit Note Number is to be recorded in the Invoice column.
4. Page Number of Creditor A/c is to be recorded in the L.F. Column.
5. Net value of the goods returned is recorded in the Amount column.

Purchases Returns Book

Date	Particulars	Debit Note No.	L.F.No	Amount Rs.

5.5 Sales Book

The goods sold on credit are recorded in this book. The cash sales of goods and Sale of Assets (Furniture, Machinery etc.) are not recorded. The Outward invoice or bills prepared by the trader are the source documents for recording entries in this book. Sales book also called as '***Sales Day book or Sales Journal***'.

If the trader sell goods on credit, an invoice is given to the buyer. The proforma of this outward Invoice resembles the Proforma of Inward Invoice. This is prepared with a duplicate copy, one copy is sent to the customer and the second copy is kept by trader. In some cases it may be prepared in triplicate for giving a copy to the transporter. Ex. In GST Outward supply

(Sale) bills must be in triplicate. The credit sale transactions are recorded in sales book on the basis of duplicate invoice copy.

Sales Book contains five columns. Those are Date, Particulars, Invoice No. , L.F.No and Amount.

1. Transaction Date is to be recorded in the Date column.
2. Name and address of the Debtor is to be recorded in the particulars column.
3. Serial Number of the Invoice is to be recorded in the Invoice column.
4. Page Number of Debtor A/c is to be recorded in the L.F. Column.
5. Net Amount has to be recorded in the Amount column.

Sales Book

Date	Particulars	outward Invoice No.	L.F.No	Amount Rs.

5.6 Sales Returns Book

The goods returned by the customers sold for credit are recorded in this book. As the goods are coming into the firm, this book is also called as "***Returns Inward Book***". On receipt of goods from the customer, credit note is prepared and serially numbered and dated.

Credit Note: It is a document (note) prepared and sent to the customer to inform that his account is credited with the amount of goods returned by him. It is a common practice to make it in red ink.

Sales Returns Book contains five columns. Those are Date, Particulars, Credit Note No., L.F.No and Amount.

1. Date of goods returned by the customer is to be recorded in the Date column.
2. Name and address to whom the goods are returned is to be recorded in the particulars column.
3. Credit Note Number is to be recorded in the Invoice column.
4. Page Number of the Debtor A/c is to be recorded in the L.F. Column.
5. Net value of the goods returned is recorded in the Amount column.

Sales Returns Book

Date	Particulars	Credit Note No.	L.F. No	Amount Rs.

5.7 Cash Book

In this book, all the transactions relating to cash receipts and cash payments are recorded. It starts with the cash or bank balance at the beginning of the period. It gives the closing balance at the end of the period. It is the only subsidiary book which acts as both Journal and Ledger.

5.8 Bills Receivable Book

A trader draws bills on the debtors for the amount due from them, such bills drawn by the traders and duly accepted by the debtors are called '***Bills receivable'***. The amount on bills to be received is entered in bill receivable book. This book contains the details of the bill date, acceptor's name, amount, term, place of payment etc.

Bills Receivable Book

No. Of Bill	Date Received	Date of bill	From whom received	Drawer	Acceptor	Where payable	Term	Due date	Ledger Folio	Amount	Cash book folio	Remarks

5.9 Bills Payable Book

Every business organisation accepts the bills to the creditors, like wholesalers or manufacturers for the purchase of goods on credit. Such bills drawn by creditors and accepted by traders are called bills payable and they are recorded in a separate book called ***'Bills Payable Book'***.

Bills Payable Book

No. of bill	Date of bill	To whom given	Drawer	Payee	Where payable	Term	Due date	Ledger Folio	Amount paid	Date of Payment	Cash Book Folio	Remarks

5.10 Journal Proper

This book is maintained to record transactions, which do not find place in other seven Subsidiary Books. The Journal Proper also known as '***Journal Residual*** '. The format of Journal Proper is similar to the ordinary journal.

5.11 Treatment of Trade Discount

Trade Discount: The rebate offered by the supplier on the catalogue price is known as trade discount. After deducting the trade discount from the purchase price, the only net amount is to be recorded in the books, if the discount is given by the trader.

Short Answer type Questions

1. Define Invoice.
2. What is Debit Note?
3. What is Credit Note?
4. Define Journal Proper .
5. What is Trade Discount?

Long Answer Type Questions

1. Explain different types of Subsidiary Books in detail.

Illustration : 1

Enter the following transactions in the proper subsidiary books

2012 March

1	Goods purchased from Kalyani	Rs. 14,000
6	Goods sold to Jitendra	Rs. 9,000
9	Goods purchased from Lakshmi	Rs. 7,000
14	Goods purchased from Durga & Co	Rs. 6,000
15	Jitendra returned goods worth	Rs. 2,000
17	Goods returned to Lakshmi	Rs. 500

Purchases Book

Date	Particulars	Inward Invoice No.	L.F.No	Amount Rs.
2012 March				
1	Kalyani			14,000
9	Lakshmi			7,000
14	Durga & Co			6,000
	Debited to Purchase Account			28,000

Sales Book

Date	Particulars	outward Invoice No.	L.F.No	Amount Rs.
2012 March				
6	Jitendra			6,000
	Credited to Sales Account			6,000

Sales Returns Book

Date	Particulars	Credit Note No.	L.F. No	Amount Rs.
2012 March				
15	Jitendra			2,000
	Debited to sales returns account			2,000

Purchases Returns Book

Date	Particulars	Debit Note	L.F.No	Amount

		No.		Rs.
2012 March 17	Lakshmi			500
	Credited to Purchase Returns account			500

Illustration 2

2010 January

1	Goods purchased from Nagalakshmi & Co	Rs. 1,000
5	Goods sold by Varaprasad	Rs. 2,500
14	Goods purchased from Sridevi	Rs. 4,000
15	Goods returned to Varaprasad	Rs. 600
18	Goods sold to Hema	Rs. 5,000
20	Goods sold to Mahesh	Rs. 1,500
22	Goods sold to BVS &Co	Rs. 2,000
26	Goods returned to Sridevi	Rs. 700
28	Hema returned goods worth	Rs. 500
31	Goods returned by Mahesh	Rs. 400

Purchases Book

Date	Particulars	Inward Invoice No.	L.F.No	Amount Rs.
2010, Jan				
1	Naga Lakshmi & Co			1,000
5	Varaprasad			2,500
14	Sridevi			4,000
	Debited to Purchase Account			7,500

Sales Book

Date	Particulars	outward Invoice No.	L.F.No	Amount Rs.
2010, Jan				
18	Hema			5,000
20	Mahesh			1,500
22	BVS &Co			2,000
	Credited to Sales Account			8,500

Sales Returns Book

Date	Particulars	Credit	L.F.	Amount

		Note No.	No	Rs.
2010, Jan				
28	Hema			500
31	Mahesh			400
	Debited to sales returns account			900

Purchases Returns Book

Date	Particulars	Debit Note No.	L.F.No	Amount Rs.
2010, Jan				
15	Varaprasad			600
26	Sridevi			700
	Credited to Purchase Returns account			1,300

Illustration 3:

Venusri started business on 1st Jan, 2017 with assets: cash Rs. 18,000, Stock Rs. 10,000, Furniture Rs. 24,000, Machinery Rs.10,000 and Creditors Rs. 3,500 and Bank Over draft Rs.2,500 pass opening entry.

Journal Proper

Date	Particulars		L.F.No.	Debit Rs.	Credit Rs.
2017 Jan 1st	Cash A/c	Dr		18,000	
	Stock A/c	Dr		10,000	
	Furniture A/c	Dr		24,000	
	Machinery A/c	Dr		10,000	
	To Creditors A/c				3,500
	To Bank Over Draft				2,500
	To Capital Account				56,000
	(Being the opening entry for the above assets and liabilities)				

Note : In the above entry, four assets are debited with their values and liabilities are credited with their values. The difference between the assets and liabilities is credited to capital account.

Total Assets	18,000+10,000+24,000+10,000	=	62,000
Total Liabilities	3,500+2,500	=	6,000
	Capital	=	56,000

Illustration 4:

Write the opening entry as on 1-4-2016 from the following in the books of Mrudula

Balance sheet of Mrudula on 31st March 2016

Liabilities	Amount Rs.	Assets	Amount Rs.
Sundry Creditors	25,000	Cash	15,000
Bills Payable	10,000	Sundry Debtors	20,000
Capital	45,000	Stock	15,000
		Machinery	30,000
	80,000		80,000

Journal Proper

Date	Particulars	L.F.No.	Debit Rs.	Credit Rs.
2016, April 1	Cash A/c Dr		15,000	
	Stock A/c Dr		15,000	
	Sundry Debitors A/c Dr		20,000	
	Stock A/c Dr		30,000	
	Machinery A/c Dr			
	To Sundry Creditors A/c			25,000
	To Bills Payable A/c			10,000
	To Capital A/c			45,000
	(Being the balance of the previous year brought to the current year)			

Exercises

1. Enter the following transactions in the proper subsidiary books

2014 March

1	Goods purchased from Mounika	Rs. 14,000
2	Sold goods to Ramachandra	Rs. 9,000
9	Goods purchased from Santhi	Rs. 7,000
14	Goods purchased from Bhagyalakshmi & Co	Rs. 6,000
15	Goods returned by Ramachandra	Rs. 2,000
17	Goods returned to Santhi	Rs. 500

2. Enter the following transactions in the proper subsidiary books

2011 August

1	Goods sold to Asha	Rs. 40,000
7	Goods purchased from Balu	Rs. 16,000
9	Goods Purchased from Saikrishna	Rs. 5,000
14	Goods returned to Balu	Rs. 2,000
23	Asha returned goods	Rs. 250
29	Goods returned to Saikrishna	Rs. 100

3. Prepare proper subsidiary books for the following transactions

2012 December

1	Goods Sold to Prasad	Rs. 15,000
3	Goods Purchased from Kalyanai	Rs. 10,000

5	Purchased goods from Hema	Rs. 5,000
10	Sold goods to Teja	Rs. 5,000
13	Sold goods to Sireesha Traders	Rs. 3,000
18	Goods returned by Prasad	Rs. 2,000
20	Goods returned to Kalyani	Rs. 1,000
22	Goods returned to Hema	Rs. 500
25	Goods returned by Teja	Rs. 200

4. Enter the following transactions in the proper subsidiary books

2013 July

1 Goods Purchased from Govind Rs. 20,000
3 Goods Sold by Vinay Rs. 10,000
5 Goods Purchased from Chaitanya Rs. 5,000
6 Goods sold to Vijaya for cash Rs. 11,500
8 Goods returned to Vinay Rs. 500
10 Goods Returned to Govind Rs. 2,000
14 Goods Purchased from Baby for cash Rs. 1,000
16 Sold goods to Vasantha Rs. 15,000
18 Sold goods to SRK Industries Rs. 7,000
22 SRK Industries returned goods Rs. 700

5. Enter the following transactions in the proper subsidiary books

2017 August

1 Goods purchased from Nageswari 10,000
3 Goods sold by KNLProjects Rs.5,000
7 Goods sold to Veera Industries Rs. 8,000
9 Goods sold to Phaneendra Rs. 2,000
12 Goods sold to Jagadeeswari Pharma Rs. 10,000
18 Returned goods to Nageswarri 1,000
20 Goods returned by Veera Industries Rs. 300
22 Goods returned to KNL Projects Rs. 250
23 Goods sold to Sudha Foods Rs. 2,000
24 Goods returned by Jagadeeswari Pharma Rs. 500
24 Goods returned by Sudha Foods Rs. 200

6. Balasai & Associates started business with Cash Rs. 1,00,000, Furniture Rs. 20,000, Fixtures Rs. 2,000, Machinery Rs. 20,000

UNIT - VI
CASH BOOK

6.1 Meaning and Significance of Cash Book

Cash book is a very popular subsidiary book maintained by all business organizations irrespective of their nature, as big or small. All the cash transactions of a business are primarily recorded in cash book. Business transactions are mainly two types 1. Cash Transactions 2. Credit Transactions. Cash transactions involve cash receipts and cash payments. If the number of transactions related to cash is large, it is necessary to maintain a subsidiary (separate) book for recording cash receipts and cash payments. Cash book records all the cash receipts and cash payments and gives the balance of cash in the business at any time.

Cash receipts are recorded on the Debit side and cash payments are recorded on the Credit side of the Cash Book. The principle of Real Account is applied to this. The difference between Debit total and Credit total reveals the balance of cash. Cash book always shows Debit balance, because a business unit cannot pay more than its receipts.

6.2 Features of Cash Book

1. Cash book is a subsidiary book.
2. It records all cash transactions.
3. Cash book acts as Cash Account, preparation of a separate cash A/c in ledger is not required.
4. It gives the Cash and Bank balance of a business at any given period.
5. Mistakes or Frauds can be detected by verifying the closing balance of cash book with the actual amount of cash in hand.
6. It records cash receipts on the debit side and cash payments on the credit side.

Cash book will show Debit Balance only.

6.3Kinds of Cash Books

There are different kinds of cash books maintained by the business organisation depending on the size of business. Those are

1. Simple Cash Book (or) Single Column Cash Book
2. Double Column Cash Book
3. Triple Column Cash Book

4. Petty Cash Book

6.4Simple Cash Book (or) Single Column Cash Book

Simple Cash Book (or) Single column cash book records all cash transactions of the business in a chronological order. Cash receipts are to be debited and cash payments are to be credited. We can ascertain the balance like other accounts, after entering all the transactions. The format of single column cash book is as follows.

Dr. **Simple Cash Book (or) Single Column Cash Book** **Cr.**

Date	Particulars	L.F.	Amount Rs.	Date	Particulars	L.F.	Amount Rs.

Simple Cash Book (or) Cash Book contains four columns in both Debit and Credit sides. Those are Date, Particulars, L.F.No and Amount.

1. Date on which cash received is to be recorded in the debit side Date column and Date on which cash payment is made is to be recorded in the credit side Date Column.
2. Name of the account from whom cash received is to be recorded in the debit side particulars column and name of the account to whom cash paid is to be recorded in the credit side particulars column.
3. Page Number of the Ledger A/c is to be recorded in the L.F. Column.
4. Amount of transaction is recorded in the Amount column.

Illustration – 1

2017 January

1	Samitha started business with cash	Rs.80,000
4	Purchases	Rs. 20,000
6	Cash deposited at Bank	Rs. 30,000
8	Sales	Rs. 14,000
10	Purchased goods from Harshitha for cash	Rs. 5,000
14	Manager salary	Rs. 12,500
16	Office expenses	Rs. 2,500
17	Stationery Purchses	Rs. 350
21	Sale of old newspapers	Rs. 90
23	Drawings	Rs. 5,000
25	Rent paid	Rs. 2,800
29	Interest Received	Rs. 1,250
31	Travelling expenses paid	Rs. 1,150

Dr. **Simple Cash Book** **Cr.**

Date	Particulars	L.F.	Amount	Date	Particulars	L.F.	Amount
2017 January 1	To Capital A/c		80,000	2017 January 4	By Purchases A/c		20,000
8	To Sales A/c		14,000	6	By Bank A/c		30,000
21	To Old News papers A/c		90	10	By Purchases A/c		5,000
29	To Interest A/c		1,250	14	By Salaries A/c		12,500
				16	By Office expenses A/c		2,500
				17	By Stationery A/c		450
				23	By Drawings A/c		5,000
				25	By Rent A/c		2,800
				31	By Travelling Expenses A/c		1,150
				31	By Balance c/d		15,940
			95,340				95,340
Feb, 1	To Balance b/d		15,940				

Illustration – 2

Enter the following transactions in single column cash book of Sri hitha

2012 December,

1	Opening Balance	Rs. 20,000
4	Received from Sivanandam	Rs. 4,000
8	Paid to Krishna	Rs. 1,000
16	Goods sold for cash	Rs. 1,600
19	Received from Saroja for the full settlement of his account	Rs. 1,710
28	Goods purchased for cash	Rs. 1,600
31	Paid salaries	Rs. 1,140
31	Rent Paid	Rs. 1,000

Dr. **Simple Cash Book** **Cr**

Date	Particulars	L.F.	Amount	Date	Particulars	L.F.	Amount
2012 Dec 1	To Opening Balance		20,000	2012 Dec 8	By Krishna A/c		1,000
4	To Sivanandam A/c		4,000	28	By Purchases A/c		1,600
16	To Sales A/c		1,600	31	By Salaries A/c		1,140
19	To Saroja A/c		1,710	31	By Rent A/c		1,000
				31	By Balance c/d		22,570
			27,310				27,310
2013 Jan 1	To Balance b/d		22,570				

6.4 Double column Cash Book (or) Two Column Cash Book

This cash book is an extension of Single Column Cash Book. In double column cash book, an additional column is provided for the discount. On the debit sided discount allowed column and on the credit side discount received column is provided along with cash column. There are two columns for amount on each side of the cash book. One is for cash or bank and the other is for Discount. This cash book also called as Two Column Cash Book.

Discount: Discount is an incentive given by the creditor to debtor for prompt payment. Discount is of two types. Those are 1) Trade Discount 2) Cash Discount

Trade Discount: The discount given by the seller to buyer is known as "***Trade Discount***". This discount is deducted from the Catalogue price in shown in the invoice and the account is prepared by taking net amount. The trade discount should not be recorded in the books of accounts.

Cash Discount: The discount for prompt or early payment is called cash discount. There are two types in Cash Discount. Those are 1)***Discount Allowed*** 2) ***Discount Received***.

The Double column Cash Book is again classified into Two types those are

1. Cash book with Cash and Discount Columns
2. Cash book with Bank and Discount Columns

6.4.1 Cash book with Cash and Discount Columns

If any business having only Cash Receipts and Cash Payments, the cash book with Cash and discount columns is used. The cash receipts are entered on the debit side, where as cash payments are entered on the credit side. In this book, cash columns are balanced like the other ledger accounts but discount columns are not balanced. The proforma of Cash and discount column cash book is as follows.

Dr **Cash and Discount column cash book** **Cr**

Date	Particulars	L.F. No	Discount Allowed	Amount Rs.	Date	Particulars	L.F. No	Discount Received	Amount Rs.

6.4.2 Cash book with Bank and Discount Columns

Many business organizations carry their transactions in the form of Cheques, NEFT, RTGS etc through banks. The receipt of cheques, NEFT, RTGS etc are mentioned in the bank column of cash book. Instead of cash column, bank column is provided in this cash book in both debit and credit sides. The bank columns are balanced to identify the bank balance. The proforma of Bank and discount column cash book is as follows.

Dr **Bank and Discount column cash book** **Cr**

Date	Particulars	L.F. No	Discount Allowed	Bank Rs.	Date	Particulars	L.F. No	Discount Received	Bank Rs.

Illustration – 3

Prepare two column cash book from the following transactions

2018 January

1	Opening Balance	Rs. 2,00,000
6	Payment made to Kameswari	Rs. 6,700
	Discount received	Rs. 300
8	Goods purchased for cash	Rs. 10,000
10	Sales	Rs. 14,000
23	Cash received from Kella & co.,	Rs. 19,800
	Discount allowed	Rs. 700
31	Salaries paid	Rs. 1,300
31	Cash received from SNL Pioneer Projects	Rs. 6,300
	Discount allowed	Rs. 200
31	Paid Rent	Rs. 1,000

Dr. Cash and Discount column Cash Book Cr.

Date	Particulars	L.F. No	Discount Allowed	Amount Rs.	Date	Particulars	L.F. No	Discount Received	Amount Rs.
2018					2018				
Jan 1	To Balance b/d			200,000	Jan 6	By Kameswari A/c		300	6,700
10	To Sales A/c			14,000	8	By Purchases A/c			10,000
23	To Kella &Co A/c		700	19,800	31	By Salaries A/c			1,300
31	To SNL Pioneer Projects A/c		200	6,300	31	By Rent A/c			1,000
					31	By Balance c/d			221100
			900	240100				300	240100
Feb-01	By Balance b/d		221100						

Illustration – 4

Prepare Bank and discount column cash book in the books of Sri Sivananda Enterprises

2015 October

1	Bank Balance	Rs. 9,000
4	Cheque issued to Kotak Mahindra	Rs. 1,000
7	Cheque received from Sastry	Rs. 3,000
11	NEFT made to Adibabu	Rs. 1,300
	Discount received	Rs. 200
14	Salaries paid by cheque	Rs. 1,200
19	RTGS made to Kumar traders	Rs. 750
	Discount received	Rs. 250
24	Cheque received from Lakshman	Rs. 1,200
	Discount allowed	Rs. 300
27	Office rent paid by cheque	Rs. 600
30	Cheque received from Sankar	Rs. 800

Discount allowed Rs. 200

Dr. Bank and Discount column Cash Book of Sri Sivananda Enterprises Cr.

Date	Particulars	L.F. No	Discount Allowed	Bank Rs.	Date	Particulars	L.F. No	Discount Received	Bank Rs.
2015 Oct 1	To Opening Balance			90,000	2015 Oct 4	By Kotak Mahindra A/c			10,000
7	To Sastry A/c			30,000	11	By Adibabu A/c		200	10,300
24	To Lakshman A/c		300	10,200	14	By Salaries A/c			12,000
30	To Sankar A/c		200	8,000	19	By Kumar Traders A/c		500	7,500
					27	By Office Rent A/c			600
					31	By Balance c/d			97,800
			500	1,38,200				700	1,38,200
Feb-01	By Balance b/d		97,800						

6.5 Three Column Cash Book

In addition to the Date, Particulars, L.F. No., Discount and Amount columns in the double column cash book, the triple column cash book contains bank column. It contains three columns for amount on both debit and credit sides. This book also called or known as Cash book with Cash, Bank and Discount columns.

- It records both cash and bank transactions.
- It records the transactions which affects both cash and bank at a time with the help of contra entry.

Contra Entry: An entry which appears on both sides of the Three column cash book i.e., Debit side as well as Credit side is called "***Contra Entry***". It affects both the bank and the cash columns at a time on both sides of the cash book. The contra entries represents by writing alphabet **"C"** in L.F. column on each side of the cash book.

The contra entries are recorded in the following cases

a) When cash is deposited into bank.
b) When cash is withdrawn from bank for office use.
c) When an account is opened with bank.
d) When a cheque received from others on one day and deposited in the bank on another day.

The proforma of Three column cash book is as follows.

Dr. Three column cash book Cr.

Date	Particulars	L.F. No	Discount Allowed	Amount Rs.	Bank Rs.	Date	Particulars	L.F. No	Discount Received	Amount Rs.	Bank Rs.

Illustration – 5

Prepare three column cash book for the following transaction in the books Vaarahi

2018 January

1	Capital Introduced	Rs. 1,00,000
3	Deposited at bank	Rs. 45,000
4	Goods purchased for cash	Rs. 2,550
5	Cash received from Prasad	Rs. 6,700
	Discount Allowed	Rs. 300
7	Cash paid to Devi	Rs. 6,800
	Discount received	Rs. 200
11	Cheque issued to Sailaja	Rs. 10,000
19	Cheque received from Srinivas	Rs. 40,000
20	Srinivas cheque deposited at bank	
26	Cash with drawn from bank for office use	Rs. 15,000
30	Sold goods for cash	Rs. 21,600
31	Salaries paid through cheque	Rs. 18,000
31	Deposited at bank	Rs. 12,000
31	Rent paid	Rs. 1,400

Dr. **Cash book with Discount, Cash and Bank Columns** Cr.

Date	Particulars	L.F. No	Discount Allowed	Amount Rs.	Bank Rs.	Date	Particulars	L.F. No	Discount Received	Amount Rs.	Bank Rs.
2018 Jan 1	To Capital A/c			1,00,000		2018 Jan 3	By Bank A/c	C		45,000	
3	To Cash A/c	C			45,000	4	By Purchase A/c			2,550	
5	To Prasad A/c		300	6,700		7	By Devi A/c		200	6,800	
19	To Srinivas A/c			40,000		11	By Sailaja A/c				10,000
20	To Cash A/c	C			40,000	20	By Bank A/c	C		40,000	
26	To Bank a/c	C		15,000		26	By Cash A/c	C			15,000
30	To Sales A/c			21,600		31	By Salaries A/c				18,000
31	To Cash A/c	C			12,000	31	By Bank A/c	C		12,000	
						31	By Rent A/c			1,400	
						31	By Balance c/d			75,550	54,000
			300	1,83,300	97,000				200	1,83,300	97,000
Feb-01	By Balance b/d			75,550	54,000						

6.6 Analytical Petty Cash Book

Due to a large number of Petty expenses or petty payments such as cartage, travelling, postage, refreshments, stationery and other expenses, it is difficult to record all such payments in regular books of accounts. To record all such payments of repetitive nature, a separate cash book is prepared which is called petty cash book.

Generally petty cash book is prepared in column wise. It means details of expenses are shown in an analytical manner. The amount of every expense is entered in total amount column and also in a separate column allotted to the respective expense. This helps to know the total amount incurred for petty expenses and also the amount incurred on each head of expense.

In this system the estimated petty amount for petty expenses is determined and handed over to the petty cashier in advance. If, all petty expenses are paid and total of such expenses paid is re – advanced to petty cashier. It follows imprest system.

Illustration 6
Prepare analytical cash book for the following details

2011	January		
	1	Advance received from head cashier	Rs. 500
	2	Travellings	Rs. 15
	8	Postal Stamps Puchased	Rs. 25
	10	Stationary Purchased	Rs. 30
	12	Carriage paid	Rs. 20
	16	Courier Charges	Rs. 27
	19	Tea & Tiffins	Rs. 15
	23	Telegram Expenses	Rs. 22
	24	Auto charges	Rs. 20
	25	Paid to Sankar	Rs. 15
	30	Pen purchased	Rs. 10

Dr. Analytical Petty cash book Cr.

Cash Received	L.F.NO	Date	Particulars	Voucher No	Total payment Rs.	Analysis of Payment								Remarks
						Travellings Rs.	Postage Rs.	Telegram Rs.	Printing & Stationery Rs.	Carriage Rs.	Refreshments Rs.	Sundries Rs.	Mislenious Rs.	
500		2011 JAN 1	To Cash											
		2	By Travellings		15	15								
		8	By Postal Stamps		25		25							
		10	By Stationery		30				30					
		12	By Carriage		20					20				
		16	By Courier Charges		27		27							
		19	By Tea & Tiffins		15						15			
		23	By Teligram		22		22							
		24	By Auto Charges		20	20								
		25	By Sankar		15							15		
		30	By Pen		10				10					
					199									
		31	By Balance c/d		301									
500					500	35	74	0	40	20	15	15	0	
		Feb-01	To Balance b/d		301									

Short Answer type Questions

1. What is Cash book? Write different types of Cash books.
2. Define Trade Discount and Trade Discount.
3. Define Contra Entry.
4. Define Analytical Petty cash book.

Long Answer Type Questions

1. Explain different types of cash books in detail.

Abbreviations

NEFT: **National Electronic Fund Transfer**
RTGS: **Real Time Gross Settlement**
IMPS: **Immediate Payment System**

Exercises

1. **Prepare Simple cash book from the following transactions.**

2011 January

1	Opening balance	Rs.	20,000
2	Received from Badrinath	Rs.	5,000
4	Goods sold to Hari	Rs.	4,000
8	Purchased goods	Rs.	2,000
9	Cash paid to Havish	Rs.	4,000
14	Wages	Rs.	1,000
18	Sales	Rs.	2,000
22	Machinery Purchases	Rs	1,000
30	Salaries paid	Rs.	1,200

Ans: Cash Balance – Rs. 21,800
Hint: January 4th goods sold to hari is a credit sale

2. **Prepare single column cash book from the below information.**

2015 March

1	Balance Brought Down	Rs.	10,000
4	Sales	Rs.	2,000
6	Purchases	Rs.	4,000
8	Travellings	Rs.	500
12	Received from Bhagmathi	Rs.	2,000
14	Cash paid to Victoria Nelson	Rs.	3,000
18	Wages paid	Rs.	500
22	Paid to Sumithra	Rs.	1,000
28	Electricity Bill paid	Rs.	800
31	Salaries paid	Rs.	1,500

Ans: Cash Balance – Rs. 2,700

3. **Prepare Simple cash book for the following transactions**

2016 March

1	Started Business with cash	Rs.	10,000
3	Purchase	Rs.	4,000
6	Goods sold for cash	Rs.	5,000
8	Paid to Ramesh	Rs.	600
10	Wages	Rs.	175
12	Telephone bill paid	Rs.	500
16	Carriage inwards	Rs.	150
19	Auto Charges paid	Rs.	200
24	Purchased goods for Cash	Rs.	2,000
26	Sales	Rs.	2,500
30	Salaries	Rs.	800

Ans : Cash Balance – Rs. 9,075

4. **Prepare Single column cash book in the books of DS Food Plaza**

2017 December

1 Started business with Cash Rs. 10,000
2 Machinery purchased Rs. 2,000
3 Goods purchased for cash Rs. 500
4 Paid to Manikanta Rs. 1,500
6 Stationery Rs. 500
10 Sales Rs. 1,000
12 Paid to Sainath Rs. 2,000
14 Received from Nageswari Rs. 1,200
16 Sold goods for cash Rs. 2,000
22 Wages Rs. 500
25 Travelings Rs. 400
30 Salaries paid Rs. 1,000

Ans: Cash Balance –Rs. 5,800

5. **Prepare Cash and Discount column from the following details**

2010 Octber

1 Opening Balance Rs. 15,000
2 Paid to Ramya Rs. 2,000
4 Received from Kalpana Rs. 3,800
Discount Allowed Rs. 200
8 Paid to Sudha Rs. 2,500
Discount Received Rs. 500
10 Received from Madhuri Rs. 1,900
Discount Allowed 100
18 Paid to Jayasri Rs. 500
21 Sales 4,000

22 Purchased goods for cash Rs. 2,000
25 Purchased goods from Prasad for cash Rs. 1,500
30 Paid Salaries Rs. 2,000

Cash Balance – Rs. 14,200, Discount Allowed – Rs. 300, Discount Received – Rs.500

6. **Prepare Cash and Discount Column Cash book for the following**

2013 September
1 Ravi Started business with Cash Rs. 40,000
3 Paid to Hrushikesav Rs. 18,500 and received discount of Rs. 500
5 Received from Arjun Rs. 19,000 and allowed a discount of Rs. 1,000
12 Goods sold to Arjun for cash Rs. 1,000
14 Purchases Rs. 2,900
16 Telephone bill paid Rs. 600
22 Cartage Rs. 250
28 Rent Paid Rs. 1,800
30 Salaries paid Rs. 1,600

7. **Prepare Bank and discount column cash book from the details**

2014 April
1 Over draft Rs. 2,500
3 Goods sold to Ganesh worth Rs. 4,500 payment received by cheque and allowed a discount of Rs. 500.
5 Purchased goods from Arjun Rs. 9,100 and received through NEFT and received a discount of Rs. 900
10 Received cheque from Sankar Narayan Rs. 20,000
12 Cheque issued to Tanmayi Rs. 10,000
15 NEFT received from Devi Rs. 5,000
18 Electricity charges paid through NET Banking Rs. 800
22 Cash paid to Anitha 2,000
25 Withdrawn from bank for personal use Rs. 2,500

8. **Prepare two column cash book from the following details**

2017 December
1 Bank Balance Rs. 20,000
2 Paid to Ramprasad through cheque Rs. 10,000
Discount Received Rs. 1,000
4 Received from Naidu through IMPS Rs. 19,800
allowed a discount of Rs. 200
10 Cheque received from Hari Rs. 1,000
12 Paid to Visali through cheque Rs. 4,000
16 NEFT received from Hari Rs. 1,000
22 Salaries paid by cheque Rs. 6,000
24 Purchased goods by cheque Rs. 11,800
Discount received Rs. 200

25 Purchased Machinery and payment made by cheque Rs. 8,000
31 Rent paid by cheque Rs. 1,000

9. **Prepare three column cash book for the following transactions in the books of Satwik**

2011 January
1 Satwik started business with cash Rs. 60,000
2 Cash deposited at bank Rs. 19,000
4 Goods purchased Rs. 12,000
6 Sales Rs. 600
8 Goods purchased from Aakash & Co Rs. 9,000
10 Cheque issued to Aakash & Co Rs. 8,900
Discount Received Rs. 100
12 Sold goods to Hasini Enterprises Rs. 7,000
14 Cash received from samitha Rs. 1,600
15 Goods purchased from Charan Rs. 2,500
17 Goods sold to Chandrasekhar Rs. 2,750
19 Receive cheque from Hasini Rs. 7,000
22 Hasini cheque deposited at bank.
24 Cheque issued to Charan Rs. 2,400
Discount received Rs. 100
25 Received cheque from Chandra sekhar Rs. 2,750
Cheque deposited in the bank on the same day.
27 Cash withdrawn from bank for office use Rs. 2,000
28 Cash withdrawn from bank for personal use Rs. 400
28 Cash withdrawn from bank for personal use Rs. 200
31 Salaries paid by cheque Rs. 3,000

Cash Balance - Rs. 33,000 Bank Balance – Rs. 11,600
Discount Received – Rs. 200 Discount allowed – Rs. – NIL -

10. **Prepare Three column cash book in the books of Jagadeeswari**

2010 July
1 Sridhar started business with cash Rs. 20,000
1 Cash deposited at bank Rs. 10,000
2 Goods purchased for cash Rs. 1,600
3 Goods sold to Sudheer Rs. 2,400 and received a cheque from him
4 Sudheer Cheque deposited at bank
5 Purchased furniture Rs. 800 and payment made by cheque
6 Invested in shares Rs. Rs. 6,000
8 Cheque received from Sekhar Rs. 4,600
Discount Allowed Rs. 250
10 Payment made to Devender by Cheque Rs. 3,000
Discount received Rs. 250

15	Machinery purchased Rs. 6,000 and payment made by cheque
18	Paid to Kishore Rs. 2,800 and received a discount of Rs. 120
19	Cash sales Rs. 3,600
20	Withdrawn from bank for personal use Rs. 900
26	Cash withdrawn from bank for office use Rs. 4,500
29	Rent paid in advance Rs. 4,000
31	Rent paid by cheque Rs. 600
31	Salaries paid Rs. 700
31	Electricity charges paid by Cheque Rs. 130

Cash Balance – Rs. 3,000 Bank Balance – Rs. 1,070

UNIT – VII
Bank Reconciliation Statement

7.1 Introduction

Bank maintains an account for each customer in its book. All the deposits done by the customer are recorded on the credit side of customer account and all the withdrawals done by the customer are recorded on the debit side of the customer account. A copy of this account is regularly sent to the customer by the bank. This copy is called "***Pass Book***". It is useful to tally the firm's bank transactions as recorded by the bank with the cash book. But, some times the bank balances shown by the cash book and that shown by the passbook may vary. So it is necessary to reconcile the balance shown by the bank column of cash book and balance shown by the pass book for a specific period of time.

7.2 Meaning and Advantages

The statement prepared to reconcile the balances of cash book and pass book is called ***"Bank Reconciliation statement"***. i.e. The Bank Reconciliation statement is a statement prepared to reconcile the difference between the balances as per the bank column of the cashbook and passbook at any given date.

Advantages

- We can locate the mistakes or errors on either side.
- Enables the business concern to get up – to – date record of transactions from the bank.
- Ensure proper evidence of payment
- Enable the business to identify the cheques deposited at bank by the business but not collected in time.
- It prevents the frauds and misappropriations

7.3 Preparation of Bank Reconciliation Statement

The preparation of Bank Reconciliation Statement starts with making adjustments to one balance to reach the other balance, which ensures agreement between both the balances. The Bank reconciliation statement usually prepared for a specific period means a month, a Quarter, half year or a year according to convenience of the firm.

The Bank Reconciliation Statement can be prepared with the balances of Cash book and Pass book in the following types.

Nature of Balance	Cash Book Shows	Pass Book Shows
Favorable Balance	Debit Balance	Credit Balance
Unfavorable Balance (Over Draft)	Credit Balance	Debit Balance

Illustration of Adjustments

Particulars	Amount Rs.	
Bank Balance as per cash book (or) Over Draft as per Pass Book		XXXXX
Add:		
1. Cheques issued but not presented for payment	XXX	
2. Interest allowed by the bank	XXX	
3. Interest, Dividend, Bills or any others directly Collected by Bank on behalf of customer	XXX	
4. Customers paid amount in the bank directly	XXX	
5. Wrong entry on the credit side of the passbook	XXX	XXXX
		XXXXXX
Less:		
1. Cheques presented into the bank but not yet collected by Bank	XXX	
2. Interest, Bank Charges and other expenses charged by Bank	XXX	
3. Payments directly paid by the bank	XXX	
4. Dishonor of cheques, bills by the bank	XXX	
5. Cheques debited in cash book but forgot to send to bank	XXX	
6. Wrong entry on the debit side of the Pass Book	XXX	XXX
Balance as per Pass Book (Credit Balance) (or) Over draft balance as per Pass Book (Credit Balance)		XXXXX

Favourable Balance

Illustration 1:

Prepare Bank Reconciliation statement from the following information.

1. Bank Balance as per cash book Rs. 14,000
2. Cheques issued but not presented by the customers at bank Rs. 2,500
3. Cheques submitted to the bank but not collected by bank Rs. 1,000
4. Cheque received and entered in the cash book but not presented to bank Rs. 200
5. Payment directly paid by customer in our bank account Rs. 700
6. Bank debited bank charges Rs. 14 and credited interest Rs. 25 in the pass book.

Bank reconciliation statement

Particulars	Amount Rs.	
Bank Balance as per cash book		14,000
Add:		
1. Cheques issued but not presented at bank	2,500	
2. Payment directly paid by the customer into our bank account	700	
3. Credited bank interest in bank account	25	3,225
		17,225
Less:		
1. Cheques submitted to bank but not collected by bank	1,000	
2. Cheques received but not submitted to bank	200	
3. Bank debited bank charges	14	1,214
Bank Balance as per pass book		16,011

Illustration 2:

Prepare Bank Reconciliation statement as on 31st December, 2016 from the following information.

1. December 1, 2016 Cashbook showing balance Rs. 14,000
2. Cheques issued before the due date but not submitted to the bank by the customers Rs. 4,500
3. A cheque worth Rs. 3,500 sent to the bank on 16th December but not collected by bank as on due date.
4. A cheque worth Rs. 280 received from the customer and entered in the cash book but not sent to the bank for collection.
5. Interest credited Rs. 90 and debited bank charges Rs. 14 are not entered in the cash book.

Bank reconciliation statement as on 31st December, 2016

Particulars	Amount Rs.	
Bank Balance as per cash book		14,000
Add:		
1. Cheques issued but submitted to bank for payment	4,500	
2. Interest credited in pass book	90	
		4,590
		18,590
Less:		
1. Cheques sent to bank but not collected	3,500	
2. Cheques entered in the cash book but not sent to bank	280	
3. Expenses debited in the pass book	14	3,794
Bank Balance as per pass book		14,796

Illustration 3:

Identify the Bank balance in the cash book of Sitaram as 31-12-2010 from the following details.

1. Bank balance as per pass book as on 31-12-2010 Rs. 8,000
2. Cheques worth Rs. 1,200 issued in the last week of December but those are submitted for payment on 2nd January 2011.
3. Cheques worth Rs. 2,500 deposited in on 26th December are collected before the due date.
4. Cheques deposited at bank for collection on 29th December 2010 but are collected by bank on 4th January, 2011 worth Rs. 2,000
5. Interest on bank balance Rs. 200 entered in the pass book on 31st December 2010. But it is identified by the Sitaram on 8th January, 2011.
6. Cheques issued on December 15th worth Rs. 600 are presented at bank on December 29th.
7. Salary for the month of December to Sitaram Rs. 1,500 is paid directly to his bank account.
8. Divedend on shares amount Rs. 800 is directly collected by bank on December 29th but it is intimated to sitaram on 2nd January, 2011.

Bank reconciliation statement of Sri Sitaram as on 31st December, 2010

Particulars	Amount Rs.	
Bank Balance as per pass book		8,000
Add:		
1. Cheques deposited at bank and collected as on 31-12-2010	2,000	
		2,000
		10,000
Less:		
1. Cheques issued but submitted for payment as on 31-12-2010	1,200	
2. Interest posted in pass book	200	
3. Salary directly paid to bank account	1,500	
4. Dividend directly collected by bank	800	3,700
Bank Balance as per Cash book		6,300

Note:

1) Cheque deposited at bank on 26th December is collected by bank on 31st December, therefore, it is not required to adjust in the Bank Reconciliation Statement.

2) Cheque issued on December 15th is submitted for payment on December 29th , therefore it is not required to adjust in the Bank Reconciliation Statement.

7.4 Overdraft:

The excess amount used by the business from its bank current account even though there is no balance in its bank current account is called ***"over draft"***. This facility is given by the bank to the business persons subject to conditions.

Unfavourable Balance or Overdraft Balance:

Illustration 4:

Prepare Bank Reconciliation Statement of Jacob from the following as on 30-06-2010

a) Overdraft as per pass book as on 30-06-2010 Rs. 540
b) Cheques issued before 30-06-2010 but not submitted to bank for payment Rs. 2,800
c) Cheques submitted to bank for collection but not collected by bank as on 30-06-2010 Rs. 3,900.
d) Interest on over draft is not posted in cash book Rs. 20
e) Insurance premium paid by bank is not posted in the cash book Rs. 400
f) Bank directly collected Interest on investments and posted in the pass book Rs. 500

Bank Reconciliation Statement of Jacob as on June 30, 2010

Particulars	Amount Rs.	
Over draft as per pass book		540
Add:		
1. Cheques issued but submitted to bank for Payment as on due date	2,800	
2. Interest on investments collected by bank and posted in pass book		3,300
	500	3,840
Less:		
1. Cheques submitted to bank for collection but not collected by bank as on due date	3,900	
2. Interest on over draft	20	
3. Insurance premium paid by bank	400	4,320
Bank balance as per cash book		480

Illustration 5:

Raman pass book showing Rs. 20,600 over draft as on 31-12-2009

1. Cheques issued before 31-12-2009 but not submitted to the bank for payment Rs. 1,600
2. Cheques submitted to bank but not credited as on 31-12-2009 Rs. 4,500
3. Bank debited interest on over draft Rs. 250
4. Interest on Investments Rs. 1,400 collected by bank is credited in pass book only.
5. Bank charges Rs. 24 not posted in the cash book.
6. Cheque dishonored worth Rs. 1,500 is posted in pass book only.

Bank Reconciliation Statement of Raman as on 31st December, 2009

Particulars	Amount Rs.

Over draft as per pass book		20,600
Add:		
1. Cheques issued but submitted to bank for Payment as on due date	1,600	
2. Interest on investments collected by banker and credited in pass book	1,400	3,000
		23,600
Less:		
1. Cheques submitted to bank for collection but not collected by bank as on due date	4,500	
2. Interest on over draft	250	
3. Bank charges posted in pass book	24	
4. Dishonored cheque	1,500	6,274
Bank over draft balance as per cash book		17,326

Short Answer type Questions

1. Define Pass Book.
2. Define Bank Reconciliation Statement.
3. Define Over draft.

Long Answer Type Questions

1. Explain the importance of Bank Reconciliation Statement.

Exercises

1. Prepare Bank Reconciliation Statement of Rayudu Prasad as on 31 March 2011
   a. Balance as per cash book Rs. 5,877.
   b. Cheques issued but submitted to bank for payment Rs. 2,013
   c. Cheques deposited but not collected by bank as on due date Rs. 1,419
   d. Banker wrongly debited Rs. 225 in the pass book.

Ans: Bank balance as per cash book Rs. 6,246

2. Prepare Bank Reconciliation Statement of Bhargav as on 31st December, 2015
   a. Bank balance as per pass book Rs. 6,245
   b. Cheques issued but not submitted to bank for payment
      1. Mahitha & Co Rs. 459
      2. Srikanth Enterprises Rs. 596
      3. Tanuja Jewellers Rs. 957
   c. Cheques submitted to bank but not collected by bank
      1. Nagalakshmi Textiles Rs. 506
      2. Satyaveni Refreshments Rs. 913
   d. Banker wrongly debited Rs. 225 in the pass book and rectified on 4th January, 2016

Ans: Bank balance as per cash book Rs. 5,877

3. Bank balance as per pass book as on 31st March, 2011
   I. Bank balance as per pass book as on 31-03-2011 Rs. 25,000
   II. Cheques sent to bank for collection worth Rs. 4,000 but bank collected cheques worth Rs. 2,000 in the month of April.
   III. Cheques issued worth Rs. 2,500 as on 25th March but cheques worth Rs. 1,500 only submitted to bank for payment.
   IV. Pass book was wrongly debited by Rs. 100
   V. Bank charges Rs. 25 posted in pass book only.
   VI. Bank directly collected interest on investments Rs. 400 and posted in pass book but not shown in cash book.
   VII. Cheque received from customer worth Rs. 150 posted in cash book but not sent to bank for collection.

Ans: Bank balance as per cash book Rs. 25,875

4. Prepare Bank Reconciliation Statement and identify the pass book balance as on 31st March, 2013.
   a. Cheques worth Rs. 600 deposited in the current account in march 2013. But, bank credited in April.
   b. Cheques issued worth Rs. 1,100 in the month of March but paid by bank in April.
   c. Bank charges Rs. 10 is appearing in the pass book twice. But it was not posted in the cash book atleast once.
   d. Cheque directly deposited in the bank account worth Rs. 500 is not shown in the cash book.
   e. A cheque worth Rs. 200 was dishonored and returned by the bank.
   f. Rs. 400 worth cheque posted in cash book twice but it is appearing in the pass book only once.
   g. Banlace as per cash book as on 31st March, 2013

Ans: Bank balance as per pass book Rs. 3,580

5. Find the correct bank balance of Stella Joseph on 31st December, 2014 from the information gathered from Cash book as well as Pass book.
   i. Bank balance as per cash book Rs. 2,980 and Bank balance as per pass book Rs. 6,830.
   ii. Cheques worth Rs. 5,000 sent to bank for collection but collected Rs. 3,800 only.
   iii. Cheques issued worth Rs. 4,600 but submitted to bank for payment Rs. 3,900 only.
   iv. A customer of Stella Joseph directly deposited in the bank account Rs. 5,000.
   v. Interest on Bank Over Draft is recorded in the pass book only Rs. 150.
   vi. A hudie worth Rs. 2,500 discounted earlier was dishonored by the bank.
   vii. Interest on fixed deposits Rs. 400 recorded in pass book.
   viii. Cash paid to a creditor Rs. 1,000 erroneously entered in the bank column of cash book.
   ix. Cheque issued but cancelled later worth Rs. 600 is recorded as issued but cancellation was not recorded.

Ans: Bank balance as per cash book Rs. 6,830.
Note: Bank bank balance as per cash book was considered in the above problem.
Note: If two balances i.e. cash book as well as pass book in the problem solve the problem by considering one balance to identify the another.

6. Prepare Bank Reconciliation Statement of Razia Begum as on 31st March, 2009 from the following information.
   a. Bank over draft as per cash book ason 31-03-2009 Rs. 2,000
   b. Cheques issued but not submitted to bank for payment Rs. 1,350
   c. Cheques deposited at but not collected by banker Rs. 560
   d. Expenses recorded in the pass book only Rs. 80
   e. Interest on investments directly collected by Bank and posted in pass book Rs. 905

Ans: Overdraft as per pass book 385

7. Prepare Bank Reconciliation Statement of Hema as on 31-12-2011 from the following details
   A. Over draft as per pass book as on 31-12-2011 Rs. 1,027
   B. Cheques issued on 31-12-2011 but paid by bank in month of January bank Rs. 1,244
   C. Interest on over draft Rs. 51 was not posted in cash book.
   D. Cheques received worth Rs. 5,340 on 30-12-2011 are posted in cash book but are sent to bank in the month of January,2012.
   E. Chechbook value Rs. 29 was reposted in the cash book in month of November.
   F. Bill receivable worth Rs. 250 was sent to bank on 28-12-2011 and posted in the cash book but collected by bank in the month of January,2012.
   G. Central Exise paid Rs. 10 paid by bank on 01-12-2011 but not posted in the cash book.
   H. Bank charges Rs. 15 posted in the pass book twice.

Ans: Bank balance as per cash book Rs. 3,345

8. Prepare Bank Reconciliation statement to Identify the pass book balance of Pavithra as on 31-12-20014.
   a. Over draft as per cash book as on 31-12-20014 Rs. 3,000.
   b. Interest on over draft for six months Rs. 100 was debited in pass book only.
   c. Bank debit bank charges in the pass book Rs. 25.
   d. Cheques issued but not submitted to bank for payment by the customers Rs. 750.
   e. Cheques submitted to bank for collection but not collected by bank Rs. 2,500.
   f. Interest on investments Rs. 900 collected by bank and posted in the pass book.

Ans: Over draft as per pass book Rs. 3,975

UNIT – VIII
TRIAL BALANCE AND RECTIFICATION

8.1 **Meaning and Significance**
8.2 **Features and Objectives of Trial Balance**
8.3 **Preparation of Trial Balance**
8.4 **Errors disclosed and not disclosed by Trial Balance**

8.1Meaning and Significance

To verify the accuracy of the postings after completion of postings in the Journal or Subsidiary Books to the ledger it is needed to prepare a statement by the businessmen. The statement where in the balances of all the accounts in the ledger are incorporated is called as ***"trial balance"***. The totals of the debit side in the trial balance should be equal to the totals of credit side.

According to **J.R.Batliboi** Trial balance is a statement, prepared with the debit and credit balances of ledger to test the arithmetical accuracy of the books.

According to **Carter** "Trial balance is the list of debit and credit balances, taken out from ledger . It also includes the balances of cash and bank taken from cash book".

According to **Spicer and Peglar,** " A trial balance is a list of all the balances standing on the ledger accounts and cash book of a concern at any given date.

8.2Features and Objectives of Trial Balance

1. It is a working statement and not an account.
2. It is not an account, it is only a statement which is prepared to verify the arithmetical accuracy of ledger accounts.
3. It is a list of balances of all ledger accounts and the cash book.
4. It is always prepared on a particular date and not for a particular period.
5. It is prepared at the end of accounting year before preparing the final accounts.

8.3Preparation of Trial Balance

The following points are to be kept in mind while preparing the Trial Balance.

1. Not required to use "To" or "By" due to it is a statement.
2. The debit column shows all the Purchases, Sales Returns, Assets, Expenses
3. The credit column shows all the Sales, Purchase Returns, Liabilities, incomes.
4. Show reserves and surpluses / reserve funds / provisions in credit columns, doubtful debts, General reserve, Reserve fund etc.
5. Show intangible assets in debit column Ex: Goodwill, Patents, Royalties, Trademarks, Copyrights etc.

Illustration of transferring balances to Trial Balance

S.L.No	Nature of Accounts	L.F.	Balances shown Dr. / Cr.
	I. Personal Accounts		
1.	Capital Account		Credit
2.	Drawings Account		Debit
3.	Sundry Debtors		Debit
4.	Sundry Creditors		Credit
5.	Bank balance		Debit
6.	Expenses to be paid		Credit
7.	Expenses paid in advance		Debit
8.	Incomes to be received		Debit
9.	Incomes received in advance		Credit
10.	Bills payable		Credit
11.	Bank Over draft		Credit
	II. Real Accounts		
12.	Opening Stock		Debit
13.	Goodwill		Debit
14.	Trademarks, Copy rights		Debit
15.	Bills receivable		Debit
16.	Buildings and Lands		Debit
17.	Machinery and Furniture		Debit
18.	Investments		Debit
	III. Nominal Accounts		
19.	Purchases (Goods)		Debit
20.	Purchase returns (Goods)		Credit
21.	Sales (Goods)		Credit
22.	Sales Returns (Goods)		Debit
23.	Expenditure accounts		Debit
24.	Losses accounts		Debit
25.	Income accounts		Credit
26.	Profit accounts		Credit
	All types of Reserves		Credit

Note: While transferring the balances in to the trial balance, all assets and expenses accounts are placed in the debit column and all liabilities and income are place in the credit column.

The format of Trial Balance is as follows.

S.L.No	Nature of Accounts	L.F.	Balances Dr. Rs.	Balances Cr. Rs.

Suspense Account:

Suspense Account is an account prepared to transfer the difference amount identified for time being, suspense account will be shown in the Trial Balance. Suspense account gets closed automatically as and when all the errors which caused the disagreement in the trial balance are rectified. Suspense account may be shown either side of the trial balance depending on net effect of the Trial Balance.

Illustration 1:

Prepare the trial balance from the following balances of different ledger accounts.

	Rs.		Rs.
Cash A/c	53,500	Sales A/c	2,000
Capital A/c	60,000	Slaries A/c	1,000
Purchases A/c	6,000	Commssion A/c	1,000
Pinakapani A/c	2,000	Sunitha A/c	500

Trial Balance

S.L.No	Nature of Accounts	L.F.	Balances Dr. Rs.	Balances Cr. Rs.
1.	Cash A/c		53,500	
2.	Capital A/c			60,000
3.	Purchases A/c		6,000	
4.	Pinakapani A/c		2,000	
5.	Sales A/c			2,000
6.	Salaries A/c		1,000	
7.	Commission A/c			1,000
8.	Sunitha A/c		500	
	Total		63,000	63,000

Illustration 2:

Prepare the Trial balance from the following balances.

	Rs.		Rs.
Capital	19,000	Stationery	150
Cash in bank	14,000	Unloading Charges	70

Cash in hand	1,430	Salaries	150
Rent paid	300	Commission paid	100
Sundry Creditors	150	Discount Received	400
Purchases	3,570	Bills receivable	450
Sales	4,630	Sundry Debtors	520
Purchase Returns	400	Bills Payable	1,000
Sales Returns	140	Goodwill	5,000
Furniture	700	Andhra Bank over draft	1,000

Trial Balance

S.L.No	Particulars	Amount Dr. Rs.	Amount Cr. Rs.
1	Capital		19,000
2	Cash in bank	14,000	
3	Cash in hand	1,430	
4	Rent	300	
5	Sundry Creditors		150
6	Purchases	3,570	
7	Sales		4,630
8	Purchase Returns		400
9	Sales Returns	140	
10	Furniture	700	
11	Stationery	150	
12	Unloading charges	70	
13	Salaries	150	
14	Commission	100	
15	Discount		400
16	Bills receivable	450	
17	Sundry Debtors	520	
18	Bills payable		1,000
19	Good will	5,000	
20	Andhra bank over draft		1,000
	Total	26580	26580

8.4Errors disclosed and not disclosed by Trial Balance

Errors not disclosed by Trial Balance

This type of errors can not be traced out in the preparation of trial balance, because these errors cannot affect the agreement of Trial Balance.

The main errors not disclosed by the trial balance are given below

1. Errors of Principle

2. Errors of omission
3. Errors of Commission
4. Compensating Errors
5. Writing to wrong head of account

1. **Errors of Principle :** Errors which are committed by violating the principles of (rules of) accounting. These errors may arise, when the distinction is not made between the capital and revenue nature items.

2. **Errors of Omission:** When a transaction is completely or partly omitted from the books of accounts such error is known as error of omission.

    1. When no entry is made for a transaction in Journal.
       Ex: Purchase of goods are not recorded in the books of original entry.
    2. If an entry is not made for a transaction in the subsidiary book.
       Ex: Paid cash to Arjun traders not entered in cash book.

3. **Error of Commission:** The errors arise due to wrong recording, Wrong casting, Wrong entry forwarding, Wrong posting, Wrong Balancing are error of commission.
    1. **Wrong Recording:** If a transaction is incorrectly recorded in the books of original is called error of commission.
       Ex: Sales of Rs. 168 recorded as Rs. 861
    2. **Wrong Casting:** When the mistake is committed in totaling is called error of commission. This error affects the agreement of trial balance.
       Ex: Purchase book under cash by 100.

4. **Compensating Errors:** If two or more errors are committed and one error multi field the another error. The net effect is unchanged. Committing an error to compensate the previous or another error is known as compensating error.

5. **Writing to wrong head of account:** Instead of recording one account, recording another account is known as writing to wrong head of account.

Errors disclosed by Trial Balance

The errors which are revealed by the trial balance are known as errors disclosed by trial balance.

The following are the errors disclosed by trial balance:

1. **Posting of transactions to wrong side of an account**
   Ex: Discount allowed posted to the credit side of discount account.
2. **Posting of wrong amount to an account**
   Ex: Purchase of Rs. 50,000 posted as Rs. 5,000 to Purchase account.

3. **Errors in totaling:** Wrong totaling made either in subsidiary books or in ledger affects the agreement of Trial Balance.
4. **Errors of Carrying forward:** If a mistake is committed in carrying forward a total of one page to the next page. This error affects the agreement of trial balance.
5. **Posting of only one aspect of Journal Entry into ledger:** Some times accountant may post only one aspect of the entry to the ledger account.
6. **Recording one aspect twice:** An account may be recorded twice in the journal.
   Ex: Paid salaries Rs. 1,000 debited twice to Salaries account.

Short Answer type Questions

1. Define Trial Balance.
2. Define Suspence Account.

Long Answer Type Questions

1. Write the errors disclosed and not disclosed by Trial Balance.

Exercises

1. Prepare Trial Balance from the following balances of Prabhakar.

	Rs.
Opening Balance	2,000
Sales	21,000
Purchases	15,600
Sales Returns	900
Commission Received in advance	2,500
Depreciation	1,200
Machinery	20,000
Sundry Debtors	5,000
Sundry Creditors	4,400
Discount received from Creditors	300
Capital	14,000
Commission Received	3,500

Ans: Total Rs. 44,700

2. Prepare Trial Balance from the following balances of Bhagya Lakshmi Enterprises

Particulars	Rs.	Particulars	Rs.
Capital	3,100	Sales	4,000
Cash in hand	250	Sundry Debtors	1,950
Bills Receivable	3,275	Bills Payable	2,375
Buildings	3,000	Bank Over Draft	2,000
Purchases	3,000		

Ans Total Rs. 11,475

3. Prepare trial balance from the following balances of Mrudula Jiyyengar.

Name of the account	Rs.	Name of the account	Rs.
Opening Stock	1,50,000	Machinery	1,16,000
Purchases	1,50,000	Debtors	40,000
Purchase Returns	20,000	Creditors	36,000
Sales	3,00,000	Bills payable	13,600
Sales Returns	28,200	Bills Receivable	12,500
Rent	2,690	Cash in hand	14,800
Salaries	14,200	Bank over draft	20,000
Advertisements	2,100	Interest on over draft	2,400
Commission Received	2,200	Capital	1,70,000
Discount (Cr.)	1,290	Drawings	14,000
Furniture	14,000		

Ans: Total Rs. 5,61,990

4. Prepare the Trial Balance from the following balances of Chittiyar as on 31st March, 2017.

Name of the account	Rs.	Name of the account	Rs.
Stock on 1st April, 2017	120,000	Investments	125,000
Purchases	250,000	Interest on Investments	20,800
Sales	600,000	Cash balance	13,600
Carriage Inwards	3,000	Premises	200,000
Carriage Outwards	1,200	Fixtures	68,000
Return Inwards	20,000	Miscellaneous Expenses	2,200
Return Outwards	10,000	Miscellaneous Incomes	1,800
Debtors	115,000	Loan from Canara Bank	115,000
Creditors	110,000	Interest on canara bank loan	18,000
Bad Debts	6,000	Capital	300,000
Stationery	4,200	Drawings	30,000
Insurance	3,400	Computers	28,000
Wages and salaries	50,000	Goodwill	100,000

Ans: Total Rs. 11,57,600

5. Prepare the Trial Balance of Sridhar

Name of the account	Rs.	Name of the account	Rs.
Cash in hand	18,600	Return Outwards	3,610
Machinery	40,000	Return Inwards	10,250
Purchases	69,000	Capital	50,000
Debtors	28,250	Drawings	10,000
Carriage Inward	2,110	Bank Loan	25,000
Carriage Outward	750	Interest on Loan	2,600
Wages	18,600	Opening Stock	35,000
Rent and Taxes	5,250	Sales	140,000
Sundry Creditors	21,200	Discount Received	2,100
Discount Allowed	1,500		

Ans: Total Rs. 2,41,910

6. Prepare the Trial Balance of S.N.L. Industries as on 31st March, 2018.

Name of the account	Rs.	Name of the account	Rs.
Cash In hand	8,200	Debtors	16,200
Bank Over Draft	10,000	Creditors	4,000
Opening Balance	35,000	Bills receivable	1,800
Purchases	72,000	Bills Payable	4,100
Purchase Returns	4,000	Capital	40,000
Sales	125,500	Drawings	4,000
Sales returns	4,000	Rent	1,700
Travelling Expenses	2,100	Salaries	2,100
Discount allowed	800	Loan (Cr)	15,000
Discount received	2,500	Interest on loan	1,200
Machinery	20,000		
Land and Buildings	36,000		

Ans: Total Rs. 2,05,100

7. Prepare the Trial Balance of Kasim & Co

Particulars	Rs.	Particulars	Rs.
Opening Stock	20,000	Purhases	24,000
Sales	29,000	Debtors	15,000
Creditors	20,000	Salaries	2,000
Cash	18,000	Capital	30,000

Ans: Total Rs. 79,000

8. Prepare the Trial Balance of Mr. Naresh from the following balances as on 31-12-2010.

Particulars	Rs.	Particulars	Rs.
Cash at Bank	30,000	Cash in Hand	14,000
Salaries	2,500	Purchases	2,56,500
Sales	3,00,000	Opening stock	25,000
Buildings	30,000	Bills Payable	10,000
Bills Receivable	10,000	Capital	58,000

Ans: Total Rs. 3,68,000

9. Prepare the Trial Balance of Saraswathi as on 31-12-2017.

Particulars	Rs.	Particulars	Rs.
Opening Stock	11,500	Sales	42,000
Purchases	25,000	Salaries	3,500
Carriage	1,000	Debtors	6,000
Creditors	5,000	Cash in Bank	10,000
Capital	10,000		

Ans: Total Rs. 57,000

10. Prepare the Trial Balance of Nasreen as on 31-12-2010.

Particulars	Rs.	Particulars	Rs.
Cash in Hand	10,000	Buildings	12,000
Debtors	16,000	Sales	45,000
Opening Stock	12,000	Capital	25,000
Purchases	22,000	Bills Payable	2,000

Ans: Total Rs. 72,000

11. Prepare Trial Balance of Visalakshi from the following balances.

Particulars	Rs.	Particulars	Rs.
Carriage	600	Creditors	4,000
Capital	15,000	Sales	31,000
Salaries	4,000	Debtors	18,000
Cash at bank	5,400	Purchases	22,000

Ans: Total Rs. 50,000

12. Prepare Trial Balance of Jessi Rose from the following balances.

Particulars	Rs.	Particulars	Rs.
Opening Stock	10,000	Sales	10,000
Bills Payable	1,600	Returns outwards	2,400
Bills Receivable	2,000	Salaries	600
Purchases	6,000	Capital	5,000
Returns Inwards	400		

Ans: Total Rs. 19,000

13. Prepare Trial Balance of Sudha from the following balances.

Particulars	Rs.	Particulars	Rs.
Capital	50,000	Buildings	20,000
Furniture	10,000	Salaries	6,000
Sundry Creditors	10,000	Drawings	2,000
Cash	30,000	Purchases	10,000
Sundry Debtors	10,000	Sales	28,000

Ans: Total Rs. 88,000

14. Prepare Trial Balance of Rani from the following balances.

Particulars	Rs.	Particulars	Rs.
Bills Receivable	18,000	Furniture	33,000
Capital	50,000	Capital	25,000
Sales	40,000	Salaries	4,000
Machinery	35,000	Drawings	5,000
Bills Payable	11,600	Return Inwards	6,600
Purchases	25,000		

Ans: Total Rs. 1,26,600

UNIT – IX
FINAL ACCOUNTS

9.1Trading account

9.1.1 Meaning and Significance

An account is to be prepared to know the results of trading activities carried during the accounting period is termed as ***"Trading account"***. Preparation of Trading account is the primary stage of final accounts. Purchasing of goods from others and selling them to others is called trading. Trading account is a nominal account. The trading expenses should be debited and the trading incomes should be credited to this account. The outcome of the trading account is either gross profit or gross loss. The trading account is to be prepared to find out the difference between actual cost of goods sold and sale proceeds.

Cost of goods sold = Purchase price of the goods + Expenses incurred on purchases.

If Opening stock and Closing stock of goods are given,

Cost of Goods Sold = Opening Stock + Net Purchases (Cash + Credit – Returns) +Direct Expenses – Closing Stock of Goods

Gross Profit / Loss = Net Sales – Cost of Goods Sold

If the selling price of goods is more than cost price, it is known as gross profit. If the selling price of goods is less than cost price, it is known as gross loss. The gross profit or gross loss of trading account will be transferred to Profit & Loss Account.

9.1.2 Performance of Trading Account

- It reveals either Gross Profit or Gross Loss.
- Gross Profit / Gross Loss Ratio can be calculated.
- Trading expenses and incomes of the current year can be compared with that of the previous year.
- On the basis of the current year and previous years trading accounts, the trader can estimate his trade revenue for future years.

Preparation of Trading account

Trading Account can be prepared in one of the following two proformas.

- Horizontal
- Vertical

Horizontal Proforma:

Dr. Trading Account for the year ending _____ Cr.

Particulars	Amount Rs.	Amount Rs.	Particulars	Amount Rs.	Amount Rs.
To Opening Stock		XXXX	By Sales	XXXX	
To Purchases	XXXX		Less: Sales Returns	XXX	XXXX
Less Purchase Returns	(-)XXX	XXXX			
			By Closing Stock		XXXX
Purchase Expenses					
To Carriage		XXXX			
To Cartage		XXXX			
To Freights		XXXX			
To Customs Duties		XXXX			
To Import Duties		XXXX			
To Clearing charges		XXXX			
Direct Expenses					
To Wages		XXXX			
To Factory Rent		XXXX			
To Factory Insurance		XXXX			
To Gas and Coal		XXXX			
To Water Charges		XXXX			
To Factory Manger's		XXXX			
Salary		XXXX			
To Work Manager's Salary		XXXX			
To Oil & Fuel		XXXX	By Gross Loss		
To Manufacturing		XXXX	(Transferred to		
Expenses		XXXX	Profit & Loss		XXXX
To Heating and Lighting			Account)		
To Gross Profit					
		XXXX			

(Transferred to Profit & Loss Account)		XXXX			XXXX

Vertical Proforma:

Trading Account for the year ending _____

Particulars	Amount Rs.	Amount Rs.
I. Net Sales		
Sales	XXX	
Less: Sales Returns	XXXX	XXXX
II. Less: Cost of Goods Sold:		
1. Opening Stock of Goods	XXXX	
2. Purchases	(XXXX)	
Less: Purchase Return		
	XXXX	
3. Purchase Expenses	XXXX	
Less: Closing Stock of Goods	(XXXX)	
		XXX
4. Direct Expenses	XXX	
Gross Profit / Gross Loss(I – II)		**XXXX**

Illustration 1:

Prepare Trading account of Seshu from the following information as on 31-12-2015

	Rs.		Rs.
Opening Stock of Goods	25,000	Wages	2,000
Purchases	23,000	Carriage	1,000
Sales	56,000	Coal & Gas	500
Sales Returns	1,000	Factory Rent	1,000
Purchase Returns	2,000	Closing Stock	2,000

Dr. Trading account of Seshu as on 31-12-2015 Cr.

Particulars	Amount Rs.	Amount Rs.	Particulars	Amount Rs.	Amount Rs.
To Opening Stock of Goods		25,000	By Sales	56,000	
To Purchases	23,000		Less: Sales Returns	1,000	55,000
Less: Purchase Returns	2,000	21,000	By Closing Stock		2,000
To Wages		2,000			
To Carriage		1,000			
To Coal & Gas		500			

To Factory Rent		1,000			
To Gross Profit (Transferred to Profit & Loss account)		6,500			
		57,000			57,000

Illustration 2

Prepare trading account of Bhargavi Sandhya Enterprises for the year ending 31-03-2018

	Rs.		Rs.
Opening Stock	15,000	Wages	2,500
Purchases	21,000	Import Duties	500
Purchase Returns	1,500	Sales	42,000
Carriage	1,300	Sales Returns	800
Factory Insurance	900	Closing Stock	3,200
Gas and Water	1,400		

Dr. Trading account of Bhargavi Sandhya Enterprises for the year ending 31-03-2018 Cr.

Particulars	Amount Rs.	Amount Rs.	Particulars	Amount Rs.	Amount Rs.
To Opening Stock		15,000	By Sales	42,000	
To Purchases	21,000		Less: Sales Returns	800	41,200
Less: Purchase Returns	1,500	19,500	By Closing Stock		3,200
To Carriage		1,300			
To Factory Insurance		900			
To Gas and Water		1,400			
To Wages		2,500			
To Import Duties		500			
To Gross Profit (Transferred to Profit & Loss account)		3,300			
		44,400			44,400

9.1.3 Adjustments

One of the most important adjustment and its accounting treatment in trading account is "Adjustment relating to Closing Stock".

Closing stock is the stock of goods unsold at the end of the accounting year. This does not appear in the trial balance.

Accounting treatment in final accounts

1. Shown on the credit side of the trading account.

2. Shown on the assets side of the balance sheet.

9.1.4 Outstanding expenses, Prepaid expenses

Out standing Expenses: Expenses relating to the current accounting period but not yet paid and are to be paid in the next year is known as outstanding expenses.

Ex: Wages for the month of march is due but not paid.

Accounting treatment of in final accounts

1. Add to the concerned expenditure item in Trading account.
2. Show as liability on liabilities side of the balance sheet.

Prepaid Expenses: Expenses relating to the next accounting year but paid in the current accounting period is called pre – paid expenses or expenses paid in advance.

Ex: Wages or prepaid insurance paid in advance

Accounting treatment in final accounts

1. Deduct from the concerned expenditure in the trading account.
2. Record in balance sheet on assets side.

Manufacturing Account

The organizations which manufacture or produce goods will prepare manufacturing account. Manufacturing account is a nominal account, hence all the expenses of goods, factory to be shown on debit side. Balance of this account is known as cost of production (Debit Balance) and is to be transferred to the trading account.

Dr. Manufacturing account of _____ for the year ended _____ Cr.

Particulars	Amount Rs.	Amount Rs.	Particulars	Amount Rs.	Amount Rs.

To Opening Stock			By Closing Stock		
a) Raw Materials	XXXX		a) Raw Materials	XXXX	
b) Partly finished goods	XXXX		b) Partly Finished	XXXX	
c) Finished Goods	XXXX	XXXX	Goods		
			c) Finished Goods	XXXX	XXXX
To Purchases	XXXX				
Less: Purchase Returns	XXXX	XXXX			
To Wages (Production)		XXXX			
To Carriage		XXXX			
To ClearingCharges		XXXX			
To Gas & Coal		XXXX			
To Oil & Fuel		XXXX			
To Factory Rent,		XXXX			
Insurance and Lighting		XXXX			
To Motive Power		XXXX	By Cost of Production (Transferred to Trading Account)		XXXX
		XXXX			XXXX

9.2 Profit and Loss Account

9.4.1 Meaning and Significance

After preparation of Trading Account, the Profit & Loss account is to be prepared to find out the net profit or net loss of the business.

9.4.2 Steps in preparation of Profit and Loss Account

This is a nominal account, so all the expenses and losses should be debited and all the incomes and gains to be credited to Profit & Loss account. The balance of Profit & Loss Account is either net profit or net loss and the same is to be added to / deducted from Capital Account in Balance Sheet.

Proforma:

Horizontal Form:

Dr. Profit & Loss A/c of _____ for the year ending _____ Cr.

Particulars	Amount Rs.	Amount Rs.	Particulars	Amount Rs.	Amount Rs.
To Gross Loss b/d		XXXX	By Gross Profit b/d		XXXX
To Administrative Expenses			By Discount Received		XXXX
To Salaries		XXXX	By Interest Received		XXXX
To Rent		XXXX	By Commission Received		XXXX
To Rates & Taxes		XXXX	By Rent Received		XXXX
To Insurance		XXXX	By Interest on Drawings		XXXX
To Printing & Stationery		XXXX	By Apprentice Premium		XXXX
To Audit Expenses		XXXX	By Profit on sale of assets		XXXX

To Legal Expenses		XXXX	By Bad Debt recovered		XXXX
To General Expenses		XXXX			
To Repairs		XXXX			
To Selling & Distribution Expenses					
To Carriage Outwards		XXXX			
To Advertisements		XXXX			
To Bank Charges		XXXX			
To Commission		XXXX			
To Bad Debts		XXXX			
To Travelling Expenses		XXXX			
To Packing Expenses		XXXX			
To Financial Expenses					
To Discount Allowed		XXXX			
To Interest on Capital		XXXX			
To Interest on Loans		XXXX			
To Losses					
To Loss on sale of assets		XXXX			
To Depreciation		XXXX			
To Loss due to Fire Accident		XXXX			
To Net Profit (Transferred to Capital Account)		XXXX	By Net Loss (Transferred to Capital Account		XXXX
		XXXX			xxxxx

Vertical Form:

Particulars	Amount Rs.	Amount Rs.
1. Gross Profit / Gross Loss		XXXX
2. Add: Incomes		
d) Discount received	XXXX	
e) Commission received	XXXX	
f) Interest received	XXXX	
g) Rent received	XXXX	
h) Profit on sale of assets	XXXX	
i) Interest on Drawings	XXXX	
	XXXX	XXXX
3. Less: Expenses		
a) Administrative Expenses	XXXX	XXXX
b) Selling and Distribution expenses	XXXX	
c) Financial Expenses	XXXX	
d) Losses	XXXX	
		(-XXXX)
Net Profit / Net Loss		XXXX

Illustration 1:
Prepare the Profit and Loss Account from the following balances of Ravi Kumar as on 31-03-2015

	Rs.		Rs.
Salaries	30,000	Discount Allowed	2,500
Gross Profit	100,000	Loss incurred in fire accident	4,000
Printing & Stationery	850	Rent, Insurance	5,000
Courier Charges	750	Received Dividend	2,000
Discount received	2,000	Misc. Expenses	4,000
Cartage	2,000	Bad Debts	1,500
Advertisements	2,500	Apprentice Premium	2,000
Rent Received	1,500	Interest on Drawings	2,500
Depreciation	3,000	Profit in sale off asset	2,000
Repairs	2,000		

Dr. Profit & Loss Account of Ravi Kumar as on 31-03-2015 Cr.

Particulars	Amount Rs.	Particulars	Amount Rs.
To Salaries	30,000	By Gross Profit	100,000
To Rent, Insurance	5,000	By Discount received	2,000
To Printing & Stationery	850	By Received Dividend	2,000
To Courier Charges	750	By Rent Received	1,500
To Mis. Expenses	4,000	By Apprentice Premium	2,000
To Cartage	2,000	By Interest on Drawings	2,500
To Advertisements	2,500	By Profit in sale off asset	2,000
To Bad Debts	1,500		
To Depreciation	3,000		
To Rapares	2,000		
To Discount Allowed	2,500		
To Loss incurred in fire accident	4,000		
To Net Profit (Transferred to Capital Account)	53,900		
	112,000		112,000

Illustration 2:

Prepare Profit and Loss Account of Sri. Venkateswara Rao on 31-03-2015 from the following balances.

Gross Profit	32,500	Mis. Expenses	1,000
Rent	4,200	Office Expenses	1,200
Salaries	5,000	Legal Expenses	1,000
Bad Debts Recovered	2,000	Discount received	750
Discount Allowed	500	Trade Expenses	2,000

Dr. Profit & Loss Account of Sri . Venkateswara Rao on 31-03-2015 Cr.

Particulars	Amount Rs.	Particulars	Amount Rs.
To Rent	4,200	By Gross Profit	32,500
To Salaries	5,000	By Bad Debts Recovered	2,000
To Trade Expenses	2,000	By Discount received	750
To Discount Allowed	500		
To Mis. Expenses	1,000		
To Office Expenses	1,200		
To Legal Expenses	1,000		
To Net Profit (Transferred to Capital Account)	20,350		

	35,250		35,250

9.4.3 Performance of Profit and Loss Account

1. Reveals net profit or net loss.
2. To find out net profit ratio.
3. Current year's administrative, selling and other expenses can be compared with the previous year's amounts.
4. Facilitates for the preparation of balance sheet.

9.4.4 Adjustments

Out Standing Expenses: Expenses relating to the current accounting period but not yet paid and are to be paid in the next year is known as outstanding expenses.

Accounting treatment in Final Accounts

1. Add to Concerned expenditure item in Profit and Loss Account.
2. Show as a liability on liabilities side of the balance sheet.

Pre – paid expenses: Expenses relating to the next accounting year but paid in the current accounting period is called pre – paid expenses or expenses paid in advance.

Accounting treatment in Final Accounts

1. Deduct from the concerned expenditure item in Profit and Loss Account.
2. Record in balance sheet on assets side.

Income: The income relating to current year but to be received in the next year are called Accrued income or income receivable.

Accounting treatment in Final Accounts

1. Add to the concerned income in Profit and Loss Account on credit side.
2. Show as an asset in balance sheet on assets side.

Note: If accrued income is given in trial balance, the amount is to be shown only in the balance sheet as an asset on assets side i.e., need not be shown in P & L Account.

Income received in advance: The income pertaining to the next year but receiving in the current year called as income received in advance. The income of next year received in the current year is not an income, so it is deemed as liability for the accounting period.

Accounting treatment in Final Accounts

1. Deduct from the concerned income in Profit & Loss Account on credit side.
2. In the balance sheet, record it as liability on the liabilities side.

Depreciation: The value of fixed assets such as machinery, furniture etc., will decrease every year due to various reasons, such as wear and tear, obsolescence etc., Such decline in the value of fixed asset is called "Depreciation". It may be defined as **decrease in the value of the asset.** Depreciation should be considered as an expense in the final accounts and generally calculated as a percentage on the value of the given in trial balance.

Accounting treatment in Final Accounts

1. Charge it to the Profit & Loss Account (Appears on the debit side).
2. Deduct it from the value of concerned asset in balance sheet on assets side.

Bad Debts: The trader sells goods on credit to some of the customers. The customers who have taken credit (Debtors) may not pay the amounts. Thus the debts which are not collected and irrecoverable are known as bad debts.

Accounting treatment in Final Accounts

1. Debit to Profit & Loss Account.
2. Deduct from debtors in the balance sheet on assets side.

Note: If Bad debts are given in Trial Balance only, it should be shown in Profit & Loss Account as loss on debit side and need not be shown in Balance sheet.

3. In Profit & Loss Account, both the bad debts (Bad debts given in trial balance and given in adjustment) are to be shown on debit side.
4. Bad debts given only in the adjustments are to be deducted from debtors in the balance sheet on assets side.

Provision for bad debts: Some debts of a particular year may or may not be recovered in the next year. These debts are known as doubtful debts. So the traders create some amount on current year debtors and keep the same to meet the doubtful bad debts of the next year, which is called as provision for bad and doubtful debts.

Accounting treatment in Final Accounts

1. Record in P & L Account on debit side.
2. Deduct from Debtors in Balance Sheet on Assets side.

Interest on Capital: It is the amount of the interest payable on owner's capital by the business organisation. The interest on capital is expenditure.

Accounting treatment in Final Accounts

1. Calculate interest on capital at a given percentage and record it in Profit & Loss account on debit side.
2. Interest on capital should be added to the capital in Balance sheet on liabilities side.

Interest on Drawings: The amount of cash or goods taken by the trader for personal use is known as drawings.

Accounting treatment in Final Accounts

1. Interest on drawings amount to be recorded in profit & loss account on credit side.
2. Interest on drawings should be deducted from capital in balance sheet (on liabilities side).

Note: When the interest on drawings is given in trial balance, it should be recorded in Profit & Loss account on credit side. No need to show it in the balance sheet.

9.3 Balance Sheet

9.3.1 Meaning and Significance

After Trading and Profit & Loss Account, Balance Sheet is the last financial statement to be prepared by the business organization.

Balance Sheet may be defined as "an orderly statement representing assets, properties, capital and liabilities of the business on a particular date".

It is the statement prepared to find out financial position i.e., assets and liabilities of business on a given date. The balance sheet explains that what a business owns (assets) and what the business owes to others (liabilities) on a given date.

The balance sheet is prepared on the basis of trial balance. Only real and personal accounts are taken into consideration in the preparation of balance sheet.

9.3.2 Objectives

1. Reveals true and fair financial position of the business.
2. Traders can know about the business assets and liabilities i.e., what it owns and what it owes.
3. Balance sheet is useful to the creditors and financial institutions to take decision to extend the credit.
4. To know the financial solvency of the business.
5.

9.3.3 Preparation of Balance Sheet

Arrangement of assets and liabilities is called marshalling.

Balance sheet should be divided into two parts as, left hand side and right hand side. The left hand side is known as liabilities side and right hand side is called as assets side. The capital and liabilities off business are shown on the liabilities side, and all assets shown on the assets side.

Balance sheet may be prepared in any one of the following order.

1. Liquidity Order
2. Permanency Order

1. **Liquidity Order:** Liquidity means convertibility of assets into cash. Assets of highest liquid is to be recorded first and next highest follows. Liabilities will be shown inn the order of short term and long term.
2. **Permanency Order:** The assets which are used permanently are recorded first and liquidity assets in the last. On liabilities side, long term liabilities first and short term liabilities next.

Balance sheet on the basis of Liquidity Order
Balance sheet of _____ as on _____

Capital & Liabilities	Amount Rs.	Amount Rs.	Assets	Amount Rs.	Amount Rs.
Bank Over draft		XXX	Cash		XXX
Bills Payable		XXX	Bank Balance		XXX
Sundry Creditors		XXX	Bills Receivable		XXX
Loans		XXX	Debtors		XXX
Capital	XXX		Closing Stock		XXX
Add: Net Profit	XXX		Furniture		XXX
			Machinery		XXX
	XXX		Buildings		XXX
Less: Drawings	(XXX)	XXX	Good will		XXX
		XXX			XXX

Balance sheet on the order of Permanency
Balance sheet of _____ as on _____

Capital & Liabilities	Amount Rs.	Amount Rs.	Assets	Amount Rs.	Amount Rs.
Bank Over draft		XXX	Cash		XXX
Bills Payable		XXX	Bank Balance		XXX
Sundry Creditors		XXX	Bills Receivable		XXX
Loans		XXX	Debtors		XXX
Capital	XXX		Closing Stock		XXX
Add: Net Profit	XXX		Furniture		XXX
			Machinery		XXX
	XXX		Buildings		XXX
Less: Drawings	(XXX)	XXX	Good will		XXX
		XXX			XXX

Illustration 1:
Prepare balance sheet from the following particulars.

Capital	44,000	Investments	12,000
Debtors	12,000	Machinery	9,000
Creditors	10,000	Cash	8,000
Furniture	10,000	Closing Stock	7,500

Balance sheet

Capital & Liabilities	Amount Rs.	Amount Rs.	Assets	Amount Rs.	Amount Rs.
Capital	44,000		Debtors		12,000
Add: Net Profit	4,500	48,500	Investments		12,000
Creditors		10,000	Furniture		10,000
			Machinery		9,000
			Cash		8,000
			Closing Stock		7,500
		58,500			58,500

Illustration 2:

Prepare balance sheet from the following particulars

Capital	45,000	Loose Tools	3,500
Add: Net Profit	6,000	Bills Receivable	12,000
Debtors	4,800	Investments	16,000
Less: Drawings	4,000	Machinery	12,000
Creditors	8,000	Closing stock	9,200
Bills Payable	2,500		

Balance Sheet

Capital & Liabilities	Amount Rs.	Amount Rs.	Assets	Amount Rs.	Amount Rs.
Capital	45,000		Debtors		4,800
Add: Net Profit	6,000		Machinery		12,000
	51,000		Loose Tools		3,500
			Bills		
Less: Drawings	4,000	47,000	Receivable		12,000
Creditors		8,000	Investments		16,000
Bills Payable		2,500	Closinng stock		9,200
		57,500			57,500

9.3.4 Arrange of Assets and Liabilities

Capital and all liabilities to be recorded on left hand side (liabilities) and assets should be shown on right hand side (Assets).

Short Answer type Questions

1. Define Trading Account.
2. Define Profit and Loss Account.
3. Define Balance sheet.
4. Define Adjustment.
5. Define Depreciation.
6. Define Bad Debts.

Long Answer Type Questions

1. Write the procedure to prepare final accounts.

Exercises

1. Prepare the trading account of Vasantha Enterprises as on 31-12-2013 from the following balances.

Particlars	Rs.	Particlars	Rs.
Opening Stock	4,500	Sales Returns	1,000
Purchases	10,600	Customs Duty	800
Purchase Returns	1,000	Factory Supervisor salary	3,000
Wages	800	Closing Stock	4,000
Carriage	700	Factory Lighting	525
Sales	16,000	Clearing Charges	1,000

Ans: Gross Loss: Rs. 1,925

2. Prepare Trading Account of Visweswar as on 31-03-20012 from the following balances

Opening Stock	30,000	Manufacturing Expenses	8,000
Purchases	65,000	Factory Rent	10,000
Purchase Returns	4,000	Freights	3,000
Sales	110,000	Wages	15,000
Sales Returns	7,000	Closing Stock	30,000

Ans: Gross Profit Rs.6,000

3. Prepare the Trading Account of Nasreen as on 31-12-2016 from the following balances

	Rs.		Rs.
Opening Stock	100,000	Sales Returns	20,000

Purchases	55,000	Coal and Gas	2,500
Sales	200,000	Purchase Returns	4,500
Freights	1,000	Exicise Duty	2,500
Wages	10,000	Closing Stock	30,000

Ans: Gross Profit Rs.43,500

4. Prepare Profit & Loss Account of Jessi Rose for the year ending 31-03-2010 from the following balances.

Particulars	Amount	Particulars	Amount
Gross Profit	34,000	Discount(Dr)	250
Cartage	1,000	Printing & Stationery	250
Salaries	2,500	Rates & Taxes	300
Rent	850	Travelling Expnses	250
Insurance	1,000	Apprentice Premium	1,000
Bad Debts	1,000		

Ans: Net Profit Rs. 27,600

5. Prepare Profit & Loss Account from the following balances of Satya Kumari for the year ending 31-12-2016.

Particulars	**Amount Rs.**	**Particulars**	**Amount Rs.**
Salaries	4,000	Advertisements	1,200
Freights	500	Audit Fee	1,500
Discount Allowed	700	Mis. Expenses	1,350
Commission Paid	1,000	Postage	850
Bad Debts	2,000	Dividend Received	500
Repares	500	Printing and Stationery	2,700
Gross Profit	36,000	Insurance Premium	1,500
Commission Received	800	Office Electricity Expenses	800
Rent Received	1,200		

Net Profit: 19,900

6. Prepare the Trading, Profit & Loss Accounts from the following balances of Sri. Arun Kumar as on 31-03-2012.

Particulars	**Amount Rs.**	**Particulars**	**Amount Rs.**
Opening Stock	8,000	Sales	53,000
Purchases	43000	Sales Returns	2,000
Purchase Returns	800	Closing Stock	22,000
Discount Received	1,000	Wages	1500
Commission	1,730	Manufacturing Expenses	800
Trade Expenses	600	Salaries	15,000

Factory Rent	2600	Office Rent	1,800
Interest on Dividend	1,690	Repares	650
Profit on sale of old machinery	620	Mis. Expenses	1,200
Rent Received	1,500	Bad Debts	860
Depreciation	850		

Ans: Gross Profit Rs. 17,300 Net Profit Rs. 3,480

7. Prepare balance sheet of Ekambareswar from the following information as on 31.03.2012.

Bank Over draft	20,000	Rent to be received	4,000
Salaries to paid	10000	Net Loss	35,000
Plant and Machinery	88,000	Furniture	40,000
Lands and Buildings	120,000	Drawings	20,000
Bills payable	20,000	Creditors	30,000
Cash in hand	12,000	Interest received in advance	2,000
Bank balance	18,000	Bank Debt	70,000
Bills Receivable	35,000	Trade Marks	15,000
Debt from Kaamakshi	45,000	Patents	22,000
Capital	250,000	Goodwill	35,000
Rent paid in advance	3,000		

Ans: Balance sheet Total: Rs. 3,92,000

8. Prepare the balance sheet of Sundareswar from the following details as on 31-03-2014.

Particulars	**Rs.**	**Particulars**	**Rs.**
Opening stock	20,000	Debtors	15,000
Creditors	50,000	Capital	100,000
Machinery	40,000	Goodwill	45,000
Motor Van	45,000	Closinng stock	25,000
Other Debts	20,000		

Ans: Balance sheet Total: Rs. 1,70,000

9. Prepare the balance sheet of Natraj from the following as on 31-03-2016.

Particualars	Amount Rs.	Particualars	Amount Rs.
Sundry Debtors	19,000	Motor Van	5,000
Closing stock	18,000	Capital	56,000
Bills payable	30,000	Net Loss	4,000
Creditors	20,200	Drawings	3,000
Debt from sundari	10,000	Furniture	4,000
Cash in hand	1,400	Buildings	10,200
Bank balance	20,000	Goodwill	30,000
Tools	1,600		

Balance sheet Total: Rs. 1,09,200

UNIT -X
Tally

10.a.1 Introduction to accounting packages
10.a.2 Features, accounting, data migration capability, duties and taxes Advantages and disadvantages
10.b.1 Financial functions of Tally
10.b.2 Inventory and application
10.b.3 Creation of company, alteration of company, master configuration, creation of groups, grouping of ledger accounts, voucher configuration, recording configuration of sample data
10.c.1. Display and reports
10.c.2 Accounting reports, Balance sheet, profit and loss account, printing reports
10.d.1 Ratio Analysis
10.d.2 Classification
10.d.3 Financial Ratios, Profitability ratio, Activity ratio analysis
10.e.1 Cash flow statement and funds flow statements
10.e.2 Preparation of funds flow statement, Limitations of funds flow statement, Analysis of funds flow statement, Cash flow in tally.

10.a.1 Introduction to accounting packages

Accounting package allows us to monitor and manage the financial health of our business. Many different types of accounting packages are available on the market, with options to suit different business sizes, sectors, industries and even work processes.

10.a.2 Features, accounting, data migration capability, duties and taxes Advantages and disadvantages

Key features of accounting packages

There are many types of accounting packages for business, with many different features and key functionalities. The package to be considered will depend on the type of business and the way of running it.

- **Basic bookkeeping** - for example sales and purchase ledgers, nominal ledger and invoicing.
- **Duties and Taxes** - Accounts system should be able to keep track of Duties and taxes and calculate your payments at the end of each Tax period.
- **Payroll processing** – Regarding employees, consider a payroll function that calculates Salaries ,ESI ,PF etc.,
- **Generation of reports** –a system that gives regular management accounts will help improve business efficiency.

- **Invoicing** - any accounts package needs to be able to produce invoices in customized way and you may want to send them by email.
- **Credit control** - an accounts package can help by highlighting where customers have exceeded their limits and provide statements to chase them.

Advantages and disadvantages of accounting package

Reliable accounting package is likely to benefit many businesses. However, such package sometimes comes with its share of problems, so it is important not to overlook the possible disadvantages.

Advantages of accounting package

Benefits of accounting package include:

- **simple data entry** - it is typically fast, straightforward and only required once
- **fast processes** - delays, for example between sale and invoicing, are minimal
- **automation of reports and analysis** - eg on profit and loss, debtors and creditors, customer accounts, inventory counts, sales, forecasting, etc
- **automation of tasks** - eg calculating pay, producing payslips, calculating taxes, etc
- **reduction of errors** - eg transposition of figures, incorrect or incomplete recording of transactions, etc
- **integration with other systems**, such as online banking and e-filing

Using accounting package can help to **save time and money**, and offers valuable insight into business. If the package is chosen carefully, investing in a computerised accounting system can be one of the best decisions.

Disadvantages of accounting package

Certain problems and disadvantages are worth considering while using accounting packages.

- **Price** - the package cost, although small in relation to other costs, is higher than a paper-based system.
- **Implementation** - manual accounts are generally easier to set up and can be more flexible than computerised accounting.
- **Support** – It may need to purchase yearly maintenance and support for the package.
- **Specialised needs** - an accounts package will typically suit most types of business. However, specialist businesses may need to refine the package or change their processes to use accounting package successfully.

  Accounting package may sometimes also have a steep learning curve, so if you are more comfortable writing up ledgers and books, keeping manual accounts may be a simpler option.

10.b.1 Introduction

Tally is a Financial accounting Package that keeps pace with complex business demands and simplifies growth. This package was developed effectively to fulfill the needs and help to overcome the challenges of growing business.

Tally's Dynamic features and MIS capabilities are designed to simplify business operations, giving you complete control over accounting, inventory and statutory process.

1. **Simple :** Tally is very simple and user friendly.
2. **Codeless System :** It is Codeless enterprise system All jobs may be performed through the name Master. The name may be altered at any time without any effect.
3. **Quick Entry / Alteration of Masters :** Master Creation is simple and fast . It provides special master entry / alteration module through several masters may be entered and altered in one screen.
4. **E-mail Capability :** Any report can be sent using this software, without using any external e-mail software.
5. **Web Publishing :** User can publish any report at any Website or FTP site in HTML format to view from any place.
6. **Export of data :** Any Report including masters and Vouchers may be exported in Any Format for import into another system(Tally / Non tally).
7. **Encrypted form :** The data of any Company can be stored in highly secured encrypted form and is impossible to break open the data.
8. **Accounting period :** You may extend the Accounting period to several Financial Years, and may keep the Accounts of a project for 5 years at one place. At any point of time one can split them to Financial years.
9. **Operations Audit :** Tally keeps a record of user name for creation / alteration of all masters & voucher data.
10. **Group Companies** : To get consolidate report of a Group of Companies, one can create a Group Company of several constituent companies.
11. **Printing** : All Tally reports can be directed for printing and can be previewed before printing.
12. **Data connectivity** : Tally data can provide ODBC connectivity to generate any report.
13. Tally prepares final accounts from regular Voucher data.
14. **Single Mode Voucher Entry:** Any lay man not knowing Debit and Credit can also use this package. Just enter the figures and tally does the rest.
15. Day to day business transactions can be recorded using Ledgers, Journals etc.
16. **Ratio Analysis:** Tally can be used for ratio Analysis for better financial management and interpretation of state of affairs of Company.
17. Cash Flow and Funds Flow statements can be easily generated with working Capital figures for proper utilization & Control of liquid resources of the Company.
18. Helps in maintaining Inventory

10.b.2 Financial Functions of Tally

Tally package is used for accounting system . The a/c package is used for maintaining the transactions of business on a daily basis by creating ledgers , journals, using reports we can view

Trial Balance, Profit and Loss A/Cs. Balance Sheet , To View Cash Flow and Finds flow statement.

10.b.3 Creation of Company

The new company can be created using the following steps.

Step 1 : Start '! programs '!tally 7.2/ tally 9.0

or

Step 2: double click on tally icon on desktop

Step 3 : Select the option create company from company information screen

Step 4 : the company creation window gets opened and user can enter all the details of company like Name of company , Mailing name , Company address , Email address of company VAT Regd no if any , using of currency symbols as Rs. the financial year of company.

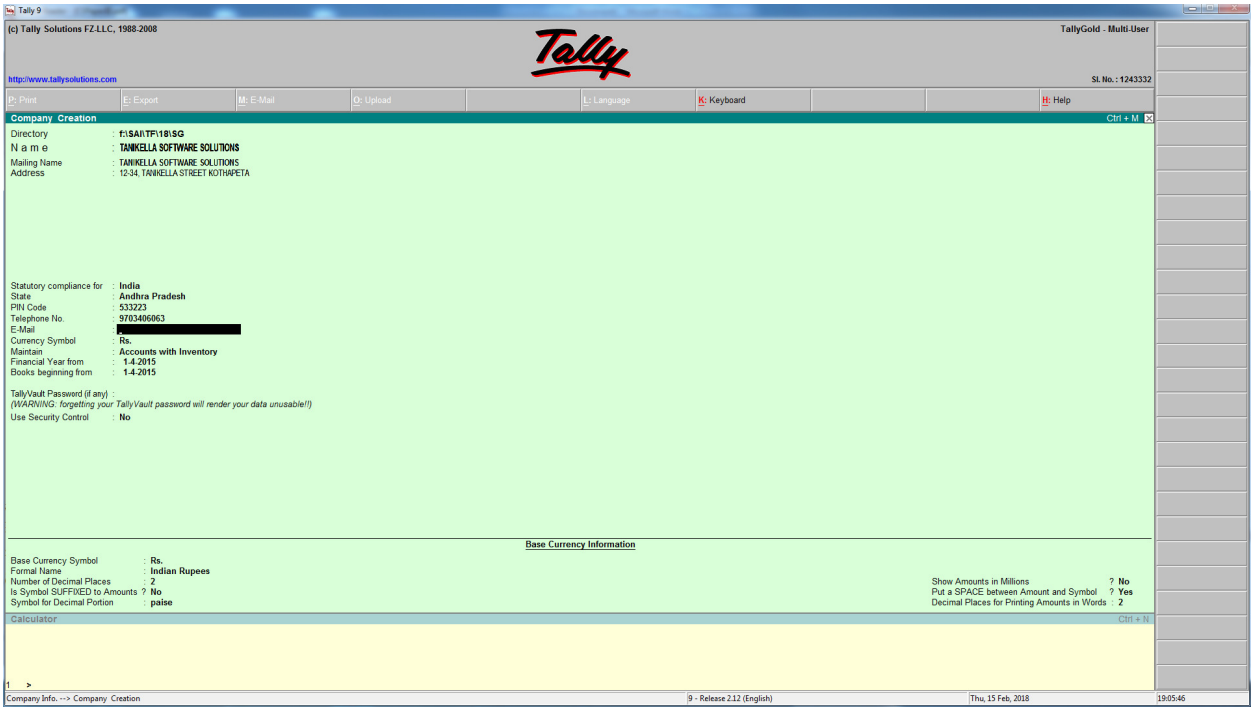


Figure 10.1

Then click on yes button to accept the details, and company gets created .

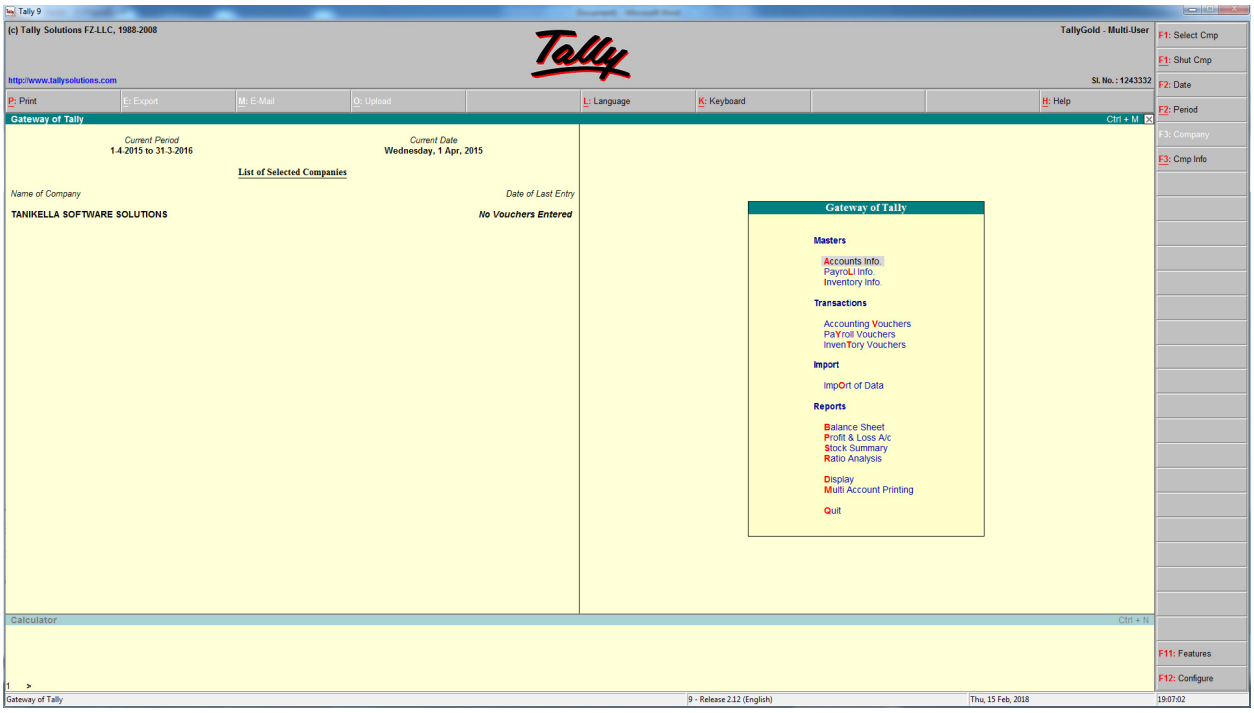


Figure 10.2

Alteration of Company :- Company details can be altered by selecting alter command from company information services where in user can altered the details of Company.

Figure 10.3

The configuration must be done before creating and starting work of the company.

10.b.4 Master Configuration

The master configuration is to configure the details like Currency Symbol, No. of decimals places, symbol to be displayed for decimal places like paisa in case of Currency Sign, Rupees, Display of names in Reports and Style of dates.

Steps to Configure

1. Press F12 key to configure
2. In the configure option menu click General option then
    1. Select the steps of names i.e Default appearance of names in Reports.
    2. Default appearance of Stock Item Names
3. Select Style of Dates as dd-mm-yy
4. Select the configuration of numbers to display Decimals
    Thousands Seperation to use, Put currency Sign
    Show numbers in Millions(and not in lakhs) : No
    and Other option to be selected are
5. Show monthly Reports to : Yes
    Reports are configured to display Graphs.

Use Separate Menu : This option is used to display Final Account Statements such as Balance sheet & Profit & Loss A/c directly on the Gateway Tally.

If This option is set to Yes , The final statement of Balance sheet and P & L A/C statement can be accessed from Gateway Tally.

The above Statements show Tables with Masters only in current Language selected in Language Configuration.

Numeric Signs : This allows to set the number styles.

Master Configuration of Accounts and Invoice Information

This Master configuration allows to configure Accts/ Inv information and Voucher entry information. This allows user to decide details to appear in this master for Accounting Voucher and Inventory Voucher.

Using F12 Function key can configure Voucher entry details and Printing options to configure the printing voucher, Invoice statement layouts etc.

Groups

The accounting principle follows some conventions for presentation of the financial reports. Transactions of similar nature are grouped and balanced into entities called Ledger Accounts.

These Ledger accounts are further organized into hierarchical levels called Account Groups.

Accounting Groups

This are a method of organizing the large population of ledger accounts into a tree structured into hierarchical view

Ledger Accounts give the details of individual transactions.

The accounting entities are further mainly divided into

- Liabilities
- Assets
- Incomes
- Expenses

Tally classifies and organizes these Accounting Entities into groups.
Some examples of Ledgers and Groups

1. Current Assets - Group
    a) Bank A/c - Ledger
2. Cash-in-hand
    a) Cash, Petty cash — Ledger
3. Deposits
4. Loans and Advances
5. Stock
6. Sundry Debtors

The ledger Accounts are transacted into Voucher

Account Group do not Participate in any Voucher but they are used to organize the Ledger Account .

Reserved Accounting Groups

Once a company is created Tally automatically creates 28 predefined Account Groups called Reserved Groups. They cannot be deleted to maintain consistency and integrity of the accounting system representing Income and Expenditure, Assets and Liabilities. There are 28 reserved Groups, of which 15 are top level primary group, and 13 are sub groups of these primary groups.

Some of reserved groups of Assets and Liabilities are

Examples of Accounting Groups

Group of Liabilities	Group of Assets
Capital A/c	Fixed Assets A/c
Reserves and Surplus	
Loans	Investments
Bank OD A/c	Current Assets
Secured Loans	Bank Accounts
Unsecured Loans	Cash-in-hand
	Loans & Advances
Current Liabilities	Deposits

Duties and Taxes	Stock-in-hand
Provisions	Sundry Debtors
Sundry Creditors	
	Misc. Expenses
	Suspense A/c
Group of Income	Group of Expenses
Sales Accounts	Purchase Accounts
Direct Income	Direct Expenses
Indirect Income	Indirect Expenses

Creation of Groups

To create Groups select Account Info Menu at Tally main menu and follow steps:-

1. Select Groups from account Info menu
2. Select Create from Single Group Option to get Account group creation screen
3. At Group name field: Enter a unique Group name.
4. At under field Select parent group from the list of Groups, the new group is placed under the selected parent group and will inherit its properties.

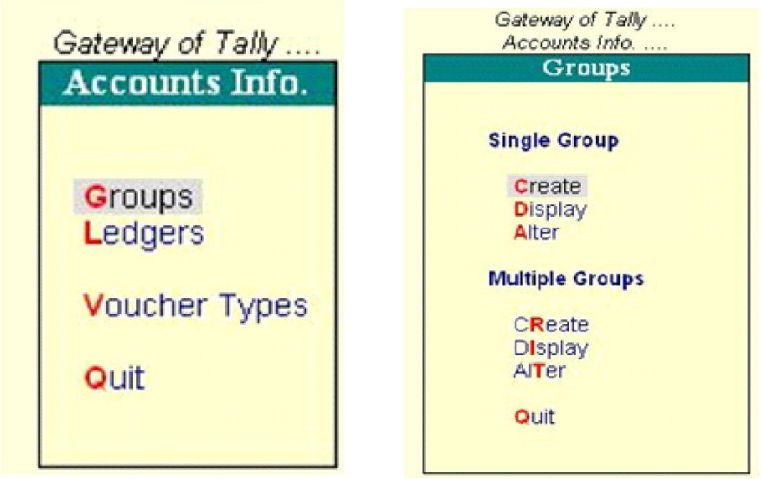


Figure 10.4

Figure 10.5

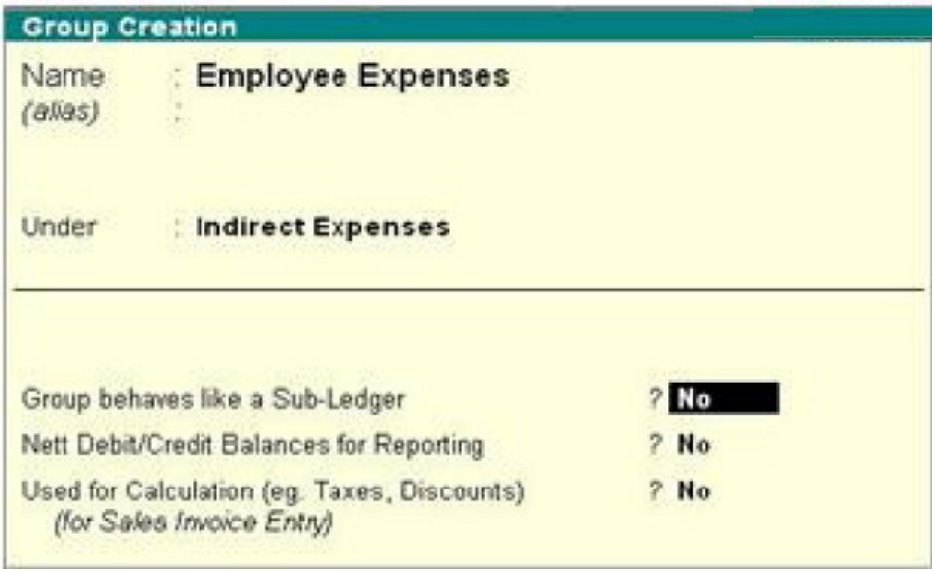


Figure 10.6

Alteration Of Group

1. Select Accounts Info > Groups > Alter and select the Account Group to get in alteration mode.
2. he respective record is displayed. Overtype the data to modify data in any field.

To change in Parent group Select Group from the list.

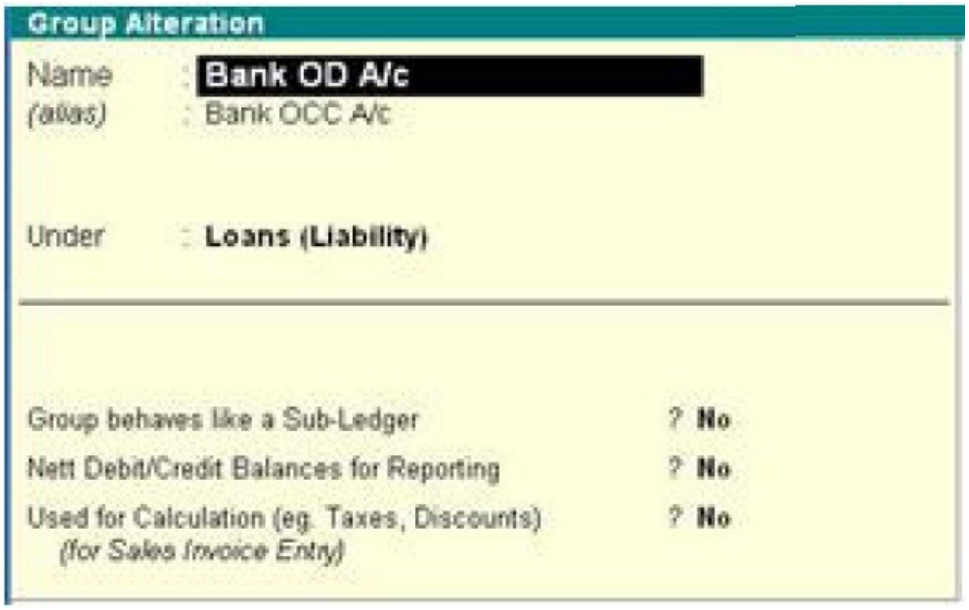


Figure 10.7

Deletion of Group

To delete a Group

1. Select Accounts Info > Group > Delete
2. Select the group from the list to delete.

However, If the Group contains any ledgers there under then the group cannot be deleted unless the ledgers created under that group are deleted.

10.b.5 Creation of Ledgers

Tally automatically creates two ledgers Cash (under Cash –in-hand group) and profit & Loss A/c (primary ledger).

To create other Ledgers Select Create under Single ledger to get Ledger creation screen.

1 Ledger Name : Enter Ledger Name at Name field.
2 Under : Select Group of Ledger from the list of Ledgers.
3 Opening Balance : Enter Amount.

Tally shows the opening balance at the right side with Dr. for Assets and Expenses Cr for Liabilities & Income.

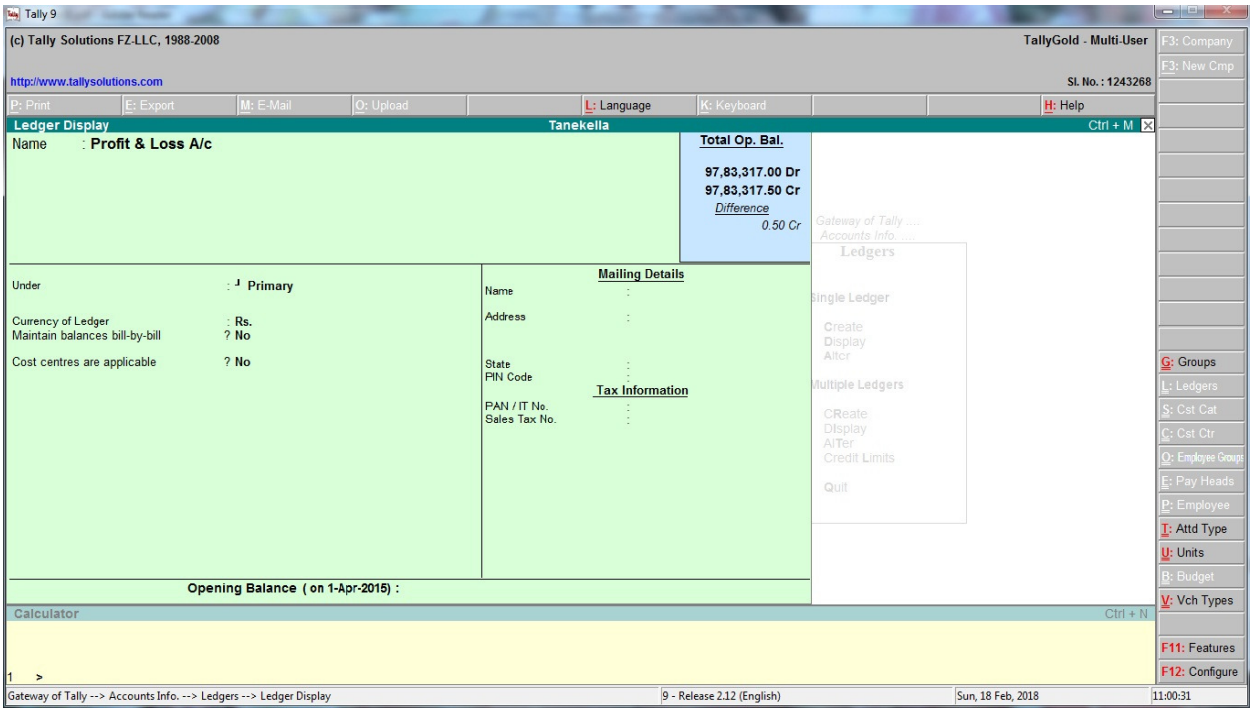


Figure 10.8

Display of Account Master: To display any Account master Select display option from the respective menu to display Group or Ledger.

Alteration of Account Master: To alter any particulars in any Master Select Alter from the respective menu., the steps are

Alteration of Ledger :

1. Select Accounts Info > Ledger > Alter and select the Account Ledger to get in alteration mode.

2. The respective record is displayed. Overtype the data to modify data in any field. and Press CTRL + A to save changes.

Deletion of Ledger :- To delete a Ledger

1. Select Accounts Info > Ledger > Delete.
2. Select the Ledger from the list to delete.

However, If the Ledger contains any entry there in then the Ledger cannot be deleted unless the entries there in are deleted.

10.b.6 Accounts Voucher

Accounts Voucher is the primary document in which complete details of accounting transactions are recorded. Like

- Payment of Salary to Employees
- Withdrawal of Cash From Bank Account

You make an accounts voucher when you receive money or pay cash. But there are instances of non cash business transactions like

- Credit Sales
- Provision of Depreciation for Fixed Assets.

Tally Account Voucher Types

As per the accounting principle all accounting transactions are entered in Journal Voucher. The following are the types of Voucher used by all kinds of business units, irrespective of their nature, size or book keeping methods.

- **Contra**
- **Receipt**
- **Payment**
- **Journal**

Following types of Voucher are used for Journal Vouchers

Sales : To record all sales . However Cash sales can be recorded through Receipt Voucher, Credit Sales through Journal Voucher .

Purchase : To record all purchases, However Cash Purchase may also be entered as payment Voucher and Credit Purchase as Journal Voucher.

Debit Note & Credit Note : These transactions are recorded through Journal voucher.

Voucher Configuration

To configure the voucher , Click F12 : Configuration at Gateway and select Voucher Entry at Configuration menu. Set Yes at Single entry mode for Payment, Receipt, & Contra Vouchers. Tally provide two forms for Single entry and Double entry for convenience, Internally data is stored in the same way . You may get same results in Single or Double mode.

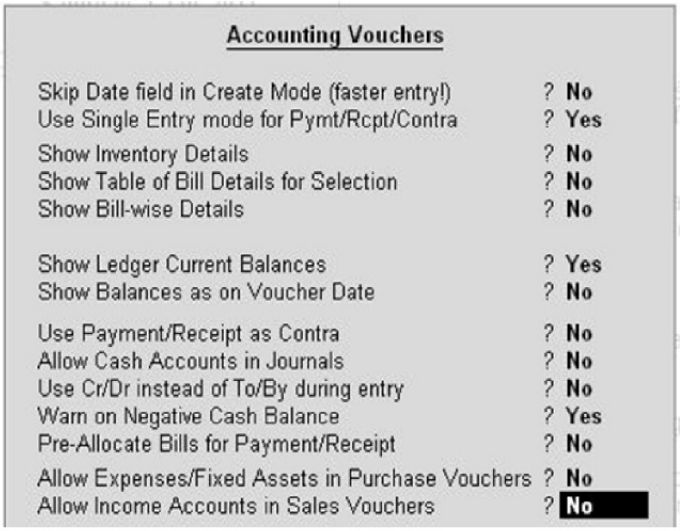


Figure 10.9

CREATION OF VOUCHER : To record a transaction through a Voucher entry , Select accounting Voucher type at Tally main menu.

Figure 10.10

To Enter Voucher press any of the Function Key as displayed in menu for each of Voucher type.

To Enter Voucher press any of the Function Key as displayed in menu for each of Voucher type.

Voucher Header : At the voucher header , Enter the following details:-

Voucher No : Tally displays voucher no serially generated in a sequence for each voucher type.

Voucher date : Current date is carried at this field to denote the date of voucher

Voucher Ledger Account : This is a Tabular area where each Ledger transaction and related data is entered.

ledger Sign : Press D for Debit and C for Credit at first column to indicate Debit or Credit Transaction.

Ledger Account : At Particulars field select the Ledger account from the List of Ledgers.

Ledger Amount : As per By/ To enter in the first column type Ledger amount in Debit or Credit Column . The Ledger entries are terminated as soon as the total Debit or Credit is Equal.

Voucher Narration : At narration field , enter voucher Narration describing the voucher transaction.

Cheque Number Entry : When any Bank Account (ledger placed under Bank Accounts) is transacted in Voucher, Tally prompts Ch. No. at Narration field, enter Cheque no and enter narration next to cheque number.

Voucher Alteration

To alter any data in any field before saving , click on the field, or use Shift + Tab or Up Arrow Key

Saving the Voucher

After complte entry of the voucher Type Yes at Accept ? to save the Voucher or CTRl + A to save the voucher.

Tally shows each voucher type in distinct color like

Voucher Type	Screen colour
Contra	White
Payment	Yellow
Receipt	Green
Journal	Blue

Figure 10.11

Voucher Entry Rules

Tally follows certain rules for voucher types These rules are validated during voucher entry and any violation is trapped immediately.

Contra Voucher

Contra voucher is used for fund transfer between cash and Bank Accounts

Following transactions should be entered in Contra Voucher :

a) **Cash deposited in Bank**
b) **Cash withdrawn from Bank for business use**
c) **Cheque of one bank deposited in another Bank.**
d) **Cash given to / received back from Petty cash**

Entry of Contra Voucher : Press F4 function key (F4 Contra) at the Voucher Entry Screen to enter Contra Voucher.

Entry Rules : The entries in Contra Voucher follow the rule shown below

Pariculars	**Debit**	**Credit**
Cr Source of Funds	(Amount)	
Dr Destination of Funds		(Amount)

The first entry is always a credit. From 2 nd entry onwards you may Debit or Credit a Ledger under Cash, Bank Accounts and Bank OCC Group only.

Examples of Contra Vouchers

1. Rs. 24000 withdrawn from Bank of Baroda, So the entry would be

Cr Bank of Baroda	24000	
Dr. Cash	24000	

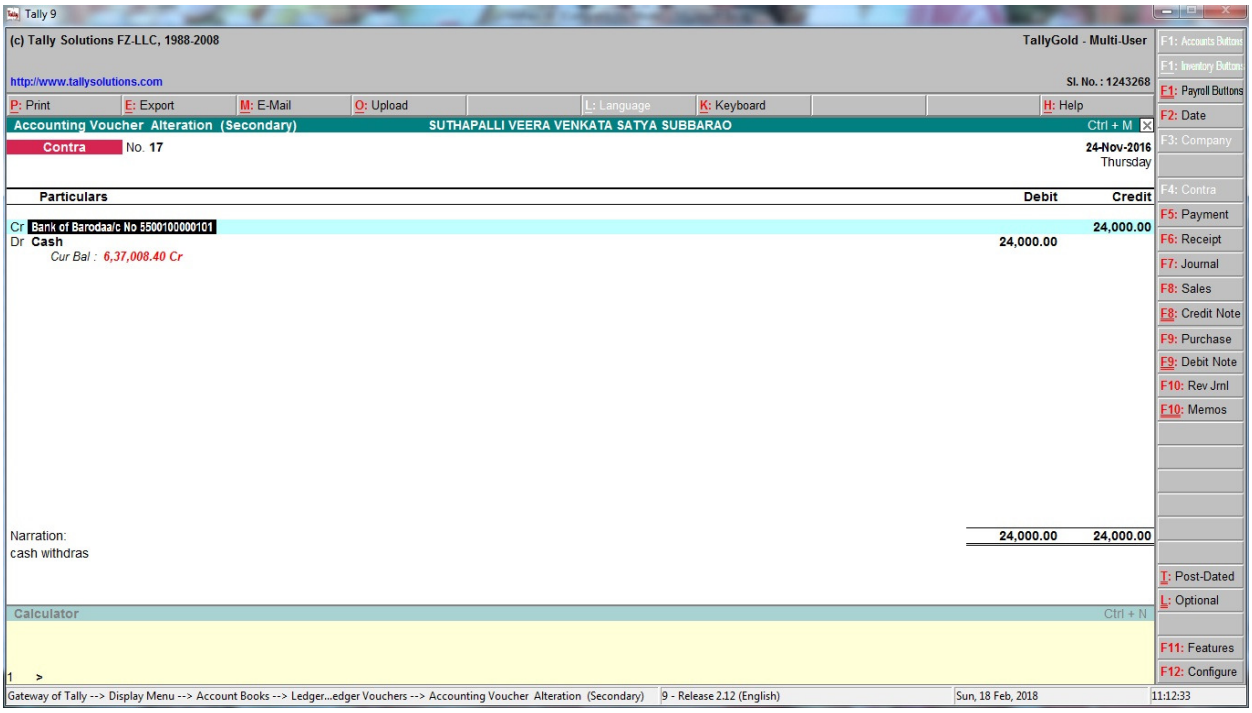


Figure 10.12

Payment Voucher

All payments are recorded in Payment Voucher Such Payments may be towards Purchases, Expenses, Acquisition of Fixed assets, payment to Creditors, Loans / Advances paid by you, or Repayment of Loans and Advances taken earlier.

Press F5 Function Key (Click F5 : Payment Button) at the Voucher entry screen.

Voucher Rules : Payment Voucher follows the rules as stated

Particulars	**Debit**	**Credit**
Dr Ledger Account Paid to		(Amount)
Cr. Cash / Bank Account	(Amount)	

Entry Rules : The first entry is always Debit and second entry onwards you may specify Debit or Credit. Ledger Account placed under the Cash in hand, Bank Accounts or Bank OCC Group must be Credited.

Entry screen

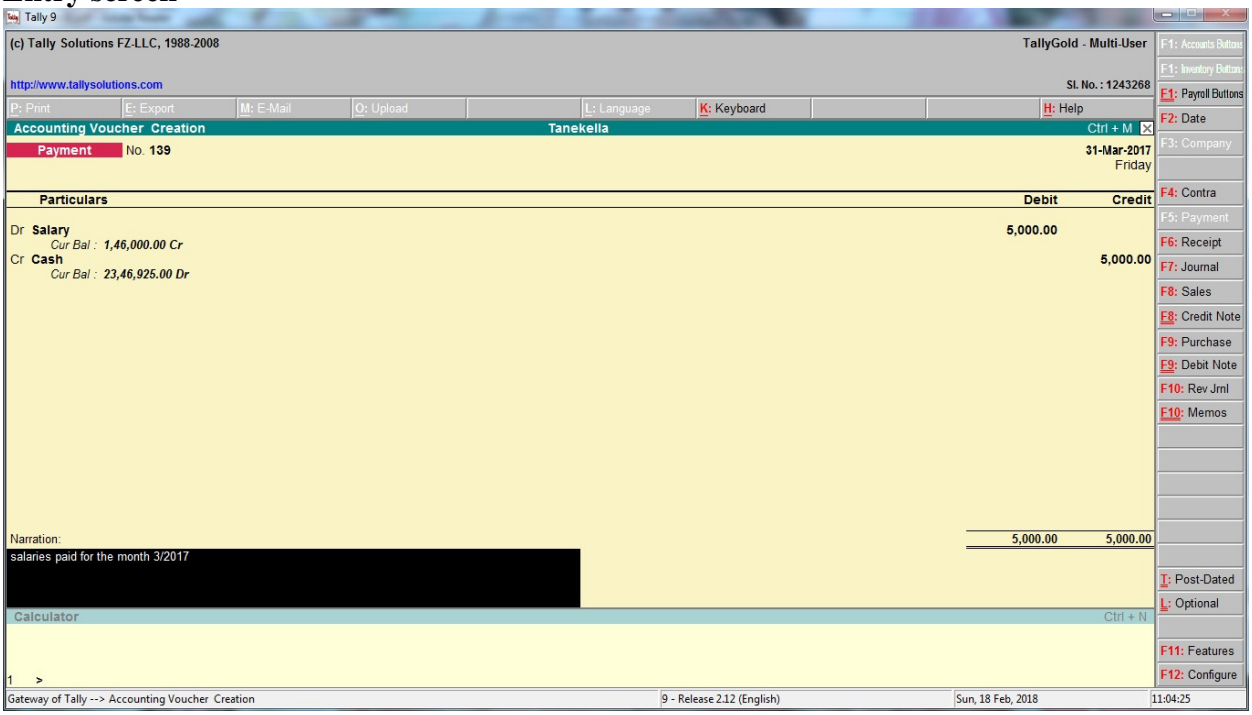


Figure 10.13

Receipt Voucher

Cash Receipts (In Cash or through Bank) are recorded through receipt voucher. Such Receipts may be through Income , Debtors, Loans / Advances taken or Refund of Loans and Advances given earlier.

Press F6 Function key (F6 Button) at the Voucher Entry screen to get Receipt Voucher.

Voucher Rules : Receipt Voucher follows the rules as stated

Pariculars	**Debit**	**Credit**
Cr Ledger Account Recd From		(Amount)
Dr. Cash / Bank Account	(Amount)	

Entry Rules : The first entry is always Credit and second entry onwards you may specify Debit or Credit. Ledger Account placed under the Cash in hand, Bank Accounts or Bank OCC Group must be Debited.

Entry screen

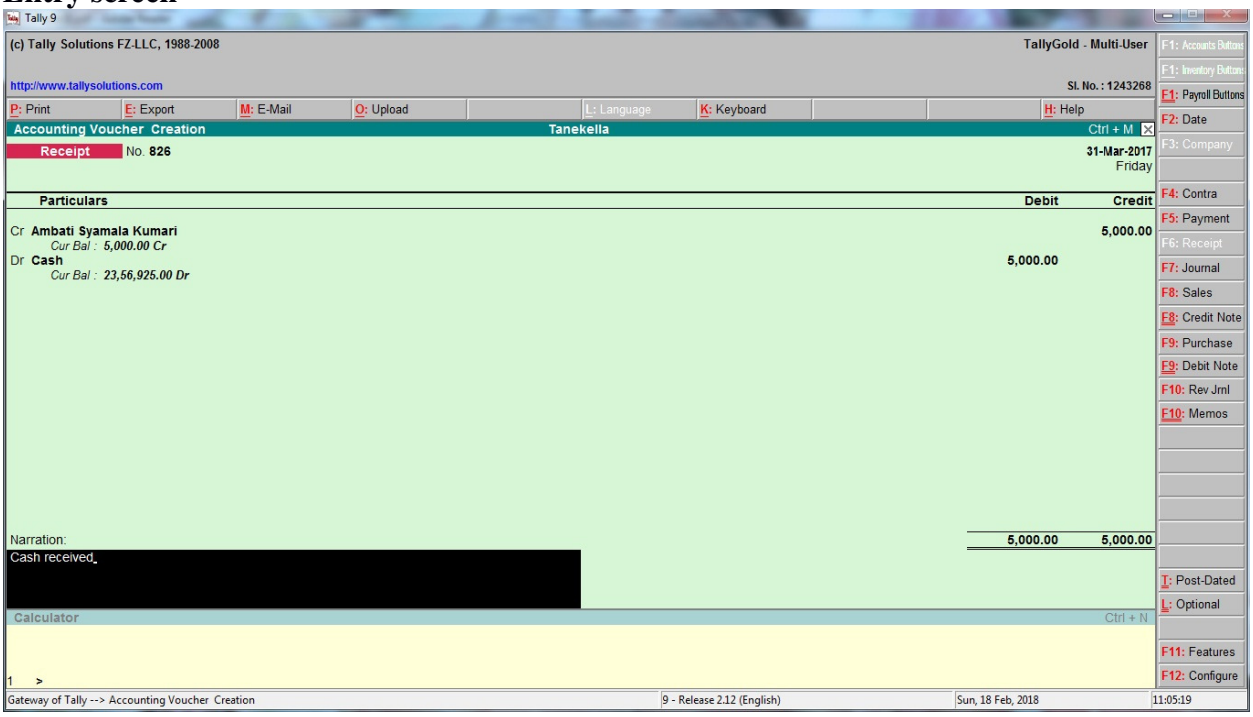


Figure 10.14

Journal Voucher

Journal is an Adjustment Voucher , normally used for non cash transactions like adjustments in Ledger Accounts.

Press F7 Function key (F7 Button) at the Voucher Entry screen to get Journal Voucher.

Entry Rules : In a Journal Voucher , only Non Cash /Bank Accounts (Ledger Accounts other than Cash , Bank, Bank OCC) may be transacted. The first entry must be Debit.

Voucher Alteration Deletion and Cancellation

You may perform Voucher Alteration, Deletion & Cancellation at Voucher Alteration Mode at the following :

Current Voucher : The voucher on the screen you are working is the current voucher. Until you save it is in Alteration mode.

Other Vouchers : You may get any other voucher by pressing

Pg Up : for Previous Voucher

Pg Dn : for Next Voucher.

To get any voucher of any other date

Press F2 and change the voucher date and then scroll through vouchers using Pg Up and Pg Dn keys.

Account Voucher Printing

After Voucher entry you may print the Voucher in two ways:

On line Voucher Printing during entry : Just after completing the Voucher entry you can print the current voucher before saving it.

Off line Voucher Printing saved Voucher : You may print all Vouchers of a day at once after the vouchers have been saved.

Tally Configuration for Voucher Printing

In the Voucher printing screen, click F12 : Configure to get Voucher printing configuration screen for the respective voucher types. Set the configuration options as desired:

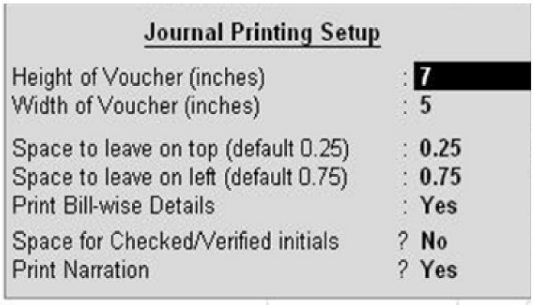


Figure 10.15

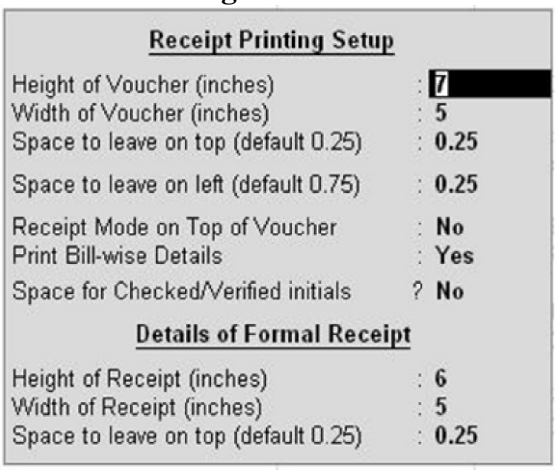


Figure 10.16

All accounting books and Day books can be printed by selecting option from the printing menu of Tally

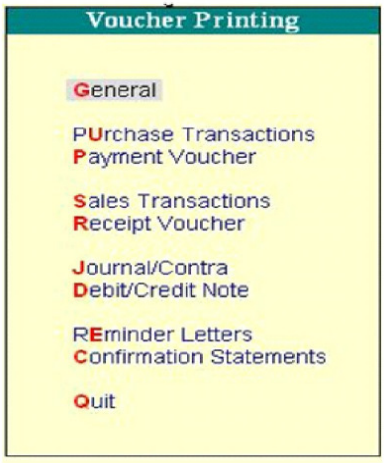


Figure 10.17

10.c.1 Reports

After the Voucher entry, its effect is reflected in various reports. Tally provides powerful display facility to view reports at various levels of details and contents of the screen.

Some top level reports like Balance Sheet, Profit & Loss Account at main menu while other reports are available through Display option at Main Menu.

Click Display to display menu from Main Menu.

Accounting Group Summary

This report shows the summary of Account groups.

Select Display > Account Books > Groups Summary.

Select an Account Group to get Group Summary for the Group.

Primary Group Summary

The primary Group Summary shows the figures of all Primary Groups. Select any Group to get required Group Summary.

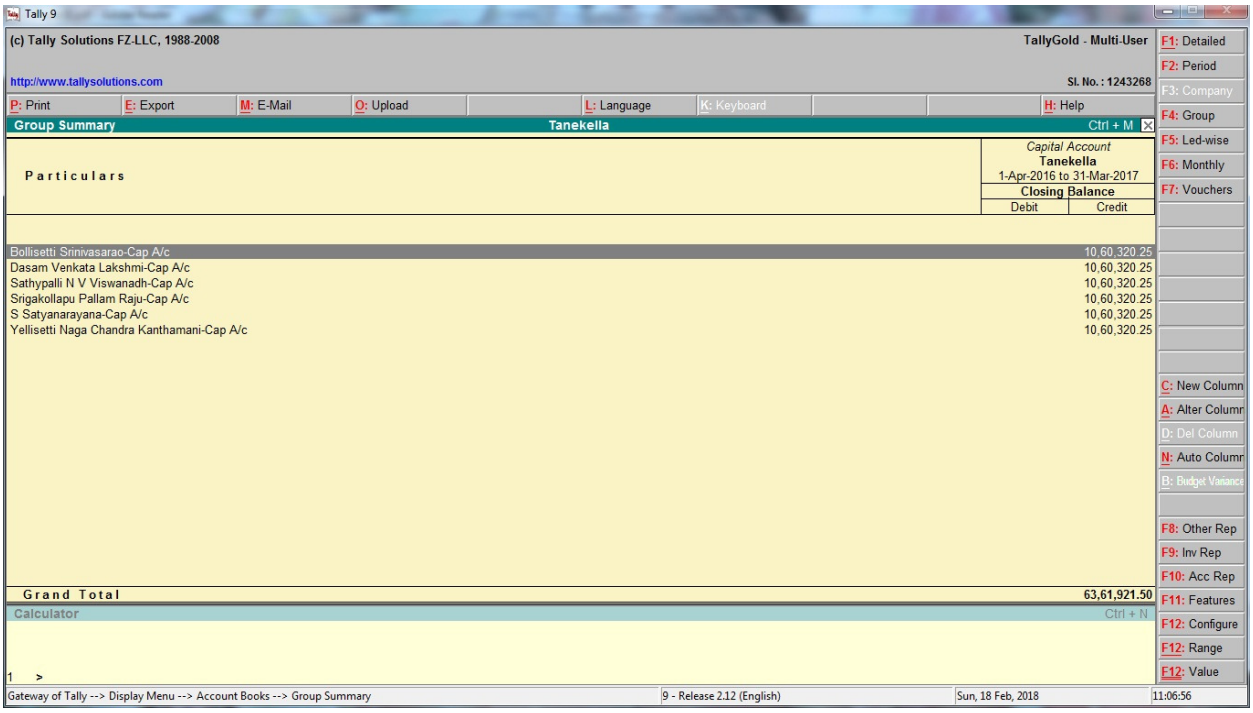


Figure 10.18

Ledger Summary

It shows the Summary of each Ledger for the current period. At Group Summary. Click F5: Ledger wise to show Ledger summary of child ledgers of the Group.

Trial Balance

Trial Balance shows the Closing Balance of Account Groups/ Ledger.
This is the next level report to Ledger.

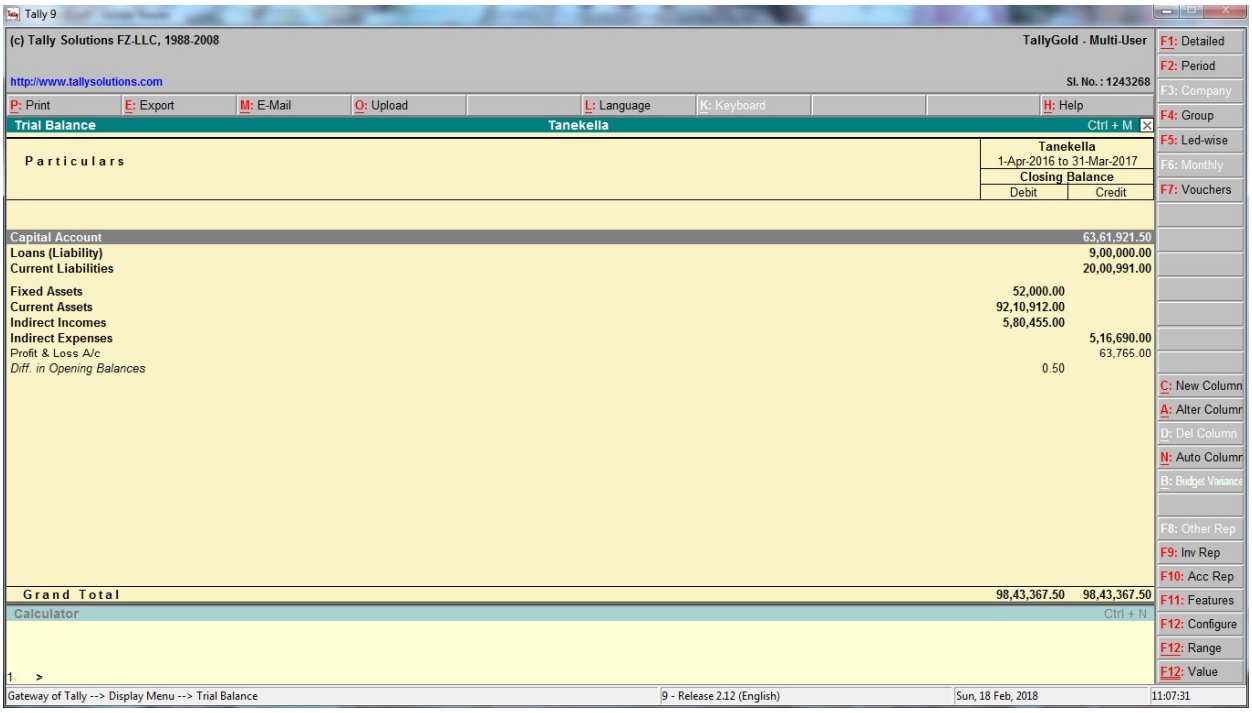


Figure 10.19

At Primary Group Trial Balance Click F1: Details to Detail Trial Balance showing next level groups/ Ledgers.

Trial Balance Configuration

At trial balance , Click F12 : Configure to get Trial Balance Configuration options:

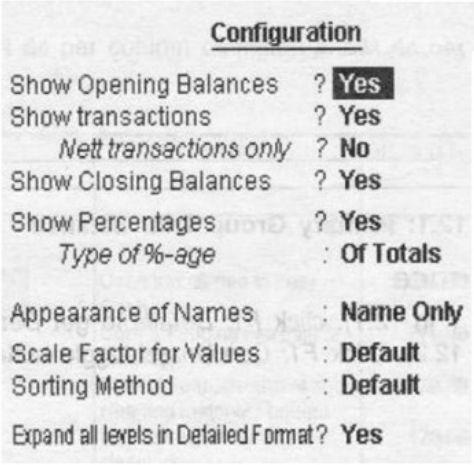


Figure 10.20

Profit and Loss Statement

The Profit & Loss Statement (popularly known as Profit & Loss Account) displays the figures of all Nominal Accounts and the Net Profit / Loss. Sales , Closing Stock, Direct and Indirect Income heads appear in the Income side; Opening Stock, Purchase, Direct and Indirect Expenses appear in the Expenditure side. Excess of Income over Expenditure shown as Nett Profit, Deficit as Nett Loss.

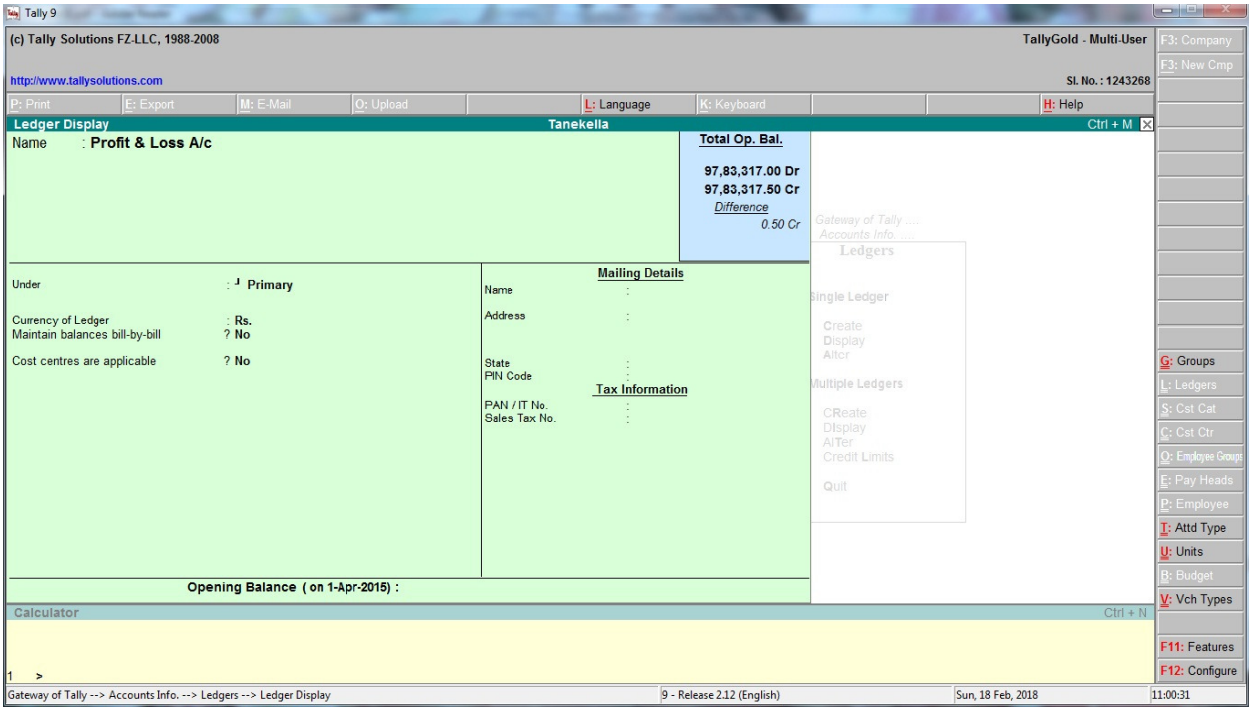


Figure 10.21

Balance Sheet

Balance Sheet is the top most Financial Statement that reveals the State of Affairs of a company as on the date of the Report. Assets side shows what the Company Owns and Liabilities side lists what is Owes. All Real and Personal Accounts appear in Balance Sheet.

Primary Balance Sheet

It shows with closing balance for Primary Group of Liabilities in one side , Assets on the other in horizontal (T) format.

Select Balance Sheet at Gateway Tally to get Primary Balance Sheet.

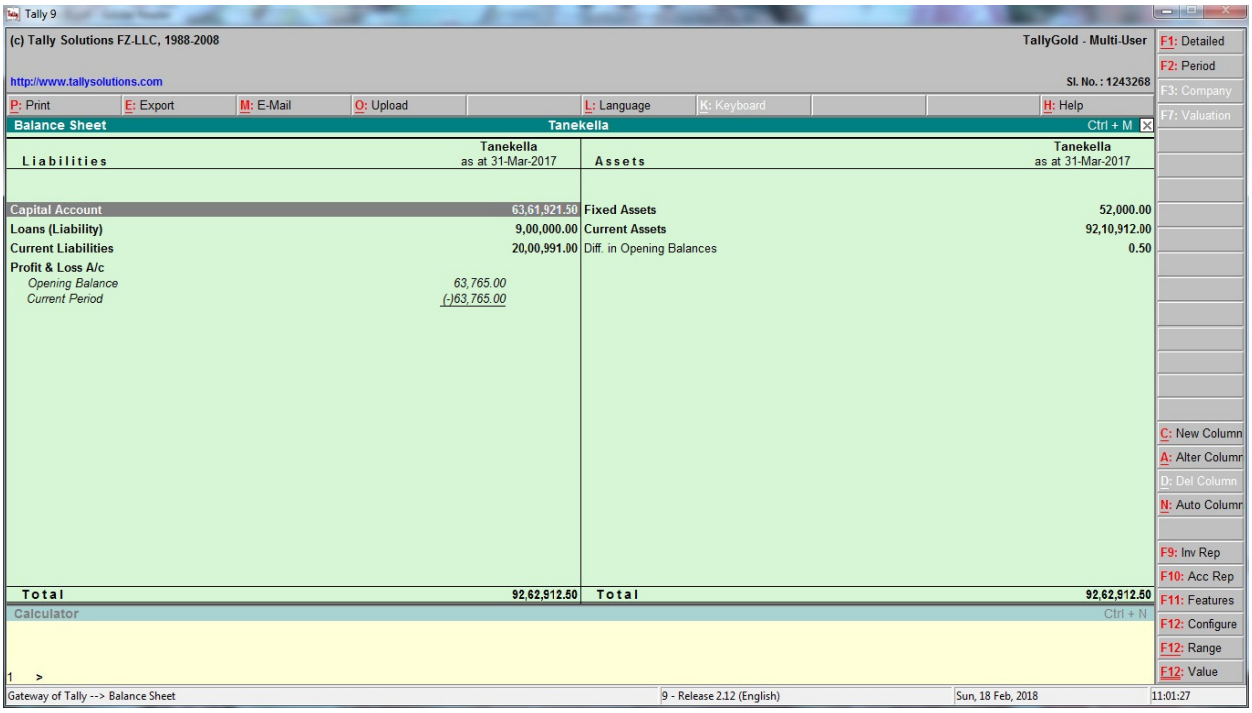


Figure 10.22

Detailed Balance Sheet

In Primary Balance Sheet, click Alt + F1 : Detailed toggle button to get Detailed Balance sheet showing next level Group/ Ledger details.

Balance sheet Configuration

In Balance Sheet , Click F12 : Configure to get Balance Sheet Configuration, set Yes at show Vertical Balance Sheet at Configuration options.

10.d.1 Ratio Analysis

Ratio Analysis is technique of analysis and interpretation of financial statements. It is the process of establishing and Interpreting and helping in making certain decisions.

It is a means of understanding the financial strength and weaknesses of a firm.

Financial accounting system contains massive data relating to P& L Statement Balance Sheet and contains substantial data in the form of amount only. To get intrinsic view about health, liquidity or earning capability of an enterprise,. Financial analysts look for some key figures & ratios to assess the strength & performance of an enterprise.

Classification of Ratios

The Ratios have been classified as

Long term Solvency and Leverage ratios or Financial operating Ratios

Long term solvency ratios convey a firm's ability to meet the interest costs and, repayments schedules of its long term obligations. E.g. Debt Equity Ratio and interest coverage ratios. Leverage ratios show proportion of debts and shareholder's funds in financing to the firm.

Activity Ratios

These ratios are calculated to measure the efficiency of the resources of a firm have been employed. These ratios are also called turnover ratios because they Indicate the speed with which assets are being converted into sales.

E.g. Debtor turnover ratio, Stock turnover ratio etc..

Profitability Ratios

These Ratios measure the results of business operation or overall performance and effectiveness of the firm.,

Eg, Gross Profit ratio, Net Profit ratio ,operating ratio or return on capital employed. etc.

Profitability ratios are two types i) In relation to sales and ii) In relation to investments.

Creation of Ratio Analysis

In Tally main menu , select Ratio Analysis to get Ratio Analysis.

The screen is divided into 2 panes. Left pane displays Principal Groups and Right pane lists Principal Ratios .

Principal Groups
At the left part some principal groups are shown

Working Capital

It is computed as Current Assets - Current Liabilities .Current Assets include 6 reserves Groups namely, Stock-in-Hand, Bank Accounts, Loans and Advances (assets), Deposits and Sundry Debtors .While Current Liabilities consists of 3 Reserved Groups namely, Duties & Taxes, Provisions and Sundry Creditors.

Normally Working Capital balance of a running concern is a positive figure. Low working Capital is an indicator of Insolvency while high level is indicator of under –Trading.

Cash-In- Hand & Bank Accounts :
It shows the total of all current bank accounts and cash accounts, showing the free cash available. This figure helps Cash Management and Payment Decision.

Bank OCC Balance
Indicates Overdraft as on Day.

Sundry Debtors & Creditors : Reveals balances as on the date along with dues till today , helps credit Management.

Sales & Purchases: Shows net value of Sales & Purchases

Stock-in-hand: Reveals funds blocked in stock

Net Profit or Loss : Shows the overall results for the period.
Working Capital turnover: Indicates the number of times working Capital has been rolled over. It is arrived by dividing Sales with Working Capital This indicates how good the working Capital has been deployed into productive return . Higher figure indicates efficient utilization of available resources.

Inventory Turnover
Indicates the number of times Stock has been made into sales. It is arrived by dividing Sales with Stock-in-hand. Higher figure indicates better management of Inventory.

Principal Ratios
At the right side you get principal ratios.

Current ratio
Computation : Current Assets / Current Liabilities
This ratio speaks about health of the organization and measures the relative ability to pay Short term Debts.

Quick Ratio
Computation Formula : [Current Assets – Stock] / Current Liabilities.
It is also termed as Acid Test Ratio. The Assets which can be quickly converted into liquid assets are considered for computation of this ratio and is considered as a better tool to measure financial strength of an organization from the liquidity Perspective.

Debt / Equity ratio
Computation Formula : Long term loans (liability) / Net Capital(Capital + Reserves)
This ratio is the proportional of long term debts to Net owned Capital. This ratio is indicator of Financial structure of the Company. Higher the Ratio, higher the risk of failure to repay Loans.

Gross Profit %
Computation Formula : (Gross Profit / Net Sales) x 100
This serves as an index of overall efficiency of main business of the organization.

Net Profit %
Computation Formula : (Net Profit / Net Sales) x 100 This serves as an indicator of overall performance of the organization.

Operating Cost %
Computation Formula : 100- Net Profit ratio

This shows the component of expenses incurred on productive activities. Lower it is, higher the profitability.

Receivables Turnover in days
It is also called as Collection Ratio which is an indicator of average collection of period of Debts.

Return on Investment %
Computation Formula : (Net Profit / capital Employed (Capital + Reserves) x 100
An important indicator for utilization of resources to generate earnings.

Return on Working Capital %
Computation Formula : (Net Profit / Working Capital) x 100
Indicates rate of return on Working capital.

Thus Principal Group figures coupled with Ratio Analysis shows the performance of the organization to exercise proper control at appropriate time for better performance and return.

10.e.1 Cash / Funds Flow

Cash & Funds flow indicates the movement of resources into various forms of Assets and Liabilities.

Cash Flow Statement

It is a statement which describes the inflows (sources) and outflows (uses) of cash equivalents in an enterprise during a specified period of time. A Cash flow statement summarizes the causes of changes in cash position of a business enterprise between two periods of two balance sheets.

Select Display > Cash & Funds Flow to Cash & Funds flow menu

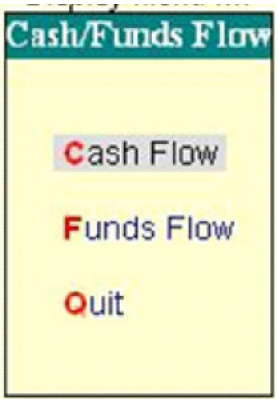


Figure 10. 23

Cash Flow

Select Cash flow at the menu to get Cash Flow Statement showing movement of money In and Out in your Business.

10.e.2Funds Flow

Funds Flow provides the information of Movement of funds, i.e. source and utilization of Fund showing the increase or decrease in Working Capital. It is a report of the financial operations of the business undertaking. It indicates various means by which funds were obtained during a particular period and ways in which these funds are employed.

Function Keys used in Tally

Function keys in tally are used for different purposes at different places. Same function key works for one function in one place and for other purpose in different place.

Ex: Alt + F1 is used for shut company at tally gateway. However same key combination is used to get detailed display of Profit & Loss Account or Balance sheet when we are in that screen. To name a few functionalities or usages of function keys in tally the below table may be useful.

Function Key	Purpose
F1	Select a Company
F1 (Alt+F1)	Shut Company, Detailed display of Profit & Loss Account or Balance sheet etc. while in those screens.
F2	Date
F2(Alt+F2)	To change accounting period
F3	Company information
F3 (Alt+F3)	To change company basic data or information.
F4	Contra Entry
F5	Payment
F6	Receipt
F7	Journal
F8	Sales
F8 (Alt+F8)	Credit Note
F9	Purchase
F9 (Alt+F9)	Debit Note
F 10	Reverse Journal
F10 (Alt+F10)	Memos
F11	Features
F12	Configuration

Note: Function key with underline is denoted for using the function key with the combination of " Alt " key in the keyboard.

Short Answer Type Questions

1. What are the function Keys used in tally?
2. How to create new group in tally?
3. What is the use of Accounts information?
4. What is Inventory Information? What options are available?
5. What is a Ledger? How to create in tally?
6. How to display reports?
7. What are the different report viewed in tally?
8. What is trial Balance?
9. What is a Cash flow statement?
10. What is a Funds flow statement?

Long Answer Type Questions

1. Write the procedure to create company in tally?
2. What is a Balance sheet? How to configure it and display the report?
3. What is ratio Analysis? What are the Principal groups you see in a report and how does it help the organization?
4. What are Cash flows and Funds Flow statement and how to obtain reports?

Reference Books:

1. Intermediate First year Accountancy Text book prescribed for C.E.C and M.E.C. Groups .
2. Financial Acccountancy Part I & II for class XI by NCERT.

Android Apps:

ePathshala by NCERT

Web sites:

https://en.wikibooks.org/wiki/Accountancy for open books

COMPUTER SCIENCE & ENGINEERING
I YEAR
PAPER-I COMPUTER FUNDAMENTALS & MS-OFFICE

PERIODS PER WEEK: 4 **PERIODS PER YEAR : 135**

BLUEPRINT

S.NO.	UNITS	NO.OF PERIODS	WEIGHTAGE OF MARKS	NO. OF SHORT QUESTIONS	NO.OF ESSAY QUESTIONS
I	Introduction to Computer systems and Hardware	20	10	2	1
II	Overview of Operating Systems:-	20	10	2	1
III	MS Word	35	24	3	3
IV	MS Excel	35	16	2	2
V	MS Power Point	25	8	1	1
	Total	135	68	10	8

Note: After completion of every unit one assignment will be given to the students Note:- The question paper contains TWO Sections.

SECTION – A contains 10 short questions carries 2marks each, SECTION – B contains 8 Long questions carries 6 marks each.

The student has to answer ALL questions in SECTION – A

Any FIVE Questions in SECTION-B.

On the Job Training : August, September & October

COMPUTER SCIENCE & ENGINEERING
I YEAR
PAPER-II PROGRAMMING IN 'C'

PERIODS PER WEEK : 4 **PERIODS PER YEAR : 135**

BLUEPRINT

S.NO.	UNITS	NO.OF PERIODS	WEIGHTAGE OF MARKS	NO. OF SHORT QUESTIONS	NO.OF ESSAY QUESTIONS
I	Introduction to Problem Solving Techniques (Algorithms and flowcharts)	15	10	2	1
II	Features of 'C'	40	24	3	3
III	Arrays in 'C'	30	16	2	2
IV	Functions	40	10	2	1
V	Structures in C	10	8	1	1
	Total	135	68	10	8

Note: After completion of every unit one/two assignments will be given to the students

Additions / Deletions/ Changes:

1. **In unit –III File operations are deleted.**
2. **Arrays precedes the Functions.**

COMPUTER SCIENCE & ENGINEERING

I YEAR

PAPER-III ACCOUNTANCY AND TALLY (THEORY)

PERIODS PER WEEK: 4 **PERIODS PER YEAR: 135**

BLUEPRINT

S.NO.	UNITS	NO.OF PERIODS	WEIGHTAGE OF MARKS	NO. OF SHORT QUESTIONS	NO.OF ESSAY QUESTIONS
I	Introduction to Accountancy	5	8	1	1
II	Double Entry System:-	5	8	1	1
III	Journal	10	2	1	-
IV	Ledger	10	2	1	-
V	Subsidiary Books	15	8	1	1
VI	Cash Book	15	8	1	1
VII	Bank reconciliation statement	15	8	1	1
VIII	Trail Balance and rectification	10	8	1	1
IX	Final Accounts	20	8	1	1
X	Tally Package	30	8	1	1
	Total	135	68	10	8

Note: After completion of every unit one/two assignments will be given to the students

Additions / Deletions/ Changes:

Unit VII "journal proper" has been deleted and introduced "Bank reconciliation statement'.

COMPUTER SCIENCE & ENGINEERING

I YEAR

MODEL QUESTION PAPER

PAPER-I COMPUTER FUNDAMENTS & MSOFFICE [THEORY]

Time:- 3 Hrs Max. Marks:- 50

SECTION-A 10 X 2=20

Note:- 1. Answer ALL Questions:
2. Each Question carries 2 Marks.

01. Define a Computer?

02. Write the names of any two input and two output devices.

03. Write any four DOS internal commands.

04. Define an operating system.

05. What is auto correct?

06. What are different views in ms-word?

07. What is a worksheet?

08. Write the number of Rows and Columns in Spreadsheet.

09. What is presentation?

10. What is slideshow?

SECTION-B

Note:- 1. Answer any FIVE Questions from the following 5 X 6= 30.
2. Each Question carries 6 Marks.

11. Draw the block diagram of computer and explain each block in it.

12. Write any 6 DOS Commands with proper syntax and examples.

13. Explain any six File menu options.

14. Explain formatting toolbar in ms-word

15. Explain Mail merge procedure with an example

16. Explain any three types of Charts in Excel

17. Explain any five statistical functions in Excel.

18. What is presentation? Write the procedure for perfect presentation.

COMPUTER SCIENCE & ENGINEERING

I YEAR

MODEL QUESTION PAPER

PAPER-II PROGRAMMING IN 'C' [THEORY]

Time:- 3 Hrs Max. Marks:- 50

SECTION-A 10 X 2=20

Note:- 1. Answer ALL Questions:
2. Each Question carries 2 Marks.

01. Define an Algorithm?
02. Write the symbols of Flowchart with purpose.
03. Define variable and constant in C.
04. What is goto statement?
05. Write the syntax of SWITCH statement
06. What is an Array?
07. What are applications of two dimensional Arrays?
08. Define a function.
09. What is Recursion?
10. Define Union.

SECTION-B

Note:- 1. Answer any FIVE Questions from the following 5 x 6= 30.
2. Each Question carries 6Marks.

11. Write an algorithm for biggest of given three numbers
12. Explain arithmetic operators with examples.
13. Write about if,if..else statements in c.
14. Explain various looping statements in c.
15. Write a program for sorting n numbers in an array.
16. Write a C program for matrix addition of two matrices.
17. Write a c program to find factorial of given number by using function.
18. What are the differences between structure and union.

COMPUTER SCIENCE & ENGINEERING

I YEAR

MODEL QUESTION PAPER

PAPER-III ACCOUNTANCY AND TALLY [THEORY]

Time:- 3 Hrs | Max. Marks:- 50

SECTION-A | 10 X 2=20

Note:- 1. Answer ALL Questions:
2. Each Question carries 2 Marks.

01. Define Account.
02. What is double entry system?
03. Define journal.
04. Define ledger?
05. What is debit note?
06. What is petty cash book?
07. What is BRS?
08. Define trial balance.
09. What is bad debts?
10. What are the function keys in Tally package?

SECTION-B

Note:- 1. Answer any FIVE Questions from the following | 5 x 6= 30.
2. Each Question carries 6Marks.

11. Describe the major concepts in Accounting.
12. Write about types of accounts.

13. Write about subsidiary books.

14. Enter the following transactions in Simple cash –book
Vamshi traders. 2017 Oct[1st]– Balance of cash 9000

3	Goods purchased	3000
5	Sales	2500
8	Interest paid	1000
10	cash purchases	1500
15	Cash Sales	2000
19	Received cash from N	1800
22	Paid cash to R	1100
26	Purchases furniture	500
29	Received commission	900
31	Paid rent	1000

15. What are the causes when the passbook balances is not tallied with cash book balances.

16. what are the objectives of trial balance? Explain.
17. Explain the following
    a) Drawings
    b) Liabilities
    c) Outstanding expenses
18. Explain the procedure to create a company account in Tally.