INTRODUCTION TO INFORMATION TECHNOLOGY

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03-08-2020

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Introduction

- **Information Technology** (IT) is the use of any computers, storage, networking and other physical devices, infrastructure and processes to create, process, store, secure and exchange all forms of electronic data. The commercial use of IT encompasses both computer technology and telephony.

Introduction

- Computer Stands for Common Oriented Machine Particularly Used for Trade, Education and Research.
- Computer can also be defined as Common Operated Machine Particularly Used for Trade, Education and Research.

Contd…

- Computer is an electronic device for storing and processing data, typically in binary form, according to instructions given to it in a variable program.
- A Computer is a machine that accepts data as input, processes that data using programs, and outputs the processed data as information.

Contd…

- **Data** – Data is defined as an unprocessed collection of raw facts, suitable for communication and processing.

For Example, Praveen, CS Department, APCAS are data. This will not give any meaningful data.

- **Information** is a collection of facts from which conclusions of facts from which conclusions maybe drawn. In Simple words, data is the raw facts that is processed to give meaningful , ordered or structured information.

Example: Praveen from CS Department of APCAS. This information conveys some meaning.

- The conversion of data into information is called as **Data Processing**.
- Computer data is considered as the information processed or stored by a computer. This information may be in the form of text documents, images, audio clips, software programs, or other types of data.
- An **Instruction** is a group of bits that define operations such as add, subtract, multiply, shift and compliment.

Contd…

- **A Computer program** is a collection of instructions that can be executed by a computer to perform a specific task.
- A computer program is usually written by a computer programmer using a programming language.

- A Computer is an electronic device that takes raw data(unprocessed) as an input from the user and processes it under the control of a set of instructions(called Program), produces a result (output) and saves it for future use.

Data Representation

- Computer handles data in the form of ‘0’ and ‘1’s.
- Any kind of data like number, alphabet, special character should be converted to ‘0’ or ‘1’ which can be understood by the Computer. ‘0’ and ‘1’ that the Computer can understand is called Machine language.

- A bit is the short form of Binary digit which can be ‘0’ or ‘1’. It is the basic unit of data in computers.
- A nibble is a collection of 4 bits (Binary digits).
- A collection of 8 bits is called Byte.
- A byte is considered as the basic unit of measuring the memory size in the computer.

- A collection of 1024 bytes is called Kilo Byte (KB).
- A collection of 1024 Kilo bytes is called Mega Byte (MB).
- A collection of 1024 mega bytes is called Giga Byte (GB).
- A collection of 1024 Giga bytes is called Terra Byte (TB).

- A collection of 1024 Terra Bytes is called Peta Byte (PB).
- A collection of 1024 Peta bytes is called Exa Byte (EB).
- A collection of 1024 Exa bytes is called Zetta Byte (ZB).
- A collection of 1024 Zetta bytes is called Yotta Byte (YB).

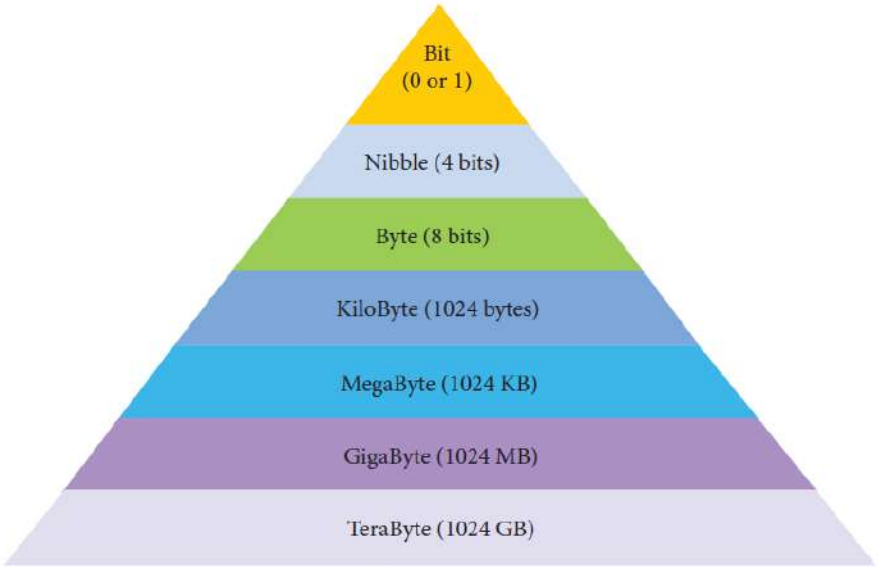

Figure 2.2 Data Representation

HISTORY OF COMPUTERS

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History of Computers

- The first generation of the computer used vacuum tubes for the circuitry and the magnetic drums for the memory and taking up the big rooms.
- A vacuum tube was a fragile glass device, which filaments as a source of electronics and could control and amplify electronic signals.
- It was the only high – speed electronic switching devices available in those days.

First Generation: Vacuum Tubes (1940–1956)

- The first-generation computers were very expensive to operate and uses a great amount of electricity and produced a large amount of heat.
- The first generation of the computer relied on the machine language. It can solve the one problem at a time can't do the multitasking work. The input was based on the punched cards and the paper tape and the output was displayed on the printouts.

- Advantages
  - Vacuum tubes were the only electronic component available during those days.
  - Vacuum tube technology made possible to make electronic digital computers.
- Disadvantages
  - The computers were very large in size.
  - They consumed a large amount of energy.
  - They heated very soon due to thousands of vacuum tubes.
  - They were not very reliable.
  - Air conditioning was required.

- Constant maintenance was required.
- Non-portable.
- Costly commercial production.
- Limited commercial use.
- Very slow speed.
- Limited programming capabilities.
- Used machine language only.
- Used magnetic drums which provide very less data storage.
- Used punch cards for input.

Vacuum Tubes

Second Generation (1956-1964)

- John Bardeen, William Shockley, and Walter Brattain invented a new electronic switching device called transistors at Bell laboratories in 1947.
- Transistors were used in the second generation of the computer and transistors replaced the vacuum tubes.
- Due to the transistor's computer becomes smaller, cheaper and faster. It is very reliable than the first generation of the computer.

- Transistors were also produced the large amount of heat that subjected the computer to damage. But some improvement was shown that in the second generation of the computer.
- High-level programming languages were also developed at the same time. The first computer of the second generation was developed for the atomic energy industry.

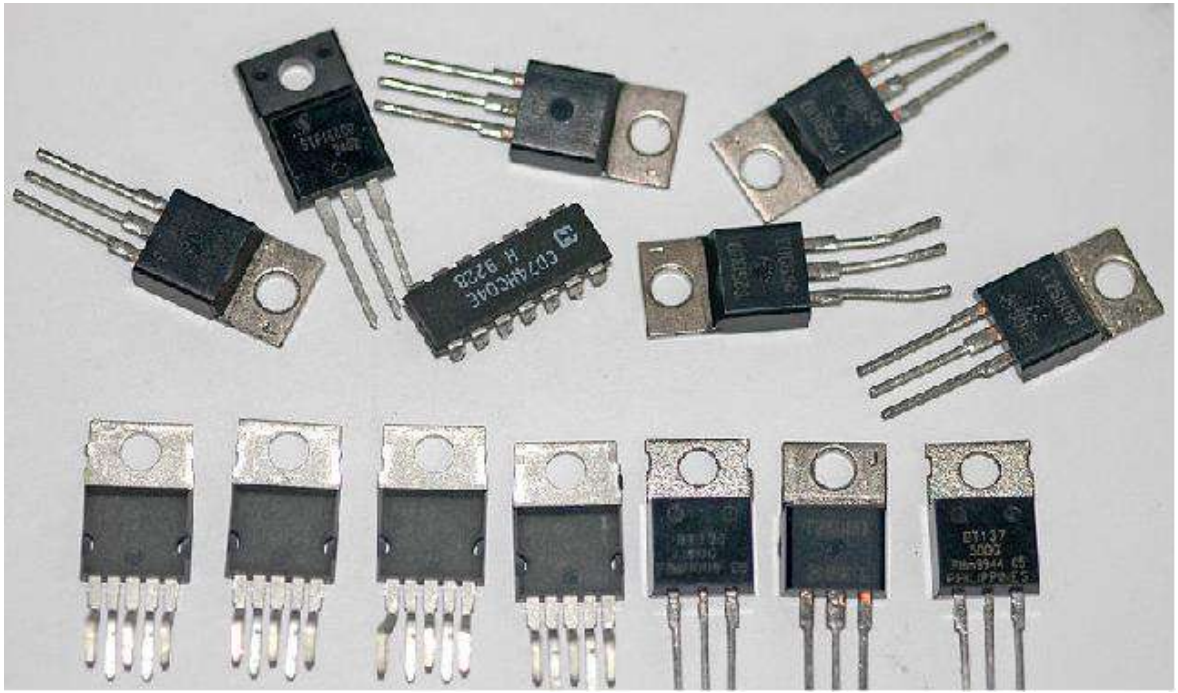
Advantages

- ✓ More reliable than the first generation.
- ✓ Good speed and can calculate the data in the microseconds.
- ✓ Also used assembly languages.
- ✓ Smaller in the size as compared to the first generation.
- ✓ Use less amount of energy.
- ✓ Portable
- ✓ Accuracy is improved than its predecessor.

Disadvantages

- ✓ Constant maintenance is required to work properly.
- ✓ Commercial production was very difficult.
- ✓ Still punched cards were used for input.
- ✓ The cooling system is required.
- ✓ More expensive and non-versatile.
- ✓ Used for specific purposes.

Transistors



Third Generation Computers (1965-1970)

- Third generation of computers are Integrated Circuits (IC) which was founded by Jack St. Clair Kilby and Robert Noyce in 1958.
- Integrated circuits are the circuits consisting of several electronic components like transistors, capacitors, and resistors.
- Transistors were placed on the silicon chips known as semiconductors which increases the speed and efficiency of the computer drastically.

- A single IC chip may contain thousands of transistors.
- Instead of the punched cards and printouts, users interacted with third generation computers through keyboards and monitors and interfaced with an OS (operating system), which allowed the device to run many applications at one time.
- This generation of the computer is small, cheaper and reliable than its predecessors.

- Another salient feature of these computers was that they were much more reliable and consumed far less power.
- The input languages for such computers were COBOL, FORTRAN-II up to FORTRAN-IV, PASCAL, ALGOL-68, BASIC, etc. These languages were much better and could represent more information.
- Consequently, more and more complex calculations are possible.

Advantages

✓ Smaller in size as compared to previous generations.

✓ More reliable.

✓ Used less energy

✓ Produced less heat as compared to the previous two generations of computers.

✓ Better speed and could calculate data in nanoseconds.

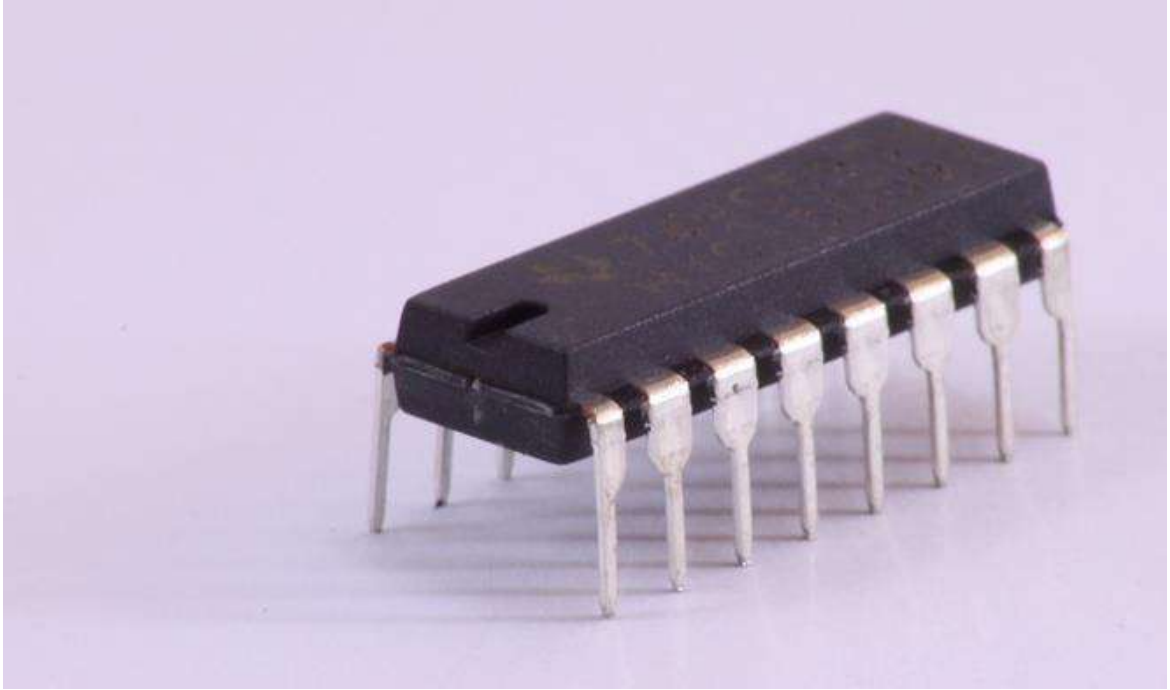
- ✓ Used fan for heat discharge to prevent damage.
- ✓ Maintenance cost was low because hardware failure is rare.
- ✓ Could be used for high-level languages.
- ✓ Versatile to an extent
- ✓ Less expensive
- ✓ Better accuracy
- ✓ Commercial production increased.
- ✓ Used mouse and keyboard for input.

Disadvantages

✓ Air conditioning was required.

✓ Highly sophisticated technology required for the manufacturing of IC chips

Integrated Circuits



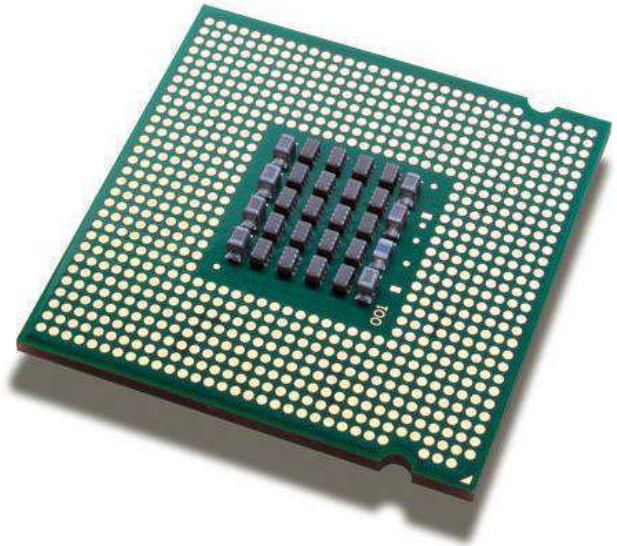
Fourth Generation Computers (1975-Present)

- The fourth-generation computers started with the invention of Microprocessor.
- The Microprocessor contains thousands of ICs.
- Ted Hoff produced the first microprocessor in 1971 for Intel. It was known as Intel 4004.
- It greatly reduced the size of computer.
- The size of modern Microprocessors is usually one square inch.
- During the fourth generation, semiconductors memories replaced magnetic core memories resulting in large random-access memories with very fast access time.

- On another side, Hard disks became cheaper, smaller, and larger in capacity.
- On the software side, several new developments came to match the new technologies of the fourth generation.
- This generation of computers had the first “supercomputers” that could perform many calculations accurately.
- The computer languages like languages like C, C+, C++, DBASE etc. were the input for these computers.

- Advantages
  - More powerful and reliable than previous generations.
  - Smaller in size
  - Fast processing power with less power consumption
  - Fan for heat discharging and thus to keep cold.
  - No air conditioning required.
  - Cheapest among all generations
  - All types of High-level languages can be used in this type of computers
- Disadvantages
  - The latest technology is required for manufacturing of Microprocessors.

Micro Processor



PARTS OF COMPUTER SYSTEM

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Parts of Computer System

- Computer System is composed of Hardware, Software, Memory and Users.

Hardware:

- Hardware consists of the mechanical parts that makeup the computer as a machine.
- Those devices are required for input, output, store the data and process the data.
- Such devices are keyboard, Mouse, Hard disk, CD Drive, Printer, Mother board, ROM, RAM, etc.,

Software

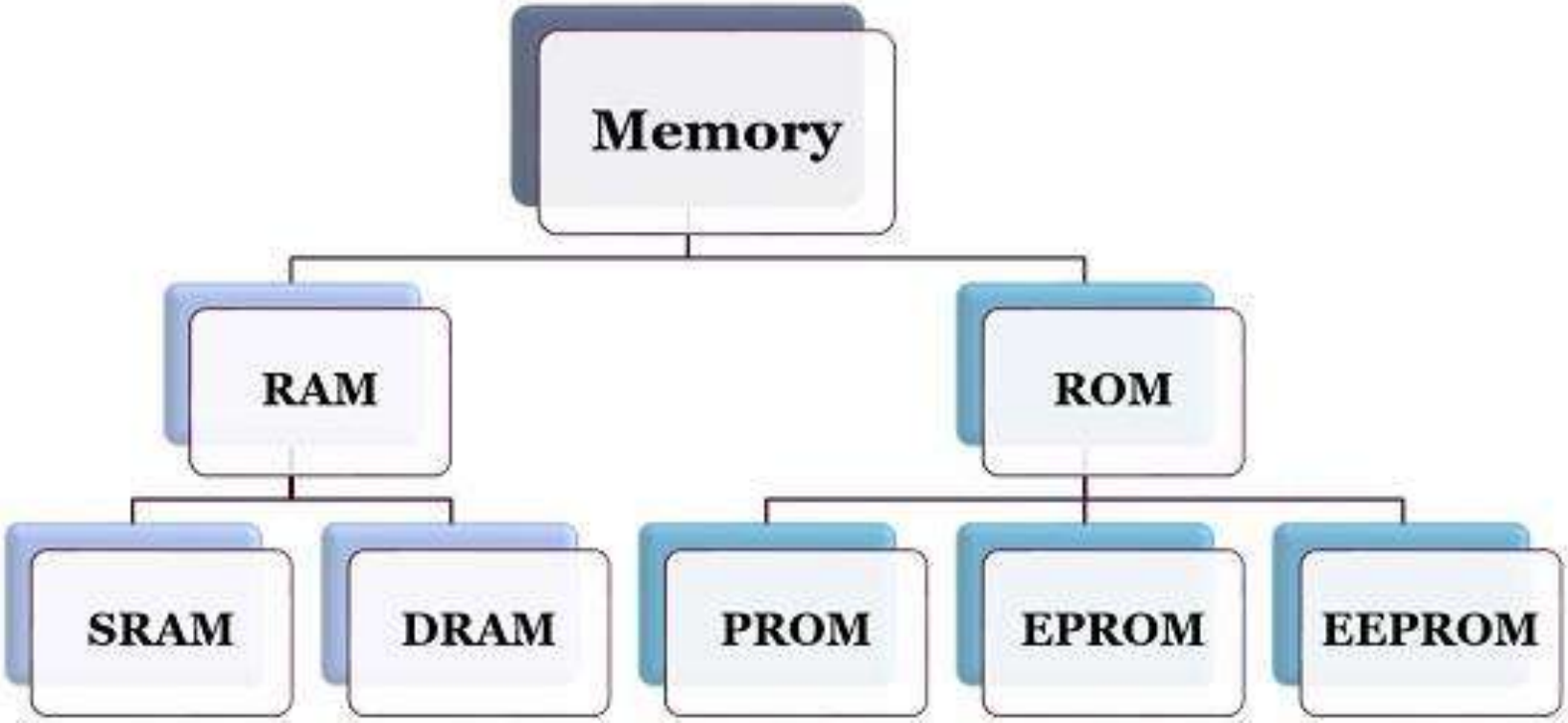
- Software is a collection of data or computer instructions that tell the computer how to work.
- *Software* comprises the entire set of *programs*, procedures, and routines associated with the operation of a computer system.
- A set of instructions that directs a computer's hardware to perform a task is called a program, or *software* program.
- **Examples** of applications include Office suites, Database programs, Web browsers, Word processors

Memory

- Computer memory is a device that is used to store data or programs (sequences of instructions) on a temporary or permanent basis.
- Computer memory is divided into Main (or Primary) memory and Auxiliary (or secondary) memory.
- Main memory holds instructions and data when a program is executing, while auxiliary memory holds data and programs not currently in use and provides long-term storage.

Main Memory

- Main memory is accessible directly by the CPU.
- Primary memory holds only those data and instructions on which the computer is currently working.
- It has a limited capacity and data is lost when power is switched off.
- It is generally made up of semiconductor device.
- The data and instruction required to be processed resides in the main memory.
- It is divided into four subcategories RAM, ROM, Cache and Registers.

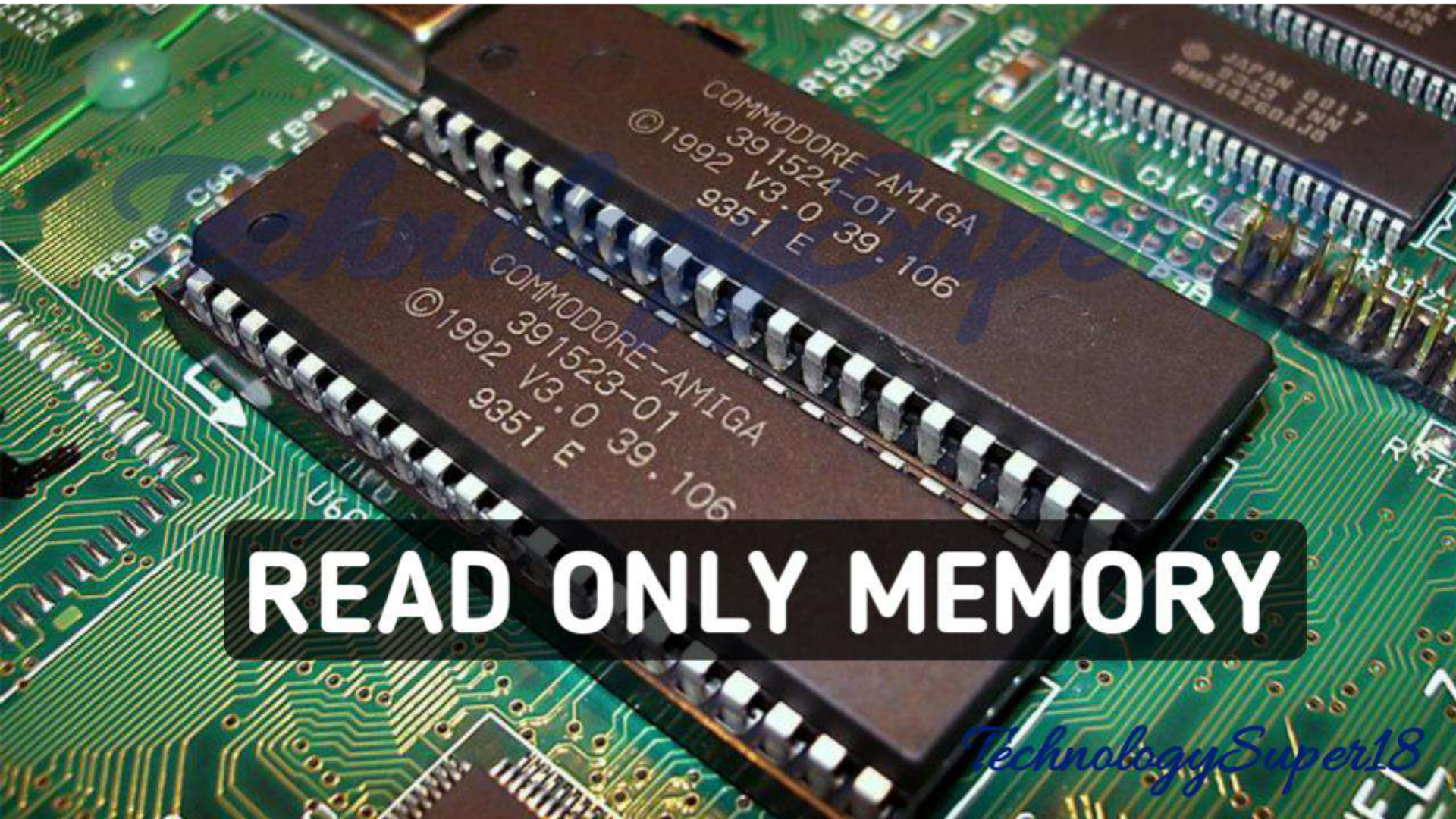

Memory
RAM
ROM
SRAM
DRAM
PROM
EPROM
EEPROM

Characteristic of Primary Memory

- The computer can't run without primary memory
- It is known as the main memory.
- It is a working memory of the computer.
- Primary memory is faster comparing to secondary memory.

Read Only Memory (ROM)

- ROM stands for Read only Memory
- ROM is non-volatile memory.
- The user cannot write data to the ROM without special access.
- ROM is usually found as a chip(s) on the motherboard and is used to store the Basic Input and Output System (BIOS) of the computer along with other important information that is needed to function.
- ROM was designed so that the BIOS could be accessed by the computer without the need for other parts of hardware.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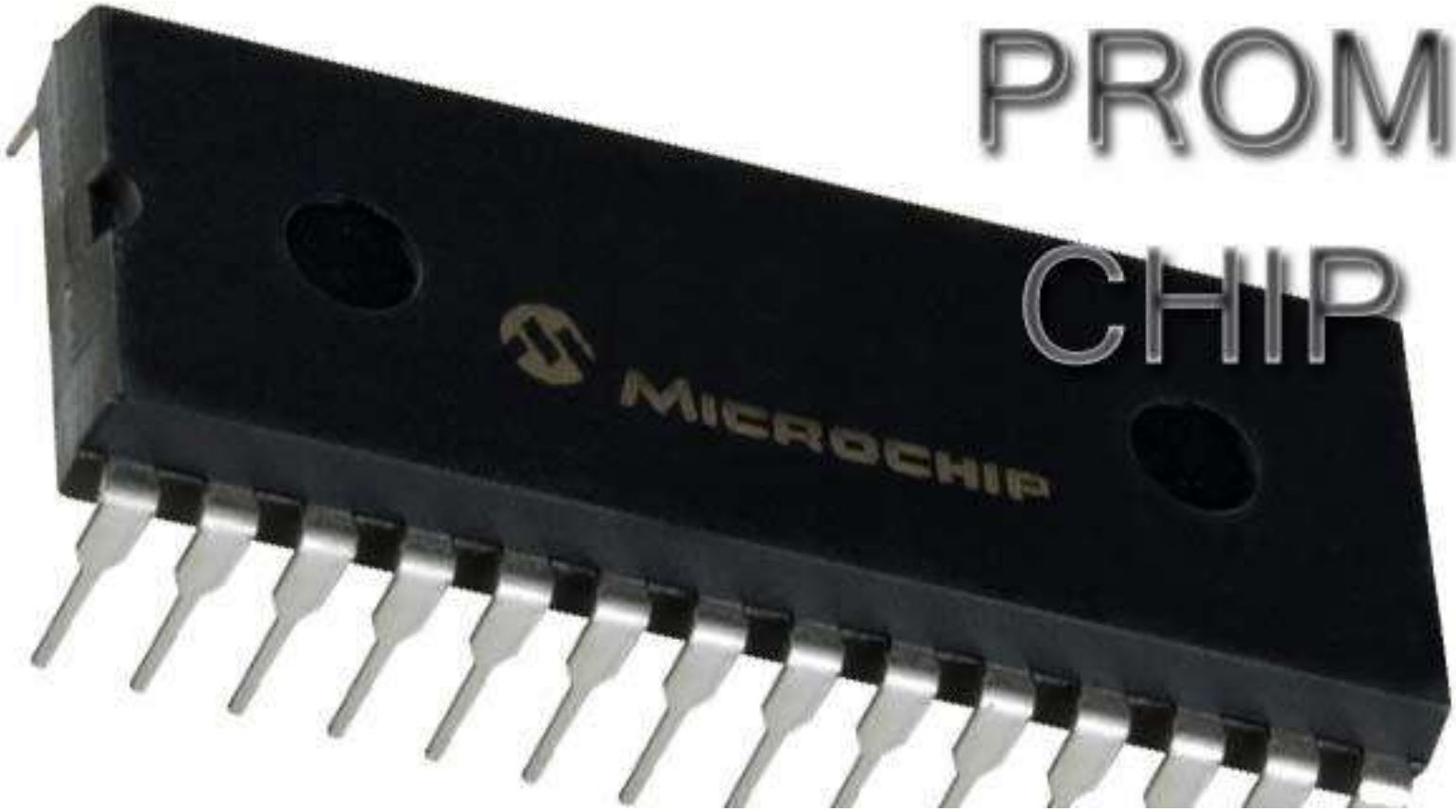
READ ONLY MEMORY
TechnologySuper18

Types of ROM

- Programmable Read Only memory (PROM)
- Erasable Programmable Read Only memory (EPROM).
- Electrically Erasable Programmable Read Only memory (EEPROM).

Programmable Read Only memory (PROM)

- PROM or Programmable ROM (Programmable Read-Only Memory) is a read-only memory that can be modified only once by a user.
- The user buys a blank PROM and enters the desired contents using a PROM program.
- Inside the PROM chip, there are small fuses which are burnt open during programming.
- PROM was first developed by Wen Tsing Chow in 1956.
- An example of a PROM is a computer BIOS in early computers.
- Today, PROM in computers has been replaced by EEPROM.


PROM
CHIP
MICROCHIP

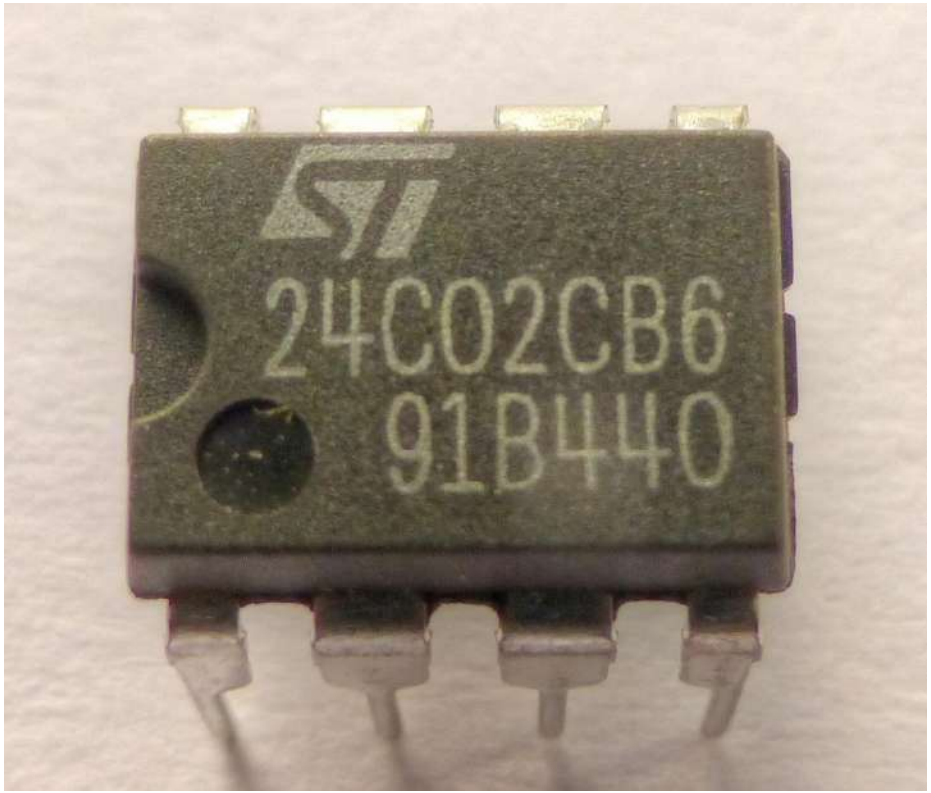
EPROM.

- **EPROM** (Erasable programmable read-only **memory**) that can be erased and re-used. Erasure is caused by shining an intense ultraviolet light through a window that is designed into the **memory** chip.
- This type of memory you can rewrite data over the old data, but you cannot keep the old data.
- So once you burn the new data into the ROM chip, the old data is gone.
- EPROM ensures each process will be performed repeatedly and is more expensive then PROM, the advantages over PROM is that is capable of multiple updates.

EPROM CHIP

EEPROM

- EEPROM -Electrically Erasable Programmable ROM.
- It can be erased and reprogrammed about ten thousand times.
- Both erasing and programming take about 4 to 10 ms (millisecond).
- In EEPROM, any location can be selectively erased and programmed.
- EEPROMs can be erased one byte at a time, rather than erasing the entire chip. Hence, the process of reprogramming is flexible but slow.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Cache Memory

- CACHE is a hardware or software component that stores data so that future requests for that data can be served faster; the data stored in a cache might be the result of an earlier computation or a copy of data stored elsewhere.
- Cache is used to store small bits of frequently accessed data from the RAM so that the processor doesn't have to wait for the RAM to respond every time it wants the same piece of information.
- Cache is volatile, like RAM, so it wipes clear whenever the computer gets turned off.
- Cache memory lies on the path between the CPU and the main memory.
- It facilitates the transfer of data between the processor and the main memory at the speed which matches to the speed of the processor.

CACHE MEMORY

- Processor registers are located inside the processor.
- Each register typically holds a word of data (often 32 or 64 bits).
- CPU instructions instruct the arithmetic logic unit to perform various calculations or other operations on this data (or with the help of it).
- Registers are the fastest of all forms of computer data storage.

Random Access Memory (RAM)

- RAM is a type of data storage used in computers, it acts as a mediator between the CPU and the storage device which helps speed up the computer.
- When the user try to access a piece of information, such as opening an application, it gets moved from the hard drive to the RAM.
- The CPU then reads from the RAM instead of the hard drive as it can access the RAM and read from it much faster than it can if the data was still on the hard drive.

- RAM is of two types –
  - Static RAM (SRAM)
  - Dynamic RAM (DRAM)
- The word **static** indicates that the memory retains its contents as long as power is being supplied. However, data is lost when the power gets down due to volatile nature.
- DRAM must be continually **refreshed** in order to maintain the data. This is done by placing the memory on a refresh circuit that rewrites the data several hundred times per second. DRAM is used for most system memory as it is cheap and small.

Characteristic of Static RAM

- ✓ Long life
- ✓ No need to refresh
- ✓ Faster
- ✓ Used as cache memory
- ✓ Large size
- ✓ Expensive
- ✓ High power consumption

Characteristics of Dynamic RAM

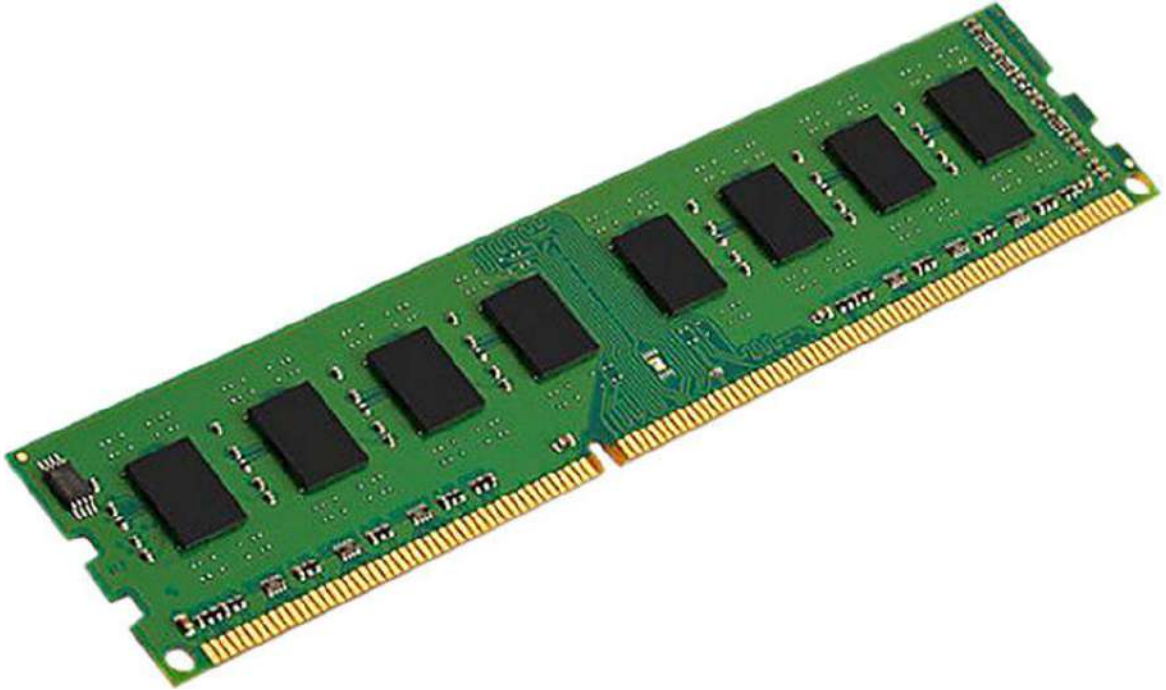
- ✓ Short data lifetime
- ✓ Needs to be refreshed continuously
- ✓ Slower as compared to SRAM
- ✓ Used as RAM
- ✓ Smaller in size
- ✓ Less expensive
- ✓ Less power consumption

Differences Between RAM and ROM

1. RAM is a temporary **storage type** of memory as data lasts only till the time the power supply is on. On the contrary, ROM is a permanent memory that retains the data for a longer duration.
2. Random-access memory is volatile in nature. But read-only memory is non-volatile in nature.
3. The **operating speed** of RAM is faster than the ROM.
4. RAM offers **memory capacity** in GB usually 1 to 256 GB per chip. On the contrary, ROM permits the storage capacity in MB, usually in the range 4 to 8 MB per chip.

5. RAM stores data on transistors thus requires a continuous **source of power**. While data stored in ROM remain unaffected with power failure.
6. The data stored in RAM is changeable by the user. Whereas the data in ROM cannot be altered by the user.
7. RAM offers the user to read as well as write data but data in ROM is pre-written and thus can only be read by the user.
8. The processor can directly access the data present in RAM. However, the data present in ROM do not permit direct access to the processor.
9. The **cost** of Random access memory is comparatively higher than the read-only memory.

RAM



Secondary Memory

- This type of memory is also known as external memory or non-volatile.
- It is slower than the main memory.
- These are used for storing data/information permanently.
- CPU directly does not access these memories, instead they are accessed via input-output routines.
- The contents of secondary memories are first transferred to the main memory, and then the CPU can access it.
- For example, disk, CD-ROM, DVD, etc.

Characteristics of Secondary Memory

- These are magnetic and optical memories.
- It is known as the backup memory.
- It is a non-volatile memory.
- Data is permanently stored even if power is switched off.
- It is used for storage of data in a computer.
- Computer may run without the secondary memory.
- Slower than primary memories.

Magnetic Tape

- In magnetic tape only one side of the ribbon is used for storing data.
- It is sequential memory which contains thin plastic ribbon to store data and coated by magnetic oxide.
- Data read/write speed is slower because of sequential access. It is highly reliable which requires magnetic tape drive writing and reading data.
- The width of the ribbon varies from 4mm to 1 Inch.

Advantages

1. These are inexpensive, i.e., low cost memories.
2. It provides backup or archival storage.
3. It can be used for large files.
4. It can be used for copying from disk files.
5. It is a reusable memory.
6. It is compact and easy to store on racks.

Disadvantages

1. Sequential access is the disadvantage, means it does not allow access randomly or directly.
2. It requires caring to store, i.e., vulnerable humidity, dust free, and suitable environment.
3. It stored data cannot be easily updated or modified, i.e., difficult to make updates on data.

Hard Disk

- •The Hard disk drive is the main and usually largest data storage device in a computer.
- It is located inside the system case (cabinet).
- •It can store anywhere from 250 gigabytes to 2 terabytes.
- •Hard disk speed is the speed at which content can be read and written on a hard disk.
- •A hard disk unit comes with a set rotation speed varying from 4500 to 7200rpm.
- •Disk access time is measured in milliseconds.

Floppy Disk

- The floppy disk (or a 3 1/2) is a removable Magnetic Storage Medium.
- Floppy disks are used for moving information between computers, laptops or other devices.
- Floppy disks are inserted into a floppy disk drive which allows data to be read or stored.
- Floppy disks store much less data than a CD-ROM disk or USB flash drive.

- A normal 3½ inch disk can store 1.44 megabytes of data. This is usually enough for simple text documents.
- A special type of floppy disk was made in the late 1980s. It could store 2.88 MB of data.
- Floppy disk technology has been around since the early 1970s (the 8-inch floppy was the first).
- Today, floppy disks have been replaced by other storage media, like USB flash drives.
- Floppy disks and drives are no longer manufactured.

Compact Disk (CD):

- It stores data and it has circular plastic; single side of the plastic is coated by aluminum alloy which stores data. It is protected by additional thin plastic covering. CD requires a CD drive for its operation.
- CDs can hold up to 700 MB worth of data, which is about 80 minutes of music.
- CD's can be Classified as CD-R, CD-RW,CD-Audio, Video CD or VCD and DVD.

USB

- A USB flash drive (USB stands for Universal Serial Bus) is a popular way to store digital information.
- Flash drives are an easy way to share data (information).
- A USB flash drive can be attached to a USB port, and provides a certain amount of storage space, which can be used to store data.
- They are called "flash drive" because they use flash memory to store files. Flash memory is a type of computer chip.

- USB flash drives have some advantages over other portable storage devices.
- They are physically much smaller and more rugged than floppy disks. They can read data faster and store more data than floppy disks.
- Flash drives are used to store any type of data file, or to move data from one computer to another.
- USB flash drives have a lot of storage space. It is often easier to use a flash drive than to carry many CD-ROMs.

- Some computer programs can be run from a USB flash drive. These special versions of programs are called "portable" versions.
- Computer administrators, or people who manage the computer systems, sometimes use flash drives.
- Sometimes flash drives are also used to run a computer virus scanner. They are often used to repair a computer system that was damaged or faulty.
- Most computers today can boot from a USB drive. Special operating systems can run from a bootable flash drive.

DVD

- A DVD (which means Digital Versatile Disc or a Digital Video Disc) is an optical disc capable of storing up to 4.7 GB of data, more than six times what a CD can hold.
- DVDs are often used to store movies at better quality than a VHS.
- Like CDs, DVDs are read with a laser.

- The disc can have one or two sides, and one or two layers of data per side; the number of sides and layers determines how much it can hold. A 12 cm diameter disc may have one of the following storage capacities:
  - DVD-5: single sided, single layer, 4.7 gigabytes (GB)
  - DVD-9: single sided, double layer, 8.5 GB .
  - DVD-10: double sided, single layer on both sides, 9.4 GB DVD-14: double sided, double layer on one side, single layer on other, 13.3 GB)
  - DVD-18: double sided, double layer on both sides, 17.1 GB

Blue Ray Disc

- Blu-ray Disc is a high-density optical disc format similar to DVD.
- A dual-layer Blu-ray disc can store up to 50GB (gigabytes) of data. This is over five times the capacity of a DVD, and over 70 times more than a CD or VCD.
- The disc was developed by the Blu-ray Disc Association (BDA) and released in 2006. The format was developed for recording, rewriting and playback of high-definition video (HD), as well as storing large amounts of data.
- Older optical disc technologies such as DVD, DVD±R, DVD±RW, and DVD-RAM used a red laser to read and write data. The new format used a blue-violet laser instead.


Blu-ray Disc

Optical Disc

	CD	DVD	BD
Capacity	700MB	4.7GB – 17GB	50GB
Wavelength	780nm	650nm	405nm
Read/Write Speed	1200KB/s	10.5MB/s	36MB/s
Example	• CD-ROM, • CD-R • CD-RW	• DVD-ROM • DVD+R/RW • DVD-R/RW • DVD-RAM	• BD-R • BD-RE

INPUT DEVICES

Input Devices

- Any device that allows information from outside the computer to be communicated to the computer is considered as an Input Device.
- These include a Keyboard, Mouse, Trackball, Spaceball, Joystick, Light Pens, Barcode readers, Image Scanners, Touch Panels and Magnetic Ink Character Recognition (MICR).
- Analog- Mouse, Trackball, Scanner, Joystick.
- Digital- Keyboard, Light pen, Touch panels.

Keyboards

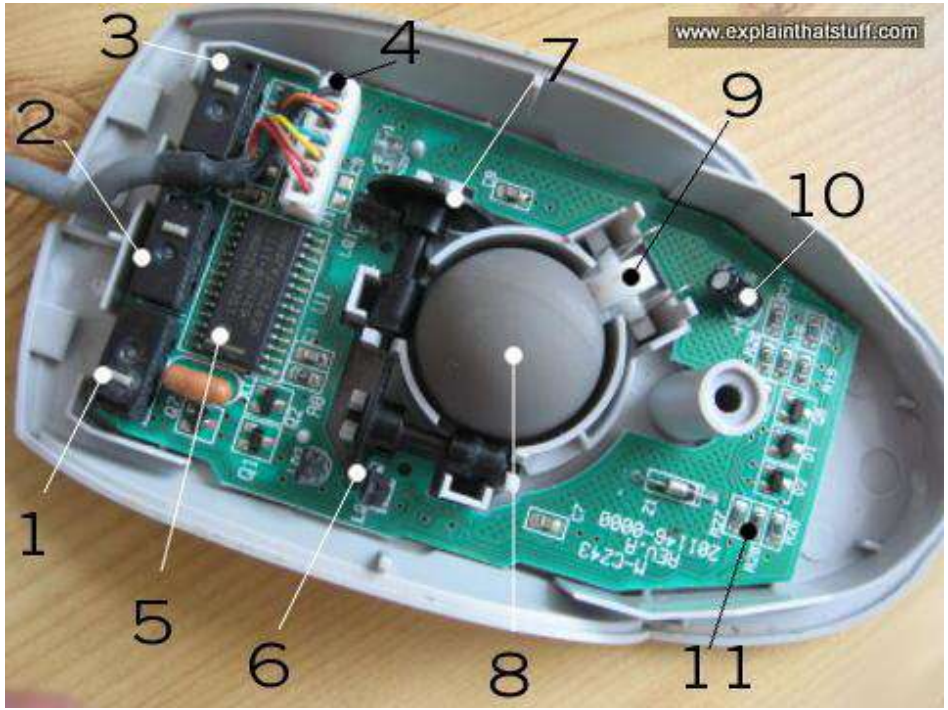
- Keyboard is used to enter the data into a computer.
- Generally 108 keys are in keyboard.
- It consists of Alphanumeric keys, function keys , Cursor control keys and Control Keys.
- Alphanumeric Keys include (A-Z),(0-9),(`~!@#$%^&*()_-+={}:";<>?,./)
- Cursor-control keys and function keys are common features on general purpose keyboards.
- Function keys (F1 to F12) allow users to enter frequently used operations in a single keystroke, and cursor-control keys can be used to select displayed objects or coordinate positions by positioning the screen cursor.
- Special Keys include Enter Key, Backspace, Number Lock, Caps Lock, Ctrl, Shift.


Esc
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
PrtSc SysRq
Scroll Lock
Pause Break
Insert
Home
Page Up
Delete
End
Page Down
Num Lock
Tab
Caps Lock
Enter
Shift
Ctrl
Alt
Pg Up
Pg Dn
Enter
Ins
Del

Mouse

- A mouse is small hand-held box used to position the screen cursor.
- Wheels or rollers on the bottom of the mouse can be used to record the amount and direction of movement.
- Another method for detecting mouse motion is with an optical sensor. For these systems, the mouse is moved over a special mouse pad that has a grid of horizontal and vertical lines.
- The optical sensor detects movement across the lines in the grid.

- There are three types of mouse.
- **Mechanical mouse:** Houses a hard rubber ball that rolls as the mouse is moved. Sensors inside the mouse body detect the movement and translate it into information that the computer interprets.
- **Optical mouse:** Uses an LED sensor to detect tabletop movement and then sends off that information to the computer for merry munching.
- **Infrared (IR) or radio frequency cordless mouse:** With both these types, the mouse relays a signal to a base station wired to the computer's mouse port. The cordless mouse requires power, which comes in the form of batteries.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Trackball

- A trackball is a computer pointing device which can perform the same functions as a mouse.
- With a trackball, The user rolls the ball to direct the cursor to the desired place on the screen and can click one of two buttons (identical to mouse buttons) near the trackball to select desktop objects or position the cursor for text entry.
- A trackball spins very freely, so a simple flick of your fingers will produce a scroll much longer than a movement with a mouse.


Logitech

Spaceball

- A graphical input device that is based on a fixed spherical ball. It allows complex objects to be positioned and rotated in three-dimensional space using the single input device.
- While a trackball is a two-dimensional positioning device, whereas a Spaceballs provides six degrees of freedom.
- Unlike the trackball, a Spaceballs does not actually move.
- Strain gauges measure the amount of pressure applied to the spaceballs to provide input for spatial positioning and orientation as the ball is pushed or pulled in various directions.
- Spaceballs are used for three-dimensional positioning and selection operations in virtual-reality systems, modeling, animation, CAD, and other applications.


COMPAQ

Joystick

- A joystick consists of a small, vertical lever (called the stick) mounted on a base that is used to steer the screen cursor around.
- Most joysticks select screen positions with actual stick movement; others respond to pressure on the stick.
- Some joysticks are mounted on a keyboard; others function as stand-alone units.
- The distance that the stick is moved in any direction from its center position corresponds to screen-cursor movement in that direction.
- Potentiometers mounted at the base of the joystick measure the amount of movement, and springs return the stick to the center position when it is released.
- One or more buttons can be programmed to act as input switches to signal certain actions once a screen position has been selected.

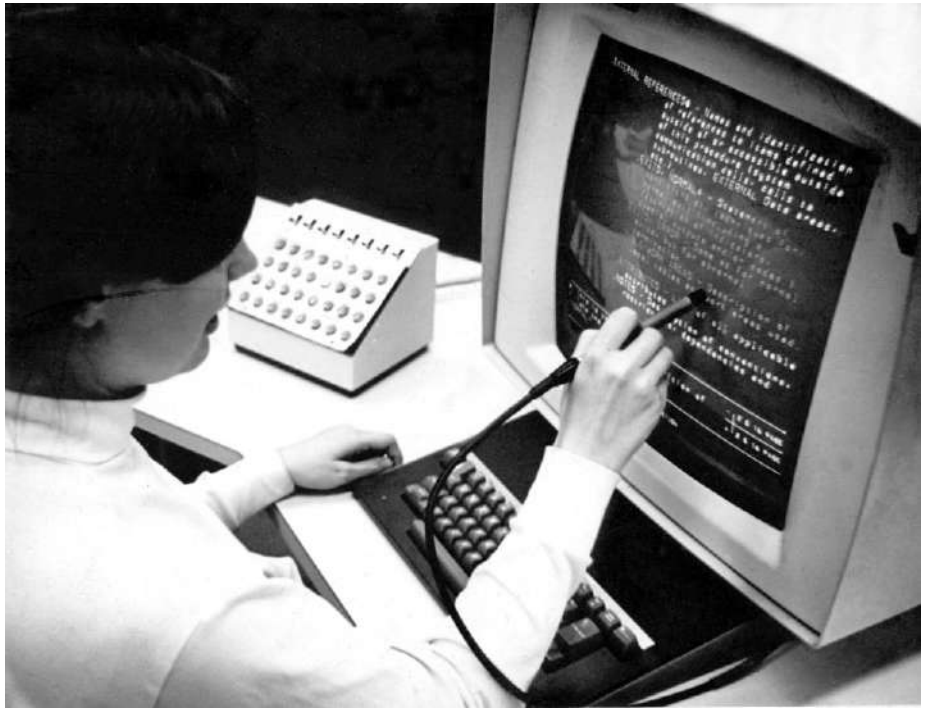

3M


5
6
3
4

Light Pen

- A **light pen** is a computer input device in the form of a light-sensitive wand used in conjunction with a computer's cathode-ray tube (CRT) display.
- It allows the user to point to displayed objects or draw on the screen in a similar way to a touchscreen but with greater positional accuracy.
- A light pen can work with any CRT-based display, but its ability to be used with LCDs.
- A **light pen** may also be used to describe the pen (stylus) used with a graphics tablet.
- Today, light pens are no longer used due to the invention of touch screens.

Light pen



Touch Panels

- Touch panels allow displayed objects or screen positions to be selected with the touch of a finger.
- A typical application of touch panels is for the selection of processing options that are represented with graphical icons.
- Some systems can be adapted for touch input by fitting a transparent device with a touch sensing mechanism over the video monitor screen.
- Touch input can be recorded using optical, electrical, or acoustical methods.
- Optical touch panels employ a line of infrared light-emitting diodes (LEDs) along one vertical edge and along one horizontal edge of the frame.
- The opposite vertical and horizontal edges contain light detectors. These detectors are used to record which beams are interrupted when the panel is touched.


Display Source
CNN
NBC
HBO
XBOX
cue

Image Scanners

- A Scanner is a device that optically scans **Images, Printed Text, Handwriting or An Object** and converts it to a digital image.
- Generally in the Flatbed scanners, the document is placed on a Glass Window for scanning.
- Drawings, Graphs, Color and Black-and-white photos, or Text can be stored for computer processing with an Image Scanner by passing an optical scanning mechanism over the information to be stored.
- Finally, it stores the image information in a specific file format such as JPEG, GIF, TIFF, BMP, PDF documents and so on.

Types of Scanner

- **Flat bed Scanners-** also called as Desktop Scanners, are the most versatile and commonly used scanners.
- **Sheet bed Scanners-** are similar to the flatbed scanners except the document is moved and the scan head is immoveable. A sheet bed scanner looks a lot like a small portable printer.
- **Hand held Scanners-** uses the same basic technology as a flatbed scanner, but rely on the user to move them instead of a motorized belt. This type of scanner typically does not provide good image quality. However, it can be useful for capturing an image quickly.

- **Drum Scanners-** are used by the publishing industry to capture incredibly detailed images.
- They use a technology called **Photo Multiplier Tube (PMT).**
- In PMT, the document to be scanned is mounted on a glass cylinder. Located at the center of the cylinder is a sensor that splits light bounced from the document into three beams.
- Each beam is sent through a colour filter into a photo multiplier tube where the light is changed into electrical signal.

Flat bed Scanner

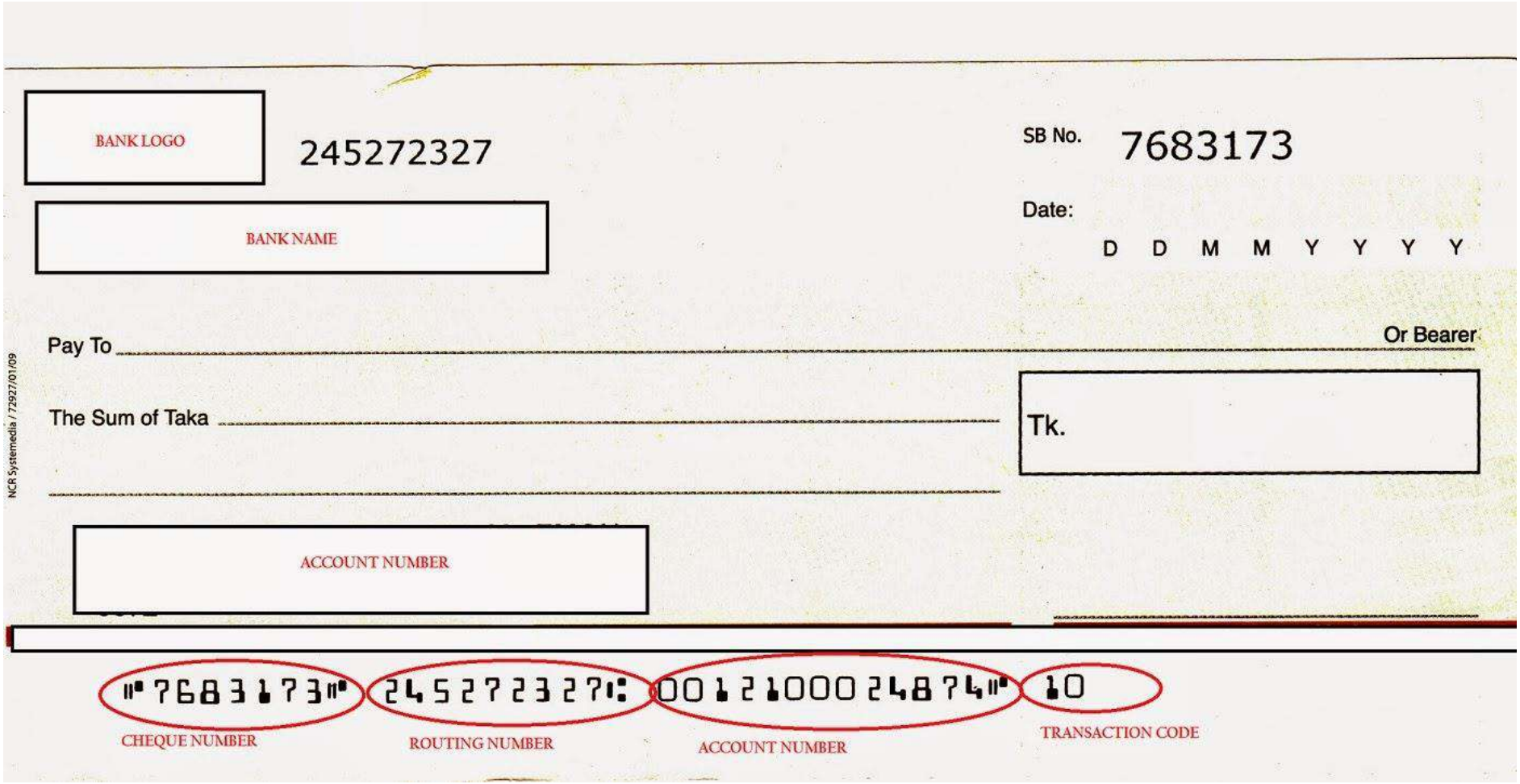
Sheet fed Scanner

Hand held Scanner

Drum Scanner

Magnetic Ink Character Recognition (MICR)

- **Magnetic ink character recognition code**, known in short as **MICR code**, is a character recognition technology used mainly by the banking industry to streamline the processing and clearance of cheques and other documents.
- MICR encoding, called the *MICR line*, is at the bottom of cheques and other vouchers and typically includes the document-type indicator, bank code, bank account number, cheque number, cheque amount (usually added after a cheque is presented for payment), and a control indicator.
- The **MICR** read head is a device built into the scanner designed to read the magnetic signal emitted by the **MICR** ink characters on the check. Each character produces a unique waveform which is read and translated by the **MICR** read head.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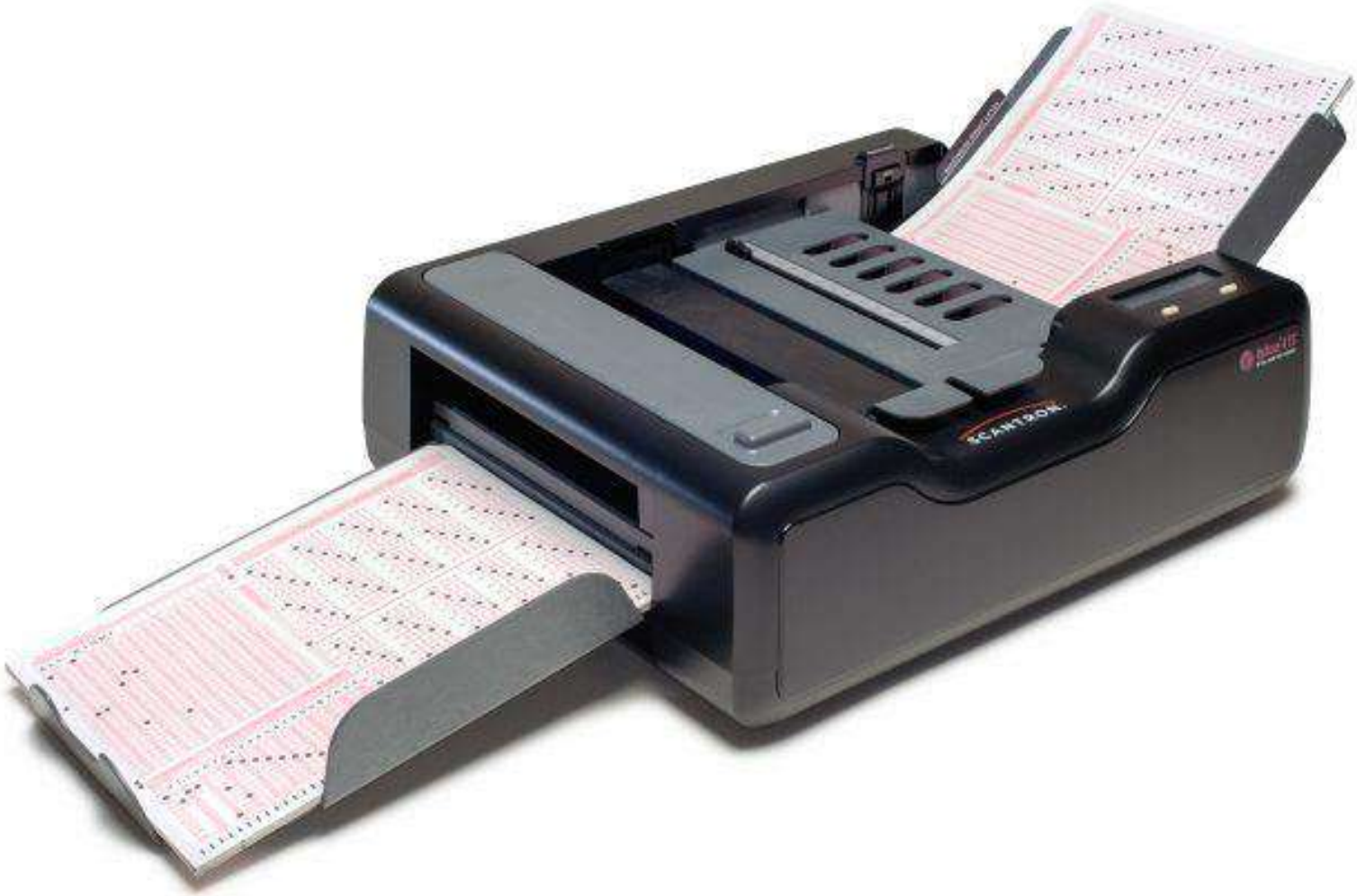
NON-NEGOTIABLE DO NOT CASH
MAGTEK

Optical Mark Recognition(OMR)

- **Optical mark recognition** (also called optical mark reading and *OMR*) is the process of capturing human-marked data from document forms such as surveys and tests.
- They are used to read questionnaires, multiple choice examination paper in the form of lines or shaded areas.
- Optical Mark Readers reads pencil or pen marks made in pre-defined positions on paper forms as responses to questions or tick list prompts.


SCANTRON

Optical Character Recognition

- *Optical character recognition* or optical character reader (*OCR*) is the electronic or mechanical conversion of images of typed, handwritten or printed text into machine-encoded text, whether from a scanned document, a photo of a document, a scene-photo (for example the text on signs and billboards in a landscape photo)

28/02/2017

Optical character recognition

From Wikipedia, the free encyclopedia

Optical character recognition (also **optical character reade**
conversion of images of typed, handwritten or print
document, a photo of a document, a scene-photo (
photo) or from subtitle text superimposed on an image (for example from a
used as a form of information entry from printed paper data records, whet
bank statements, computerised receipts, business cards, mail, printouts of
documentation. It is a common method of digitising printed texts so that they can be electron
searched, stored more compactly, displayed on-line, and used in machine processes such as c
computing, machine translation, (extracted) text-to-speech, key data and text mining. OCR is a f
in pattern recognition, artificial intelligence and computer vision.

Early versions needed to be trained with images of each character, and worked on one font at a
systems capable of producing a high degree of recognition accuracy for most fonts are now
support for a variety of digital image file format inputs.[2] Some systems are capable of
put that closely approximates the original page including images, columns, and other

HARD COPY DEVICES

Hard copy devices

- The computer processes input data to produce useful information.
- This information can be displayed or viewed on a monitor, printed on a printer or listened through speakers or headset or it can be stored in the secondary memory device for further processing or future reference.
- The different ways of output can be broadly classified as
  - ✓ Hard copy
  - ✓ Soft copy.

Soft Copy: The electronic version of an output, which usually resides in computer memory and/or on disk is known as Soft Copy. Soft copy output also includes audio and visual form of output generated using computer.

- **Hard Copy:** Hard-copy devices are the entities that produce the output which can be retained over the time. That is, nothing but printing over the paper.
- Hard- copy devices can be classified into two categories; one is the **Printers** and second is the **Plotters**.
- The quality of the pictures obtained from a device depends on dot size and the number of dots per inch, or Lines per inch, that can be displayed.
- To produce smooth characters in printed text strings, higher - quality printers shift dot positions so that adjacent dots overlap.

Monitors

- A computer **monitor** is an output device that displays information in pictorial form.
- The **monitor** displays the computer's user interface and open programs, allowing the user to interact with the computer, typically using the keyboard and mouse.
- The size of the computer screen is measured diagonally from corner to corner in inches.
- For desktop computers, common sizes are 13,15,17,19 and 21 inches.
- For laptop computers, 12.1,13.3,14.1 inches.
- There are two types of monitors: 1) Cathode Ray Tubes, 2) Liquid Crystal Display.

Printers

- Printer is an output device, which is used to print information on paper.
- There are two types of printers –
  - **Impact Printers**
  - **Non-Impact Printers**
- **Impact printers** print the characters by striking them on the ribbon, which is then pressed on the paper.
- **Non-impact printers** print the characters without using the ribbon. These printers print a complete page at a time,

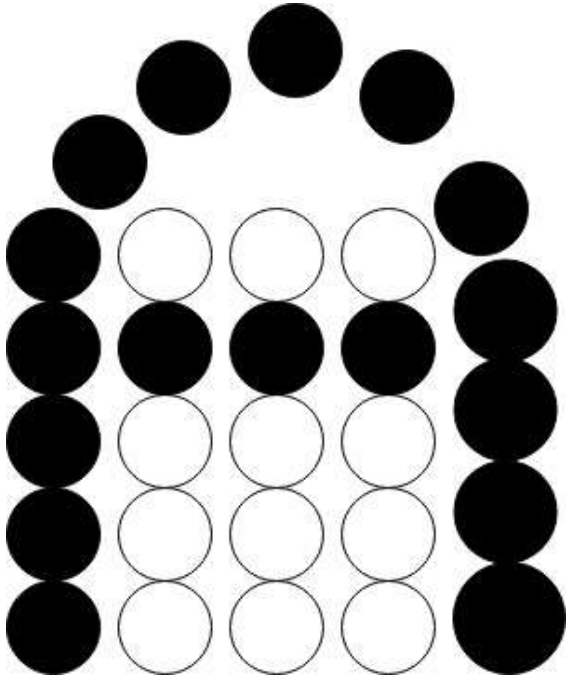
Impact printers

- Characteristics of Impact Printers are the following −
  - Very low consumable costs.
  - Very noisy
  - Useful for bulk printing due to low cost
  - There is physical contact with the paper to produce an image
- These printers are of two types −
  - Character printers
  - Line printers

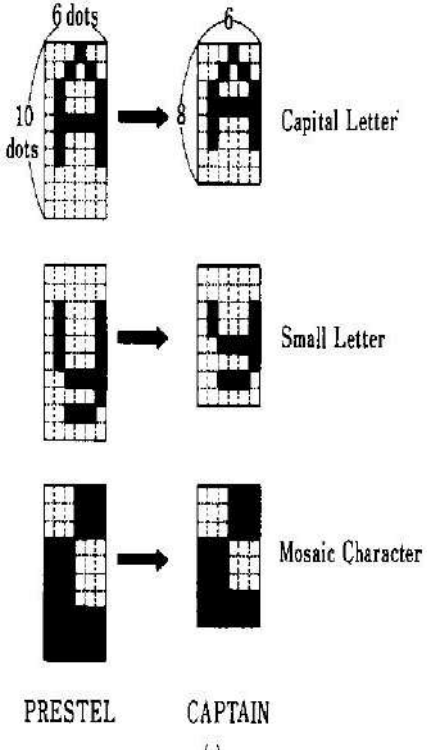
Character Printers

- Character printers are the printers which print one character at a time.
- **Dot Matrix Printer**
- Dot matrix has printed in the form of dots. A printer has a head which contains nine pins. The nine pins are arranged one below other. Each pin can be activated independently. All or only the same needles are activated at a time. When needless is not activated, and then the tip of needle stay in the head. When pin work, it comes out of the print head. In nine pin printer, pins are arranged in 5 * 7 matrixes.

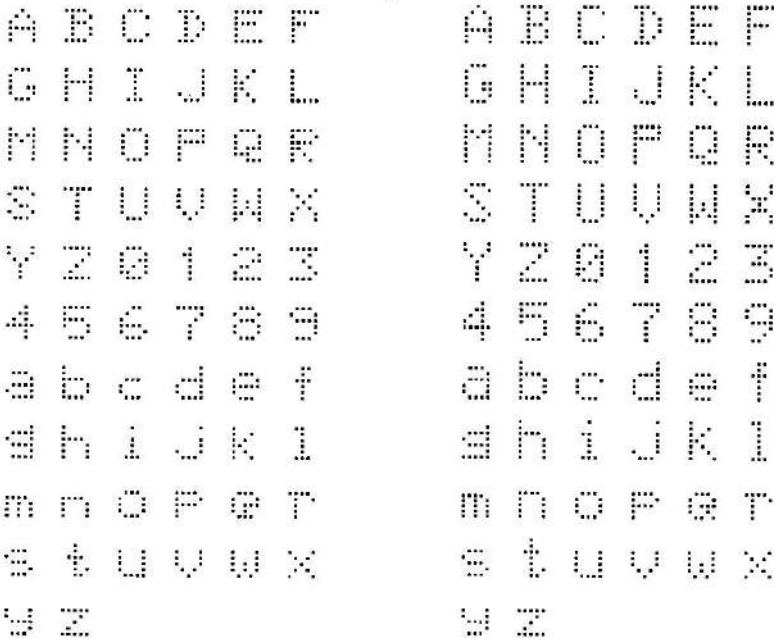
- Advantages
  - Inexpensive
  - Widely Used
  - Other language characters can be printed
- Disadvantages
  - Slow Speed
  - Poor Quality



Dot Matrix Printer


6 dots
6
10 dots
8
Capital Letter
Small Letter
Mosaic Character
PRESTEL
CAPTAIN

(a)



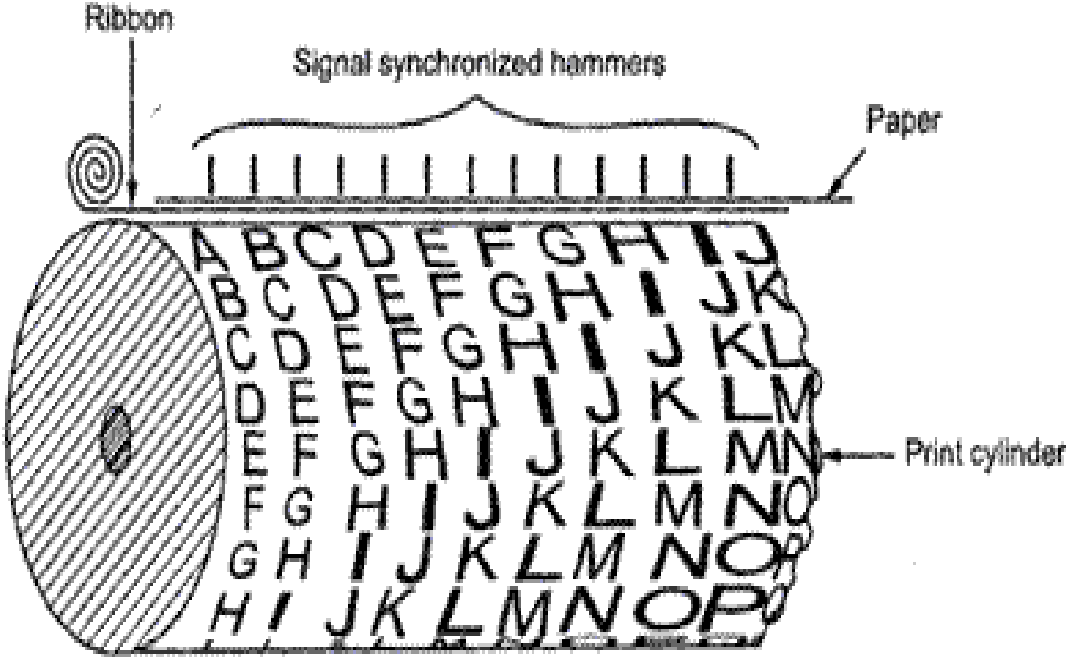
Line Printers

- **Line Printers** are the printers which print one line at a time.
- These are of two types –
  - **Drum Printer**
  - **Chain Printer**
- **Drum Printer**
- This printer is like a drum in shape hence it is called drum printer.
- The surface of the drum is divided into several tracks.
- Total tracks are equal to the size of the paper, i.e. for a paper width of 132 characters, drum will have 132 tracks.

- A character set is embossed on the track. Different character sets available in the market are 48-character set, 64 and 96 characters set.
- One rotation of drum prints one line.
- Drum printers are fast in speed and can print 300 to 2000 lines per minute.
- **Advantages**
  - Very high speed
- **Disadvantages**
  - Very expensive
  - Characters fonts cannot be changed

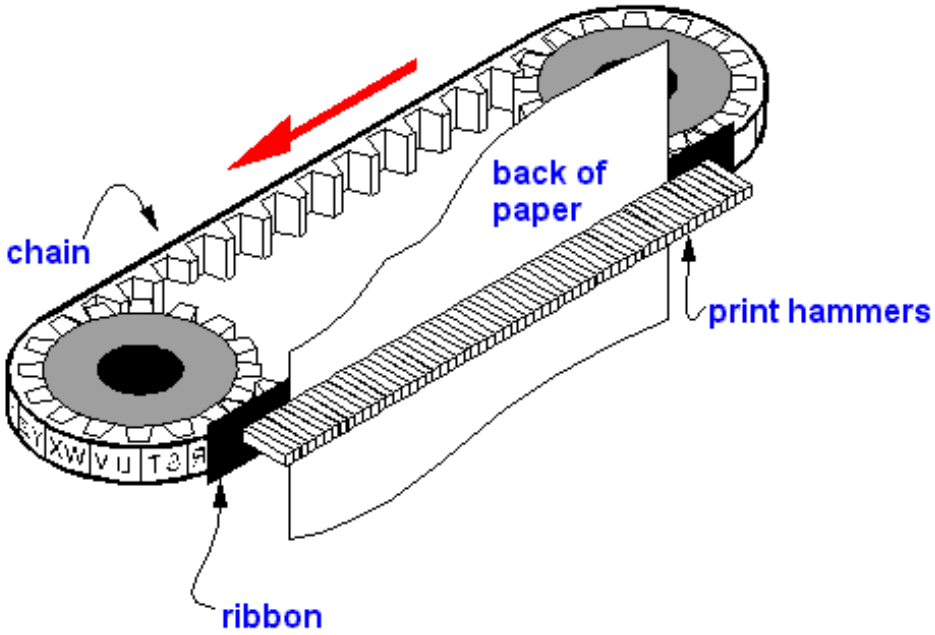
Chain Printer

- In this printer, a chain of character sets is used, hence it is called Chain Printer. A standard character set may have 48, 64, or 96 characters.
- **Advantages**
  - Character fonts can easily be changed.
  - Different languages can be used with the same printer.
- **Disadvantages**
  - Noisy



Cylinder of Drum Printer

Drum Printers



Chain Printers

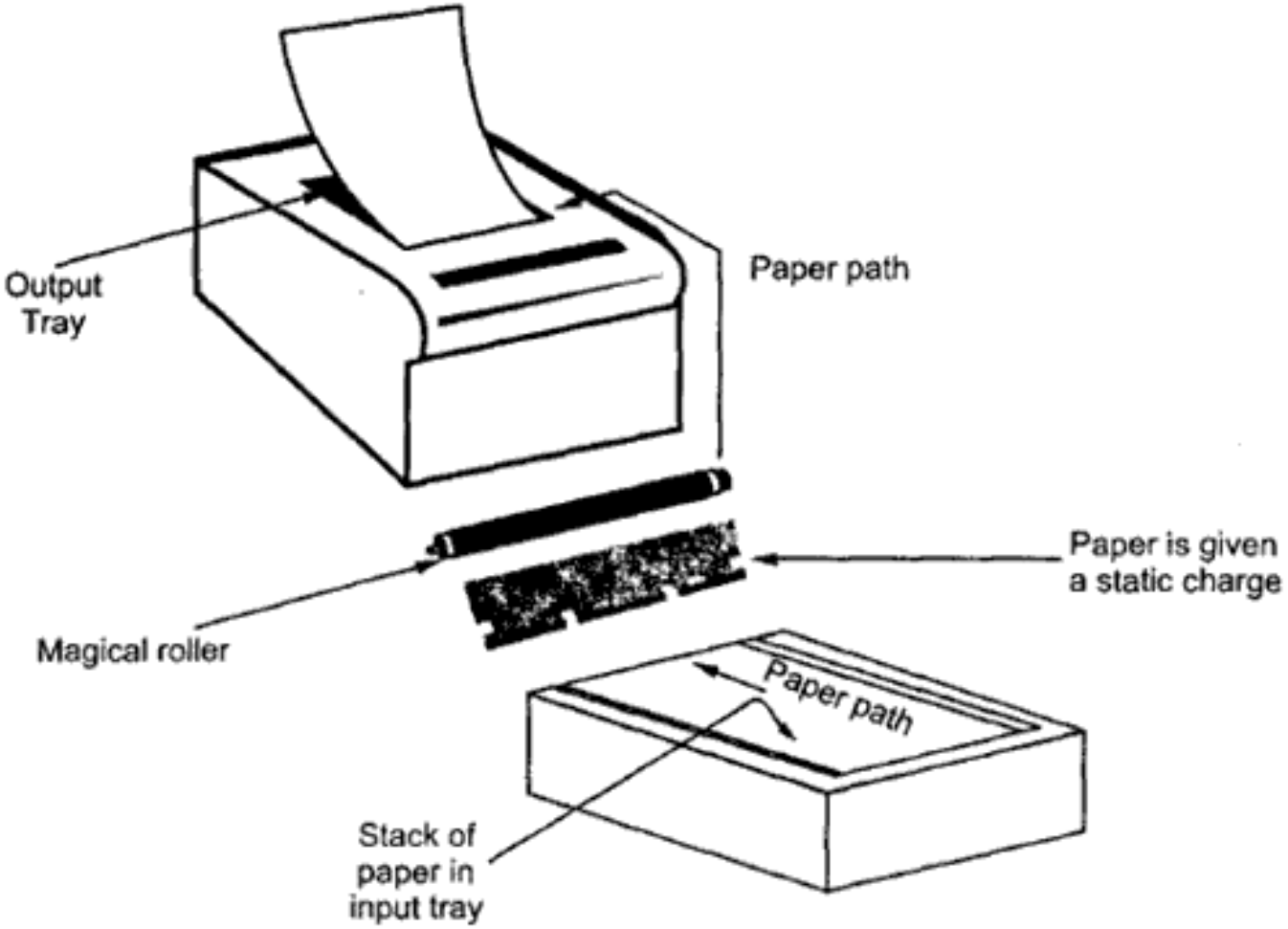
Line Printers

Non-impact Printers

- Non-impact printers print the characters without using the ribbon. These printers print a complete page at a time; thus they are also called as Page Printers.
- These printers are of two types −
  - Laser Printers
  - Inkjet Printers
- Characteristics of Non-impact Printers
  - Faster than impact printers
  - They are not noisy
  - High quality
  - Supports many fonts and different character size

Laser Printers

- They use laser lights to produce the dots needed to form the characters to be printed on a page.
- Advantages
  - Very high speed
  - Very high-quality output
  - Good graphics quality
  - Supports many fonts and different character size
- Disadvantages
  - Expensive
  - Cannot be used to produce multiple copies of a document in a single printing


Output
Tray
Paper path
Paper is given
a static charge
Magical roller
Paper path
Stack of
paper in
input tray

Colour Laser Printer

- A colour laser printer works like a single laser printer, except that the process is repeated four times with four different ink colours: Cyan, magenta, yellow and black.
- Laser printers have high resolution from 600 dots per inch upto 1200 per inch.
- These printers print 4 to 16 page of text per minute.
- The high quality and speed of laser printers make them ideal for office environment.

Inkjet Printers

- Inkjet printers are non-impact character printers based on a relatively new technology. They print characters by spraying small drops of ink onto paper. Inkjet printers produce high quality output with presentable features.
- They make less noise because no hammering is done, and these have many styles of printing modes available. Color printing is also possible. Some models of Inkjet printers can produce multiple copies of printing also.
- Advantages
  - High quality printing
  - More reliable
- Disadvantages
  - Expensive as the cost per page is high
  - Slow as compared to laser printer

Ink jet Printers

Plotters

- Plotters are a special type of output device. It is suitable for applications:
  - Architectural plan of the building.
  - CAD applications like the design of mechanical components of aircraft.
  - Many engineering applications.

Advantage:

- It can produce high-quality output on large sheets.
- It is used to provide the high precision drawing.
- It can produce graphics of various sizes.
- The speed of producing output is high.

- **Drum Plotter:**
- It consists of a drum. Paper on which design is made is kept on the drum. The drum can rotate in both directions. Plotters comprised of one or more pen and penholders. The holders are mounted perpendicular to drum surface. The pens are kept in the holder, which can move left to the right as well as right to the left. The graph plotting program controls the movement of pen and drum.
- **Flatbed Plotter:**
- It is used to draw complex design and graphs, charts. The Flatbed plotter can be kept over the table. The plotter consists of pen and holder. The pen can draw characters of various sizes. There can be one or more pens and pen holding mechanism. Each pen has ink of different color. Different colors help to produce multicolor design of document. The area of plotting is also variable. It can vary A4 to 21'*52'.

Drum Plotter

Flatbed Plotter

SOFTWARE

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Software

- Computer software is a collection of data or computer instructions that tell the computer how to work.
- This contrasts with physical hardware, from which the system is built and performs the work.
- Software is all about information processed by computer systems, programs and data.
- Computer software includes computer programs, libraries and related non-executable data, such as online documentation or digital media.
- Examples of applications include office suites, database programs, web browsers, word processors,

Software Types

- There are two main types of software:
  - Systems software
  - Application software.
- **System Software** can be designed as the software in such a way so that it can control and work with computer hardware.
- System software is also designed for providing a platform for running application software such as the operating system, file management utilities, and disk operating system (or DOS).

- System software is a software that provides platform to other software's.
- Some examples can be operating systems, antivirus software's, disk formatting software's, Computer language translators etc.
- System software serves as the interface between the hardware and the end users.

Operating System (OS)

- An operating system (OS) is a system software that manages computer's hardware and software resources.
- An operating system is a collection of system programs that together controls the operation of a computer system.
- It provides common services for computer programs.
- It controls and keeps a record of the execution of all other programs that are present in the computer, including application programs and other system software.
- Example: Linux, Unix, Microsoft Windows etc.

Device Driver

- **Device Driver** are essential piece of system software.
- Operating systems act as a link between hardware and software which enables both to communicate and do their tasks.
- A device driver is a specially written program which translates the commands from the operating system into commands that the specific hardware will understand.
- Each piece of hardware has its own driver.
- Devices from different manufactures work in different ways.

Utility software

- Utility software is a kind of system software which acts as an interface between system software and application software.
- These are those programs which are specifically designed for some particular purpose like maintenance of the computer or diagnose any error in the computer.
- Generally, these are third-party tools which come along with the operating system.
- Some Examples includes File Viewer, File Compressor, Disk Scanner, Antivirus, Disk Defragmenter, Backup Utility and Data Recovery Utility.

Application Software

- Application software is a computer software which is designed to help the user to perform single or multiple related tasks.
- Applications software can deal with user inputs and helps the user to complete the task. It is also called end-user programs.
- Examples of an application include a word processor, a spreadsheet, an accounting application, a web browser, an email client, a media player, a file viewer, simulators, a console game or a photo editor.

Difference between System Software and Application Software

System Software	Application Software
We make use of system software for operating hardware of the computer.	The user makes use of application software to perform some specific task.
When the operating system is installed on the computer, then the system software is also mounted on the machine.	We install the application software according to the requirement of the user.
System software works in the background. So the user is not able to interact with it.	Generally, the user interacts with the application software.
It can run independently as it provides the platform for the running application softwares.	It can’t run independently because it is not able to run without the presence of system software.
Example: compiler, assembler, interpreter etc..	Example: word processor, web browser, media player etc.

Programming Languages

- **Machine language** is the low level programming language.
- Machine language can only be represented by 0s and 1s.
- In earlier when we have to create a picture or show data on the screen of the computer then it is very difficult to draw using only binary digits(0s and 1s).
- For example: To write 120 in the computer system its representation is 1111000. So it is very difficult to learn. To overcome this problem the assembly language is invented.

- **Assembly language** is the more than low level and less than high-level language so it is intermediary language.
- Assembly languages use numbers, symbols, and abbreviations instead of 0s and 1s.

For example:

- For addition, subtraction and multiplications it uses symbols likes Add, sub and Mul, etc.


Assembly Language
Assembler
Machine language
(Low level language)

Machine Language	Assembly Language
Machine language is only understood by the computers.	Assembly language is only understand by human beings not by the computers.
In machine language data only represented with the help of binary format(0s and 1s), hexadecimal and octadecimal.	In assembly language data can be represented with the help of mnemonics such as Mov, Add, Sub, End etc.
Machine language is very difficult to understand by the human beings.	Assembly language is easy to understand by the human being as compare to machine language.
Modifications and error fixing cannot be done in machine language.	Modifications and error fixing can be done in assembly language.

Machine Language	Assembly Language
Machine language is very difficult to memorize so it is not possible to learn the machine language.	Easy to memorize the assembly language because some alphabets and mnemonics are used.
Execution is fast in machine language because all data is already present in binary format.	Execution is slow as compared to machine language.
There is no need of translator.The machine understandable form is the machine language.	Assembler is used as translator to convert mnemonics into machine understandable form.
Machine language is hardware dependent.	Assembly language is the machine dependent and it is not portable.
Machine language is very difficult to memorize so it is not possible to learn the machine language.	Easy to memorize the assembly language because some alphabets and mnemonics are used.

High level Language

- High level languages are instructions, which are called as statements that use brief statements or arithmetic expressions.
- High level language statements resemble the phrases or mathematics expression required to express the problem or procedure being programmed.
- Most common programming languages are considered high-level languages. Examples include C++,C#, Cobol, Java, JavaScript, PHP, Python, etc.,

- Each of these languages use different syntax.
- Some are designed for writing desktop software programs, while others are best-suited for web development. But they all are considered high-level since they must be processed by a compiler or interpreter before the code is executed.
- Source code written in languages like C++ and C# must be compiled into machine code in order to run. The compilation process converts the human-readble syntax of the high-level language into low-level code for a specific processor.
- Source code written in scripting languages like Perl and PHP can be run through an interpreter, which converts the high-level code into a low-level language on-the-fly.

Advantages

1. High level languages are programmer friendly. They are easy to write, debug and maintain.
2. It provide higher level of abstraction from machine languages.
3. It is machine independent language.
4. Easy to learn.
5. Less error prone, easy to find and debug errors.
6. High level programming results in better programming productivity.

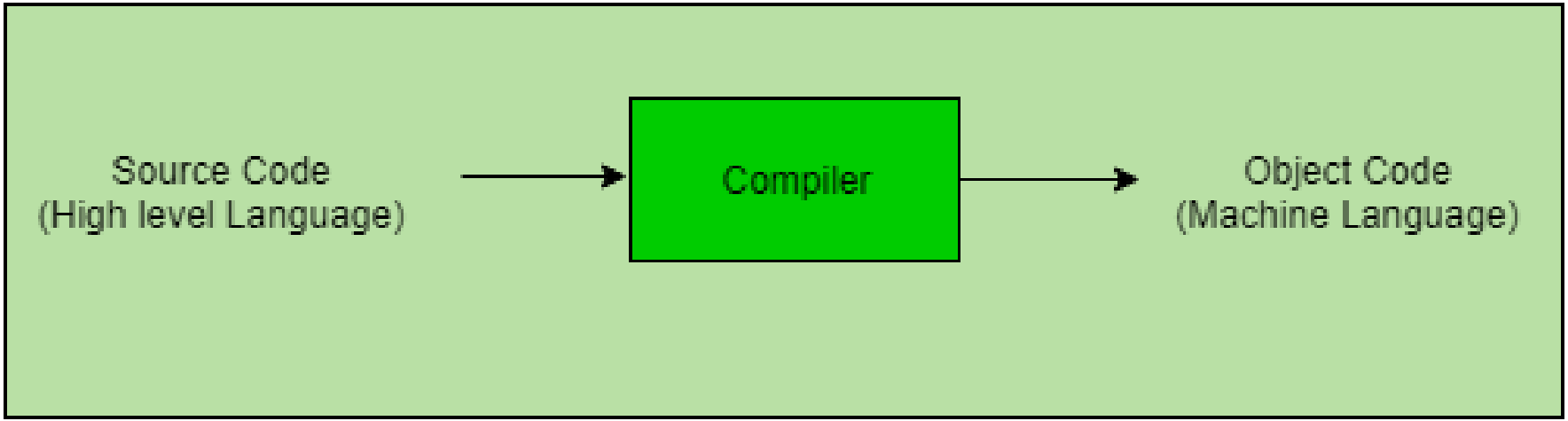
Disadvantages

1. It takes additional translation times to translate the source to machine code.
2. High level programs are comparatively slower than low level programs.
3. Compared to low level programs, they are generally less memory efficient.
4. Cannot communicate directly with the hardware.

High Level Language	Low Level Language
It is programmer friendly language.	It is a machine friendly language.
High level language is less memory efficient.	Low level language is high memory efficient.
It is easy to understand.	It is tough to understand.
It is simple to debug.	It is complex to debug comparatively.
It is simple to maintain.	It is complex to maintain comparatively.
It is portable.	It is non-portable.
It can run on any platform.	It is machine-dependent.
It needs compiler or interpreter for translation.	It needs assembler for translation.
It is used widely for programming.	It is not commonly used now-a-days in programming.

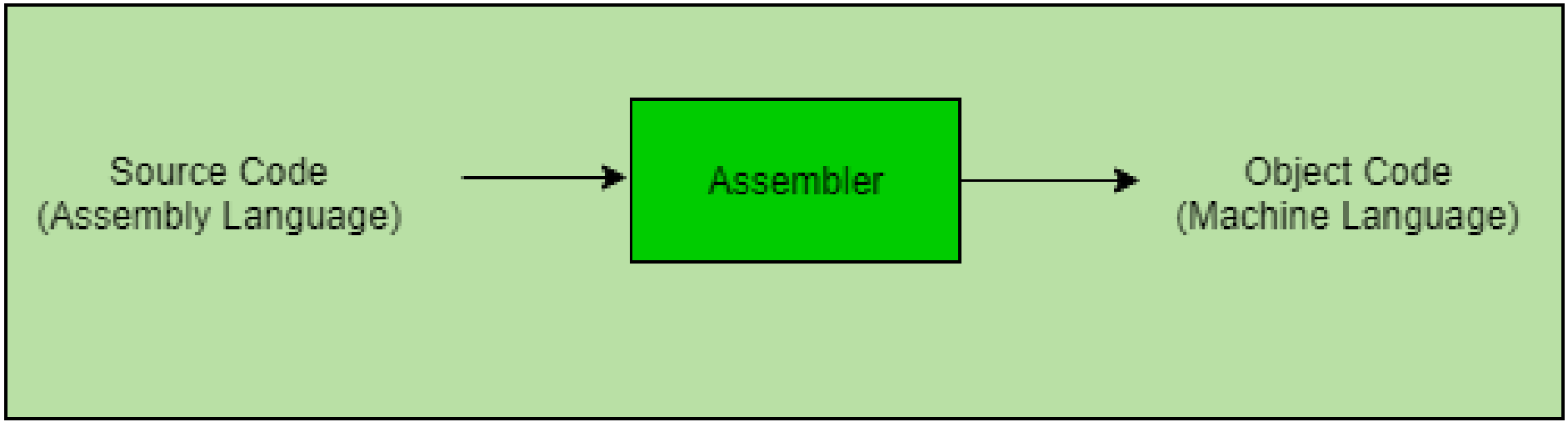
Language Processors

- The language processor that reads the complete source program written in high level language in one go and translates it into an equivalent program in machine language is called as a **Compiler**.
  - **Example:** C, C++, C#, Java.
- In a compiler, the source code is translated to object code successfully if it is free of errors. The compiler specifies the errors at the end of compilation with line numbers when there are any errors in the source code. The errors must be removed before the compiler can successfully recompile the source code again


Source Code
(High level Language)
Compiler
Object Code
(Machine Language)

Assembler

- The **Assembler** is used to translate the program written in Assembly language into machine code. The source program is an input of assembler that contains assembly language instructions. The output generated by assembler is the object code or machine code understandable by the computer.


Source Code
(Assembly Language)
Assembler
Object Code
(Machine Language)

Interpreter

- The translation of single statement of source program into machine code is done by language processor and executes it immediately before moving on to the next line is called an interpreter.
- If there is an error in the statement, the interpreter terminates its translating process at that statement and displays an error message.
- The interpreter moves on to the next line for execution only after removal of the error.
- An Interpreter directly executes instructions written in a programming or scripting language without previously converting them to an object code or machine code.
  - **Example:** Perl, Python and Matlab.

Compiler	Interpreter
A compiler is a program which coverts the entire source code of a programming language into executable machine code for a CPU.	interpreter takes a source program and runs it line by line, translating each line as it comes to it.
Compiler takes large amount of time to analyze the entire source code but the overall execution time of the program is comparatively faster.	Interpreter takes less amount of time to analyze the source code but the overall execution time of the program is slower.
Compiler generates the error message only after scanning the whole program, so debugging is comparatively hard as the error can be present any where in the program.	Its Debugging is easier as it continues translating the program until the error is met
Generates intermediate object code.	No intermediate object code is generated.
Examples: C, C++, Java	Examples: Python, Perl

OPERATING SYSTEM

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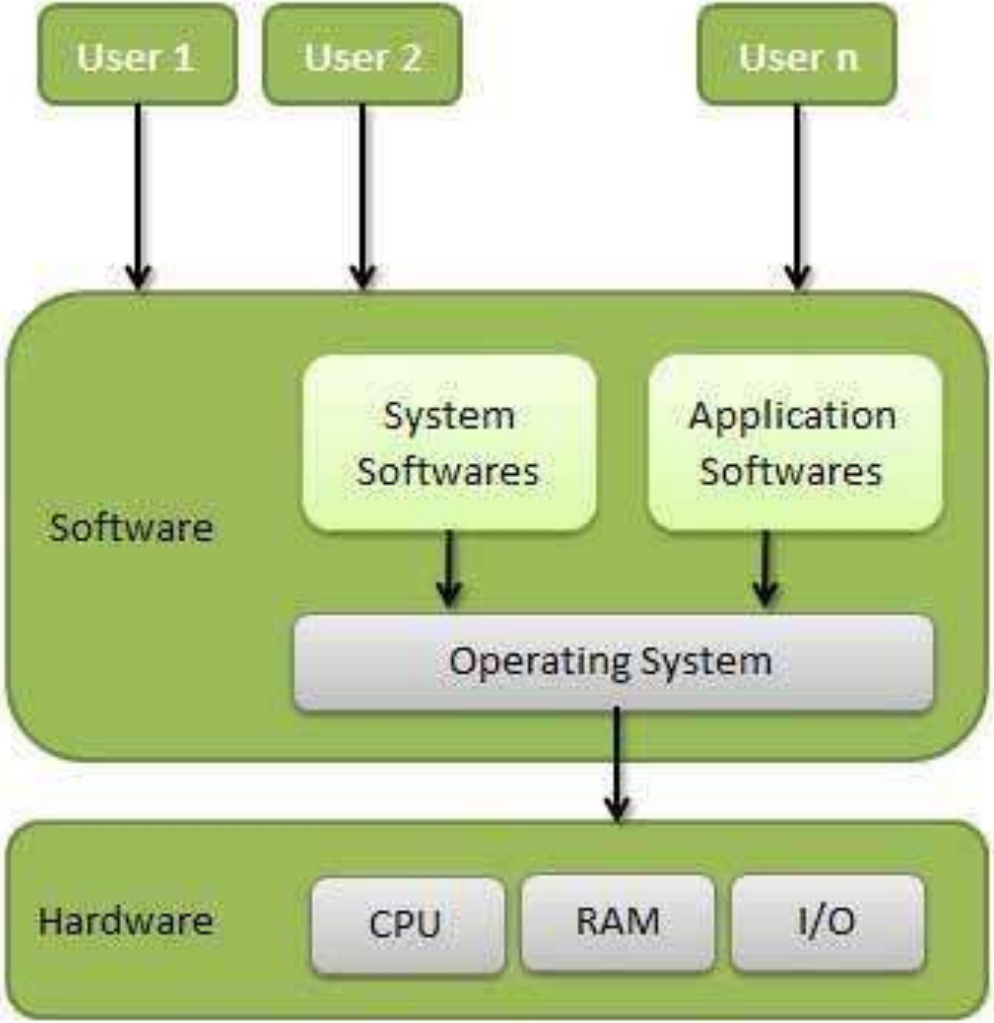
Operating System

- An Operating System (OS) is an interface between a computer user and computer hardware. An operating system is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
- Some popular Operating Systems include Linux Operating System, Windows Operating System, VMS, OS/400, AIX, z/OS, etc.
- **An operating system is a program that acts as an interface between the user and the computer hardware and controls the execution of all kinds of programs.**


User 1
User 2
User n
Software
System Softwares
Application Softwares
Operating System
Hardware
CPU
RAM
I/O

- Following are some of important functions of an operating System.
  - Memory Management
  - Processor Management
  - Device Management
  - File Management
  - Security
  - Control over system performance
  - Job accounting
  - Error detecting aids
  - Coordination between other software and users

Memory Management

- An Operating System does the following activities for memory management −
  - Keeps tracks of primary memory, i.e., what part of it are in use by whom, what part are not in use.
  - In multiprogramming, the OS decides which process will get memory when and how much.
  - Allocates the memory when a process requests it to do so.
  - De-allocates the memory when a process no longer needs it or has been terminated.

Processor Management

- In multiprogramming environment, the OS decides which process gets the processor when and for how much time. This function is called **Process Scheduling**.
- An Operating System does the following activities for processor management −
  - Keeps tracks of processor and status of process. The program responsible for this task is known as **traffic controller**.
  - Allocates the processor (CPU) to a process.
  - De-allocates processor when a process is no longer required.

Device Management

- An Operating System manages device communication via their respective drivers. It does the following activities for device management –
  - Keeps tracks of all devices. Program responsible for this task is known as the **I/O controller**.
  - Decides which process gets the device when and for how much time.
  - Allocates the device in the efficient way.
  - De-allocates devices.

File Management

- A file system is normally organized into directories for easy navigation and usage. These directories may contain files and other directions.
- An Operating System does the following activities for file management −
  - Responsible for creation and deletion of files and directories.
  - It takes file related activities such as organizing, storing, retrieving, naming and processing the files.

- **Security** – By means of password and similar other techniques, it prevents unauthorized access to programs and data.
- **Control over system performance** – Recording delays between request for a service and response from the system.
- **Job accounting** – Keeping track of time and resources used by various jobs and users.
- **Error detecting aids** – Production of dumps, traces, error messages, and other debugging and error detecting aids.
- **Coordination between other software's and users** – Coordination and assignment of compilers, interpreters, assemblers and other software to the various users of the computer systems.

Types of Operating System

Batch operating system

- The users of a batch operating system do not interact with the computer directly. Each user prepares his job on an off-line device like punch cards and submits it to the computer operator. To speed up processing, jobs with similar needs are batched together and run as a group. The programmers leave their programs with the operator and the operator then sorts the programs with similar requirements into batches.
- The problems with Batch Systems are as follows −
  - Lack of interaction between the user and the job.
  - CPU is often idle, because the speed of the mechanical I/O devices is slower than the CPU.
  - Difficult to provide the desired priority.

Time-sharing operating systems

- Time-sharing is a technique which enables many people, located at various terminals, to use a particular computer system at the same time. Time-sharing or multitasking is a logical extension of multiprogramming. Processor's time which is shared among multiple users simultaneously is termed as time-sharing.
- The main difference between Multi programmed Batch Systems and Time-Sharing Systems is that in case of Multi programmed batch systems, the objective is to maximize processor use, whereas in Time-Sharing Systems, the objective is to minimize response time.

- Multiple jobs are executed by the CPU by switching between them, but the switches occur so frequently. Thus, the user can receive an immediate response. For example, in a transaction processing, the processor executes each user program in a short burst or quantum of computation. That is, if **n** users are present, then each user can get a time quantum. When the user submits the command, the response time is in few seconds at most.
- The operating system uses CPU scheduling and multiprogramming to provide each user with a small portion of a time. Computer systems that were designed primarily as batch systems have been modified to time-sharing systems.

Network Operating System

- A Network Operating System runs on a server and provides the server the capability to manage data, users, groups, security, applications, and other networking functions.
- The primary purpose of the network operating system is to allow shared file and printer access among multiple computers in a network, typically a local area network (LAN), a private network or to other networks.
- Examples of network operating systems include Microsoft Windows Server 2003, Microsoft Windows Server 2008, UNIX, Linux, Mac OS X, Novell NetWare, and BSD.

Desktop Operating System

- Operating system that run on desktop computes are most common. Generally the operating system include Windows, Mac OS and DOS.
- Windows has many versions and the latest is Windows 10.
- Windows is currently the leading desktop operating systems.
- Mac OS runs on Apple Macintosh and PowerPC was the first widely used operating systems with GUI.

Mainframe Operating Systems

- Currently, mainframes and mini frames dominated the computing world, each computer company developed its own operating system.
- For example: IBM mainframe computers use an operating system called OS/Z and digital Equipment corporation use OpenVMS.
- These companies developed not only their own operating systems but also the applications that run on top of them.

Examples of Operating System

- Windows 1.0
- Windows 2.0
- Windows 3.0
- Windows 3.1
- Windows NT 3.1
- Windows 95
- Windows NT 4.0

- Windows 98
- Windows Millennium Edition (ME)
- Windows 2000 Professional
- Windows XP
- Windows Vista
- Windows 7
- Windows 2008
- Windows 8
- Windows 10

COMPUTER NETWORKS

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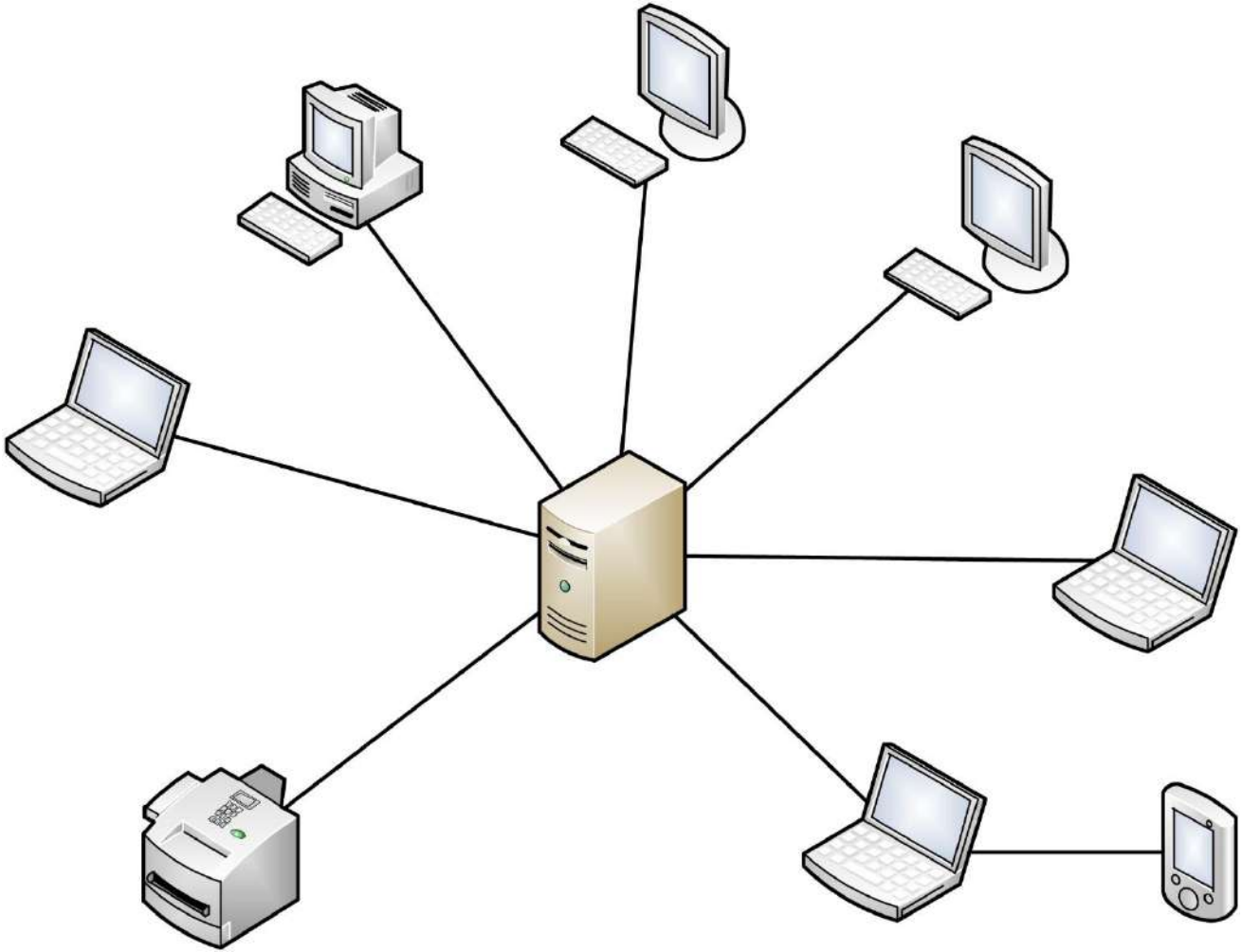
Computer Networks

- A Computer network is a group of computers linked to each other that enables the computer to communicate with another computer and share their resources, data, and applications.
- A network is a set of nodes connected by communication links. A node can be a computer, printer, or any other device capable of sending or receiving data from the other node through the network.

Components of Computer Network

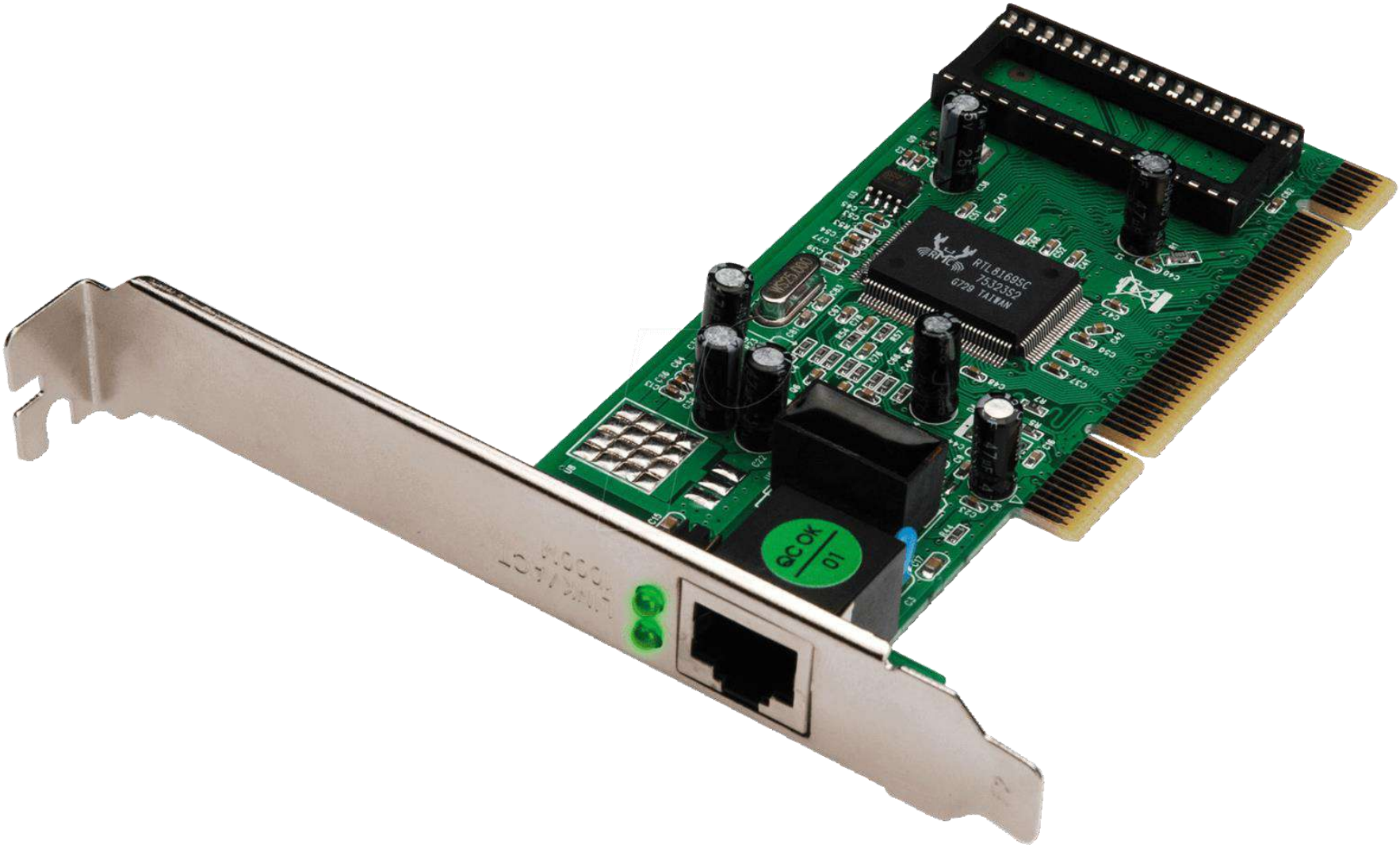
- **Servers** - Servers are computers that hold shared files, programs, and the network operating system.
- Servers provide access to network resources to all the users of the network.
- There are many kinds of servers, and one server can provide several functions.
- Sometimes it is also called host computer, servers are powerful computer that store data or application and connect to resources that are shared by the user of a network.

- For example, there are file servers, print servers, mail servers, communication servers, database servers, fax servers and web servers, to name a few.
- **Clients** - Clients are computers that access and use the network and shared network resources.
- Client computers are basically the customers(users) of the network, as they request and receive services from the servers.



- **Transmission Media** - Transmission media are the facilities used to interconnect computers in a network, such as twisted-pair wire, coaxial cable, and optical fiber cable. Transmission media are sometimes called transmission medium channels, links or lines.
- **Shared data** - Shared data are data that file servers provide to clients such as data files, printer access programs and e-mail.
- **Shared printers and other peripherals** - Shared printers and peripherals are hardware resources provided to the users of the network by servers. Resources provided include data files, printers, software, or any other items used by clients on the network.

- **Network Interface Card** - Each computer in a network has a special extension card called a network interface card (NIC).
- The NIC prepares(formats) and sends data, receives data, and controls data flow between the computer and the network.
- On the transmit side, the NIC passes frames of data on to the physical layer, which transmits the data to the physical link. On the receiver's side, the NIC processes bits received from the physical layer and processes the message based on its contents.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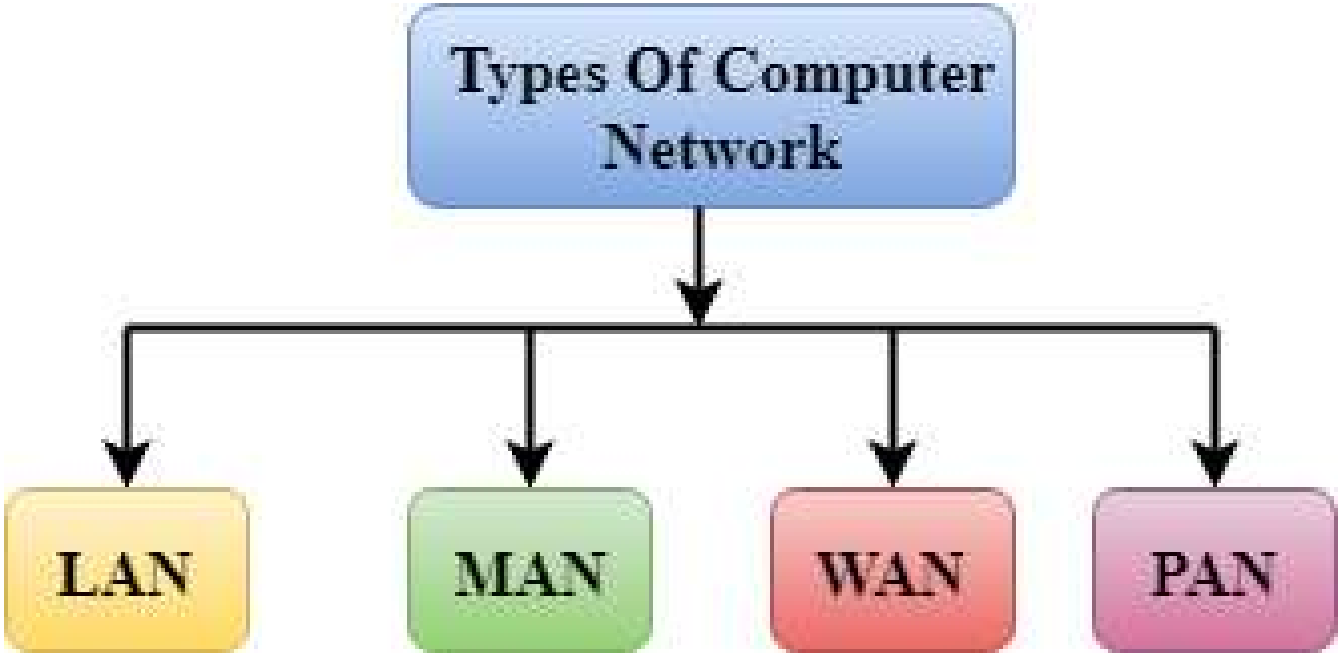
01

Uses of Computer Networks

- **Information and Resource Sharing** – Computer networks allow organizations having units which are placed apart from each other, to share information in a very effective manner. Programs and software in any computer can be accessed by other computers linked to the network. It also allows sharing of hardware equipment, like printers and scanners among varied users.
- **Retrieving Remote Information** – Through computer networks, users can retrieve remote information on a variety of topics. The information is stored in remote databases to which the user gains access through information systems like the World Wide Web.

- **Speedy Interpersonal Communication** – Computer networks have increased the speed and volume of communication like never before. Electronic Mail (email) is extensively used for sending texts, documents, images, and videos across the globe. Online communications have increased by manifold times through social networking services.
- **E-Commerce** – Computer networks have paved way for a variety of business and commercial transactions online, popularly called e-commerce. Users and organizations can pool funds, buy or sell items, pay bills, manage bank accounts, pay taxes, transfer funds and handle investments electronically.

- **Highly Reliable Systems** – Computer networks allow systems to be distributed in nature, by the virtue of which data is stored in multiple sources. This makes the system highly reliable. If a failure occurs in one source, then the system will still continue to function and data will still be available from the other sources.
- **Cost–Effective Systems** – Computer networks have reduced the cost of establishment of computer systems in organizations. Previously, it was imperative for organizations to set up expensive mainframes for computation and storage. With the advent of networks, it is sufficient to set up interconnected personal computers (PCs) for the same purpose.
- **VoIP or Voice over Internet protocol** has revolutionized telecommunication systems. Through this, telephone calls are made digitally using Internet Protocols instead of the regular analog phone lines.


Types Of Computer Network
LAN
MAN
WAN
PAN

- A computer network can be categorized by their size. A computer network is mainly of four types:
  - PAN(Personal Area Network)
  - LAN(Local Area Network)
  - MAN(Metropolitan Area Network)
  - WAN(Wide Area Network)

PAN(Personal Area Network)

- Personal Area Network is a network arranged within an individual person, typically within a range of 10 meters.
- Personal Area Network is used for connecting the computer devices of personal use is known as Personal Area Network.
- **Thomas Zimmerman** was the first research scientist to bring the idea of the Personal Area Network.
- Personal Area Network covers an area of **30 feet**.
- Personal computer devices that are used to develop the personal area network are the laptop, mobile phones, media player and play stations.

LAN(Local Area Network)

- Local Area Network is a group of computers connected to each other in a small area such as Home, building, office.
- LAN is used for connecting two or more personal computers through a communication medium such as twisted pair, coaxial cable, etc.
- It is less costly as it is built with inexpensive hardware such as hubs, network adapters, and ethernet cables.
- The data is transferred at an extremely faster rate in Local Area Network.
- Local Area Network provides higher security.


LAN

Advantages

- Using LAN, we can share the hardware and software resources like printers, FAX, drivers and hard-disk as they are on one platform and thus this type of network turns out to be cost-effective.
- As being connected on the network, the offices or firms using the same type of software for job purposes need not purchase separately for each of the host clients as the software can easily be shared with everyone on an equal level.

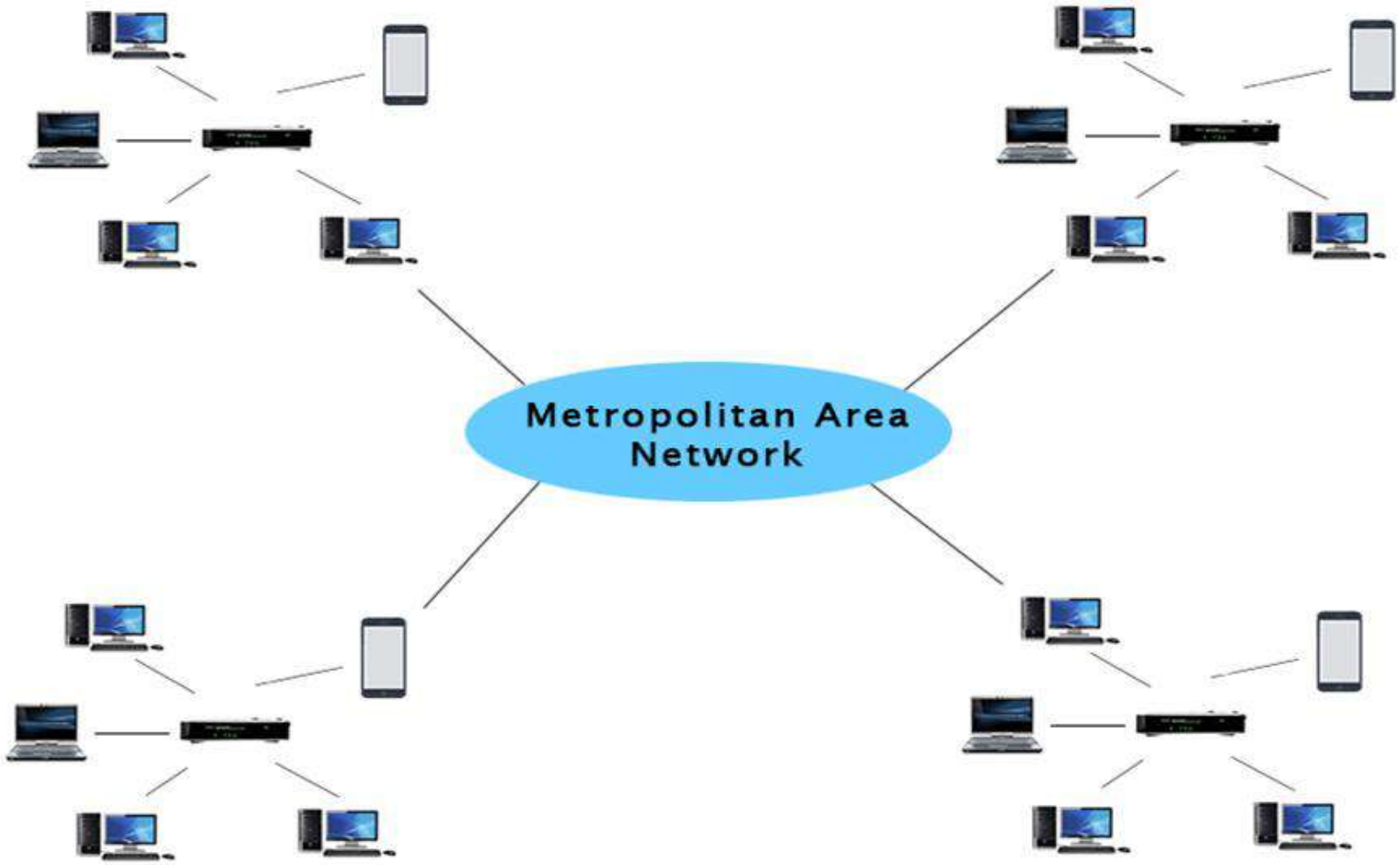
- LAN network works as a client-server model, therefore data can be stored centrally on one PC called as a server in a network and it can be accessible to all the other client PC's via LAN. By following this method, we need not store data locally at one single node.
- Communication will be handy and economical by using LAN network.
- Internet cafe owners use the LAN network to provide internet connections to multiple nodes and users connected via a single internet connection. This makes the use of the internet a cost-effective one.

Disadvantages

- The initial installation cost of the network is very high.
- It is having a geographical area limitation and can only cover a small area.
- As it works on a single cable, if it gets faulty then the overall network will stop working. Hence, it needs a full -time maintenance officer called an administrator.
- Crucial Data of offices or factories is saved on a single server which can easily be accessible by all the nodes thus it is having all time data security issues as any unauthorized person can also access the confidential data.

MAN(Metropolitan Area Network)

- A metropolitan area network is a network that covers a larger geographic area by interconnecting a different LAN to form a larger network.
- Government agencies use MAN to connect to the citizens and private industries.
- In MAN, various LANs are connected to each other through a telephone exchange line.
- It has a higher range than Local Area Network(LAN).
- Cable Television network is the best example for MAN.


Metropolitan Area
Network

Advantages

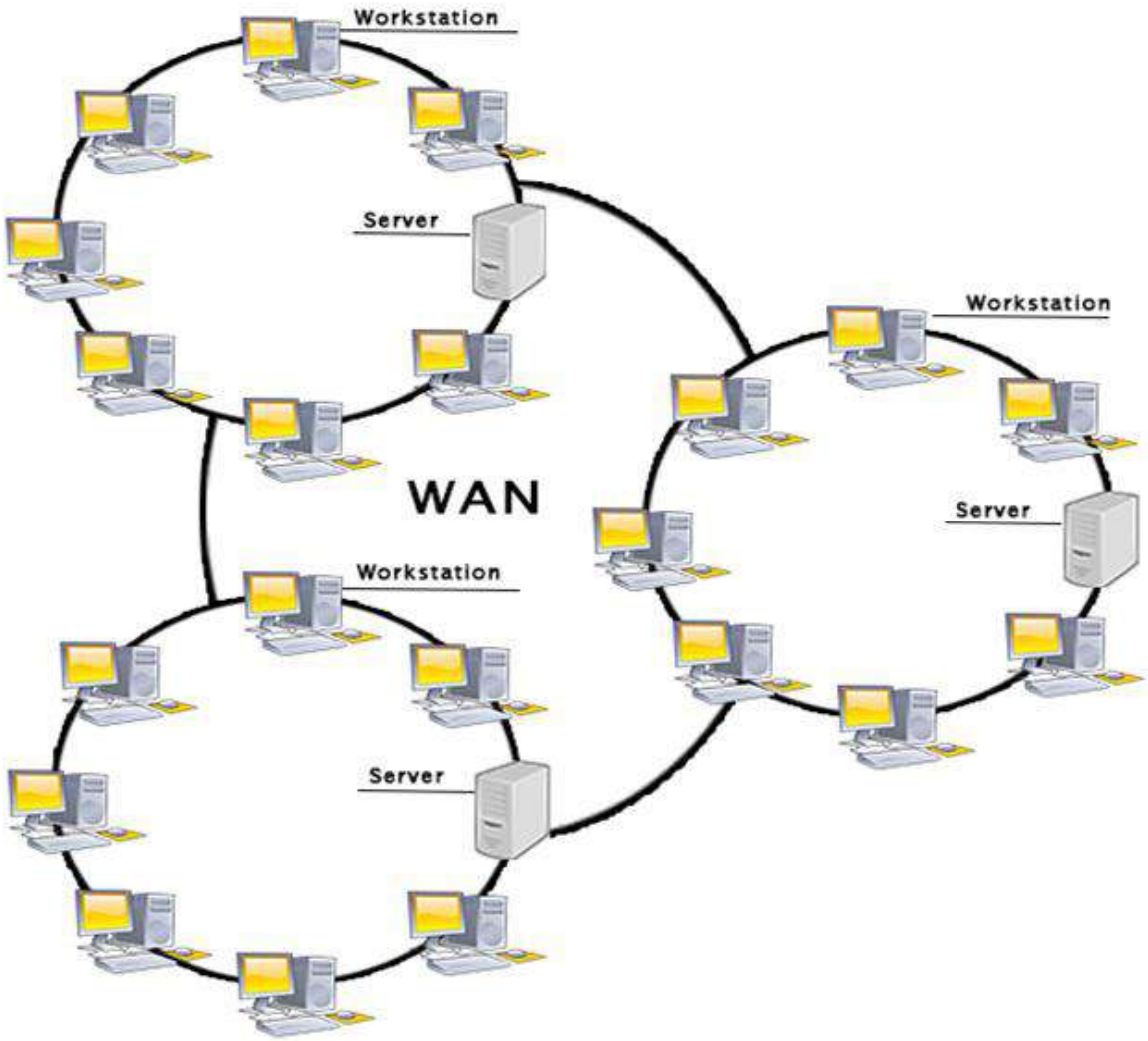
- It is very efficient and swift for communication over fiber optic cable for interconnection of networks in cities.
- It serves many villages and cities and thus provides great inter-connectivity at a low cost.
- The data can be transmitted or received simultaneously over nodes and if one link fails the other will keep the network live.

Disadvantages

- Depending upon the distance between two nodes, the cable length required for inter-connection differs every time. Thus greater will be the cable length, the more will be the cost of the network.
- Security is a big concern for this network as for such a big distance anyone can hack the network. We can't put security at each level of the network, hence it becomes easier for unwanted people to access it for their own benefits.

WAN(Wide Area Network)

- A Wide Area Network is a network that extends over a large geographical area such as states or countries.
- A Wide Area Network is quite bigger network than the LAN.
- A Wide Area Network is not limited to a single location, but it spans over a large geographical area through a telephone line, fibre optic cable or satellite links.
- The internet is one of the biggest WAN in the world.
- A Wide Area Network is widely used in the field of Business, government, and education.


Workstation
Server
WAN
Workstation
Server
Workstation
Server

Advantages of WAN

- **Geographical area:** A Wide Area Network provides a large geographical area. Suppose if the branch of our office is in a different city then we can connect with them through WAN. The internet provides a leased line through which we can connect with another branch.
- **Centralized data:** In case of WAN network, data is centralized. Therefore, we do not need to buy the emails, files or back up servers.
- **Get updated files:** Software companies work on the live server. Therefore, the programmers get the updated files within seconds.

Advantages

- ✓ **Exchange messages:** In a WAN network, messages are transmitted fast. The web application like Facebook, Whatsapp, Skype allows you to communicate with friends.
- ✓ **Sharing of software and resources:** In WAN network, we can share the software and other resources like a hard drive, RAM.
- ✓ **Global business:** We can do the business over the internet globally.
- ✓ **High bandwidth:** If we use the leased lines for our company then this gives the high bandwidth. The high bandwidth increases the data transfer rate which in turn increases the productivity of our company.

Disadvantages

- **Security issue:** A WAN network has more security issues as compared to LAN and MAN network as all the technologies are combined together that creates the security problem.
- **Needs Firewall & antivirus software:** The data is transferred on the internet which can be changed or hacked by the hackers, so the firewall needs to be used. Some people can inject the virus in our system so antivirus is needed to protect from such a virus.
- **High Setup cost:** An installation cost of the WAN network is high as it involves the purchasing of routers, switches.
- **Troubleshooting problems:** It covers a large area so fixing the problem is difficult.

Internetwork

- An internetwork is defined as two or more computer network LANs or WAN or computer network segments are connected using devices, and they are configured by a local addressing scheme. This process is known as internetworking.
- An interconnection between public, private, commercial, industrial, or government computer networks can also be defined as internetworking.
- An internetworking uses the internet protocol.

LAN	MAN	WAN
Local Area Network is a group of computers connected to each other in a small area.	Metropolitan Area Network is a larger network of computers and other network devices which are connected together usually spans several buildings.	A Wide Area Network is a network that extends over a large geographical area such as states or countries.
LAN has very high speed	Slow compared to LAN	Various based on geographical location of the servers
Speeds can be 10mbps to 1000 mbps	Speed can be 10 or 100 Mbps	Speed can be 10 or 100 Mbps
Uses Guided Media	Uses Guided or Unguided Media	Uses Guided or Unguided Media

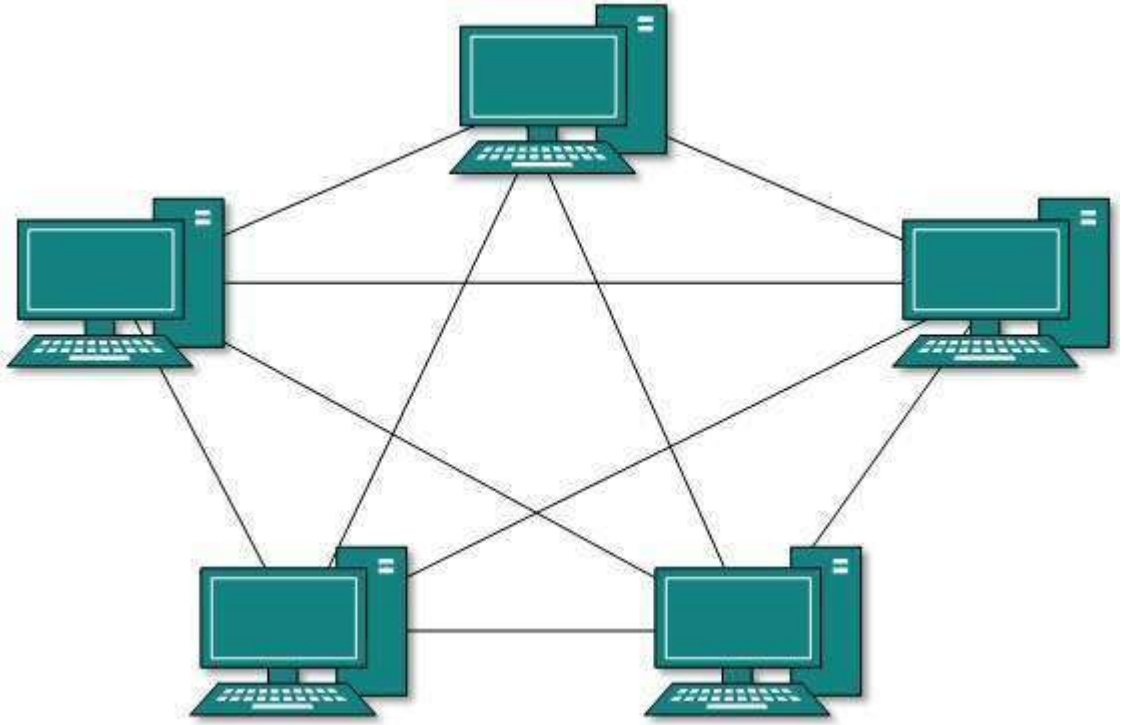
Network Topology

- Geometric representation of how the computers are connected to each other is known as Network topology.
- There are five types of topology –
  - Mesh Topology,
  - Star Topology,
  - Bus Topology,
  - Ring Topology
  - Tree Topology.

Mesh Topology

- In mesh topology each device is connected to every other device on the network through a dedicated point-to-point link.
- Dedicated lines means that the link only carries data for the two connected devices only.
- Mesh technology comes into two types:
  - **Full Mesh:** All hosts have a point-to-point connection to every other host in the network. Thus for every new host n(n-1)/2 connections are required. It provides the most reliable network structure among all network topologies.
  - **Partially Mesh:** Not all hosts have point-to-point connection to every other host. Hosts connect to each other in some arbitrarily fashion. This topology exists where we need to provide reliability to some hosts out of all.

Mesh Topology



- If suppose, N number of devices are connected with each other in mesh topology, then total number of ports that is required by each device is N-1.
- In the Figure 1, there are 5 devices connected to each other, hence total number of ports required is 4.
- If suppose, N number of devices are connected with each other in mesh topology, then total number of dedicated links required to connect them is ${}^{N}C_{2}$ i.e. N(N-1)/2.
- In the Figure 1, there are 5 devices connected to each other, hence total number of links required is 5*4/2 = 10.

Advantages

1. No data traffic issues as there is a dedicated link between two devices which means the link is only available for those two devices.
2. Mesh topology is reliable and robust as failure of one link doesn't affect other links and the communication between other devices on the network.
3. Mesh topology is secure because there is a point to point link thus unauthorized access is not possible.
4. Fault detection is easy.
5. Adding new devices would not disrupt the communication between other devices.

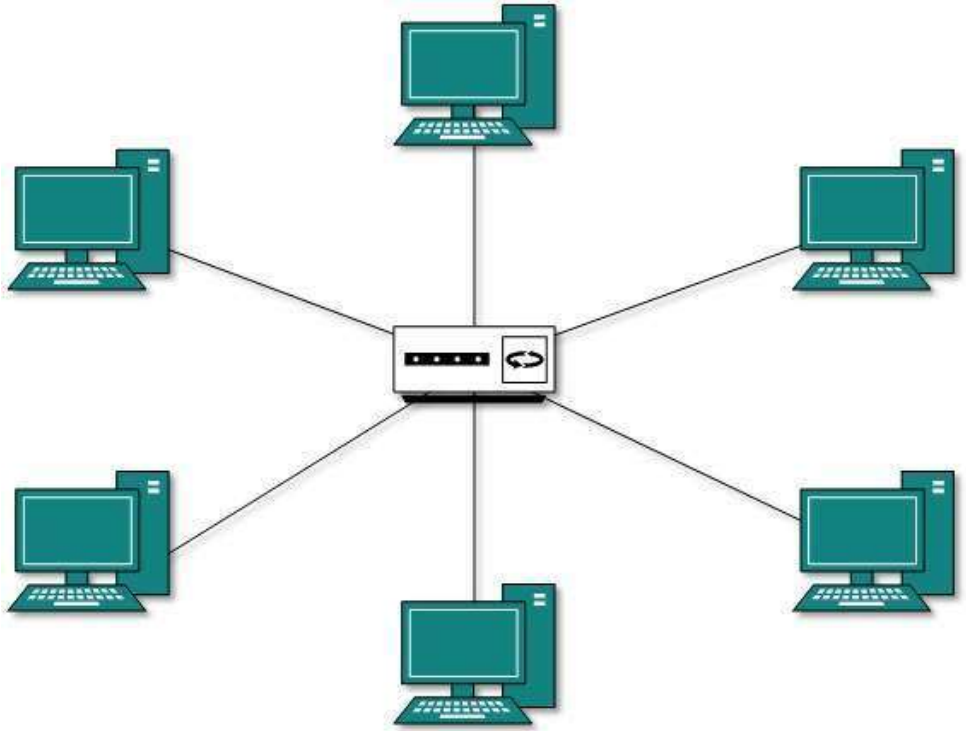
Disadvantages

1. Amount of wires required to connected each system is tedious and headache.
2. Since each device needs to be connected with other devices, number of I/O ports required must be huge.
3. Cost of maintenance is high.
4. Scalability issues because a device cannot be connected with large number of devices with a dedicated point to point link.

Star Topology

- In Star topology, each device in the network is connected to a central device called hub.
- Unlike Mesh topology, star topology doesn't allow direct communication between devices, a device must have to communicate through hub.
- If one device wants to send data to other device, it has to first send the data to hub and then the hub transmit that data to the designated device.

Star Topology



Advantages

1. Less expensive because each device only need one I/O port and needs to be connected with hub with one link.
2. Less amount of cables required because each device needs to be connected with the hub only.
3. Robust, if one link fails, other links will work just fine.
4. Easy fault detection because the link can be easily identified.
5. It is easily expandable as new stations can be added to the open ports on the hub.
6. Star topology networks are cost-effective as it uses inexpensive coaxial cable
7. It supports a bandwidth of approx. 100Mbps. Ethernet 100BaseT is one of the most popular Star topology networks

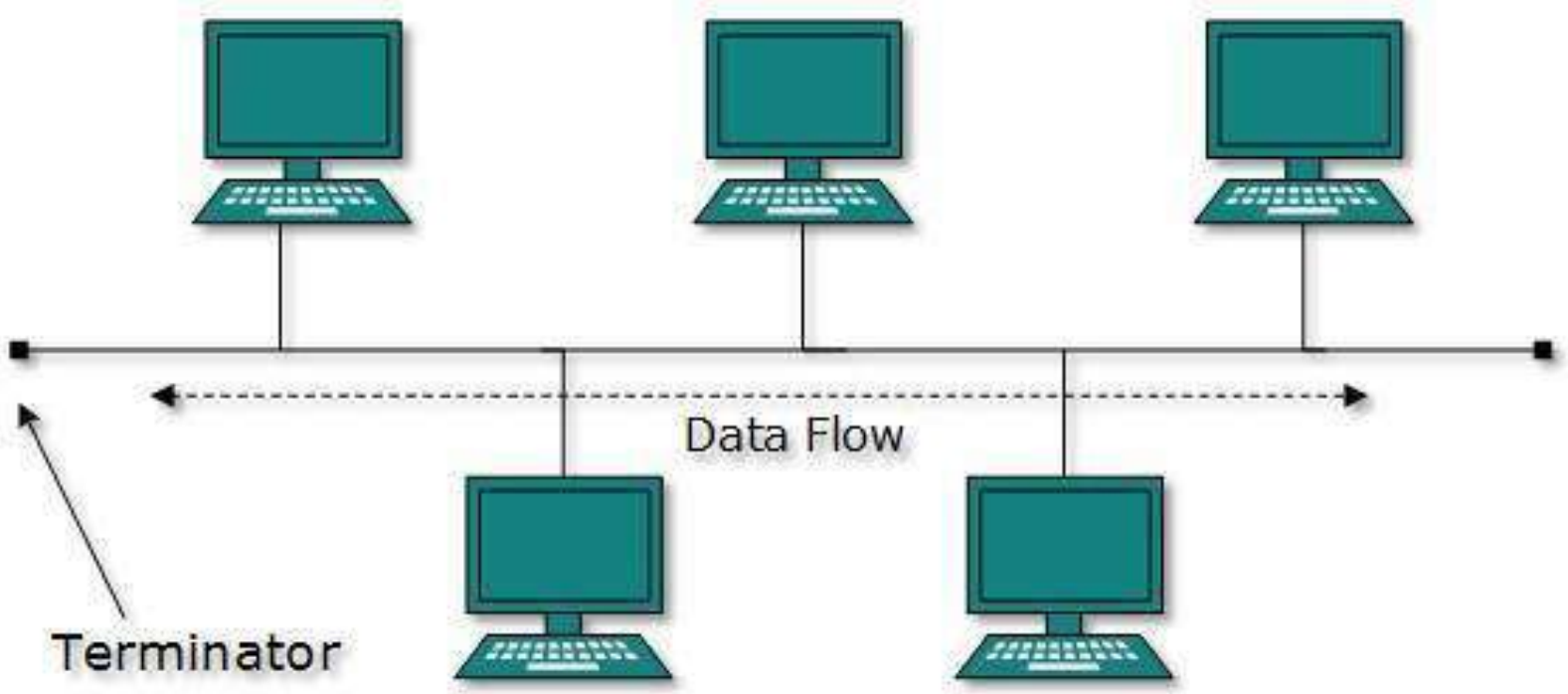
Disadvantages

1. If the central hub or switch goes down, then all the connected nodes will not be able to communicate with each other.
2. Performance is based on the single concentrator i.e. hub.
3. Hub requires more resources and regular maintenance because it is the central system of star topology.

Bus Topology

- Bus topology is a network type in which every computer and network device is connected to single cable.
- Each node is either connected directly connected to the backbone cable.
- When a node wants to send a message over the network, it puts a message over the network. All the stations available in the network will receive the message whether it has been addressed or not.
- The bus topology is mainly used in 802.3 (ethernet) and 802.4 standard networks.
- The configuration of a bus topology is quite simpler as compared to other topologies.

- The backbone cable is considered as a **"single lane"** through which the message is broadcast to all the stations.
- The most common access method of the bus topologies is **CSMA** (Carrier Sense Multiple Access).
- **CSMA:** It is a media access control used to control the data flow so that data integrity is maintained, i.e., the packets do not get lost. There are two alternative ways of handling the problems that occur when two nodes send the messages simultaneously.
  - **CSMA-CD:** CSMA CD (**Collision detection**) is an access method used to detect the collision. Once the collision is detected, the sender will stop transmitting the data. Therefore, it works on "**recovery after the collision**".
  - **CSMA-CA:** CSMA CA **(Collision Avoidance)** is an access method used to avoid the collision by checking whether the transmission media is busy or not. If busy, then the sender waits until the media becomes idle. This technique effectively reduces the possibility of the collision. It does not work on "recovery after the collision".


Data Flow
Terminator

Advantages

- If N devices are connected to each other in bus topology, then the number of cables required to connect them is 1 ?which is known as backbone cable and N drop lines are required.
- Coaxial or twisted pair cables are mainly used in bus-based networks that support up to 10 Mbps.
- A failure in one node will not have any effect on other nodes.

Disadvantages

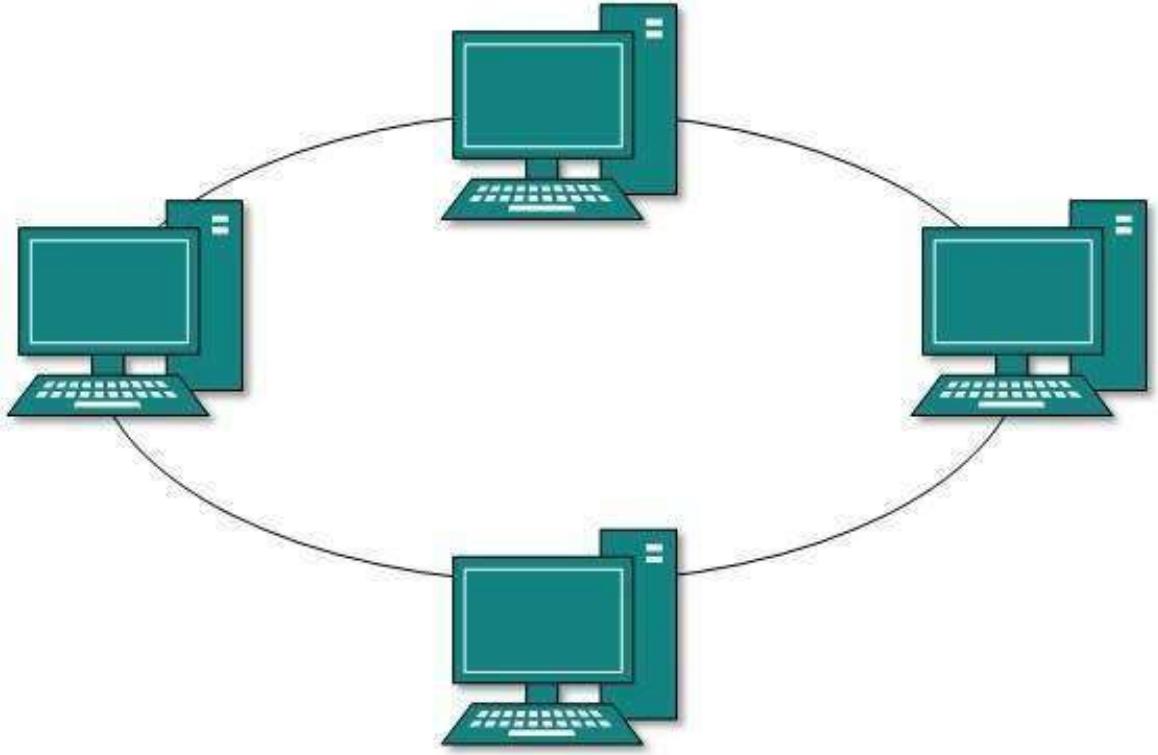
- A bus topology is quite simpler, but still it requires a lot of cabling.
- It requires specialized test equipment to determine the cable faults. If any fault occurs in the cable, then it would disrupt the communication for all the nodes.
- If two nodes send the messages simultaneously, then the signals of both the nodes collide with each other.
- If the network traffic is heavy, it increases collisions in the network.
- Adding new devices to the network would slow down the network.

Ring Topology

- Ring topology is like a bus topology, but with connected ends.
- In ring topology, each host machine connects to exactly two other machines, creating a circular network structure.
- The node that receives the message from the previous computer will retransmit to the next node.
- The data flows in one direction, i.e., it is unidirectional.

- The data in a ring topology flow in a clockwise direction.
- The most common access method of the ring topology is **Token passing**.
  - **Token passing:** It is a network access method in which token is passed from one computer to computer until it reaches the destination.
  - The sender modifies the token by putting the address along with the data.
  - The data is passed from one device to another device until the destination address matches. Once the token received by the destination device, then it sends the acknowledgment to the sender.

Ring Topology



Advantages

- Easy to install.
- Does not require network server to manage the connectivity between the computers and it is easier to add or remove a device from the topology only two links are required to be changed.
- Performs better than a bus topology under heavy network load.

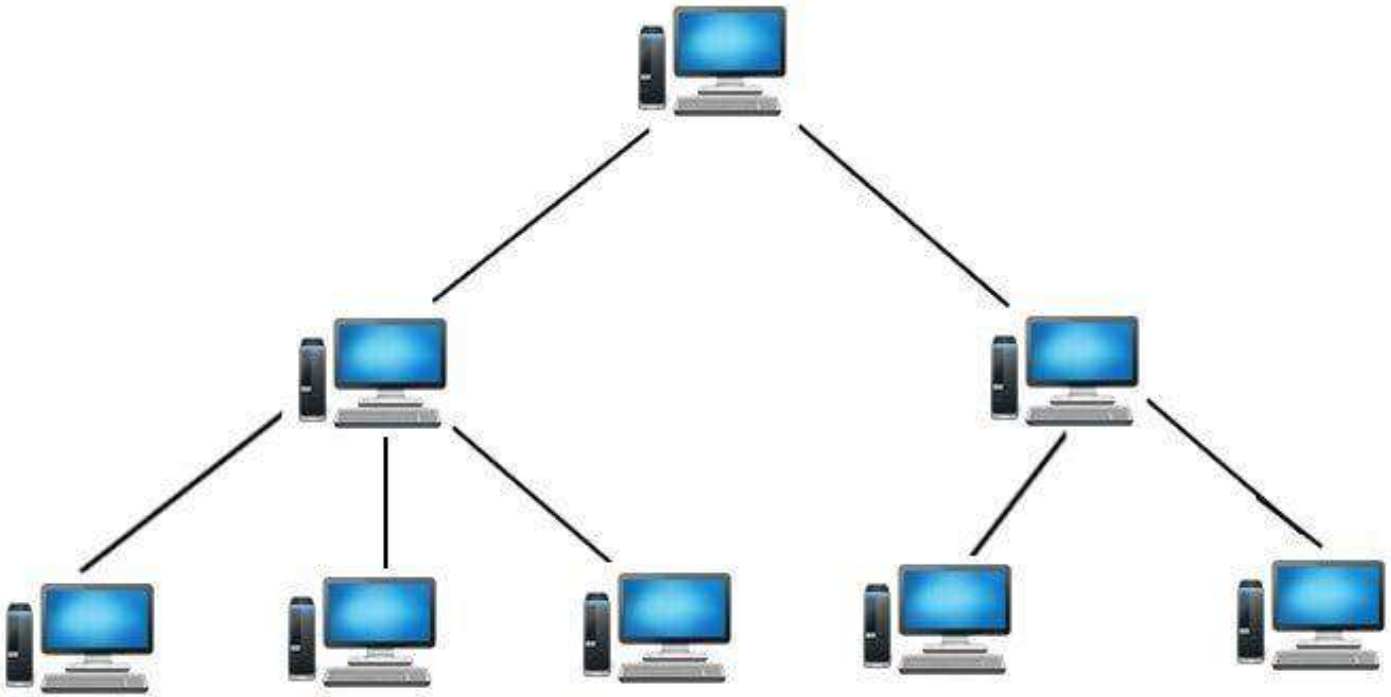
Disadvantages

- One malfunctioning workstation or bad port can create problems for the entire network.
- Modification of devices can affect the network.
- Network adapter card is more expensive than ethernet cards and hubs.
- Much slower than an ethernet network under normal load.

Tree Topology

- Tree topology combines the characteristics of bus topology and star topology.
- A tree topology is a type of structure in which all the computers are connected with each other in hierarchical fashion.
- The top-most node in tree topology is known as a root node, and all other nodes are the descendants of the root node.
- There is only one path exists between two nodes for the data transmission. Thus, it forms a parent-child hierarchy.

Tree Topology



Advantages

- Tree topology is mainly used to provide broadband transmission, i.e., signals are sent over long distances without being attenuated.
- Network is easily expandable.
- In tree topology, the whole network is divided into segments known as star networks which can be easily managed and maintained.
- Error detection and error correction are very easy in a tree topology.
- The breakdown in one station does not affect the entire network.

Disadvantages

- Devices required for broadband transmission are very costly.
- Maintenance is difficult.
- Scalability of the network depends on the types of cables used.
- A tree topology mainly relies on main bus cable and failure in main bus cable will damage the overall network.
- If new devices are added, then it becomes difficult to reconfigure.

MICROSOFT WORD

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- Word Processing is the manipulation of character set, word, text, numbers, sentences, and paragraphs in the document so that it is error free and looks attractive.
- The work of preparing and formatting document was done manually with the help of typewriter.
- A word processor is an application software for word processing, with a word processing program, you can create letters, tables, newsletters, and academic papers that are easy to revise.
- Word processor is a software package that enables you to create, edit, print and save documents for future retrieval and reference.
- Word processors can create multiple types of files, including text files (.txt), rich text files (.rtf), HTML files (.htm & .html), and Word files (.doc & .docx). Some word processors can also be used to create XML files (.xml).

Word processing Softwares

- Abiword (Free).
- Apple iWork.
- Corel WordPerfect.
- Google Docs (online and free).
- LibreOffice -> Writer (free).
- Microsoft Office -> Microsoft Word.
- Apache OpenOffice (free).
- Sun StarOffice (Free)
- LibreOffice Writer (Free)

Benefits of Word Processor

- Book - Write a book.
- Document - Any text document that requires formatting.
- Help documentation - Support documentation for a product or service.
- Journal - Keep a digital version of your daily, weekly, or monthly journal.
- Letter - Write a letter to one or more people. Mail merge could also be used to automatically fill in the name, address, and other fields of the letter.
- Marketing plan - An overview of a plan to help market a new product or service.
- Memo - Create a memo for employees.
- Report - A status report or book report.
- Résumé - Create or maintain your résumé.
- Calendars- Yearly calendar of various types.

Features of word processing

Text formatting - Changing the font, font size, font color, bold, italicizing, underline, etc.

Copying, cutting, and pasting - Once text is entered into a document, it can be copied or cut and pasted in the current document or another document.

Multimedia - Insert clip art, charts, images, pictures, and video into a document.

Spelling and Grammar - Checks for spelling and grammar errors in a document.

Adjust the layout - Capable of modifying the margins, size, and layout of a document.

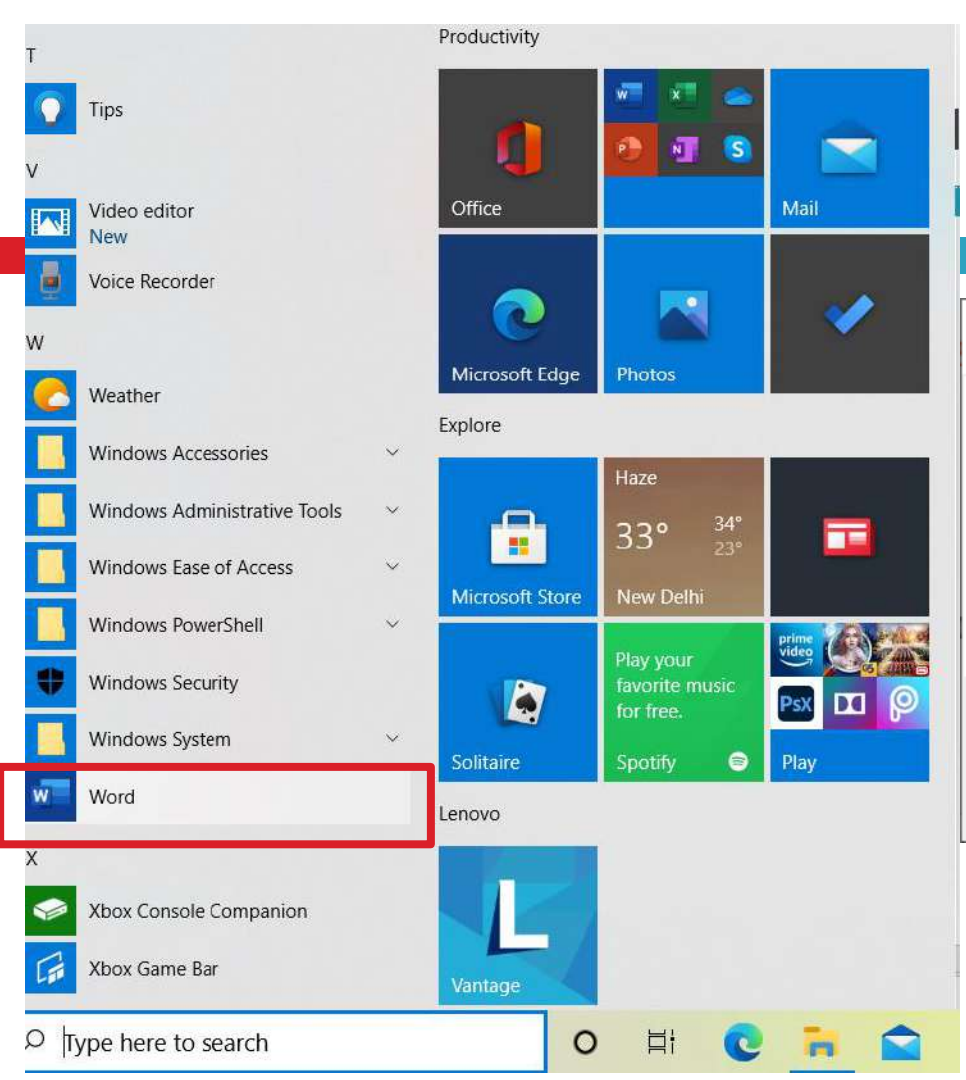
Find - Word processors give you the ability to quickly find any word or text in any size of the document.

- **Search and Replace -** You can use the Search and Replace feature to replace any text throughout a document.
- **Indentation and lists -** Set and format tabs, bullet lists, and number lists.
- **Insert tables -** Add tables to a document.
- **Word wrap -** Word processors can detect the edges of a page or container and automatically wrap the text using word wrap.
- **Header and footer -** Being able to adjust and change text in the header and footer of a document.
- **Thesaurus -** Look up alternatives to a word without leaving the program.
- **Multiple windows -** While working on a document, you can have additional windows with other documents for comparison or move text between documents.

- **AutoCorrect -** Automatically correct common errors (e.g., typing "teh" and having it autocorrected to "the").
- **Mailers and labels -** Create mailers or print labels.
- **Import data -** Import and format data from CSV, database, or another source.
- **Headers and footers -** The headers and footers of a document can be customized to contain page numbers, dates, footnotes, or text for all pages or specific pages of the document.
- **Merge -** Word processors allow data from other documents and files to be automatically merged into a new document. For example, you can mail merge names into a letter.
- **Macros -** Setup macros to perform common tasks.
- **Collaboration -** More modern word processors help multiple people work on the same document at the same time.

MS Word

- Microsoft word is one of the most popular word processing programs supported by both Mac and PC platforms.
- Microsoft word is used to create documents, brochures, leaflets, outlines, resumes, lists and simple web pages.
- To begin Microsoft Word, goto Start→ Programs→Microsoft Office → Microsoft Word. (or)
- Select Windows Key + R to obtain Run Command, there type Winword and click Ok to start Microsoft Word.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Voice Recorder
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Windows Accessories
Windows Administrative Tools
Windows Ease of Access
Windows PowerShell
Windows Security
Windows System
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Xbox Console Companion
Xbox Game Bar
Productivity
Office
Mail
Microsoft Edge
Photos
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Play your favorite music for free.
Spotify
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Vantage
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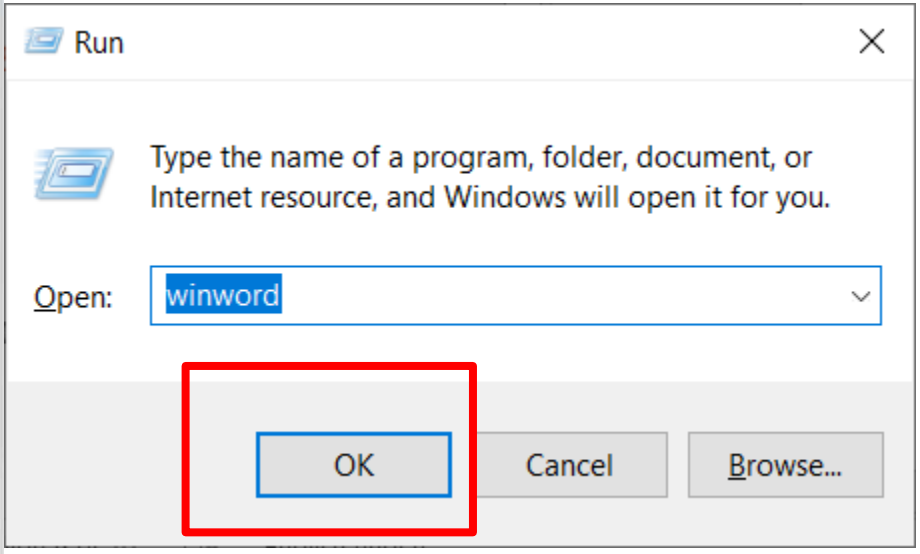

Run
Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
Open:
winword
OK
Cancel
Browse...

Word

Home

New

Open

Account

Feedback

Options

New

Adjacency letter

Adjacency report

Adjacency resume

Apothecary letter

Apothecary newsletter

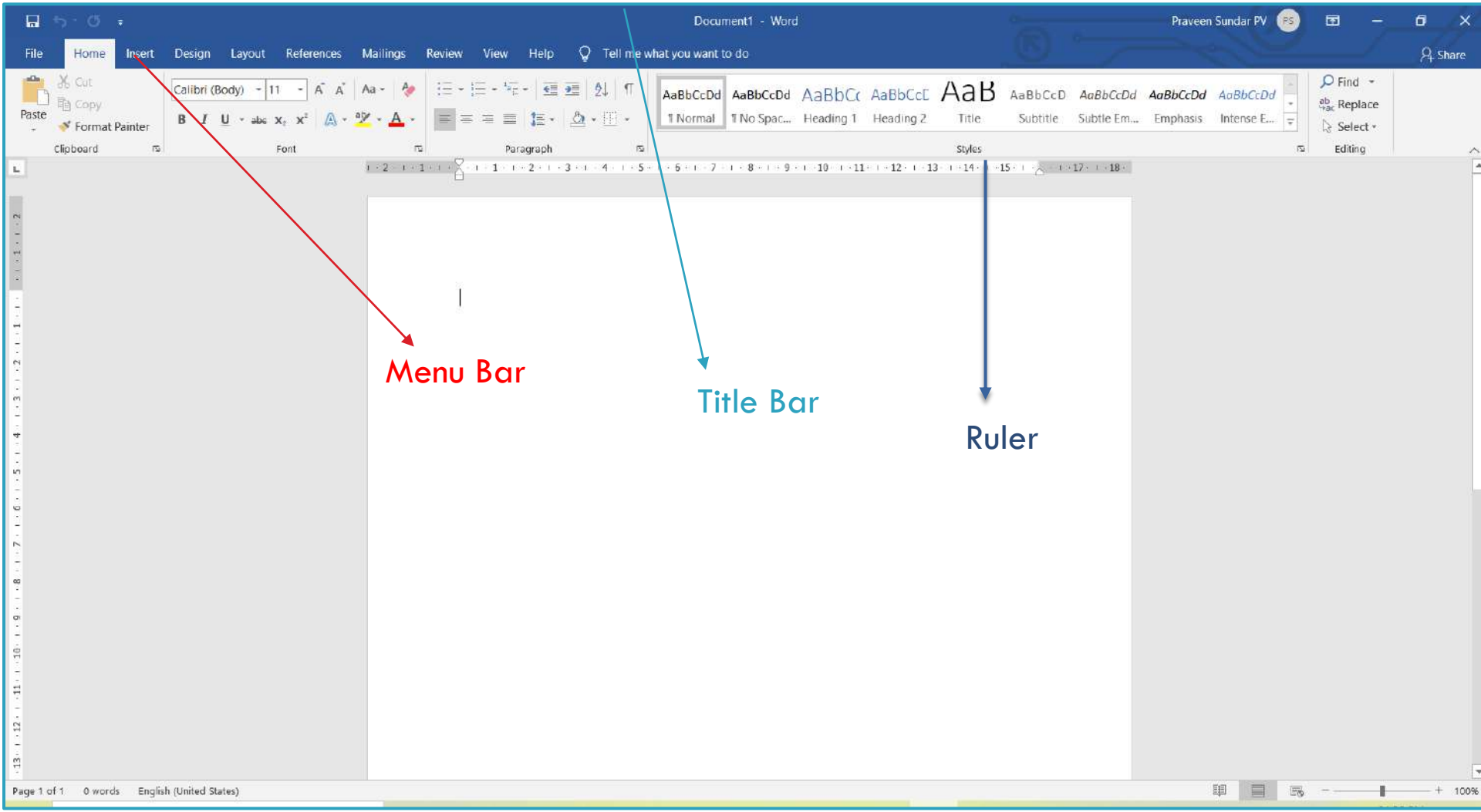
Apothecary resume

Blog post

Chronological letter

Chronological resume

Essential letter


Document1 - Word
Praveen Sundar PV
File
Home
Insert
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Mailings
Review
View
Help
Tell me what you want to do
Share
Cut
Copy
Format Painter
Paste
Clipboard
Calibri (Body)
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Paragraph
Normal
No Spac...
Heading 1
Heading 2
Title
Subtitle
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Menu Bar
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Page 1 of 1
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English (United States)
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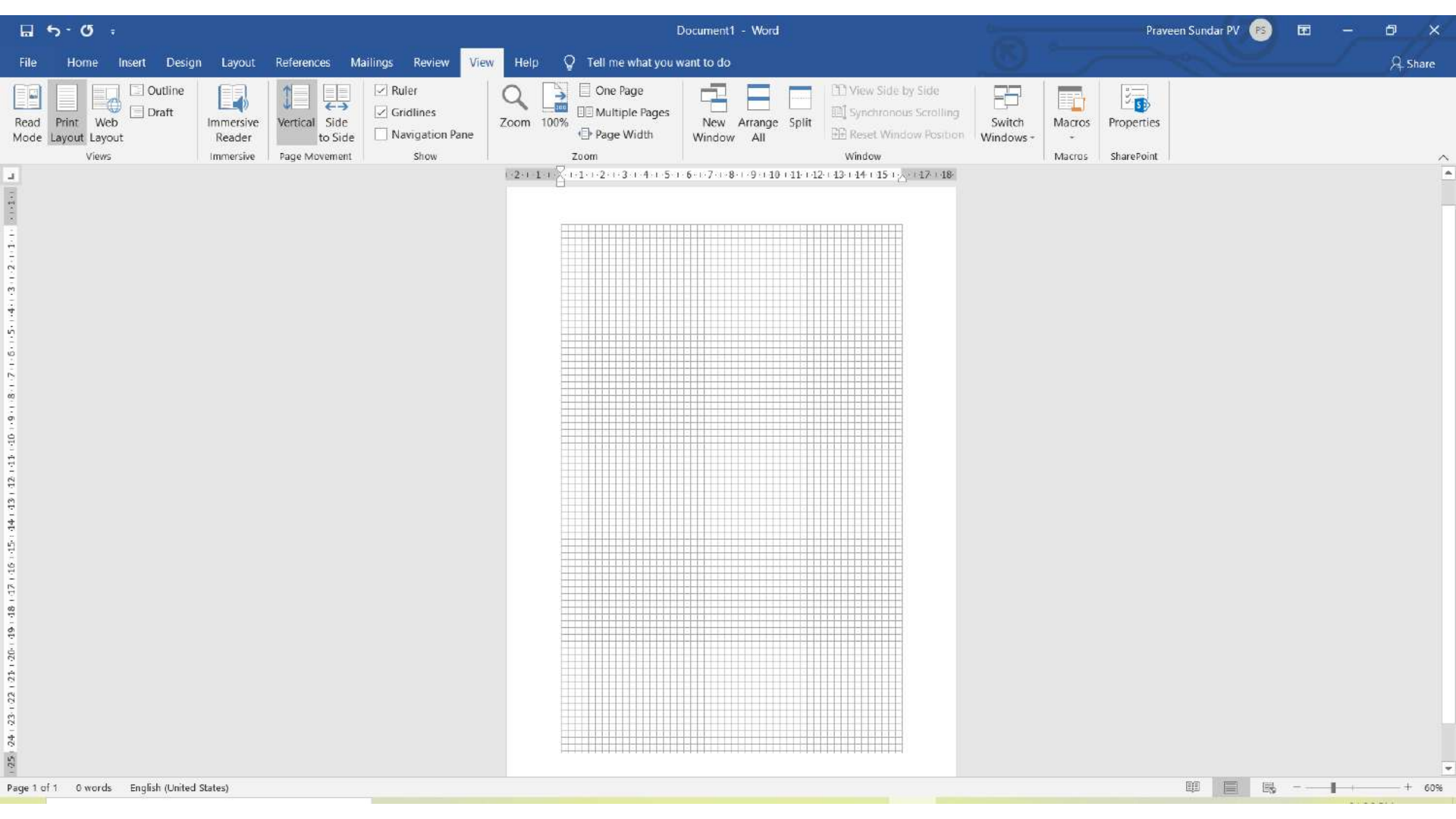
Document1 - Word
Praveen Sundar PV
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Help
Tell me what you want to do
Share
Read Mode
Print Layout
Web Layout
Outline
Draft
Views
Immersive Reader
Immersive
Vertical
Side to Side
Page Movement
Ruler
Gridlines
Navigation Pane
Show
Zoom
100%
One Page
Multiple Pages
Page Width
Zoom
New Window
Arrange All
Split
View Side by Side
Synchronous Scrolling
Reset Window Position
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Macros
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Properties
SharePoint
Page 1 of 1
0 words
English (United States)
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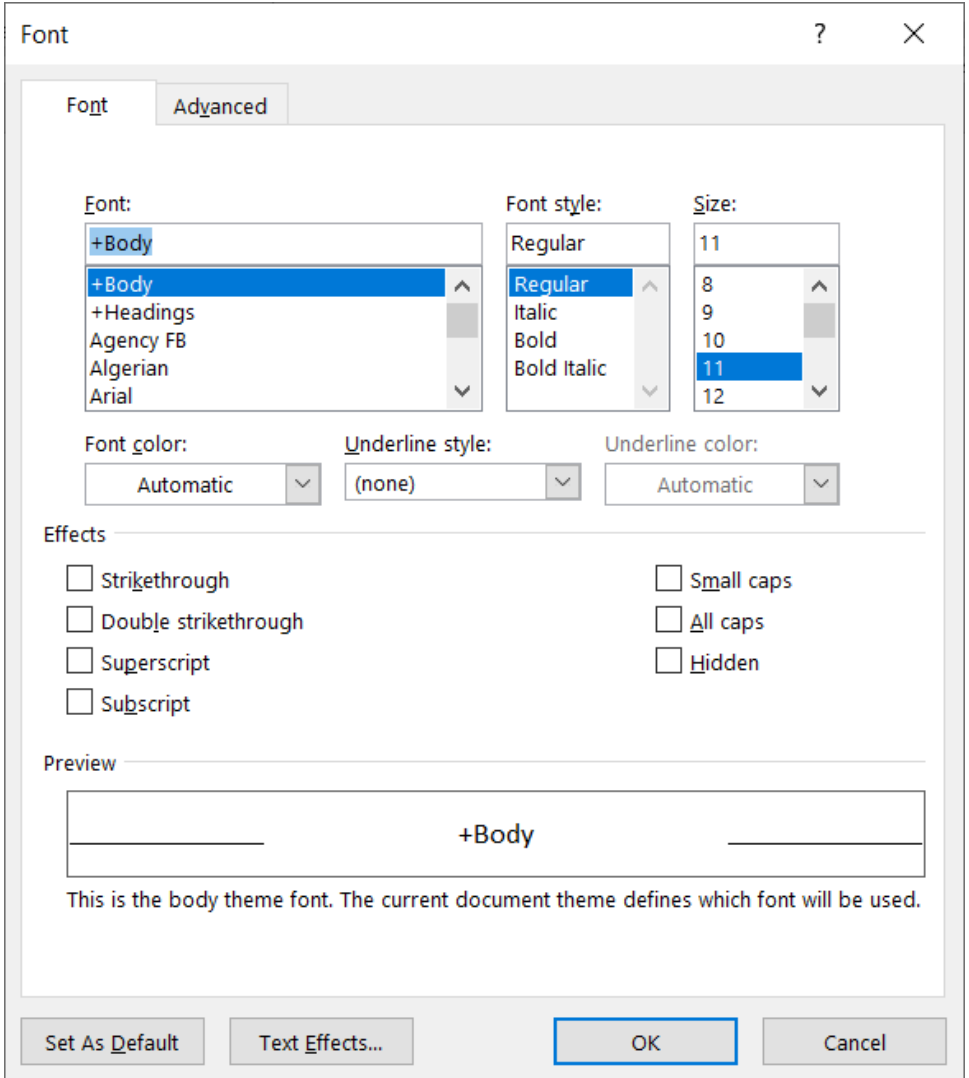
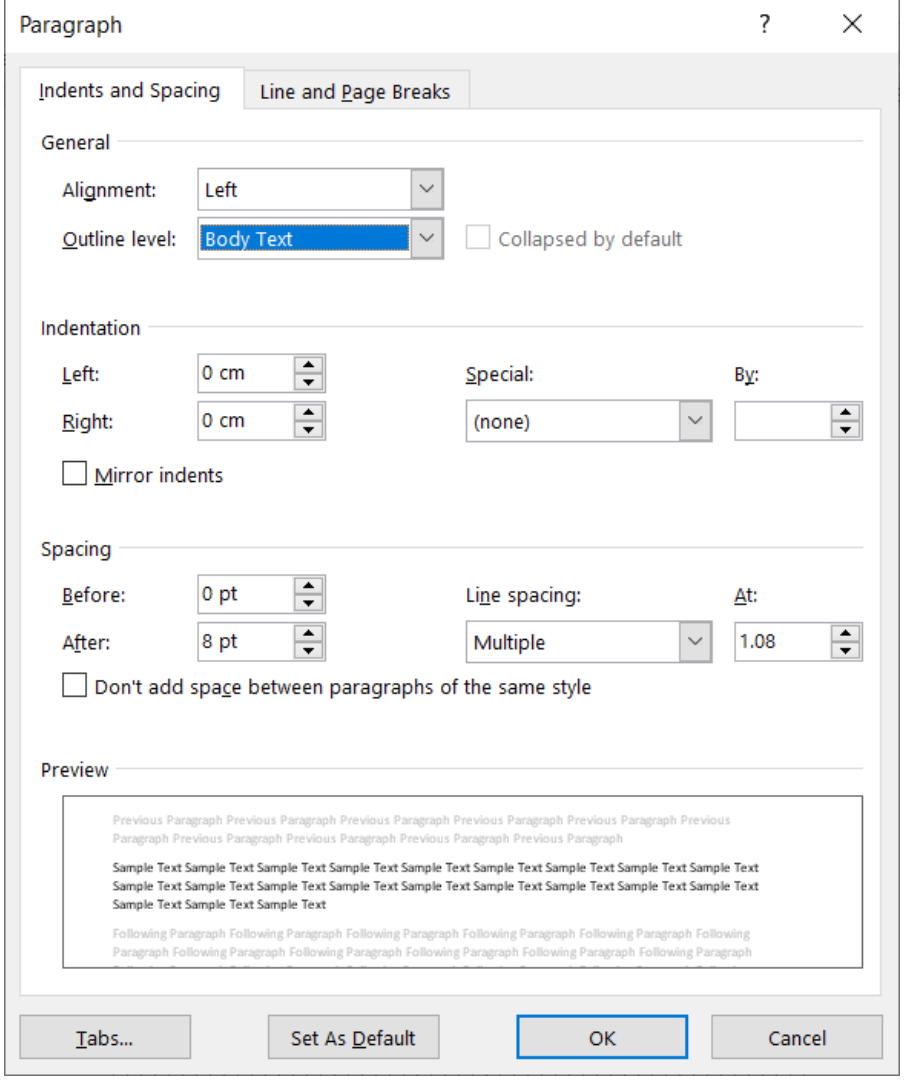

Font
Font
Advanced
Font:
+Body
+Body
+Headings
Agency FB
Algerian
Arial
Font style:
Regular
Regular
Italic
Bold
Bold Italic
Size:
11
8
9
10
11
12
Font color:
Automatic
Underline style:
(none)
Underline color:
Automatic
Effects
Strikethrough
Double strikethrough
Superscript
Subscript
Small caps
All caps
Hidden
Preview
+Body
This is the body theme font. The current document theme defines which font will be used.
Set As Default
Text Effects...
OK
Cancel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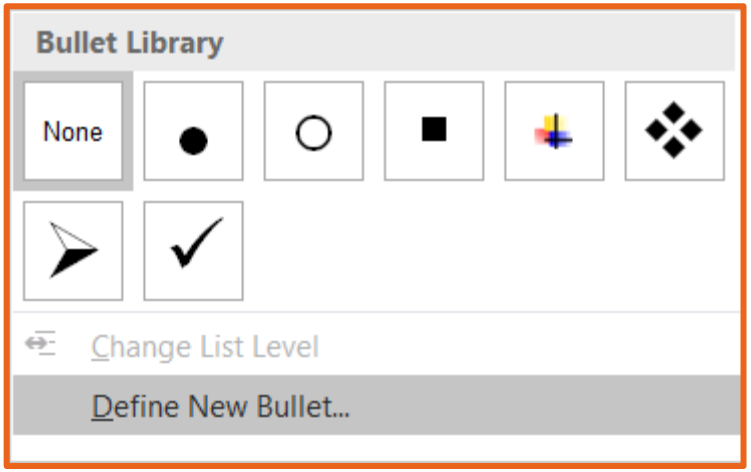
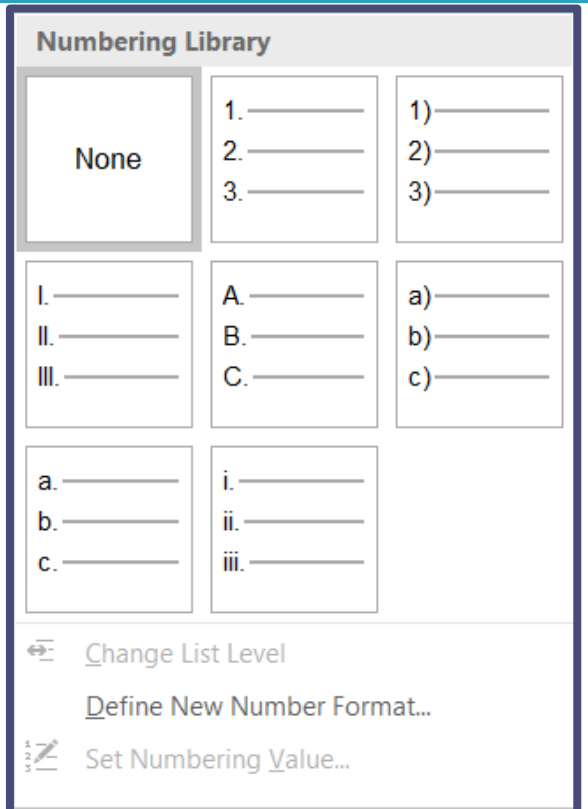
Indents and Spacing
Line and Page Breaks
General
Alignment:
Left
Outline level:
Body Text
Collapsed by default
Indentation
Left:
0 cm
Right:
0 cm
Special:
(none)
By:
Mirror indents
Spacing
Before:
0 pt
After:
8 pt
Line spacing:
Multiple
At:
1.08
Don't add space between paragraphs of the same style
Preview
Previous Paragraph Previous Paragraph Previous Paragraph Previous Paragraph Previous Paragraph Previous Paragraph Previous Paragraph Previous Paragraph Previous Paragraph Previous Paragraph Previous Paragraph
Sample Text Sample Text
Following Paragraph Following Paragraph Following Paragraph Following Paragraph Following Paragraph Following Paragraph Following Paragraph Following Paragraph Following Paragraph Following Paragraph Following Paragraph Following Paragraph
Tabs...
Set As Default
OK
Cancel

Bullets and Numbering

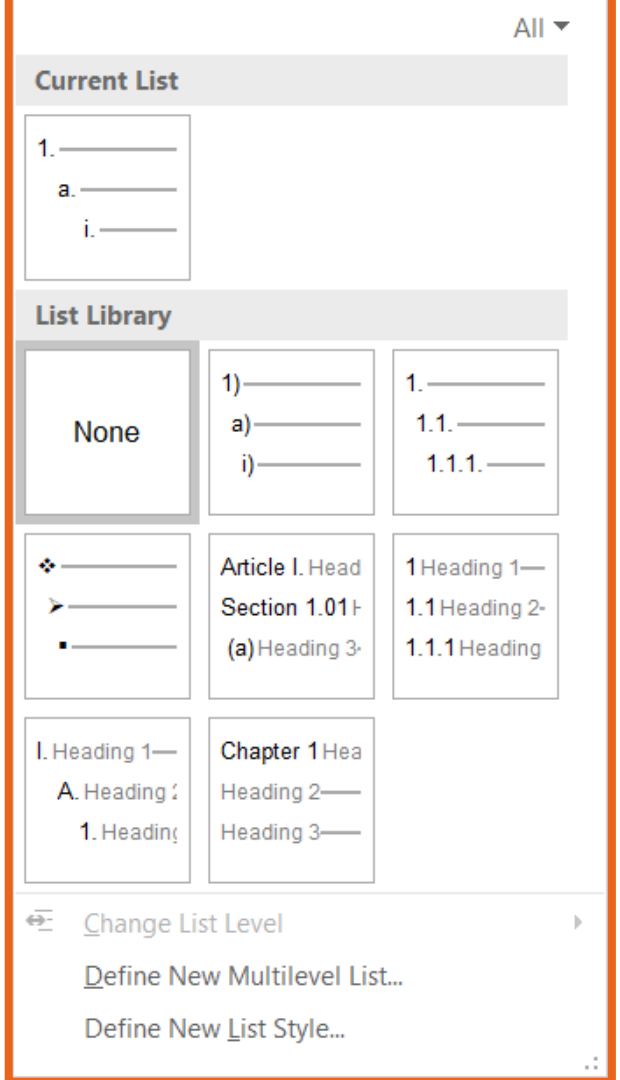




- UG Courses
  - BA English
  - BA Tamil
  - B.sc Physics
  - B.sc Chemistry
  - B.sc Biology
  - B.sc Micro
  - B. Com
  - BCA
  - Bsc CS

PG Courses

1) MA English
2) MA Tamil
3) M. Com
4) MCA


All
Current List
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a.
i.
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None
1)
a)
i)
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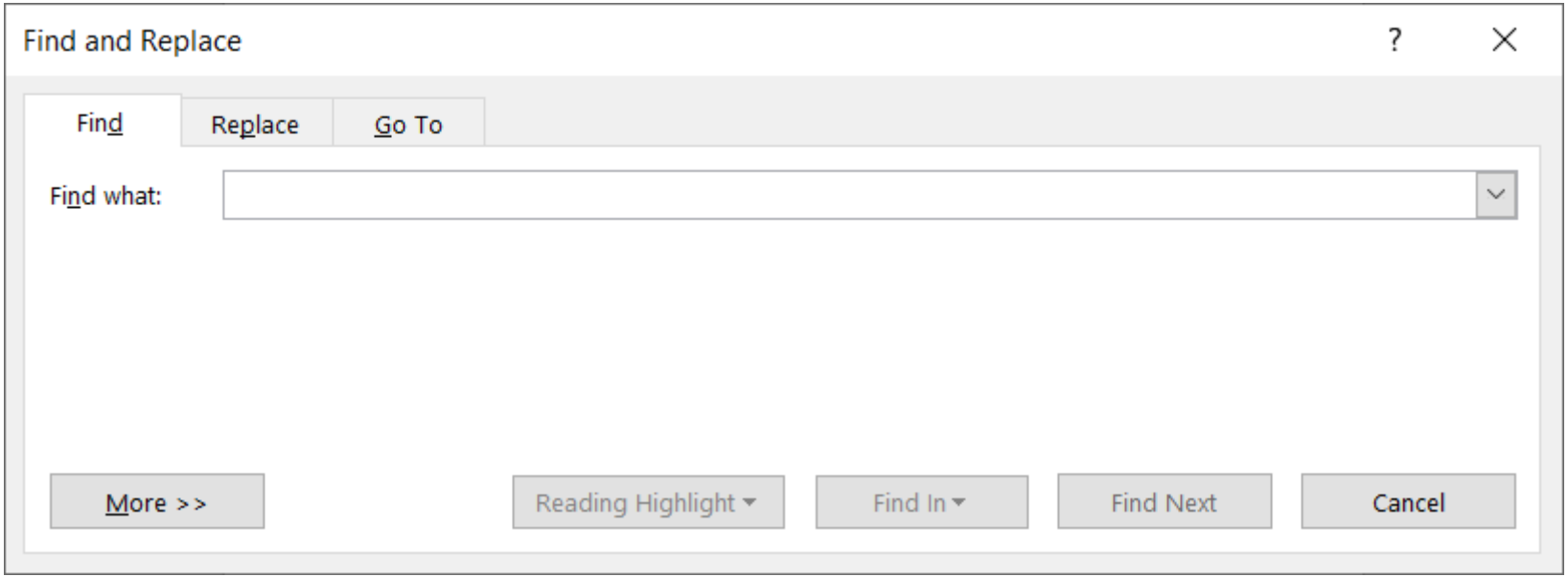
1.1.
1.1.1.
Article I. Head
Section 1.01
(a) Heading 3
1 Heading 1
1.1 Heading 2
1.1.1 Heading
I. Heading 1
A. Heading 2
1. Heading
Chapter 1 Hea
Heading 2
Heading 3
Change List Level
Define New Multilevel List...
Define New List Style...

Find


Find and Replace
?
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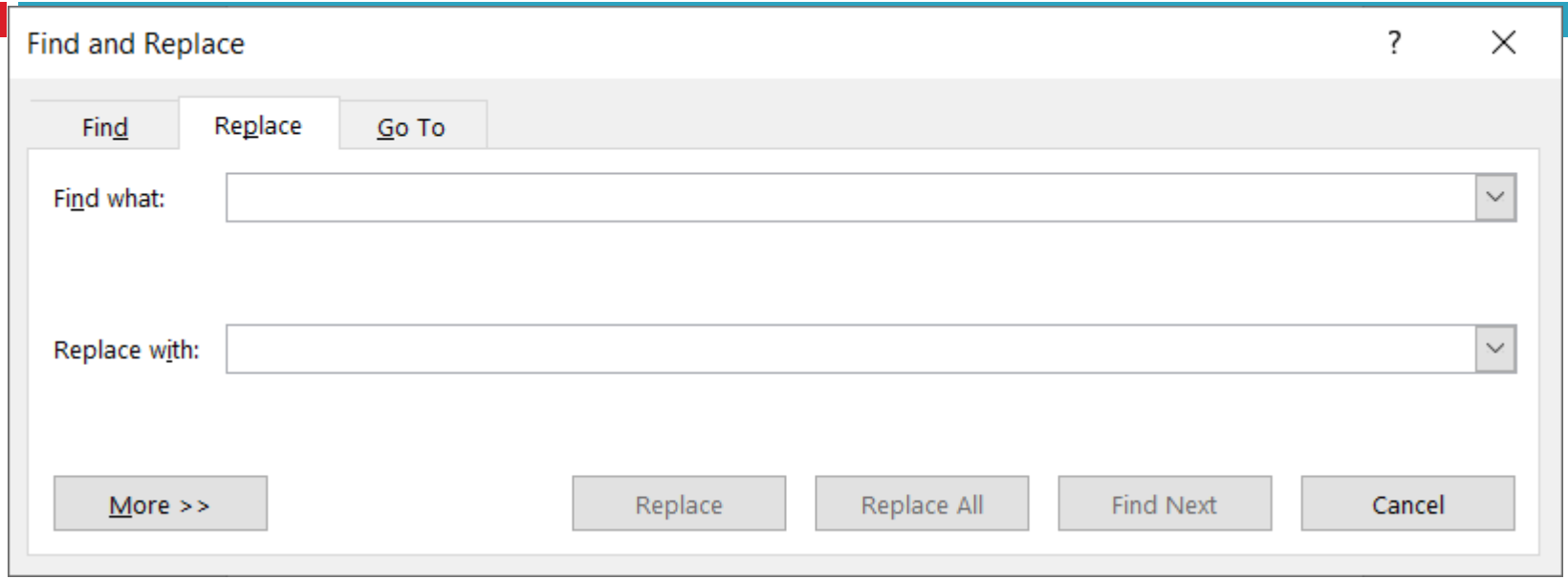
Replace
Go To
Find what:
More >>
Reading Highlight
Find In
Find Next
Cancel

Replace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?
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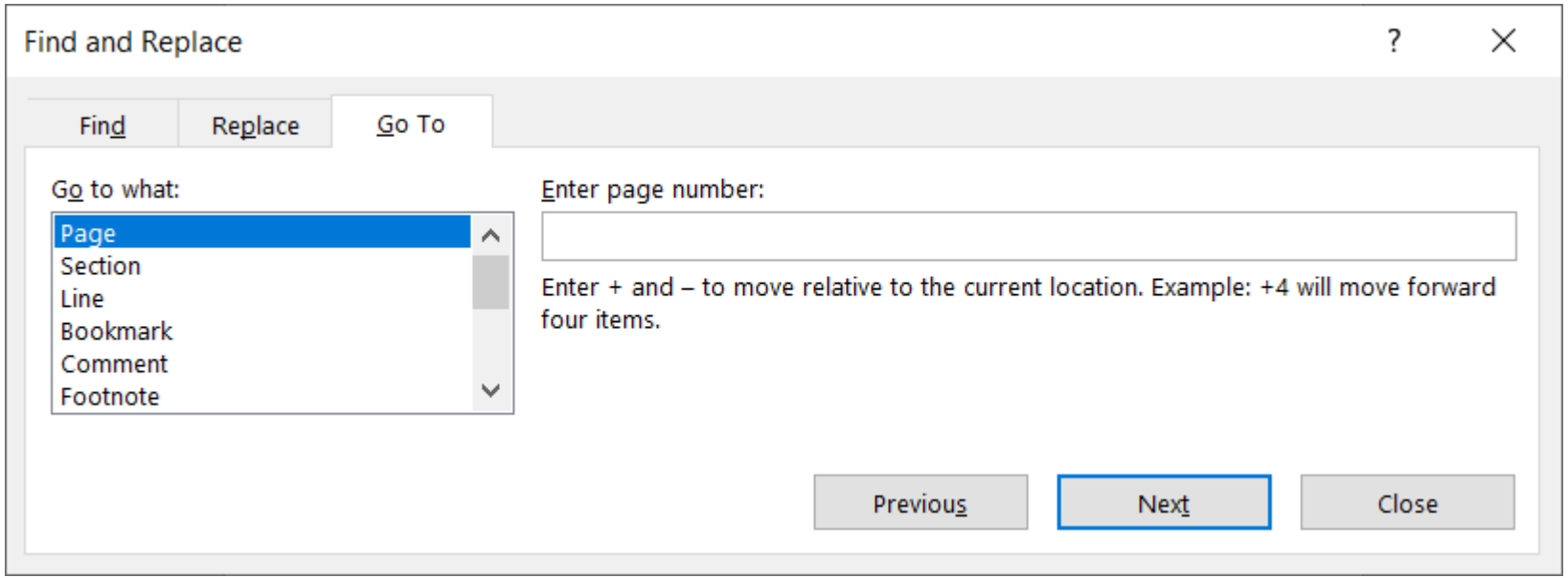
Replace
Go To
Find what:
Replace with:
More >>
Replace
Replace All
Find Next
Cancel

Goto


Find and Replace
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Go to what:
Page
Section
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Comment
Footnote
Enter page number:
Enter + and – to move relative to the current location. Example: +4 will move forward four items.
Previous
Next
Close

Insert Menu


Document1 - Word
Praveen Sundar PV
File
Home
Insert
Design
Layout
References
Mailings
Review
View
Help
Tell me what you want to do
Cover Page
Blank Page
Page Break
Pages
Table
Tables
Pictures
Shapes
Icons
3D Models
SmartArt
Chart
Screenshot
Illustrations
Get Add-ins
My Add-ins
Wikipedia
Add-ins
Online Video
Media
Link
Bookmark
Cross-reference
Links
Comment
Comments
Header
Footer
Page Number
Header & Footer
Text Box
Quick Parts
WordArt
Drop Cap
Signature Line
Date & Time
Object
Text
Equation
Symbol
Symbols

Design Menu


Document1 - Word
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File
Home
Insert
Design
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Mailings
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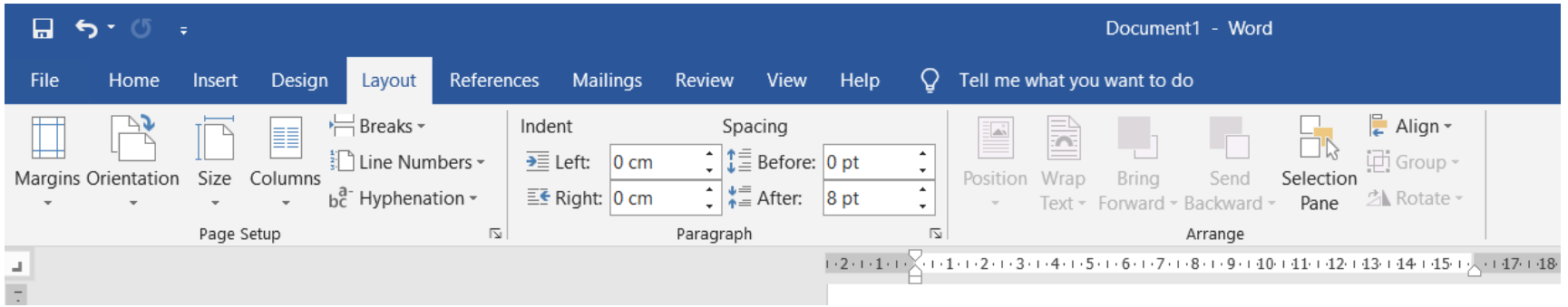
View
Help
Tell me what you want to do
Themes
Colors
Fonts
Paragraph Spacing
Effects
Set as Default
Watermark
Page Color
Page Borders
Document Formatting
Page Background

Layout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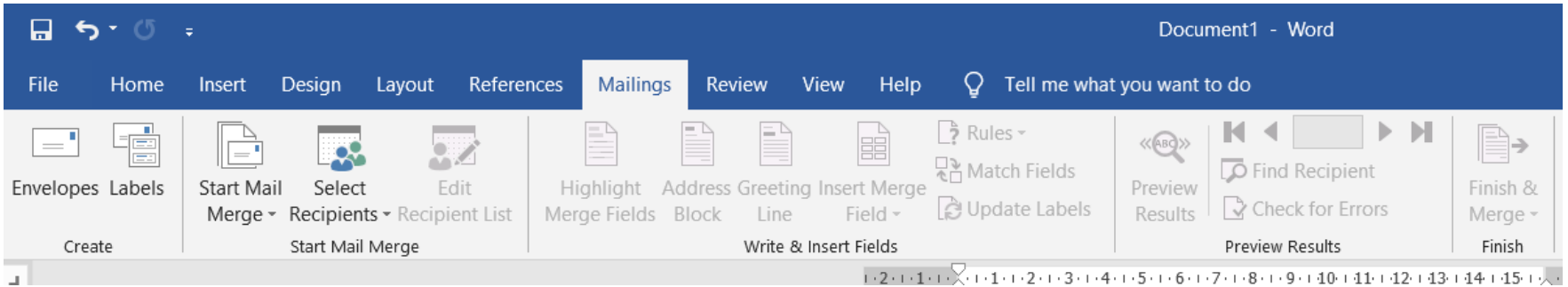
Help
Tell me what you want to do
Margins
Orientation
Size
Columns
Breaks
Line Numbers
Hyphenation
Page Setup
Indent
Left: 0 cm
Right: 0 cm
Spacing
Before: 0 pt
After: 8 pt
Paragraph
Position
Wrap Text
Bring Forward
Send Backward
Selection Pane
Align
Group
Rotate
Arrange

Mailings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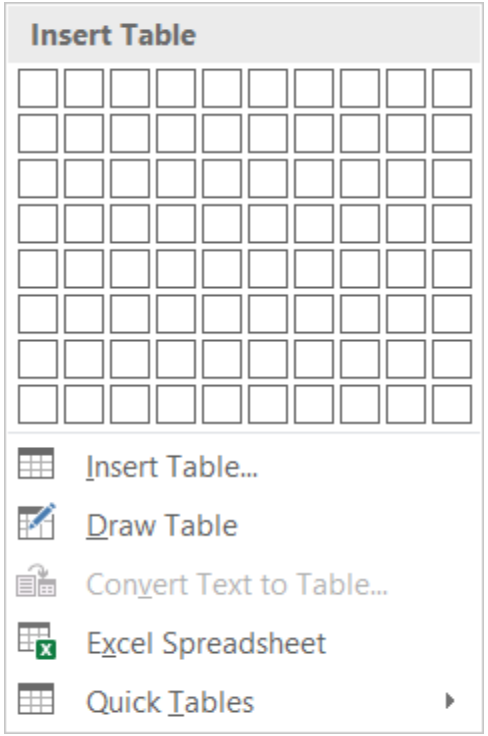
Select Recipients
Edit Recipient List
Start Mail Merge
Highlight Merge Fields
Address Block
Greeting Line
Insert Merge Field
Rules
Match Fields
Update Labels
Write & Insert Fields
Preview Results
Find Recipient
Check for Errors
Preview Results
Finish & Merge
Finish

Inserting Tables

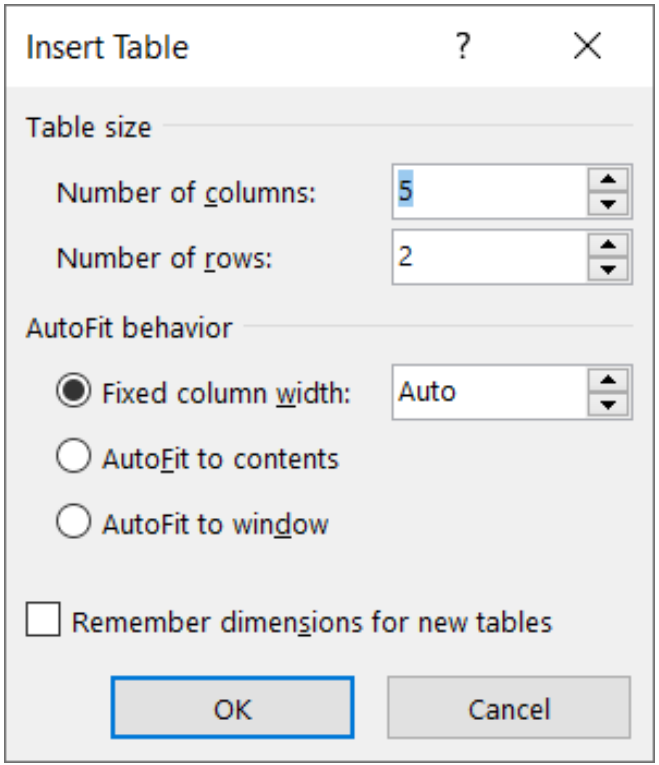
- *Tables* organize text into rows and columns, which can make the text easy to type, edit, and format while spacing it correctly in your document. Tables organize text into cells, where a *cell* is the intersection of a row and a column.
- Word provides four ways to create a table:
  - Click the Insert tab, click the Table icon, and then highlight the number of rows and columns for your table (up to a maximum of eight rows and ten columns).
  - Use the Insert Table dialog box.
  - Draw the size and position of the table with the mouse.
  - Convert existing text (divided by a delimiter character such as a tab or a comma).

Creating a table by highlighting rows and columns



- Creating a table by highlighting rows and columns can be fast, but it limits the size of your table to a maximum of eight rows and ten columns. To create a table by highlighting rows and columns, follow these steps:
  1. Click the Insert tab.
  2. Move the cursor where you want to insert a table in your document.
  3. Click the Table icon. A pull-down menu appears.
  4. Move the mouse pointer to highlight the number of rows and columns you want to create for your table.
  5. When you highlight rows and columns, Word displays your table directly in your document so you can see exactly what your table will look like.
  6. Click the left mouse button when you're happy with the size of your table.

Insert Table dialog box



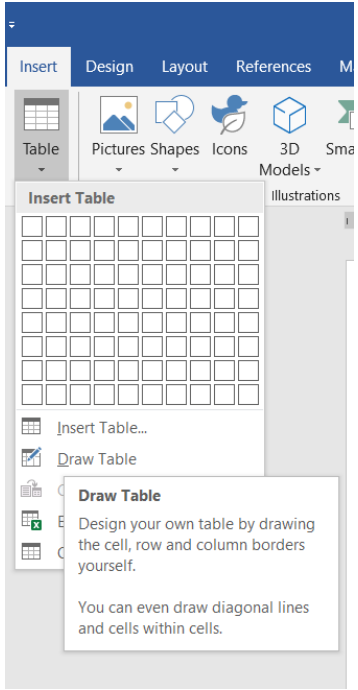
- To create a table by defining a specific number of rows and columns (up to a maximum of 63 columns), follow these steps:
  1. Click the Insert tab.
  2. Move the cursor where you want to insert a table.
  3. Click the Table icon. A pull-down menu appears.
  4. Click Insert Table. The Insert Table dialog box appears.
  5. Click in the Number of Columns text box and type a number between 1 and 63, or click the up or down arrow to define the number of columns.
  6. Click in the Number of Rows text box and type a number or click the up or down arrow to define the number of rows.

In the AutoFit Behavior group, select one of the following radio buttons:

- Fixed Column Width: Defines a fixed size for the column widths, such as 0.3 inches
- AutoFit to Contents: Defines the width of a column based on the width of the largest item stored in that column
- AutoFit to Window: Expands (or shrinks) the table to fit within the current size of the document window

Click OK. Word draws the table in your document.

Drawing a Table



- Drawing a table can be especially useful when you want to place a table in the middle of a page and create rows and columns of different sizes.
- To draw a table in your Word document, follow these steps:
  1. Click the Insert tab.
  2. Click the Table icon. A pull-down menu appears.
  3. Click Draw Table. The mouse pointer turns into a Pencil icon.

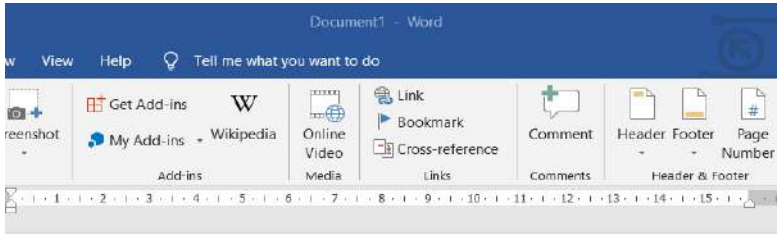
- Move the mouse pointer where you want to draw your table, hold down the left mouse button, and drag the mouse to draw your table.
- Word draws a rectangular dotted box to show where your table will appear.
- Release the left mouse button when you're happy with the size and position of your table.
- Draw the boundaries for your table's rows and columns:
  - To draw vertical lines in your table, move the mouse pointer to the top or bottom of the table, hold down the left mouse button, and drag the mouse up and down.
  - To draw horizontal lines in your table, move the mouse pointer to the left or right side of the table, hold down the left mouse button, and drag the mouse right and left to draw.

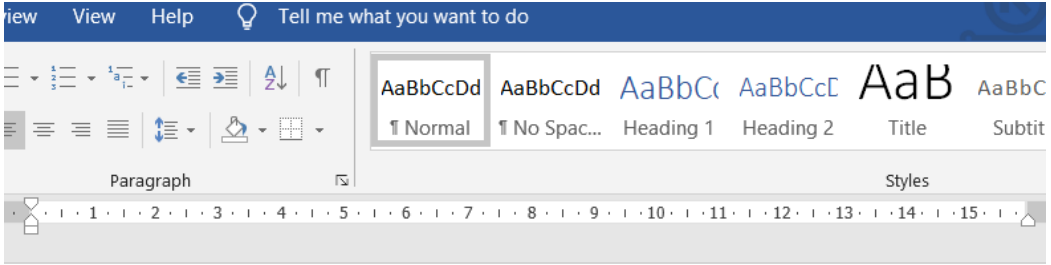
- Press Esc or double-click to turn the mouse pointer from a Pencil icon back to an I-beam pointer.
- If you need to draw new lines on a table later, click anywhere inside that table, and the Table Tools Layout tab appears. Then click the Draw Table icon to turn the mouse pointer into a Pencil icon. Now you can draw new lines in your table.

Table in Word from existing text

- If you have existing text that you'd like to turn into a table, you need to first separate it into chunks so Word knows how to place the text in individual cells in a table. To separate text, you need to use a unique character such as
  - Return (paragraph mark)
  - Tab
  - Comma.
  - Other characters, such as the # or @ characters
- By using the same unique character to divide text, you can define how you want Word to define how much text to display in each individual cell of a table.

- To convert existing text into a table, follow these steps:
  1. Click the Insert tab.
  2. Select the text that you want to convert into a table.
  3. Click the Table icon. A pull-down menu appears.
  4. Click the Convert Text to Table command. The Convert Text to Table dialog box appears
  5. Select a radio button in the Separate Text At group. Choose the option that corresponds to the way you divided your text. So if you divided your text by tabs, you would select the Tabs radio button.
  6. Click OK. Word converts your text into a table.



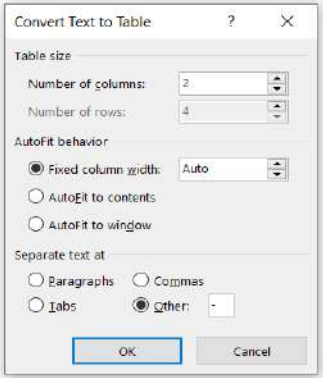


Search and Replace - You can use the Search and Replace feature to replace any text throughout a document.

Indentation and lists - Set and format tabs, bullet lists, and number lists.

Insert tables - Add tables to a document.

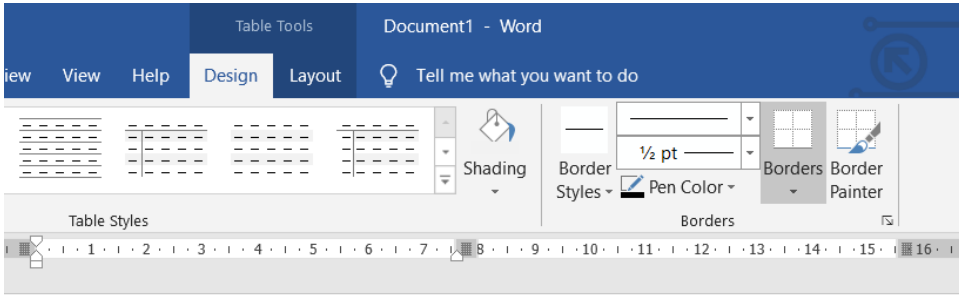
Word wrap - Word processors can detect the edges of a page or container and automatically wrap the text using word wrap.



Search and Replace	You can use the Search and Replace feature to replace any text throughout a document.
Indentation and lists	Set and format tabs, bullet lists, and number lists.
Insert tables	Add tables to a document.
Word wrap	Word processors can detect the edges of a page or container and automatically wrap the text using word wrap.

Formatting and Coloring a Table

- After you create a table, you can format individual cells (spaces formed by the intersection of a row and a column) — or entire rows and columns — by aligning text in cells, resizing columns and rows, and adding borders, shading, or colors. All these changes can make the text inside the cells easier to read.



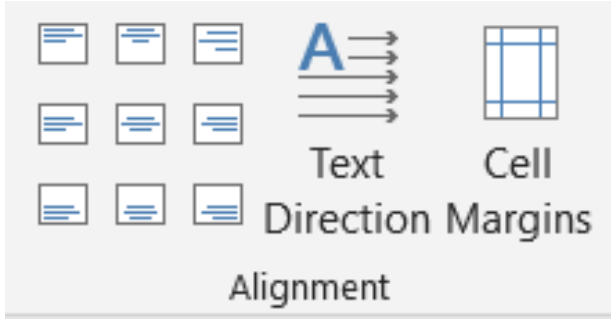
Search and Replace	You can use the Search and Replace feature to replace any text throughout a document.
Indentation and lists	Set and format tabs, bullet lists, and number lists.
Insert tables	Add tables to a document.
Word wrap	Word processors can detect the edges of a page or container and automatically wrap the text using word wrap.

Selecting all or part of a table

- Selecting all or part of a table in Word 2019
- To format and color a table, you must first select the table, row, column, or cell that you want to modify. To select all or part of a table, follow these steps:
  - Click in the table, row, column, or cell you want to modify. The Table Tools tab appears.
  - Click the Layout tab under the Table Tools heading.
  - In the Table group, click Select. A pull-down menu appears.
  - Choose an option, such as Select Row or Select Column. Word highlights your chosen item in the table. At this point, you can choose a command to modify the selected row or column (as when you choose a color or alignment).

Aligning text in a Word table cell

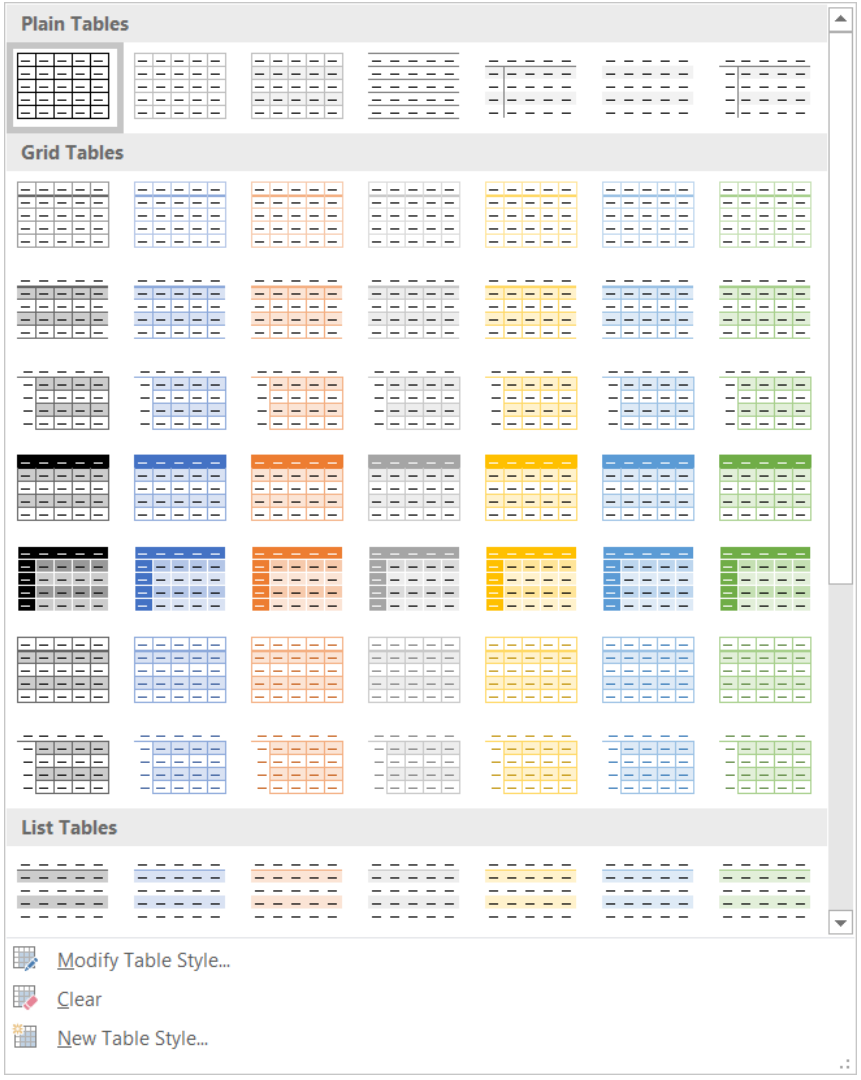
- You can align text in a table cell in nine ways: top left (the default alignment), top center, top right, center left, center, center right, bottom left, bottom center, and bottom right.
- To align one or more cells, follow these steps:
  - Click in the cell (or select multiple cells) that contains text you want to align. The Table Tools tab appears.
  - Click the Layout tab under the Table Tools heading.
  - In the Alignment group, click an alignment icon such as Top Right or Bottom Center.
- Word aligns your text. If you change the alignment of blank cells, any new text you type in those blank cells will appear according to the alignment you choose.



Top Left	Top Center	Top Right
Center Left	Center	Center Right
Bottom Left	Bottom Center	Bottom Right

Choosing a table style

- By coloring rows or columns and adding borders, you can customize the appearance of your tables. However, it can be much faster to use a predesigned table style instead, which can automatically format your text, color rows, and add borders to your tables.
- To choose a table style, follow these steps:
  - Move the cursor inside the table you want to modify.
  - Click the Design tab under the Table Tools tab.
  - In the Table Style Options group, select or clear check boxes, such as the Header Row or Last Column check box.
  - In the Table Styles group, click the More button. A pull-down menu of styles appears. As you move the mouse pointer over a table style, Word displays a live preview of your table formatted in the selected style.
  - Click a table style. Word formats your table according to the style you chose.


Plain Tables
Grid Tables
List Tables
Modify Table Style...
Clear
New Table Style...

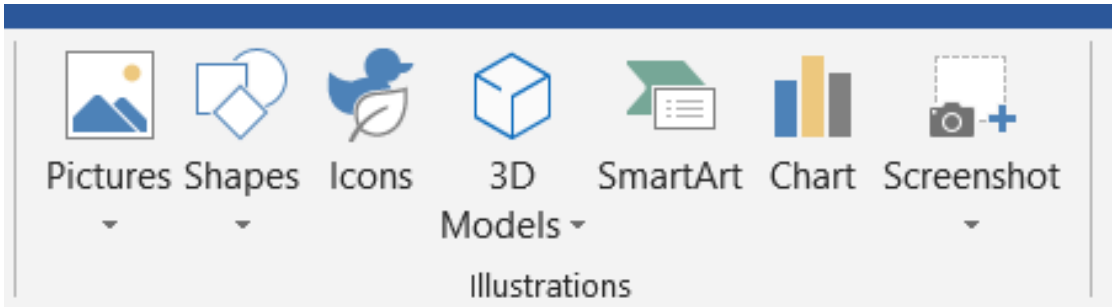
Resizing columns and rows

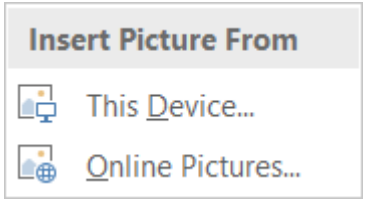
- You may need to resize a column or row in your table to expand or shrink it so your text doesn't appear crowded or surrounded by empty space. You can resize a column or row by using the mouse or by defining row heights and column widths.
- To resize a row or column with the mouse, follow these steps:
  - Click anywhere inside the table you want to adjust, then move the mouse pointer over the row or column border that you want to resize. The mouse pointer turns into a two-way pointing arrow.
  - Hold the left mouse button down and drag the mouse to resize the row or column. Release the left mouse button when you're happy with the size of the row or column.

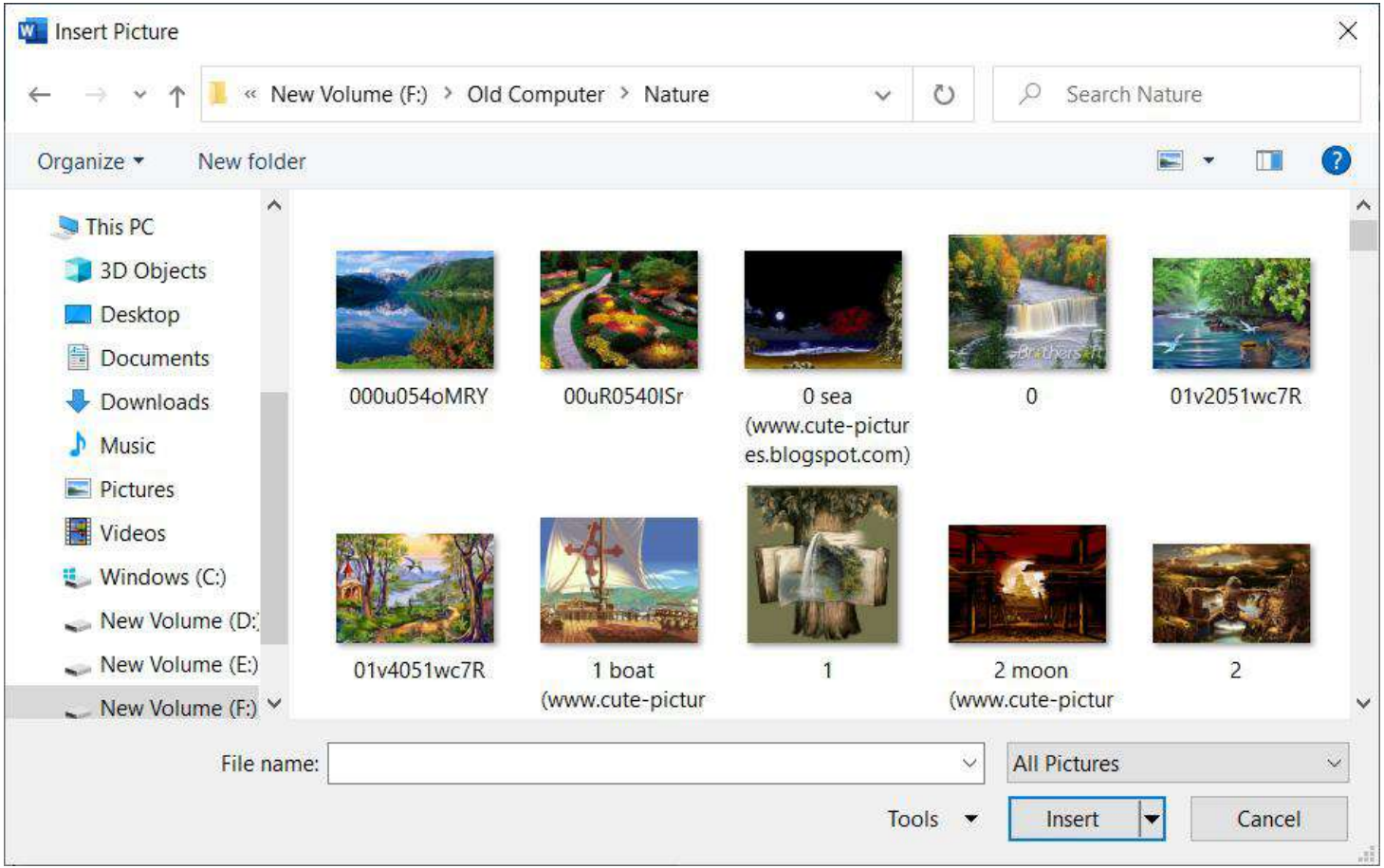
- Using the mouse to resize a row or column can be fast, but if you want to resize a row or column to a specific height or width, you can type the specific dimensions by following these steps:
  - Select the row, column, or table that you want to modify.
  - If you select the entire table, you can adjust the width or height of rows and columns for the entire table.
  - Click the Layout tab under the Table Tools tab.
  - Click the Width text box and type a value (or click the up or down arrow to choose a value).
  - Click the Height text box and type a value (or click the up or down arrow to choose a value).

Inserting Pictures

- Pictures make our text more attractive and readable. You can insert relevant pictures in your text by following these steps;
  - Place the cursor where you want to insert the picture
  - Select the Insert tab on Ribbon
  - In Illustrations group click the Picture command;
  - It displays 'Insert Picture' dialog box
  - Select the desired image
  - Click Insert to insert the picture


Pictures
Shapes
Icons
3D Models
SmartArt
Chart
Screenshot
Illustrations


Insert Picture From
This Device...
Online Pictures...


Insert Picture
New Volume (F:) › Old Computer › Nature
Search Nature
Organize
New folder
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Windows (C:)
New Volume (D:)
New Volume (E:)
New Volume (F:)
000u054oMRY
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0 sea (www.cute-pictures.blogspot.com)
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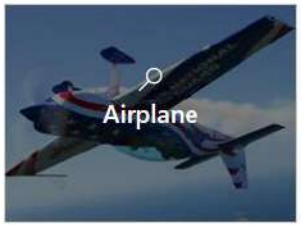
01v4051wc7R
1 boat (www.cute-pictur
1
2 moon (www.cute-pictur
2
File name:
All Pictures
Tools
Insert
Cancel

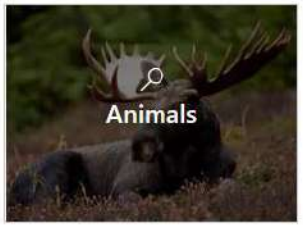
Inserting Images from the Web

- Place the cursor where you want to insert the picture
- Select the Insert tab on Ribbon
- In Illustrations group click the Picture command;
- Choose Insert⟶ Online Pictures.
- Click in the Office.com Clip Art search box, type poinsettia, and press Enter. A selection of pictures that have poinsettia as a keyword appear in the task pane.
- Scroll through the resulting clips.
- Click one of the clips and then click the Insert button to insert it.

Online Pictures

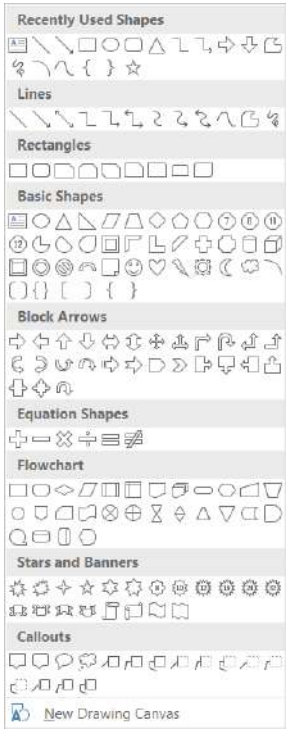
Powered by Bing





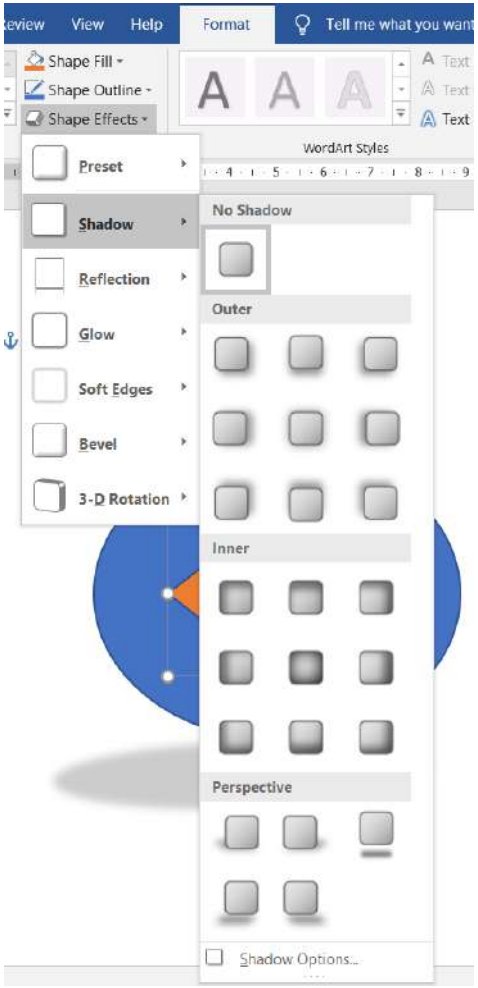
OneDrive

Insert Shapes



- Word comes with a library of common shapes ready to insert in a document. These include basic shapes, such as squares, circles, geometric figures, lines, and arrows — plus popular symbols.
- Graphics professionals refer to these types of images as **line art**.
- To place some line art in a document, follow these steps:
  - Click the Insert tab.
  - In the Illustrations group, click the Shapes button.
  - The button holds a menu that lists shapes organized by type.
  - Choose a predefined shape.
  - The mouse pointer changes to a plus sign (+).
  - Drag to create the shape.
  - The shape is placed into the document, floating in front of the text.

- At this point, you can adjust the shape: Change its size, location, or colors.
- Use the Drawing Tools Format tab, conveniently shown on the Ribbon while the shape is selected, to affect those changes.
- Instantly change the image by using the Shape Styles group on the Ribbon's Drawing Tools Format tab. Choose a new style from the Shape Gallery.
- Other items in the Shape Styles group affect the selected shape specifically:
  - Click the Shape Fill button to set the fill color;
  - Use the Shape Outline button to set the shape's outline color;
  - Choose an outline thickness from the Shape Outline button's menu, on the Weight submenu;
  - Use the Shape Effects button to apply 3D effects, shadows, and other fancy formatting to the shape.


eview
View
Help
Format
Tell me what you want
Shape Fill
Shape Outline
Shape Effects
WordArt Styles
Preset
Shadow
Reflection
Glow
Soft Edges
Bevel
3-D Rotation
No Shadow
Outer
Inner
Perspective
Shadow Options...

Charts

- A **chart** is a tool you can use to **communicate data graphically**. Including a chart in your document can allow your reader to see the **meaning behind the numbers**, and it can make showing **comparisons** and **trends** easier.
- Word has several types of charts, allowing you to choose the one that best fits your data. In order to use charts effectively, you'll need to understand how different charts are used.
- Word uses a **spreadsheet** as a placeholder for entering chart data, much like **Excel**. The process of entering data is fairly simple,

Adding charts to Word

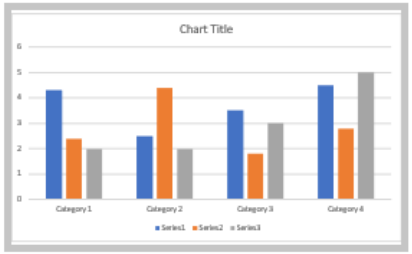
- Microsoft Word enables adding charts and graphs of many kinds in your document, from simple pie charts to 3D surface graphs. To do this, simply:
  1. Place the cursor where you want your chart to appear
  2. Go to “Insert” on the main ribbon and select “Chart” from the “Illustrations” section
  3. In the new window, pick the type of chart you want in your document and click “OK”
  4. Your chart will now appear in the position selected and an Excel spreadsheet window will open (called “Chart in Microsoft Word”)
  5. Edit the values and labels in the Excel window to reflect the data required for your chart

Insert Chart

All Charts

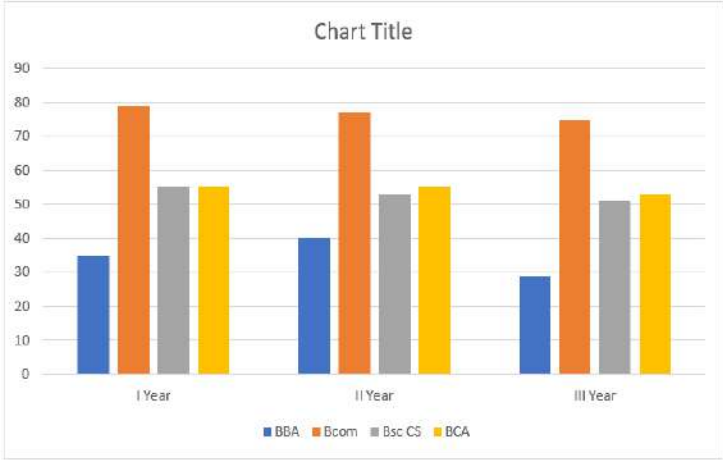
- Recent
- Templates
- Column
- Line
- Pie
- Bar
- Area
- X Y (Scatter)
- Map
- Stock
- Surface
- Radar
- Treemap
- Sunburst
- Histogram
- Box & Whisker
- Waterfall
- Funnel
- Combo

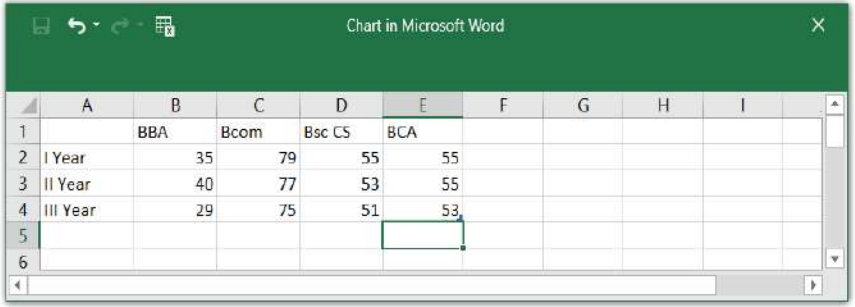
Clustered Column



OK

Cancel





	A	B	C	D	E	F	G	H	I
1		BBA	Bcom	Bsc CS	BCA				
2	I Year	35	79	55	55				
3	II Year	40	77	53	55				
4	III Year	29	75	51	53				
5									
6									

To change the chart layout:

- Word's predefined chart layouts allow you to modify chart elements—including chart titles, legends, and data labels—to make your chart easier to read.
- Select the chart you want to modify. The Design tab will appear.
- From the Design tab, click the Quick Layout command.
- Select the desired predefined layout from the menu that appears.
- The chart will update to reflect the new layout.
- To change a chart element (such as the chart title), click the element and begin typing.

Adding Equations to Word

- To insert equations in Word from one of the preset equations,
- First place your cursor at the insertion point in your document where you want the equation to appear.
- Then click the “Insert” tab in the Ribbon. At the right end of the tab is the “Symbols” button group. Click the drop-down arrow on the “Equation” button in this button group to then open the menu of choices.
- Scroll through the “Built-In” section to view the available preset equations.
- After finding the preset equation to insert, then click it in either of these areas to insert it into your document.

- Alternatively, it is possible to insert equations in Word by manually entering an equation.
- To manually insert an equation, first place your cursor at the insertion point in your document where you want the equation to appear.
- Then click the “Insert” tab in the Ribbon.
- Then click the “Equation” button in the “Symbols” button group.
- A blank equation is then inserted into your document.

Built-In

Area of Circle

$$A = \pi r^2$$

Binomial Theorem

$$(x + a)^n = \sum_{k=0}^{n} \binom{n}{k} x^k a^{n-k}$$

Expansion of a Sum

$$(1 + x)^n = 1 + \frac{nx}{1!} + \frac{n(n-1)x^2}{2!} + \cdots$$

Fourier Series

$$f(x) = a_0 + \sum_{n=1}^{\infty} \left(a_n \cos\frac{n\pi x}{L} + b_n \sin\frac{n\pi x}{L} \right)$$

Pythagorean Theorem

$$a^2 + b^2 = c^2$$

More Equations from Office.com

Insert New Equation

- The “Equation Tools” contextual tab then appears, with the “Design” tab selected.
- We can use the “Symbols” and “Structures” button groups, in conjunction with your keyboard, to then enter your desired equation into the equation field.
- After inserting equations in Word using either option, click the drop-down arrow in the equation field to see a menu of options.
- Selecting the “Save as New Equation…” option from the menu adds the equation to the drop-down menu of the “Equation” button.
- It is possible to choose how the equation looks by selecting the “Professional” or “Linear” options.

- The next options, “Change to Inline” or “Change to Display,” set how to insert the equation into the document.
- Selecting “Display” lets you adjust the equation’s justification by using the options in the drop-down menu under the “Justification” option.
- Selecting “Inline” locks the equation to its original insertion point.
- To delete an equation, select it in your document. Then press the “Delete” or “Del” key on your keyboard.

Procedure : Creating mail merge

1. Click Mail Merge … command under tools menu.
2. In Mail Merge helper dialog box, click the button create, which opens a menu click Form Letters… command.
3. In Microsoft Word message box, click Active Window command button.
4. Again in Mail Merge helper dialog box, click Get Data button, which opens a menu click create Data Source… command.
5. Create Data Source dialog box opens, Remove the unwanted field names from the list under Field names in header row, using the button Remove field Name. Click OK button.
6. Now 'Save As' dialog box opens to save the data file. Save the file name with .dat extension (info.dat).
7. In Microsoft word message box, click Edit Data Source button.
8. In Data form dialog box, after entering each record, click Add New button. After entering all records, click OK button.
9. In Microsoft word screen, under available toolbars, Click Insert Merge field, click the field names one by one.
10. Now, click Mail Merge… command, under Tools Menu.
11. In Mail Merge helper dialog box, click Merge… button.
12. Merge dialog box opens, Click Merge button.

Now you document is merged with the info.dat

MICROSOFT EXCEL

Dr P.V. Praveen Sundar,
Assistant Professor,
Department of Computer Science
Adhiparasakthi College of Arts & Science,
Kalavai.

Microsoft Excel: Spread Sheet

- MS-Excel is a window based powerful spreadsheet (Worksheet) package.
- Spreadsheet is wonderful analysis tool with automatic recalculation.
- Banking system, payroll system, Sales and stock maintenance also made in the MS-Excel spreadsheet.
- A spreadsheet is basically a large grid that is separated into rows and columns.
- Easy evaluation, What if analysis, Chart and report creations are one of the tools in the MS-Excel.
- Microsoft Excel is a spread sheet program that allows you to perform various calculations, estimations, and formulations with data.

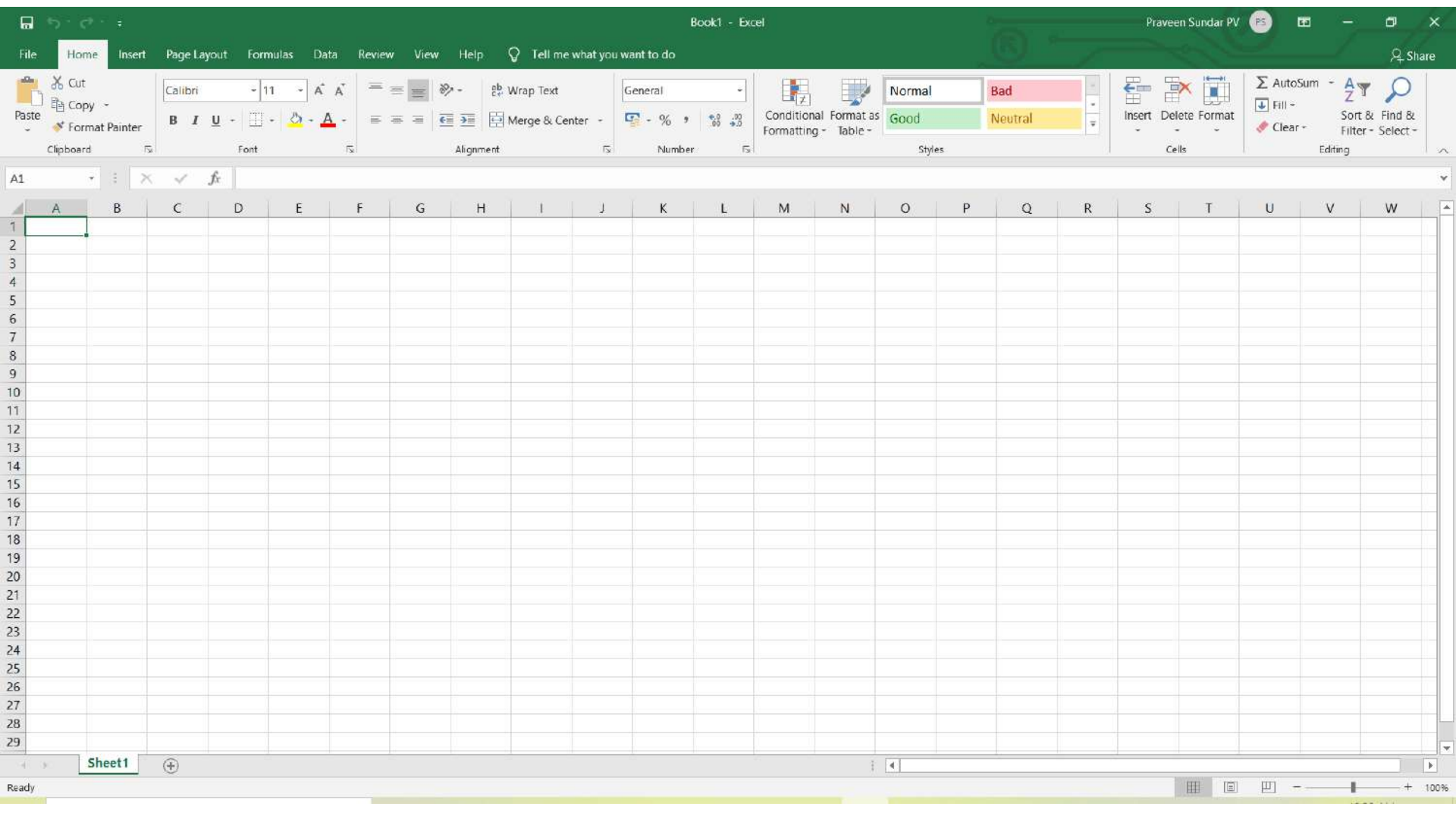
- It is the electronic counter part of a paper ledger sheet which consists of a grid of columns and rows.
- The total number of rows in excel is 65,536 and min is 256.
- The row is identified by alphabets like A, B,C etc. The column is identified by numbers or digits.
- It provides various facilities like:
  - Inserting charts
  - Creating graphs
  - Analyzing situations
  - Help in decision-making

Features of Excel or Spreadsheet

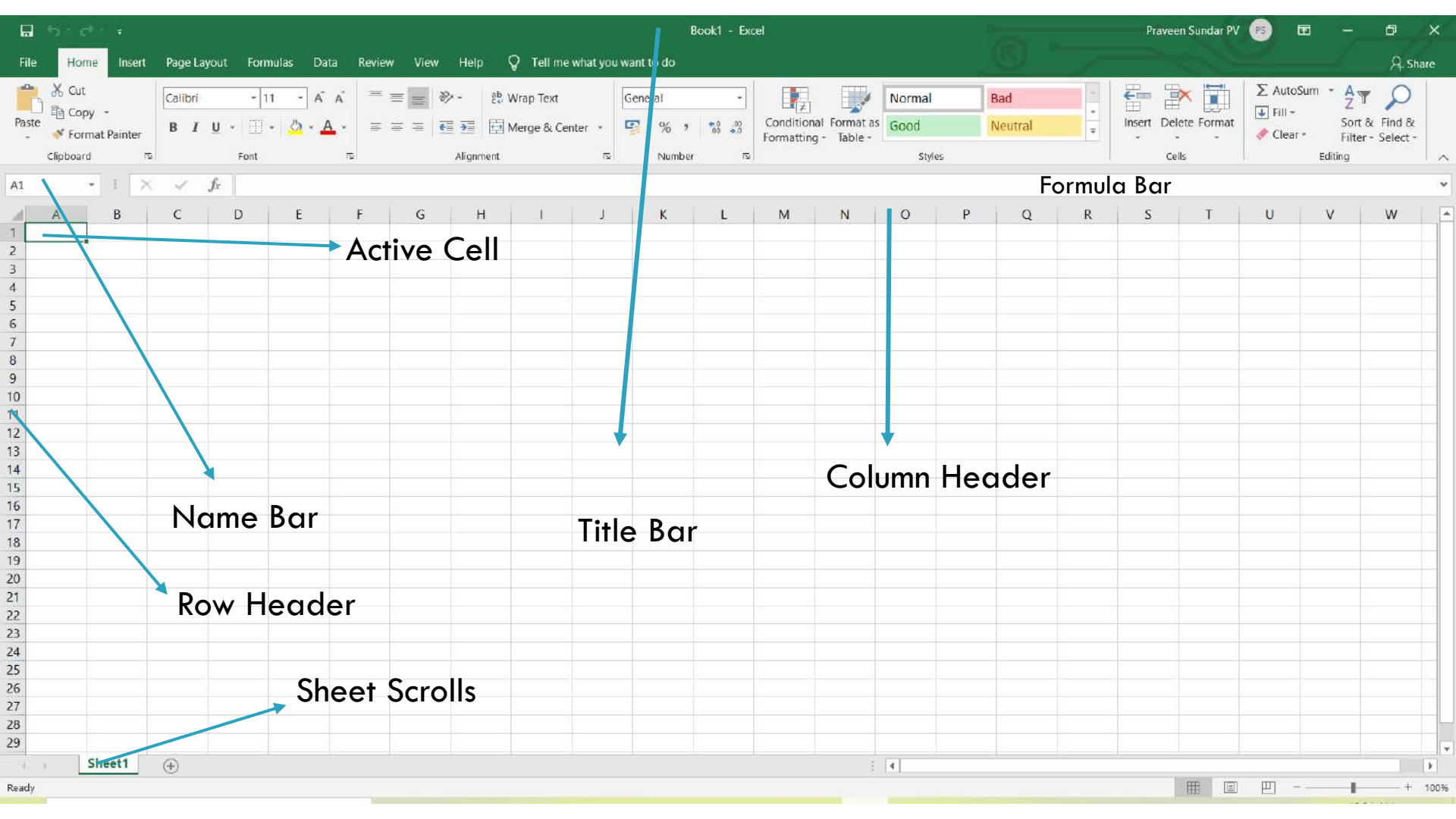
- Special mathematical, trigonometric, financial and statistical functions are available. All complicated calculations can be performed vary easily using these functions.
- The result of a calculations can be accurate.
- Data can also be viewed in the form of graphs.
- The information stored in a worksheet can be transferred to other software program.
- The entire worksheet or any part, it can be printed in desired format.
- The worksheet is saved can be retrieved and modified later as when required.

Starting Excel

- Click on the start button on the Taskbar.
- To begin Microsoft Excel , goto Start→ All Programs→Microsoft Office → Microsoft Excel. (or)
- Select Windows Key + R to obtain Run Command, there type Excel and click Ok to start Microsoft Excel.
- The following excel window displayed on the screen.


Book1 - Excel
Praveen Sundar PV
File
Home
Insert
Page Layout
Formulas
Data
Review
View
Help
Tell me what you want to do
Share
Cut
Copy
Format Painter
Paste
Clipboard
Calibri
11
Font
Wrap Text
Merge & Center
Alignment
General
Number
Conditional Formatting
Format as Table
Normal
Bad
Good
Neutral
Styles
Insert
Delete
Format
Cells
AutoSum
Fill
Clear
Sort & Filter
Find & Select
Editing
A1
Sheet1
Ready
100%

- Creating a Workbook
- Creating a workbook: Menu option
- Creating a workbook: Toolbar option.
- Opening an existing workbook
- Saving workbook
- Closing a workbook
- Components of an Excel Windows


Book1 - Excel
Praveen Sundar PV
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Share
Paste
Cut
Copy
Format Painter
Clipboard
Calibri
11
Font
Wrap Text
Merge & Center
Alignment
General
Number
Conditional Formatting
Format as Table
Normal
Bad
Good
Neutral
Styles
Insert
Delete
Format
Cells
AutoSum
Fill
Clear
Sort & Filter
Find & Select
Editing
A1
Formula Bar
Active Cell
Name Bar
Title Bar
Column Header
Row Header
Sheet Scrolls
Sheet1
Ready
100%

- Working with Worksheet
  - Entering the Data (Text, Numeric, Logical, Formulas)
  - Editing the Cell content.
  - Working with rows and Columns
    - Adjusting Row Height and Column Width
    - Inserting Rows and Columns
    - Deleting Rows and Columns
    - Moving Rows and Columns
    - Copying Rows and Columns
- Printing in Excel
- Hiding Columns

- Organizing Worksheets
  - Inserting Worksheets
  - Moving Worksheets
  - Copying Worksheets
  - Deleting Worksheets
  - Renaming Worksheets
- Charts in Excel

Charts in Excel

- Excel provides you different types of charts that suit your purpose. Based on the type of data, you can create a chart. You can also change the chart type later.
- Excel offers the following major chart types −
  - Column Chart
  - Line Chart
  - Pie Chart
  - Doughnut Chart
  - Bar Chart
  - Area Chart
  - XY (Scatter) Chart
  - Bubble Chart
  - Stock Chart
  - Surface Chart
  - Radar Chart
  - Combo Chart

- **Column Chart:** A Column Chart typically displays the categories along the horizontal (category) axis and values along the vertical (value) axis. To create a column chart, arrange the data in columns or rows on the worksheet.
- **Line Chart :** Line charts can show continuous data over time on an evenly scaled Axis. Therefore, they are ideal for showing trends in data at equal intervals, such as months, quarters or years.
- In a Line chart –
  - Category data is distributed evenly along the horizontal axis.
  - Value data is distributed evenly along the vertical axis.

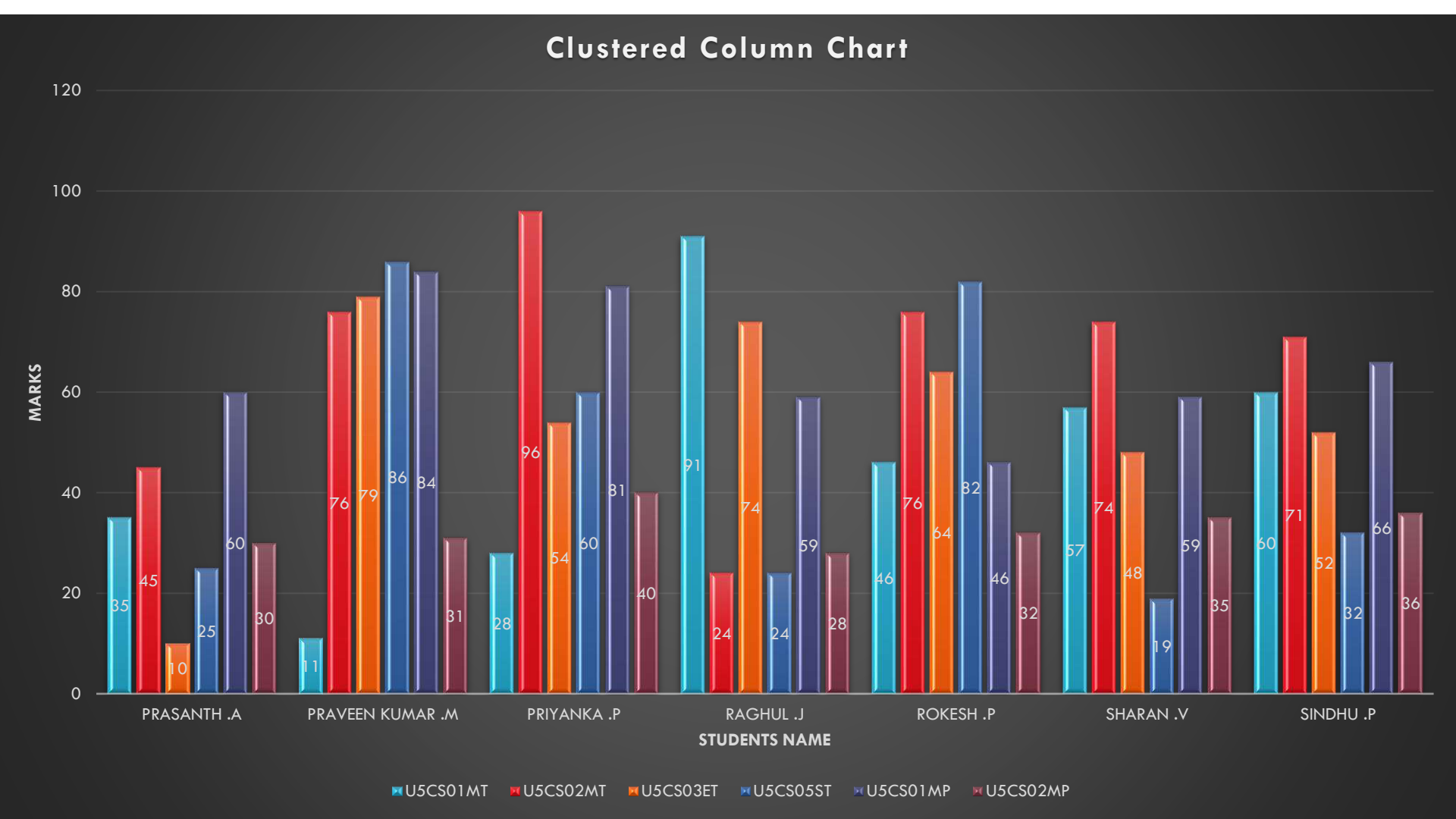
- **Pie Chart :**Pie charts show the size of items in one data series, proportional to the sum of the items. The data points in a pie chart are shown as a percentage of the whole pie. To create a Pie Chart, arrange the data in one column or row on the worksheet.
- **Doughnut Chart:** A Doughnut chart shows the relationship of parts to a whole. It is similar to a Pie Chart with the only difference that a Doughnut Chart can contain more than one data series, whereas, a Pie Chart can contain only one data series. A Doughnut Chart contains rings and each ring representing one data series. To create a Doughnut Chart, arrange the data in columns or rows on a worksheet.
- **Bar Chart :** Bar Charts illustrate comparisons among individual items. In a Bar Chart, the categories are organized along the vertical axis and the values are organized along the horizontal axis. To create a Bar Chart, arrange the data in columns or rows on the Worksheet.

- **Area Chart:** Area Charts can be used to plot the change over time and draw attention to the total value across a trend. By showing the sum of the plotted values, an area chart also shows the relationship of parts to a whole. To create an Area Chart, arrange the data in columns or rows on the worksheet.
- **XY (Scatter) Chart**
- XY (Scatter) charts are typically used for showing and comparing numeric values, like scientific, statistical, and engineering data.
- A Scatter chart has two Value Axes –
  - Horizontal (x) Value Axis
  - Vertical (y) Value Axis
- It combines x and y values into single data points and displays them in irregular intervals, or clusters. To create a Scatter chart, arrange the data in columns and rows on the worksheet.
- Place the x values in one row or column, and then enter the corresponding y values in the adjacent rows or columns.

- **Bubble Chart :** A Bubble chart is like a Scatter chart with an additional third column to specify the size of the bubbles it shows to represent the data points in the data series.
- **Stock Chart:** As the name implies, Stock charts can show fluctuations in stock prices. However, a Stock chart can also be used to show fluctuations in other data, such as daily rainfall or annual temperatures.
- **Surface Chart:** A Surface chart is useful when you want to find the optimum combinations between two sets of data. As in a topographic map, colors and patterns indicate areas that are in the same range of values.
- **Radar Chart:** Radar charts compare the aggregate values of several data series. To create a Radar chart, arrange the data in columns or rows on the worksheet.
- **Combo Chart:** Combo charts combine two or more chart types to make the data easy to understand, especially when the data is widely varied. It is shown with a secondary axis and is even easier to read. To create a Combo chart, arrange the data in columns and rows on the worksheet.

- Consider the following Data,

STUDENT NAME	U5CS01MT	U5CS02MT	U5CS03ET	U5CS05ST	U5CS01MP	U5CS02MP
PRASANTH .A	35	45	10	25	60	30
PRAVEEN KUMAR .M	11	76	79	86	84	31
PRIYANKA .P	28	96	54	60	81	40
RAGHUL .J	91	24	74	24	59	28
ROKESH .P	46	76	64	82	46	32
SHARAN .V	57	74	48	19	59	35
SINDHU .P	60	71	52	32	66	36


Clustered Column Chart
120
100
80
60
40
20
0
MARKS
35
45
10
25
60
30
11
76
79
86
84
31
28
96
54
60
81
40
91
24
74
24
59
28
46
76
64
82
46
32
57
74
48
19
59
35
60
71
52
32
66
36
PRASANTH .A
PRAVEEN KUMAR .M
PRIYANKA .P
RAGHUL .J
ROKESH .P
SHARAN .V
SINDHU .P
STUDENTS NAME
U5CS01MT
U5CS02MT
U5CS03ET
U5CS05ST
U5CS01MP
U5CS02MP

INTRODUCTION TO MULTIMEDIA

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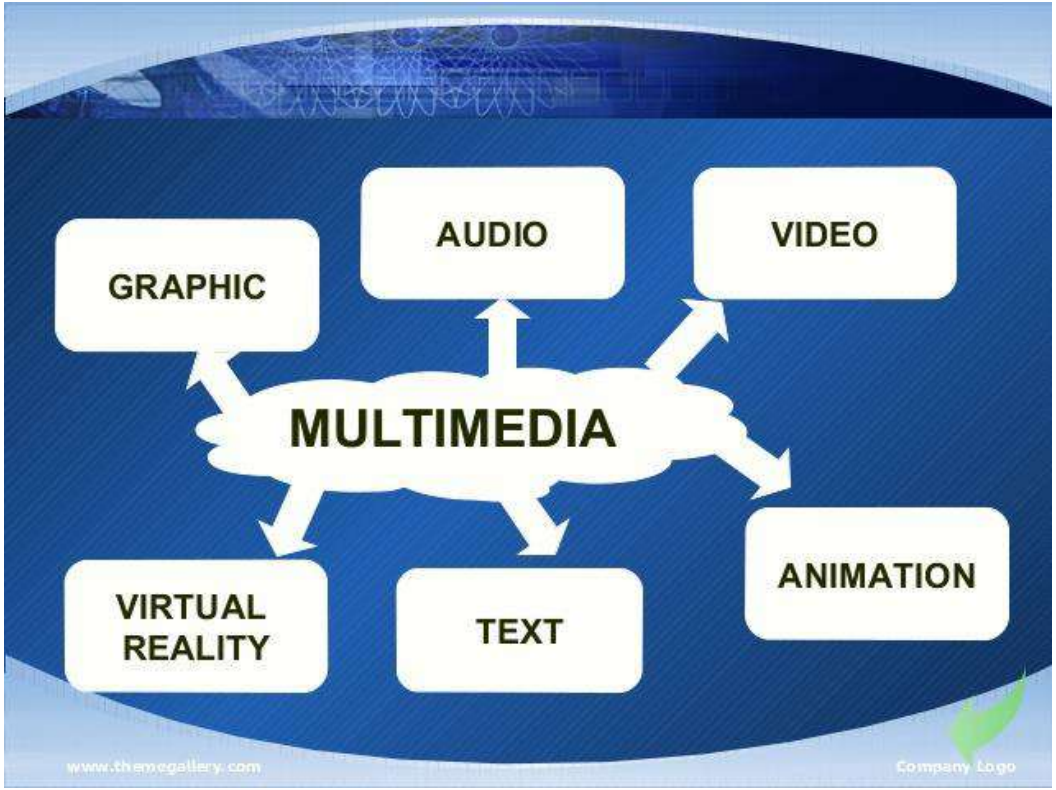
Adhiparasakthi College of Arts & Science,
Kalavai.

Multimedia

- Multimedia is a combination of text, graphics, images, audio, video and animation.
- Multimedia as name suggests is the combination of Multi and Media that is many types of media (hardware/software) used for communication of information.
- Multimedia is characterized by an audio-visual interface, which provides an excellent medium for user interactivity.
- It improves information retention.
- Computer games are the most common applications of multimedia.
- Multimedia also become an integral part of the internet. Web pages can contain animated images.


GRAPHIC
AUDIO
VIDEO
MULTIMEDIA
ANIMATION
VIRTUAL REALITY
TEXT
www.themegallery.com
Company Logo

Applications of Multimedia

- Following are the common areas of applications of multimedia.
- **Multimedia in Business:**
  - The business application of multimedia includes, product demos, instant messaging.
  - Multimedia is used in business for training employees using projectors, presenting sales, educating customers etc.
  - It helps for the promotion of business and new products.
  - One the excellent applications is voice and live conferencing.
  - A multimedia can make a audience come live.

Multimedia in Hospital-

- Multimedia best use in hospitals is for real time monitoring of conditions of patients in critical illness or accident.
- The conditions are displayed continuously on a computer screen and can alert the doctor/nurse on duty if any changes are observed on the screen.
- Multimedia makes it possible to consult a surgeon or an expert who can watch an ongoing surgery line on his PC monitor and give online advice at any crucial juncture.
- In hospitals multimedia can also be used to diagnose an illness with CD-ROMs/ Cassettes/ DVDs full of multimedia based information about various diseases and their treatment.
- Some hospitals extensively use multimedia presentations in training their junior staff of doctors and nurses. Multimedia displays are now extensively used during critical surgeries.

Multimedia in Entertainment:

- Multimedia is heavily used in the entertainment industry, especially to develop special effects in movies and animations (VFX, 3D animation, etc.).
- Multimedia games are a popular pastime and are software programs available either as CD-ROMs or online.
- Some video games also use multimedia features.
- Multimedia applications that allow users to actively participate instead of just sitting by as passive recipients of information are called interactive multimedia.

- **Education:**
  - In Education, multimedia is used to produce computer-based training courses (popularly called CBTs) and reference books like encyclopedia.
  - A CBT lets the user go through a series of presentations, text about a particular topic, and associated illustrations in various information formats.
  - Edutainment is an informal term used to describe combining education with entertainment, especially multimedia entertainment.
- **Engineering:**
  - Software engineers may use multimedia in Computer Simulations for anything from entertainment to training such as military or industrial training.
  - Multimedia for software interfaces are often done as collaboration between creative professionals and software engineers.

- **Industry:**
  - In the Industrial sector, multimedia is used as a way to help present information to shareholders, superiors and coworkers.
  - Multimedia is also helpful for providing employee training, advertising and selling products all over the world via virtually unlimited web-based technologies.
- **Mathematical and Scientific Research:**
  - In Mathematical and Scientific Research, multimedia is mainly used for modeling and simulation.
  - For example, a scientist can look at a molecular model of a particular substance and manipulate it to arrive at a new substance.
  - Representative research can be found in journals such as the Journal of Multimedia.

Elements of Multimedia

- The various elements of multimedia are as follows:
  - Text
  - Images
  - Sound / Audio
  - Video

Text

- Text usually contains words and symbols. It is the most common form of Communication. Usually text provides the core structure to the package.
- Using Text in Multimedia
  - Text in multimedia applications can be
    - Page titles
    - Labels and pictures
    - Delivering information in the form of multiple sentences and paragraph.
- Text technology is based on creating letters and numbers, special characters to build words, sentences and paragraph of information.

- Text elements fall into the following categories.
  - Alphabet characters
  - Numbers
  - Special characters
- Although multimedia products include pictures audio and video, text may be the most common data type found in these applications.

Image

- A graphic, or graphical image, is a digital representation of non-text information such as a drawing, chart, or photo.
- Pictorial representation that are created by the primitive objects such as lines, polygons, circles, curves and arcs.
- Many Web pages use colorful graphical designs and images to convey messages.
- Graphics are the backbone of any multimedia product.
- Graphics in the form of pictures, clip art, photographs and line art are used to provide backgrounds, informational content and navigational controls for multimedia products.
- Graphics are created using a variety of tools including paint, drawing software, image scanners and digital camera.

- Graphics are stored in files in a variety of formats and sizes.
- There are two types of Graphics:
  - **Bitmap images-** Bitmap images are real images that can be captured from devices such as digital cameras or scanners. Generally bitmap images are not editable. Bitmap images require a large amount of memory.
  - **Vector Graphics-** Vector graphics are drawn on the computer and only require a small amount of memory. These graphics are editable.
- Image File Formats : The various image files formats are as follows:
  - JPEG— Joint Photographic Expert Group
  - BMP — Bit Map File
  - GIF — Graphical Interchange File Format
  - PNG — Portable Network Graphics
  - TIFF — Tagged Image File Format

Animation

- **Animation-** Animation is a process of making a static image look like it is moving.
- An animation is just a continuous series of still images that are displayed in a sequence.
- The animation can be used effectively for attracting attention.
- Animation also makes a presentation light and attractive.
- Animation is very popular in multimedia application.

Audio

- A multimedia application may require the use of speech, music and sound effects. These are called audio or sound element of multimedia.
- Speech is also a perfect way for teaching.
- Audio are of analog and digital types.
- Analog audio or sound refers to the original sound signal.
- Computer stores the sound in digital form.
- Therefore, the sound used in multimedia application is digital audio.

- The various audio file formats are as follows:
- **MP3 –**
- It stands for MPEG-1 Audio Layer 3. It was released in 1993 and became popular. It is most popular audio format for music files. Main aim of MP3 is to remove all those sounds which not hearable or less noticeable by humans ears. Hence making size of music file small. MP3 is like universal format which is compatible almost every device.
- **AAC –**
- It stands for Advanced Audio Coding. It was developed in 1997 after MP3.The compression algorithm used by AAC is much more complex and advanced than MP3, so when compared a particular audio file in MP3 and AAC formats at the same bitrate, the AAC one will generally have better sound quality. It is the standard audio compression method used by YouTube, Android, iOS, iTunes, and PlayStations.

- **WMA –** It stands for Windows Media Audio. It was released in 1999.It was designed to remove some of the flaws of MP3 compression method. In terms of quality it is better than MP3. But is not widely used.
- **WAV –** It stands for Waveform Audio File Format, it was developed by Microsoft and IBM in 1991. It is just a Windows container for audio formats. It is compatible with both Windows and Mac.
- **AIFF –**It stands for Audio Interchange File Format. It was developed by Apple for Mac systems in 1988. Like WAV files, AIFF files can contain multiple kinds of audio. It is compatible with both Windows and Mac.
- Audio includes speech, audio effects, ambient sound(For example, background sound of the sea) and music.

Video

- Video- The term video refers to the moving picture, accompanied by sound such as a picture in television.
- Video element of multimedia application gives a lot of information in small duration of time.
- Digital video is useful in multimedia application for showing real life objects.
- Video have highest performance demand on the computer memory and on the bandwidth if placed on the internet.
- Digital video files can be stored like any other files in the computer and the quality of the video can still be maintained. The digital video files can be transferred within a computer network. The digital video clips can be edited easily.

- The various audio file formats are as follows:
- **Flash Video Format (.flv):** This video format is very popular due to the availability of flash player for cross platform. These video files are supported by almost every browser making suitable for web. This format is compact and support progressive and streaming download. Some users of this format are Youtube, Yahoo! Video, VEVO etc.
- **AVI format (.avi):** Audio Video Interleave which can contain both audio and video data. It was developed by Microsoft. It uses less compression can contain almost any codecs. It is popular among internet user due to multiple codecs support. All windows OS support this format including another player for other platform exist.

- **MP4 (.mp4) :** This format is used to store to store audio and video stream online. MP4 file format was created by Moving Picture Experts Group (MPEG) as a multimedia container format store audio visual data. It used different compression technique for video and audio.
- **WMV (Windows Media Video):** This format was developed by Microsoft. It was designed for web streaming applications. WMV files are the very small in size over the Web, as their file size decreases after compression, due to which results in poor video quality. But this make it only file format which can be send through e-mail.
- **QuickTime Format (.mov):** This format was developed by Apple. It can store multiple tracks(for different language), text file(subtitle) and effects. MOV files are of high quality and are usually big in file size. It is supported both by Windows and Apple.
- **3GP (.3gp):** This is both audio and video file format which was designed to transmit data between 3G phones and the internet. It is most commonly used to capture video from the phone and upload it online. Both Windows and Mac support the format.

Desktop Publishing Basics

- Desktop publishing is the use of the computer and software to create visual displays of ideas and information.
- Desktop publishing documents may be for desktop or commercial printing or electronic distribution, including PDF, slideshows, email newsletters, electronic books, and the Web.
- Desktop publishing is a term coined after the development of a specific type of software. It's about using that software to combine and rearrange text and images and creating digital files for print, online viewing, or websites.
- Before the invention of desktop publishing software, the tasks involved in desktop publishing were done manually by people who specialized in graphic design, typesetting, and prepress tasks.

Things You Can Do With Desktop Publishing

With desktop publishing software and hardware you can:

- Design print communications such as brochures, fliers, ads, and posters.
- Design print communications such as catalogs, directories, and annual reports.
- Design logos, business cards, and letterhead.
- Design and publish newsletters, magazines, and newspapers.
- Design books and booklets.
- Convert print communications to formats for the web and smart devices such as tablets and phones.
- Create resumes and business forms including invoices, inventory sheets, memos, and labels.
- Self-publish books, newsletters, and e-books.

- Design and publish blogs and websites.
- Design slides shows, presentations, and handouts.
- Create and print greeting cards, banners, postcards, candy wrappers, and iron-on transfers.
- Make digital scrapbooks and print or digital photo albums.
- Create decorative labels, envelopes, trading cards, calendars, and charts.
- Design store signs, highway signs, and billboards.
- Take work designed by others and putting it into the correct format for digital or offset printing or for publishing online.
- Create more attractive, readable reports, posters, and print or on-screen presentations for school or business.

List of Desktop Publishing Software.

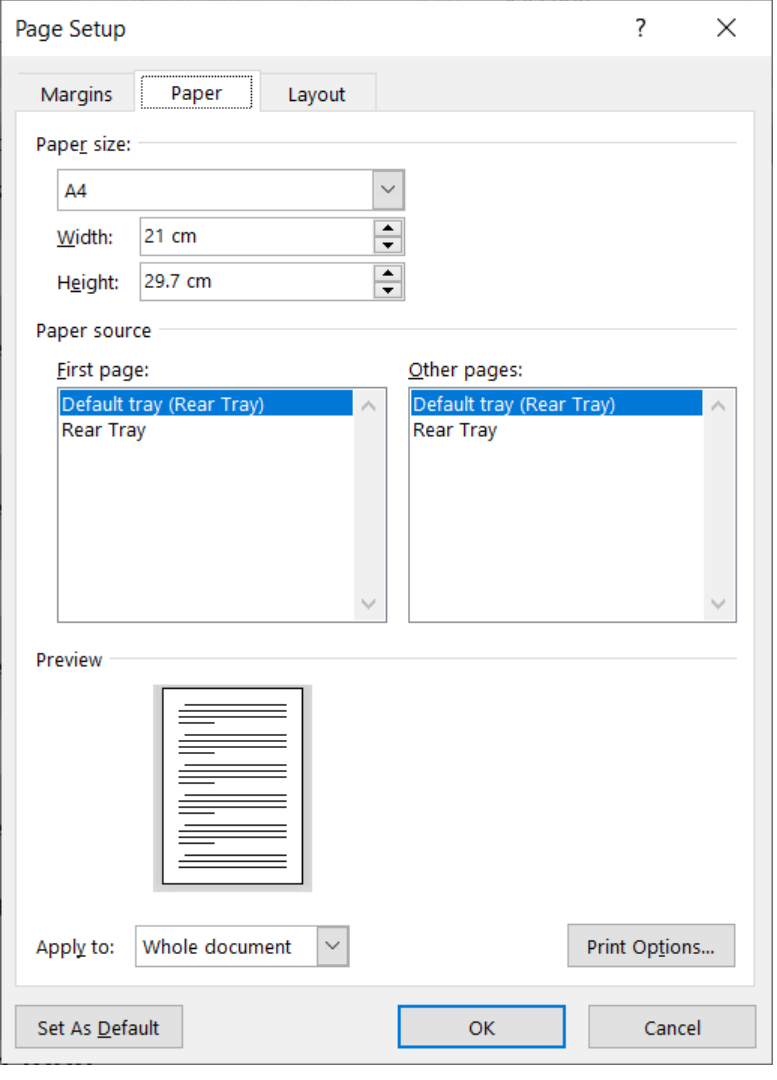
- Adobe FrameMaker
- Adobe Illustrator
- Adobe PageMaker
- Adobe Photoshop
- Coreldraw
- LibreOffice Impress
- LibreOffice Writer
- Microsoft PowerPoint
- Microsoft Publisher
- Microsoft Word

Page Layout Programs

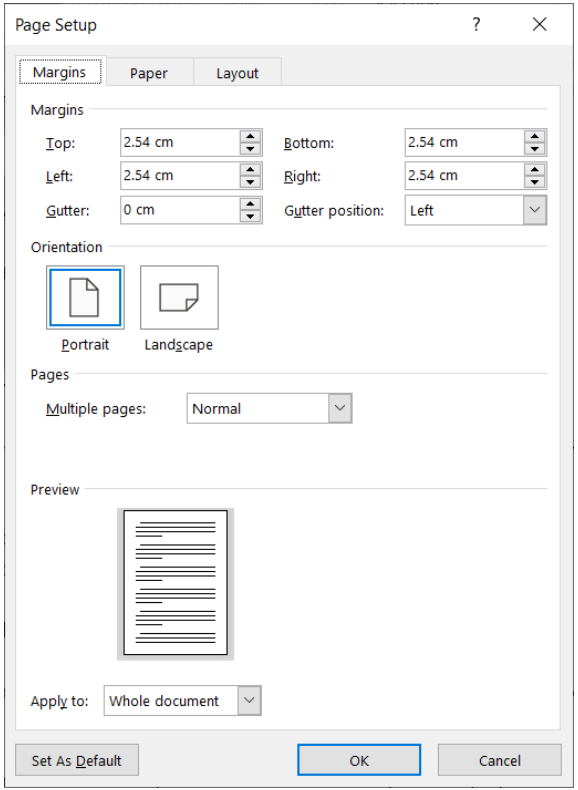
- Page layout is the part of graphic design that deals in the arrangement of visual elements on a page.
- Page formatting is the layout of the page when it is printed on a printer. It includes page size, page orientation, page margins, headers and footer etc.
- Page formatting is defined in page setup dialog box
- Use the following steps:
  - Choose Page setup from File menu(File Page Setup) Short cut: Alt+F+U
  - Set the paper size, page orientation, margins, print preview and printing a document.

Page Size

- The height and the width of the page on which matter (text and graphics) are printed is called the size of the page.
- Page size of document is defined in the Page Setup from the File menu. To define page size:
  - Click File Menu and select Page Setup command.
  - Select Paper Size tab and select appropriate page size from a list of given standard sizes.
- Some standard page sizes and their dimensions are as follows:
  - Letter: with paper size of 8.5 by 11 inches
  - Legal: with paper size of 8.5 by 14 inches
  - A4:with paper size of 8.27 by 11.69 inches
  - Executive :with paper size of 7.25 by 10.5 inches
  - Custom size: Any dimensions can be given.


Page Setup
Margins
Paper
Layout
Paper size:
A4
Width:
21 cm
Height:
29.7 cm
Paper source
First page:
Default tray (Rear Tray)
Rear Tray
Other pages:
Default tray (Rear Tray)
Rear Tray
Preview
Apply to:
Whole document
Print Options...
Set As Default
OK
Cancel

- Page Orientation:
- Orientation refers to whether the text is to printed length wise or width-wise.
- When the text is printed or typed length-wise this is called **Portrait Page Orientation**.
- When the text is printed or typed width wise. this is called **Landscape Page Orientation**.



- **Margins:** Margin is the distance from the text of the paper's edge.
- Ruler line in a word processor displayed the position of margins.
- The Margins are different types.
  - **Left Margin** — This is the distance between the text and the left edge of the paper.
  - **Right margin** — This is the distance between the text and the right edge of the paper.
  - **Top Margin** — This is the distance between the text and the top edge of the paper.
  - **Bottom Margin** — This is the distance between the text and the bottom edge of the paper.

- **Print Preview**
- Before you print a document, you should view it to get an idea as to how will look when printed.
- This can be done through Print Preview.
- To start a preview of the document before printing.
  - Click the print preview button on the Standard Toolbar.
  - Or choose Print preview form File menu (File →Print Preview)
  - Shortcut Alt+ F+V

Print

Print

Copies: 1

Printer

Canon E470 series
Ready

Printer Properties

Settings

Print All Pages
The whole thing

Pages:

Print One Sided
Only print on one side of the...

Collated
1,2,3 1,2,3 1,2,3

Portrait Orientation

A4
21 cm x 29.7 cm

Normal Margins
Top: 2.54 cm Bottom: 2.54 c...

1 Page Per Sheet

Page Setup

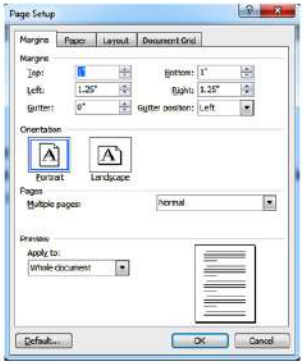
Page Setting and Formatting in Microsoft Word

Written on April 26, 2016 by Claudio Dies in Microsoft Word No Comments

Last updated onTuesday, April 26, 2016

Page Formatting

The settings of output page when it is printed on a printer are called page formatting. These include page size, page orientation, page margins, etc. Page formatting is defined in **Page Setup** under **File menu**. When Page Setup command is applied, a dialog box as shown below appears.



The page setup dialog box contains the following four tabs:

- Margins
- Paper Size
- Paper Source
- Layout

Page Size

The height and the width of the page on which matter (text and graphics) are printed is called the size of the page. Page size of document is defined in the Page Setup from the File menu. To define page size:

- Click File Menu and select Page Setup command.
- Select Paper Size tab and select appropriate page size from a list of given standard sizes
- Some standard page sizes and their dimensions are as follows:

Letter

with paper size of 8.5 by 11 inches

Legal

with paper size of 8.5 by 14 inches

A4

with paper size of 8.27 by 11.69 inches

Executive

with paper size of 7.25 by 10.5 inches

Custom size

Any dimensions can be given.

Page Orientation

The direction in which document is printed on paper is called page orientation. The document can be printed on paper in two ways. These are:

- Along the length of the paper. This is called Portrait Orientation.
- Along the width of the paper. This is called Landscape Orientation.

Header and Footers

Header is the information that is printed in the top margin of the page. It usually consists of page number, name of the book, name of the chapter, etc.

Footer is the information that is printed in the bottom margin of the page. Both the header and the footer can be viewed in Print Layout mode.

Text Generation

- From a design perspective, the choice of font size, style and text attributes need to be related both to the complexity of the message and to its venue.
- Some useful tips for designing the text in your multimedia application
  - Use legible fonts that can be easily read.
  - Vary the font size and style according to the importance of message.
  - Indent your paragraph wherever required.
  - Explore the effects of different colors and shadows to add depth to your applications.
  - Use menus for easy navigation and meaningful words for menu items.
  - Use buttons, icons or symbols for user interaction.

Graphics for DTP

- Graphics is a generic term used to describe the pictorial representation of data.
- Pictorial representations that are created by the primitive objects such as lines, polygons, circles, curves, and arcs.
- Graphics are the backbone of any multimedia product.
- Graphics in the form of pictures, clip art, photographs and line art are used to provide backgrounds, informational content navigational controls for multimedia products.
- Graphics are created using a variety of tools including paint drawing software, image scanners and digital camera.
- Graphics are stored in files in a variety of formats and sizes.

Print Production

- A major parts of any word processing software is to print document.
- To print a document, you can specify which printer to use and how many copies to print.
- To print a document use the follow step:
  - Choose print from File menu(File → Print) Or
  - Click Print icon from the standard toolbar
  - Short Cut: Ctrl + P / Alt+F+P
- This dialog box allows you to select the number copies and how many pages of the document, you want to print. You can specify the range the document to print by choosing:
  - **All** — To print all the pages in the document.
  - **Current Page** — To print the current page in the document
  - **Pages** — To print certain number of pages.
  - **Number of Copies** — It allows you to enter the number of copies you want to print.
  - **Pages per Sheet** — It offers you to select the number of pages in the document that you want to print on each sheet of paper.

Print

Home
New
Open
Info
Save
Save As
History
Print
Share
Export
Close
Account
Feedback
Options

Print

Copies: 1

Printer

Canon E470 series
Ready

Printer Properties

Settings

Print All Pages
The whole thing

Pages:

Print One Sided
Only print on one side of the...

Collated
1,2,3 1,2,3 1,2,3

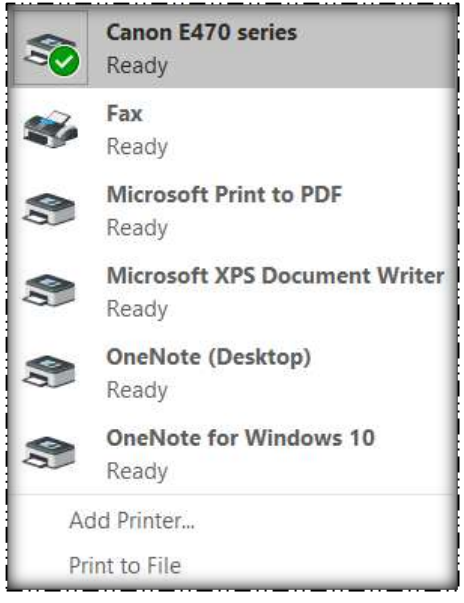
Portrait Orientation

A4
21 cm x 29.7 cm

Normal Margins
Top: 2.54 cm Bottom: 2.54 c...

1 Page Per Sheet

Page Setup



INTRODUCTION TO INTERNET

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II BCom

Internet

- Internet is a network of network that connect computers all over the world.
- Network is an interconnection of systems to share data and information.
- Internet is a collection of government, academic, commercial, individual and other sites.

History of Internet

- In 1969,Department of Defense (DoD) USA created a small network of four computers called ARPANET (**A**dvanced **R**esearch **P**rojects **A**gency **Net**work).
- This Network was setup for the military purpose.
- The Primary goal of ARPANET was to allow multiple users to send and receive information simultaneously over the communication path.
- The Network operated with a technique called packet switching using TCP.

- The ARPANET was successful, and many universities joined the network.
- This ARPANET was divided into two parts MILNET and ARPANET.
- MILNET was used for military related sites and ARPANET for non-military related sites.
- These two networks were connected together by Internet Protocol (IP).
- The combined set of protocol is called TCP/IP.

- During the 1970's networks like BITNET and USENET came into being.
- Around 1980's NSFNET (National Science Foundation Network) was created.
- In 1984, NSF designed a high-speed successor to the ARPANET for all university research groups.

Internet Services

- **E-mail:** This service has been available since the early days of the ARPANET and its enormous popular. Email enables people to send messages as well as files to one or more people.
- **Mailing Lists:** enables groups of people to conduct group conversations by email.
- **News:** Usenet Newsgroups are specialized forums in which users with common interest can exchange messages. It enables online group discussions to occur, using a system of news server to store messages of 10,000.
- **Remote login:** Users on the internet can log into any other machine on the internet on which they have account.
- **File Transfer:** Users can copy files from one machine on the internet to another.

- **Online Chat-** Provides a way for real time online chatting to occur, where participants read each other messages.
- **Voice and Video Conferencing:** Two or more people to hear and see each other, with the help of camera fixed over these and share other applications.
- **Internet Telephony (VoIP):** Allows the internet users to talk across internet to any PC equipped to receive the call.
- **Browser:** Contains the basic software that can retrieve, view and send information over the internet.
- **Download:** To copy data from a remote computer to the local computer.
- **Upload:** To send data from local computer to remote computer.

Internet Terminologies

- **Client:** A client is any computer on the network that requests services from another computer on the network. To be able to request services and access the resources present on some other computer on the network, the client should have adequate access permissions.
- **Server:** A server is a computer that receives requests from client computers, process these requests and send the output to the respective client computers that had placed requests. The range of services that a server can offer a client is based on the permissions possessed by the client. The server computer defines these permissions.

Client-Server Network

- Client-Server Network is one of the most basic architecture that is used for computer connectivity.
- In this type of network, several client computers are connected to the server and also to each other.
- Client computers request services from the server computer, and the server accepts/rejects these requests.
- The server computer is also responsible for storing relevant information that is frequently used by the client.

Web Server.

- A Web Server is a computer that is dedicated to provide web services to clients on the internet.
- A Web server is a dedicated computer that uses HTTP (Hypertext Transfer Protocol) and other protocols to respond to client requests made over the World Wide Web.
- The main job of a web server is to display website content through storing, processing and delivering webpages to users.
- Basically **web server** is used to host the **web** sites but there exists other **web servers** also such as gaming, storage, FTP, email etc.

Internet Service Provider (ISP)

- Internet services typically provided by ISPs can include Internet access, Internet transit, domain name registration, webhosting, Usenet service, and colocation.
- ISP's are companies that help users connect to the internet for a monthly fee. In return, they provide a username and password and a telephone number.
- The username and password are used to authenticate the user on the internet.
- Some of the ISP are Hathway, Railwire, JIO, Airtel, Vodafone, BSNL, etc.,

Modem

- To access the internet, a user requires a hardware device called a Modem.
- The word Modem originated from the word's ***modulator*** and ***demodulator***.
- A modem transmits data over telephonic lines as analog signals and then converts them to digital signals that can be interpreted by a computer.
- The sending **modem** modulates the data into a signal that is compatible with the phone line, and the receiving **modem** demodulates the signal back into digital data.

Web Page

- A web page is a simple document displayable by a browser. Such documents are written in the HTML language.
- A Web page may be Static or Dynamic. Static pages show the same content each time they are viewed. Dynamic pages have content that can change each time they are accessed. These pages are typically written in scripting languages such as PHP, Perl, ASP, or JSP.
- Collection of web pages is called as website.
- Web development is the work involved in developing a Web site for the Internet or an intranet. Web development can range from developing a simple single static page of plain text to complex Web-based Internet applications, electronic businesses, and social network services.

Web Hosting

- Web hosting is a service of providing online space for storage of web pages. These web pages are made available via World Wide Web. The companies which offer website hosting are known as Web hosts.
- The servers on which web site is hosted remain switched on 24 x7. These servers are run by web hosting companies. Each server has its own IP address. Since IP addresses are difficult to remember therefore, webmaster points their domain name to the IP address of the server their website is stored on.

Domain Name System

- **The Domain Name System (DNS)** is the phonebook of the Internet. DNS translates domain names to IP addresses so browsers can load Internet resources.
- A domain name is a unique name associated with a specific IP address by a program that runs on an Internet host computer.
- This program, which coordinates the IP addresses and domain names for all computers attached to it, is called DNS (Domain Name System).
- Domain names are case insensitive so com and COM mean the same thing.

Types of Domain Naming System

- DNS is divided into two categories:
  - Generic Top Level Domain(gTLD)
  - Country code Top Level Domain(ccTLD)

Generic Top Level Domain (gTLD)

- There are seven domains within the generic top-level domal (gTLD).
- They .com, .org, .net, .gov, .mil, . edu, .int.
- The .com, .org, of .net are open domains and anyone can register their names within the domains.
- .edu is restricted to individuals register
- . gov is restricted to u by government agencies and its employees
- and mil is restricted to u military.

.biz	Business of all sizes
.com	commercial organizations, businesses and companies
.org	organisation site (non-profits, etc.)
.net	Network providers or commercial companies
.edu	educational site (universities, schools, etc.)
.gov	government organizations
.info	Business organizations of individuals providing general information's.
int	organizations established by international treaty
.mil	military site
.pro	Certified professionals such as doctors, lawyers and accountants.

Country code top- level domains (ccTLD)

- Country code top- level domains (ccTLD) are two letter designations assigned to individual countries.
- Each country linked to the Web has a two letter top-level domain, for example .fr is France, .ie is Ireland, in is India etc.
- Presently there are close to 250 such ccTLDs one for each country in the world.
- The registration process for sites with the ccTLDs slightly different from that using the gTLDs.
- The registration can be assigned through one of the several registrars accredited with The Internet Corporation for Assigned Names and Numbers(ICANN).
- ICANN currently accredits domain-name registrars for the following country code top level domain (ccTLD).

Domain	Country	Domain	Country
.af	Afghanistan	.it	Italy
.aq	Antarctica	.is	Island
.at	Austria	jP	Japan
.bd	Bangladesh	.kw	Kuwait
.bm	Bermuda	.lk	Sri Lanka
.br	Brazil	.ly	Libya
.bt	Bhutan	.ma	Morocco
.ca	Canada	.mn	Magnolia
.ch	Switzerland	.mx	Maxico
.cn	China	.ng	Nigeria
.co	Colombia	.n1	Netherland
.cu	Cuba	.nz	New Zealand
.de	Germany	.om	Oman
.dk	Denmark	.pk	Pakistan
.eg	Egypt	.qa	Qatar
.fr	France	.sa	Saudi Arabia
.hu	Hungary	.sd	Sudan
.in	India	.se	Sweden
.th	Thailand	.sg	Singapore
.tw	Taiwan		

Uniform Resource Locator (URL)

- Every Web page has a unique address called a URL (Uniform Resource Locator) which identifies where it is located on the Web.
- For example, the URL for APCAS home page is: http://www.apcas.in/home/
- The basic parts of a URL often provide "clues" to where a web page originates and who might be responsible for the information at that page or site.
- URLs have three basic parts: the protocol, the server name and the resource ID.

- Look again at APCAS's URL below to see these three parts.
- The protocol is shown at the beginning of the URL before the double slash (//); the server name is between the double slash (//) and the first single slash (/); and the resource id is everything after the first single slash(/).

  http://www.apcas.in/home/

  protocol |Server Name |resource id

- Let's examine each part of this URL:

First part: protocol (http://)

- The protocol identifies the method (set of rules) by which the resource is transmitted. All Web pages use Hypertext Transfer Protocol (HTTP). Thus, all web URL's begin with http://.

- **Second Part: Server Name**
- The server name identifies the computer on which the resource is found.
- This part of the URL commonly identifies which company, agency or organization may be either directly responsible for the information, or is simply providing the computer space where the information is stored.
- Web server names often begin with the letters www, but not always.
- The server name always ends with a dot and a three-letter or two-letter extension called the domain name.

- The domain is important because it usually identifies the type of organization that created or sponsored the resource. Sometimes it indicates the country where the server is located.
- The most common domain names are:
  - .com which identifies company or commercial sites
  - .org for non-profit organization sites
  - .edu for educational sites
  - .gov for government sites
  - .net for Internet service providers or other types of networks.

- If the domain name is two letters, it identifies a country, e.g. .us for the United States,
  - .uk for the United Kingdom,
  - .au for Australia,
  - .mx for Mexico or
  - .ca for Canada.
- The server name for our college website is: www.apcas.in. The server name may also be the name of a website.
- Websites can be either all of the pages on one server(computer) or all of the pages under a specific sub directory on a server.

- **Third part: resource ID (home/)**
- The resource ID is the name of the file for the page and any directories or subdirectories under which it is stored on the specified computer.
- The resource ID for our College's homepage is: /home.htm. (A "homepage" is the opening or main page for any web site that provides links to all of the other pages on the site.)
- The part of the resource ID after the last slash (/) is the file name for the specific page or other resource.
- The file name ends with a three or four letter designation that specifies the file type (e.g., .htm or .html for A standard Web page, .jpg or .gif for common graphic files.)

Hypertext

- Hypertext is text which contains links to other texts.
- Hypertext is text displayed on a computer display or other electronic devices with references to other text that the reader can immediately access.
- Hypertext documents are interconnected by hyperlinks, which are typically activated by a mouse click, keypress set or by touching the screen.

Hypermedia

- Hypermedia is an extension of the term hypertext.
- Hypermedia is a nonlinear medium of information that includes graphics, audio, video, plain text and hyperlinks.
- The term was first used in a 1965 article written by Ted Nelson.
- The World Wide Web is a classic example of hypermedia.
- The most common type of hypermedia is an image link. Photos or graphics on the Web are often linked to other pages.

HTTP

- Hypertext Transfer Protocol(HTTP) is an internet standard or set of rules that allows the exchange of information on the World Wide Web.
- HTTP defines how messages are formatted and transmitted and what actions Web servers and browsers should take in response to various commands.
- For example, when anyone enter a URL, in browser, this actually sends an HTTP command to the Web server directing it to fetch and transmit the requested Web page. Sending and receiving messages can be done through HTTP.

Working of the Internet

- The internet works on a Client-server approach. Whenever the user wants to retrieve a webpage, the internet works as follows:
  - A user enters the URL of the webpage in the address bar of the web browser.
  - The web browser requests the Domain Name Server for the IP address corresponding to www.google.com.
  - After receiving the IP address, the browser sends the request for the webpage to the Internet using HTTP protocol which specific the way the browser and Web Server communicates.

- The Internet Routers send the request to the intended web server.
- Then the web server receives the request using HTTP protocol. It then examines the hard disk or memory and if the requested file is found it returns it back to the web browser and closes the Http connection.
- The Web browser then interprets the file and displays contents of the webpage in the browser window.

Internet Addressing

- Internet Protocol defines a universal addressing called IP Address. An Internet Protocol address (IP address) is a numerical label assigned to each device connected to a computer network that uses the Internet Protocol for communication.
- An IP address serves two main functions: host or network interface identification and location addressing.
- IP addresses are written and displayed in human-readable notations, such as 172.16.254.1 in IPv4, and 2001:db8:0:1234:0:567:8:1 in IPv6.
- Network administrators assign an IP address to each device connected to a network. Such assignments may be on a static or dynamic basis, depending on network practices and software features.

- The IP address space is managed globally by the Internet Assigned Numbers Authority (IANA), and by five regional Internet registries (RIRs) responsible in their designated territories for assignment to local Internet registries, such as Internet service providers (ISPs), and other end users.
- Internet Protocol version 4 (IPv4) defines an IP address as a 32-bit number. However, because of the growth of the Internet and the depletion of available IPv4 addresses, a new version of IP (IPv6), using 128 bits for the IP address, was standardized in 1998.

- An IP address serves two principal functions.
- It identifies the host, or more specifically its network interface, and it provides the location of the host in the network, and thus the capability of establishing a path to that host.
- Its role has been characterized as follows:
  - "A name indicates what we seek.
  - An address indicates where it is.
  - A route indicates how to get there."
- The header of each IP packet contains the IP address of the sending host, and that of the destination host.

Email Basics

- Email is a service which allows us to send the message in electronic mode over the internet. It offers an efficient, inexpensive and real time mean of distributing information among people.
- Each user of email is assigned a unique name for his email account. This name is known as E-mail address. Different users can send and receive messages according to the e-mail address.
- E-mail is generally of the form username@domainname. For example, apcasgbn19@rediffmail.com is an e-mail address where apcasgbn19 is username and rediffmail.com is domain name.
  - The username and the domain name are separated by @ (at) symbol.
  - E-mail addresses are not case sensitive.
  - Spaces are not allowed in e-mail address.

Components of E-mail Message

- E-mail message comprises of different components: E-mail Header, Greeting, Text, and Signature.
- E-mail Header: The first five lines of an E-mail message is called E-mail header.
- The header part comprises of following fields:
  - From
  - Date
  - To
  - Subject
  - CC
  - BCC

- **From:** The From field indicates the sender's address i.e. who sent the e-mail.
- **Date:** The Date field indicates the date when the e-mail was sent.
- **To:** The To field indicates the recipient's address i.e. to whom the e-mail is sent.
- **Subject:** The Subject field indicates the purpose of e-mail. It should be precise and to the point.
- **CC:** CC stands for Carbon copy. It includes those recipient addresses whom we want to keep informed but not exactly the intended recipient.

- **BCC:** BCC stands for Black Carbon Copy. It is used when we do not want one or more of the recipients to know that someone else was copied on the message.
- **Greeting:** Greeting is the opening of the actual message.
- **Text:** It represents the actual content of the message.
- **Signature:** This is the final part of an e-mail message. It includes Name of Sender, Address, and Contact Number.
- **Attachment:** Ability to attach file(s) along with the message is one of the most useful features of email. The attachment may be a word document, PowerPoint presentation, audio/video files, or images. The maximum size allowed is 25 MB.

Advantages of Email

- **Productivity tools:** Email is usually packaged with a calendar, address book, instant messaging, and more for convenience and productivity.
- **Access to web services:** If you want to sign up for an account like Facebook or order products from services like Amazon, you will need an email address so you can be safely identified and contacted.
- **Easy mail management:** Email service providers have tools that allow you to file, label, prioritize, find, group, and filter your emails for easy management. You can even easily control spam, or junk email.

- **Privacy:** Your email is delivered to your own personal and private account with a password required to access and view emails.
- **Communication with multiple people:** You can send an email to multiple people at once, giving you the option to include as few as or as many people as you want in a conversation.
- **Accessible anywhere at any time:** You don't have to be at home to get your mail. You can access it from any computer or mobile device that has an Internet connection.
- **Reliable:** Many of the mail systems notify the sender if e-mail message was undeliverable.

- **Speed:** E-mail is very fast. However, the speed also depends upon the underlying network.
- Inexpensive: The cost of sending e-mail is very low.
- **Printable:** It is easy to obtain a hardcopy of an e-mail. Also an electronic copy of an e-mail can also be saved for records.
- **Global:** E-mail can be sent and received by a person sitting across the globe.
- **Generality:** It is also possible to send graphics, programs and sounds with an e-mail.

Disadvantages

- Apart from several benefits of E-mail, there also exists some disadvantages as discussed below:
  - Forgery
  - Overload
  - Misdirection
  - Junk
  - No response

- **Forgery:** E-mail doesn't prevent from forgery, that is, someone impersonating the sender, since sender is usually not authenticated in any way.
- **Overload:** Convenience of E-mail may result in a flood of mail.
- **Misdirection:** It is possible that you may send e-mail to an unintended recipient.
- **Junk:** Junk emails are undesirable and inappropriate emails. Junk emails are sometimes referred to as spam.
- **No Response:** It may be frustrating when the recipient does not read the e-mail and respond on a regular basis.

Web Development Tools

- HTML
- JavaScript
- ASP.Net
- PHP
- CSS
- Microsoft Word

- **HTML:** HTML Stands for Hypertext Markup Language. HTML is the standard markup language for creating Web pages. HTML describes the structure of a Web page. HTML consists of a series of elements. HTML elements tell the browser how to display the content.
- **JavaScript** is a text-based programming language used both on the client-side and server-side that allows you to make web pages interactive. Where HTML and CSS are languages that give structure and style to web pages, JavaScript gives web pages interactive elements that engage a user.

- **CSS:** Stands for "Cascading Style Sheet." Cascading style sheets are used to format the layout of Web pages. They can be used to define text styles, table sizes, and other aspects of Web pages that previously could only be defined in a page's HTML.
- **ASP.NET** is an open source, server-side web application framework created by Microsoft that runs on Windows and was started in the early 2000s. ASP.NET allows developers to create web applications, web services, and dynamic content-driven websites.
- **PHP** is a recursive acronym for "PHP: Hypertext Preprocessor". PHP is a server side scripting language that is embedded in HTML. It is used to manage dynamic content, databases, session tracking, even build entire e-commerce sites.

INTRODUCTION TO HTML

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05-02-2021

II BCom

HTML

- HTML stands for **H**yper **T**ext **M**arkup **L**anguage, which is the most widely used language on Web to develop web pages.
- HTML was created by Tim Berners-Lee in 1991.
- The first ever version of HTML was HTML 1.0, but the first standard version was HTML 2.0, published in 1999.
- HTML is the combination of Hypertext and Markup language.
- Hypertext defines the link between the web pages.
- Markup language is used to define the text document within tag which defines the structure of web pages.

HTML Verisons

HTML Version	Year
HTML 1.0	1991
HTML 2.0	1995
HTML 3.2	1997
HTML 4.01	1999
XHTML	2000
HTML 5	2014

Features of HTML:

- It is easy to learn and easy to use.
- It is platform independent.
- Images, video and audio can be added to a web page.
- Hypertext can be added to text.
- It is a markup language.

Why learn HTML?

- It is a simple markup language. Its implementation is easy.
- It is used to create a website.
- Helps in developing fundamentals about web programming.
- Boost professional career.

- **Advantages:**
  - HTML is an easy to learn, easy to apply and it's totally free you will just need a text editor and a browser.
  - It is supported by all browsers.
  - It can be integrated with other languages like CSS, JavaScript etc.
- **Disadvantages:**
  - HTML can only create static webpages. For dynamic webpages, other languages have to be used.
  - A large amount of code has to be written to create a simple web page.
  - There is Lack of security in HTML.
  - HTML language is not centralized i.e. all the web-pages that are connected, you have to design them separately else need to use CSS.
  - HTML become complex when you try to create a huge website.

HTML Tags

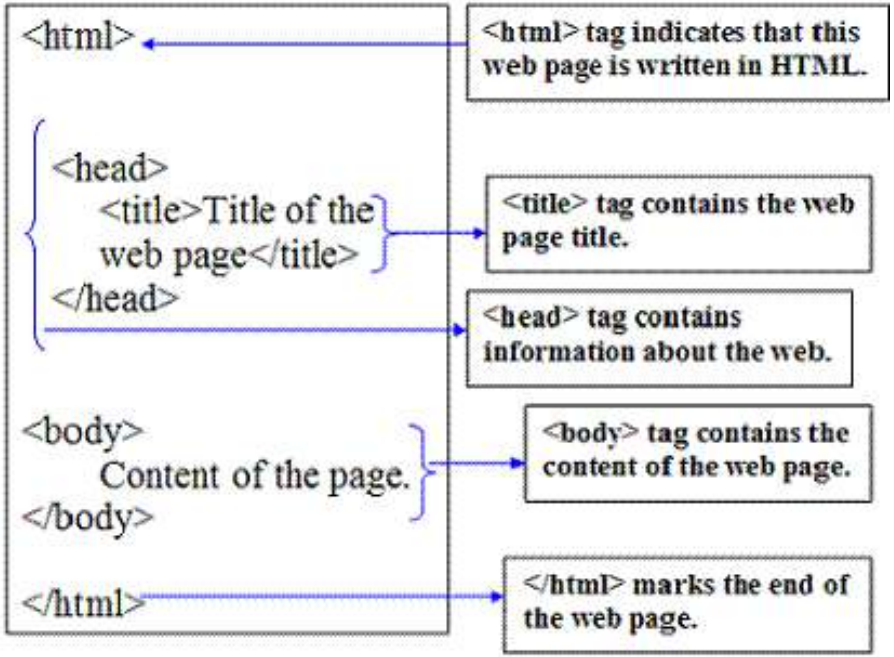
- HTML tags are like keywords which defines that how web browser will format and display the content.
- Tags are used to represent various elements of web page like Header, Footer, Title, Images etc.,
- With the help of tags, a web browser can distinguish between an HTML content and a simple content.
- When a web browser reads an HTML document, browser reads it from top to bottom and left to right.
- HTML is made up of tags and its attributes. Tags are known as elements of HTML. Additional information such as color, alignment etc., can be included with an HTML tag is known as **Attribute**. Attributes are used to improve the appearance of an HTML document.

- All HTML tags must enclosed within < > these brackets.
- HTML tags are normally comes with pairs like and
- The first tag in a pair is the start tag, the second tag is the end tag.
- Start and end tags are also called as opening tags and closing tags.
- It is mandatory to include closing tags. If omitted, the browser applies the effect of the opening tag until the end of page.
- Tags are of two types
  - Paired or Container Tags
  - Singular or Empty Tags

- **Paired tags or Container Tags:**
  - Paired tags require an opening tag that turns a formatting feature on and a closing tag that turns the feature off.
  - Paired tags must surround the text you want formatted with that feature.
  - For example, <u> and </u> will underline text.
- **Singular Tags or Empty Tags:**
  - Unpaired tags work alone, and are usually placed before the text you want formatted.
  - For Example, The <hr> which is used to draw horizontal line across the width of the document and line break <br> tags are empty tags.

Structure of HTML

- All HTML documents must begin with opening tag <html> and ending with </html>.
- An HTML Document is mainly divided into two parts:
  - **HEAD:** This contains the information about the HTML document. For Example, Title of the page, version of HTML, Meta Data etc. This section begins with <head> and ends with </head>. The <title>….. </title> is used to display the title of the web page in browser window.
  - **BODY:** This contains everything you want to display on the Web Page. The Body Section begins with <body> and ends with </body> . Every content enclosed within this tag will be shown on the web page, it maybe a text or images or audios or videos or even links.


<html>
<head>
<title>Title of the
web page</title>
</head>
<body>
Content of the page.
</body>
</html>
<html> tag indicates that this web page is written in HTML.
<title> tag contains the web page title.
<head> tag contains information about the web.
<body> tag contains the content of the web page.
</html> marks the end of the web page.

Simple Webpage


```
<html>
<head>
        <title> First Web page </title>
</head>
<body>
        Welcome to B.Com Students
</body>
</html>
```

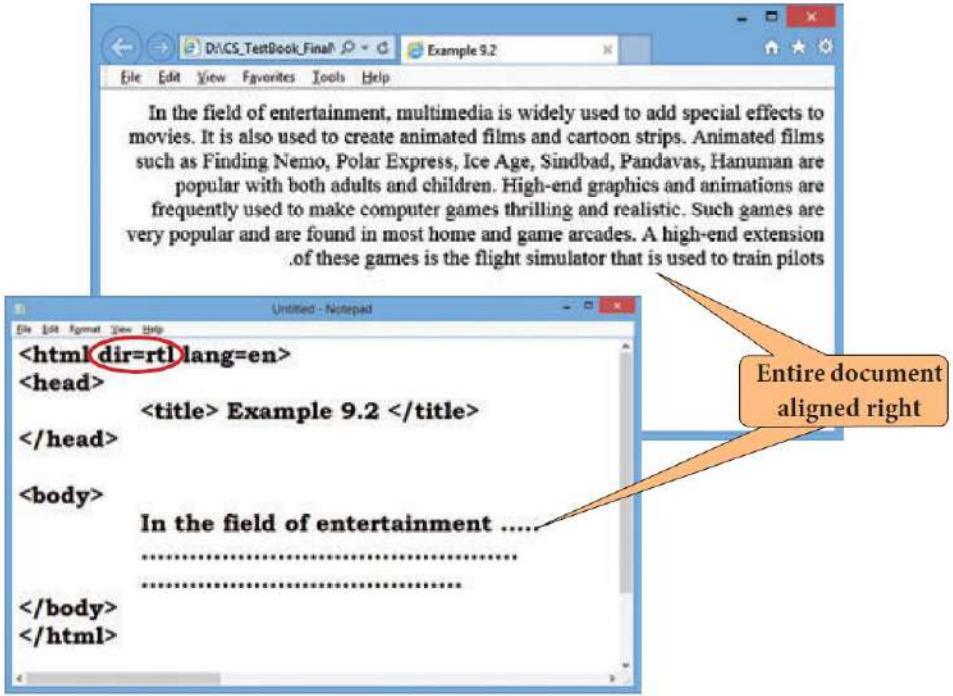
Attributes

- Attributes are special words used inside a tag to specify additional information to a tag.
- Attributes should be placed within the opening tag.
- Most of the tags support specialized attributes and there are also a few global elements that can be used with any tag.
- Global elements are common to all HTML elements; they can be used on all elements.

Attributes of <html> tag

- The <html> tag is used to specify the beginning and closing of an HTML document.
- This tag does not have any effect on appearance of document.
- This is only used to make browsers and other programs, known that this is an HTML document.
- <html> tag has two attributes viz. **dir and lang** to specify the text direction and language setting respectively.

attribute	Value to be set to attribute	Description
dir	ltr (align left-to-right) rtl (align right-to-left)	dir attribute specifies the direction of the text to be aligned within the entire document. It is global attribute. • ltr is the default value • rtl is used for Arabian languages.
lang	Predefined language code English – en Tamil – ta Telugu – te	lang attribute specify the language used with in the document. Predefined language code will be used for this purpose. Malayalam – ml; Kannada – kn; Hindi – hi; French – fr; German – de;


D:\CS_TextBook_Final\
Example 9.2
File Edit View Favorites Tools Help
In the field of entertainment, multimedia is widely used to add special effects to movies. It is also used to create animated films and cartoon strips. Animated films such as Finding Nemo, Polar Express, Ice Age, Sindbad, Pandavas, Hanuman are popular with both adults and children. High-end graphics and animations are frequently used to make computer games thrilling and realistic. Such games are very popular and are found in most home and game arcades. A high-end extension .of these games is the flight simulator that is used to train pilots
Untitled - Notepad
<html dir=rtl lang=en>
<head>
<title> Example 9.2 </title>
</head>
<body>
In the field of entertainment ....
.....
.....
</body>
</html>
Entire document aligned right

Attributes of <body> tag

- The <body> tag defines the document's body. The contents of an HTML page reside within the <body> tag. <body> tag contains several attributes.

  (i) Background Color: bgcolor = color

- By default all the browsers display the text on white background. However, the background color of the browser can be changed by using **bgcolor** tag.
- The tag to change background colour:

  <body bgcolor = color_name/color_code>

Illustration 10.1 – HTML code to change background colour of a browser

```
<html>
<head>
        <title> Background Colour change </title>
</head>
        <body bgcolor = yellow>
                This is my browser with different colour
</body>
</html>
```

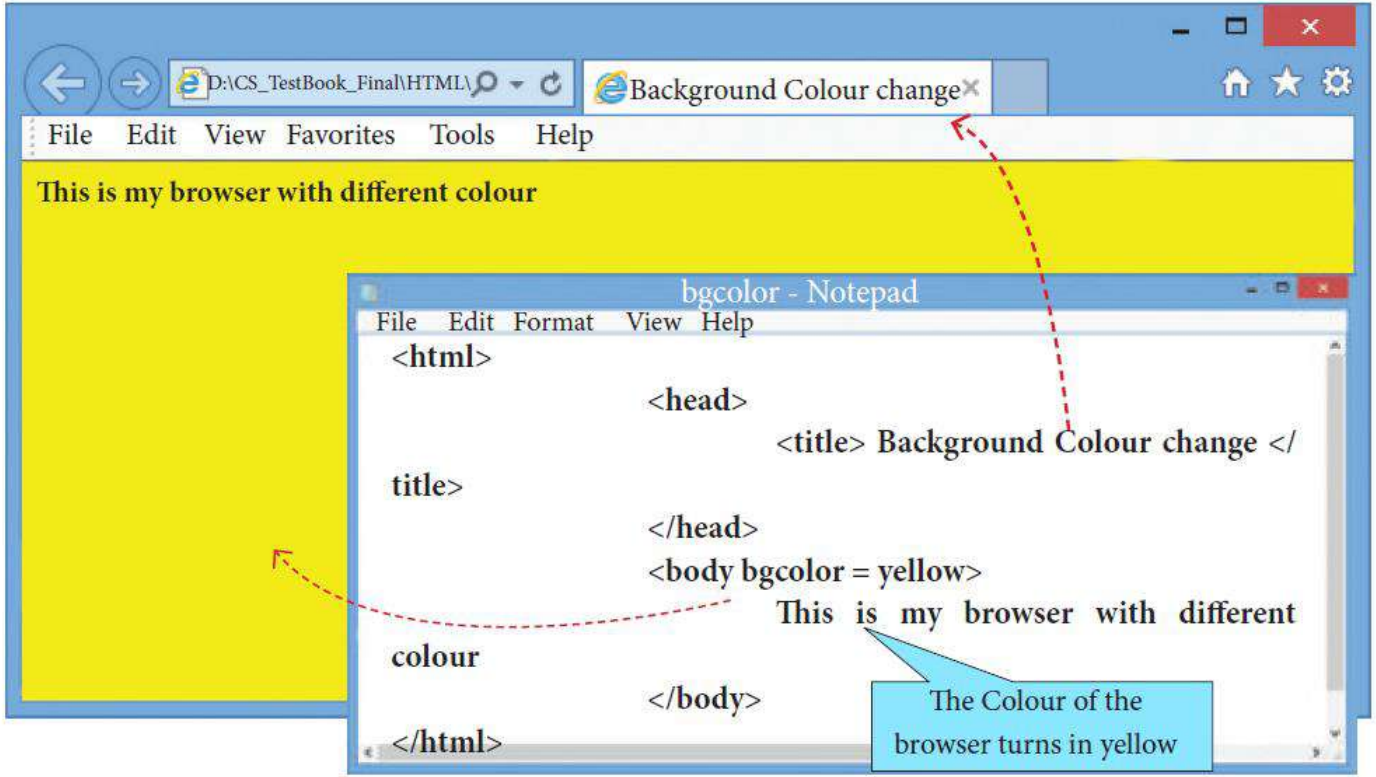


Figure 10.9 Internet Explorer with Yellow background

- In the above HTML code, colour name has been used to change the background color of the browser's body section.
- Generally colors in HTML are represented as six digit hexadecimal values.
- Color name can be used for only few colors. But, color code (hexadecimal value) will be more flexible to handle colors.
- The six digit hexadecimal value is the combinations of three, two digit number sequence represent a color. First two digits represent Red, next two digits for Green and last two digits for Blue (RGB) in the range of 00 – FF.
- For example, 000000 is black and FFFFFF is white. FF0000 is bright red.
- Modern browsers support nearly 140 colors.
- Color code should be prefixed with #.

- The following table shows some basic colors with their hexadecimal code.

Table 10.2 – Some basic Color names with code

Color Name	Hexadecimal value	Color Name	Hexadecimal value
Red	#FF0000	Olive	#808000
Blue	#0000FF	White	#FFFFFF
Green	#008000	Black	#000000
Yellow	#FFFF00	Maroon	#800000
Lime	#00FF00	Grey	#808080
Purple	#800080	Aqua	#00FFFF
Silver	#C0C0C0	Brown	#A52A2A

- To know the complete color code visit:
- https://www.w3schools.com/tags/ref_colornames.asp

File Edit View History Bookmarks Tools Help

Background Colour change

file:///C:/Users/Dr.PV.Praveen Sundar/Desktop/Bcom/color.html 300% Search

This is my browser with different colour

color - Notepad

File Edit Format View Help

```
<html>
<head>
<title> Background Colour change </title>
</head>
<body bgcolor = #87CEFA>
This is my browser with different colour
</body>
</html>
```

Ln 1, Col 1 100% Windows (CRLF) UTF-8

To change the background text Color

- Body text Colour: text = color
- The default text colour of body section is “black”, it is often called as automatic color.
- The text attribute within body tag is used to change the text colour.
- The tag to change body text colour:

<body text = color_name/color_code>

File Edit View History Bookmarks Tools Help

Background Colour and Text chang

file:///C:/Users/Dr.PV.Praveen Sundar/Desktop/Bcom/color.html 300%

Search

This is my browser with different colour and Text

color - Notepad

File Edit Format View Help

```
<html>
<head>
<title> Background Colour and Text change </title>
</head>
<body bgcolor = #87CEFA Text= #FF00FF>
This is my browser with different colour and Text
</body>
</html>
```

Ln 6, Col 50 100% Windows (CRLF) UTF-8

To change the Background Image

- Background image: **background=image**
- An image or picture can be applied as background to a webpage. While inserting an image as background, the text will be displayed on top of the image.
- Background images can be a texture or bitmap or even a photo.
- When you insert a small image, the browser takes the image and repeats it across and down to fill browser window. Inserting animated images (GIF images) creates more interesting.
- The tag to apply an image as background:
- <body background = “image_name_with_extenstion”>

Illustration 10.3 – HTML code to apply an image as background

```
<html>
<head>
        <title> Image as background </title>
</head>
        <body background = "flower01.gif">
        This is my browser with an image as background
</body>
</html>
```

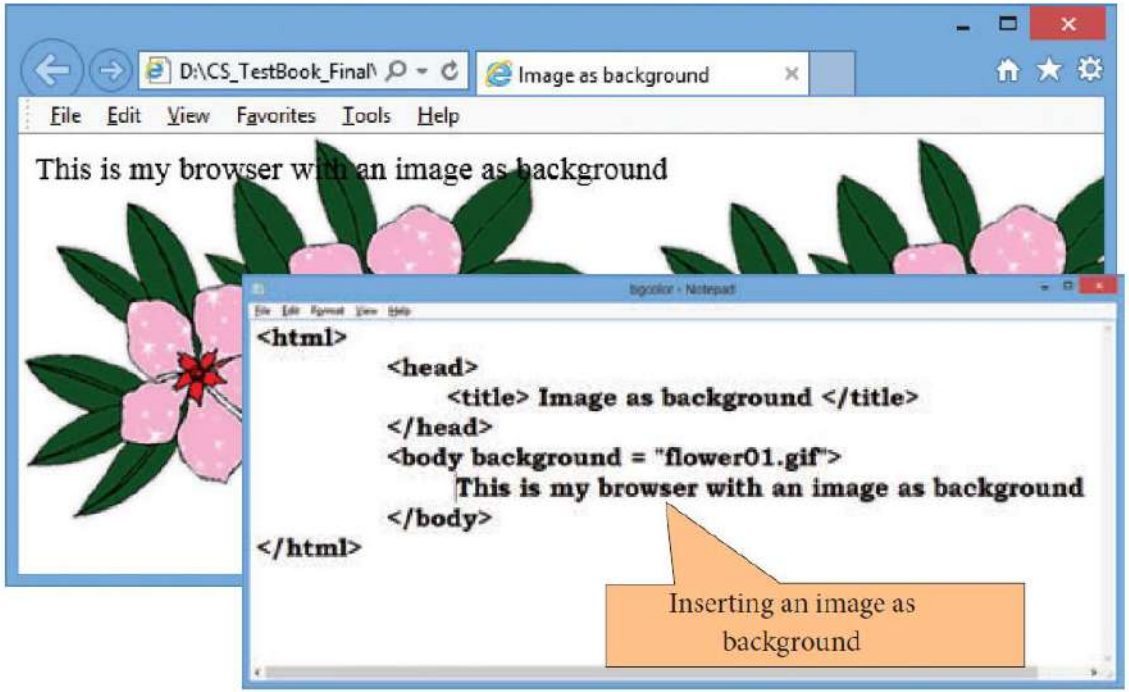
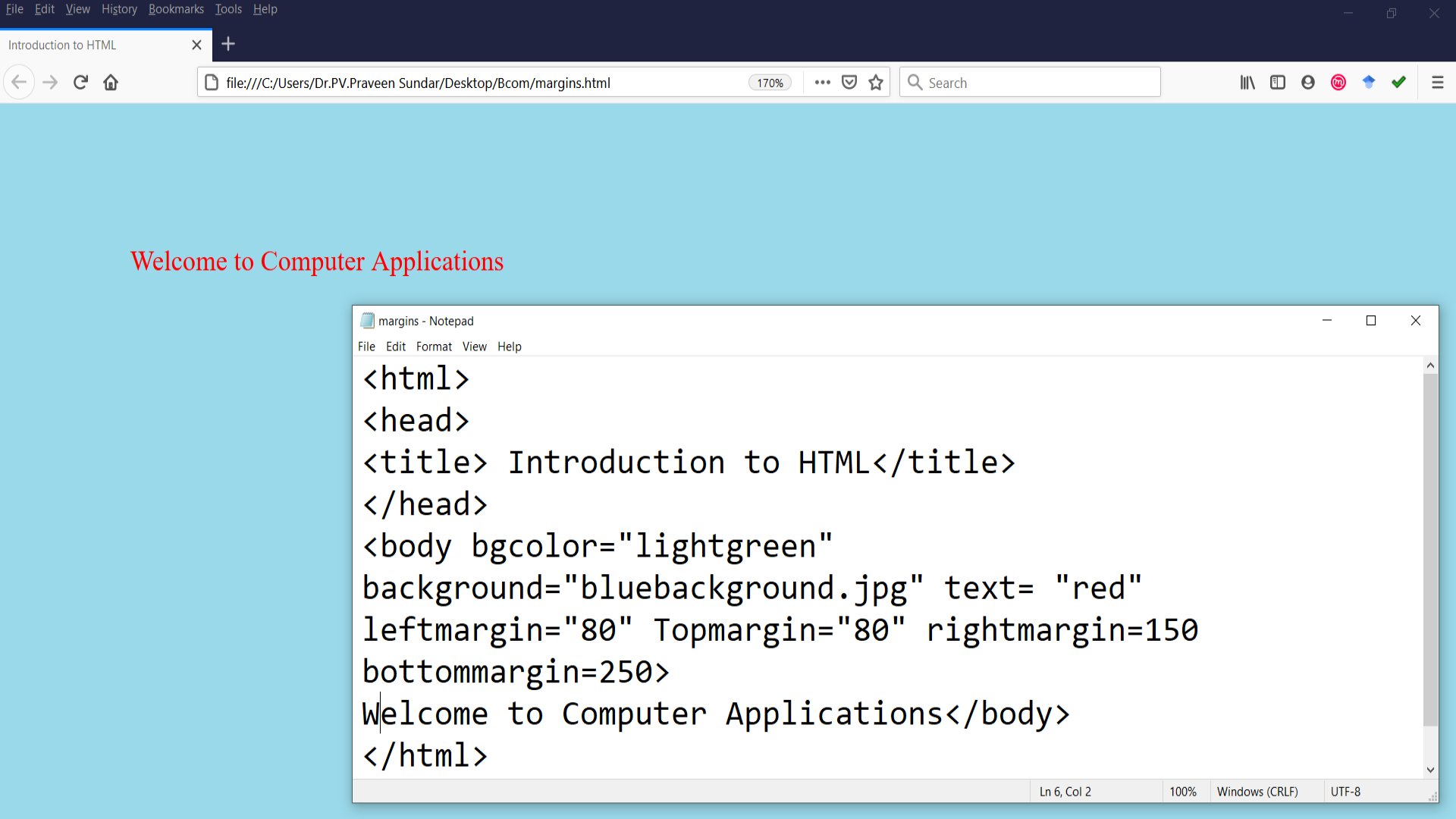


Figure 10.10 Internet Explorer with an image as background

- While including an image as background, the image file name is not required to be in double quotes. The code <body background = flower01.gif> can also produce the same result.
- If your image file name is long or split as two more words or along with path, should be specify within double quotes.
- Remember that, if the image file and HTML source are located in different locations i.e. in different folder or drive, file path should be clearly specified along with image file name. In the above case, image file and HTML source file both are located within the same folder. So, path name is not mentioned.
- For example, If the image file is somewhere in a folder (say Images folder in E: drive), you must specify its full path within double quotes as given below.
- **<body background = "E:\Images\ flower01.gif">**

Setting Margin Values

- Setting Margins: margin = value
- The margin refers the blank area from left, right, top edge or Bottom Edge of the browser window.
- Generally there is no default margin setting in any browser. If you want to leave some space as margin to left,right,top or bottom; leftmargin or topmargin or rightmargin or bottommargin attributes will be used respectively.
- The tag to specify the left, right, top and bottom margin:
- **<body leftmargin = value topmargin = value rightmargin=value bottom margin=value>**
- The Value is referred as pixels (72 pixels to an inch)


File Edit View History Bookmarks Tools Help
Introduction to HTML
file:///C:/Users/Dr.PV.Praveen Sundar/Desktop/Bcom/margins.html
170%
Search
Welcome to Computer Applications
margins - Notepad
File Edit Format View Help
<html>
<head>
<title> Introduction to HTML</title>
</head>
<body bgcolor="lightgreen"
background="bluebackground.jpg" text= "red"
leftmargin="80" Topmargin="80" rightmargin=150
bottommargin=250>
Welcome to Computer Applications</body>
</html>
Ln 6, Col 2
100%
Windows (CRLF)
UTF-8

Headings

- Headings are used to include titles to sections of a web page.
- HTML has six levels of headings viz. <h1> to <h6>.
- The number with h indicates the level of heading. Header tags are display the body text as bolder and larger in size according to its level.
- The syntax of heading tags:
- <h…> Heading text </h…>

HTML code with Headings


```
<html>
        <head>
                <title> Heading </title>
</head>
<body>
        <h1> Welcome to Computer Application</h1>
        <h2> Welcome to Computer Application</h2>
        <h3> Welcome to Computer Application</h3>
        <h4> Welcome to Computer Application</h4>
        <h5> Welcome to Computer Application</h5>
        <h6> Welcome to Computer Application</h6>
</body>
</html>
```

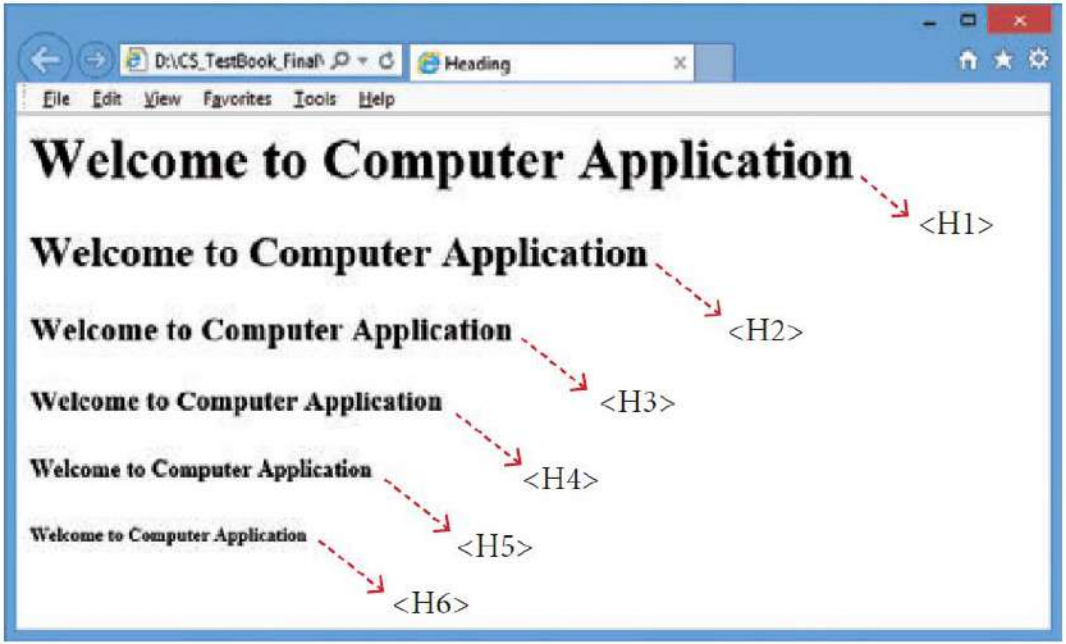


Figure10.12 – Different levels of Headings

Attribute of Headings tag

- Align is an attribute to set right, center and justify alignment to headings. Left if the default alignment, so that it is not supported in latest version of HTML. Justify alignment is not supported by older browsers.
- The tag is to specify the alignment to headings:

  <h# align = value>

- Where # is the level number, value may be Right, Center or Justify. Justify alignment only used for paragraphs.

```
<html>
        <head>
                <title> Heading </title>
</head>
<body>
        <h1 align=center> Welcome to Computer Application </h1>
        <h2 align=right> Welcome to Computer Application </h2>
</body>
</html>
```


E:\CS_TestBook_Final\
Heading
File Edit View Favorites Tools Help
Welcome to Computer Application
Welcome to Computer Application
<h1 align=center> Welcome to Computer Application </h1>
<h2 align=right> Welcome to Computer Application </h2>

Line Breaks and Paragraphs

- Browser applications are having some special rules for displaying text.
- They do not recognize returns, tabs or even more than one space between words.
- Usually, HTML document with multiple lines of text, browser will display it as a single line.
- The **
** tag is used for line break.
- The <br> is an empty tag, does not have close tag and attribute.
- It should be placed at the end of a line

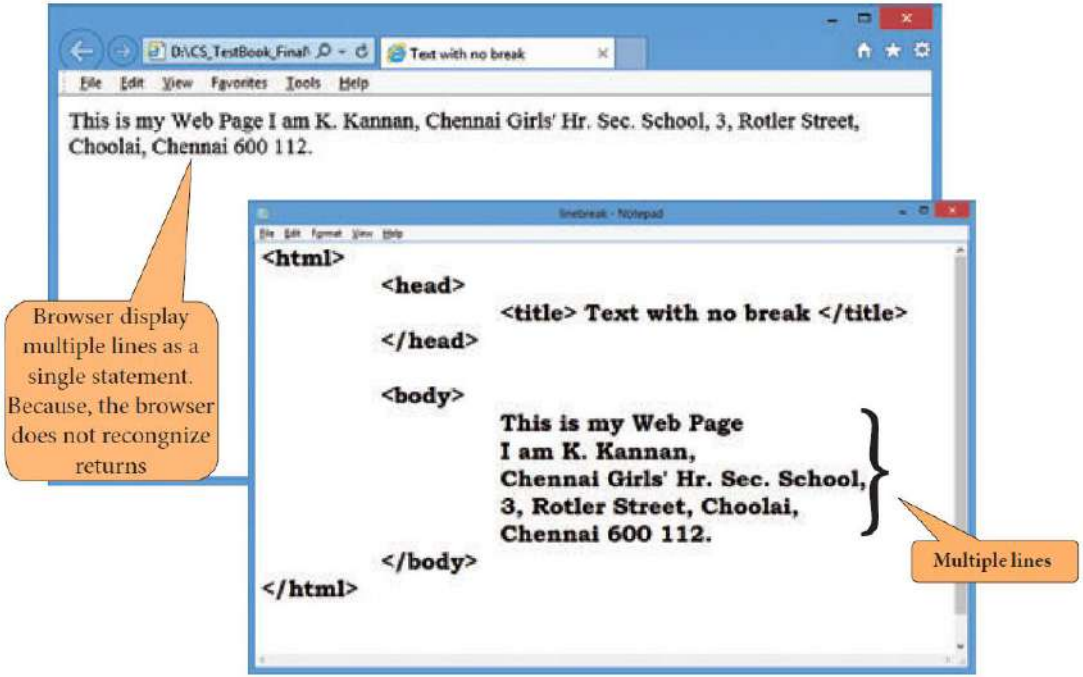


Figure 10.14 Multiline statement displayed as Single line

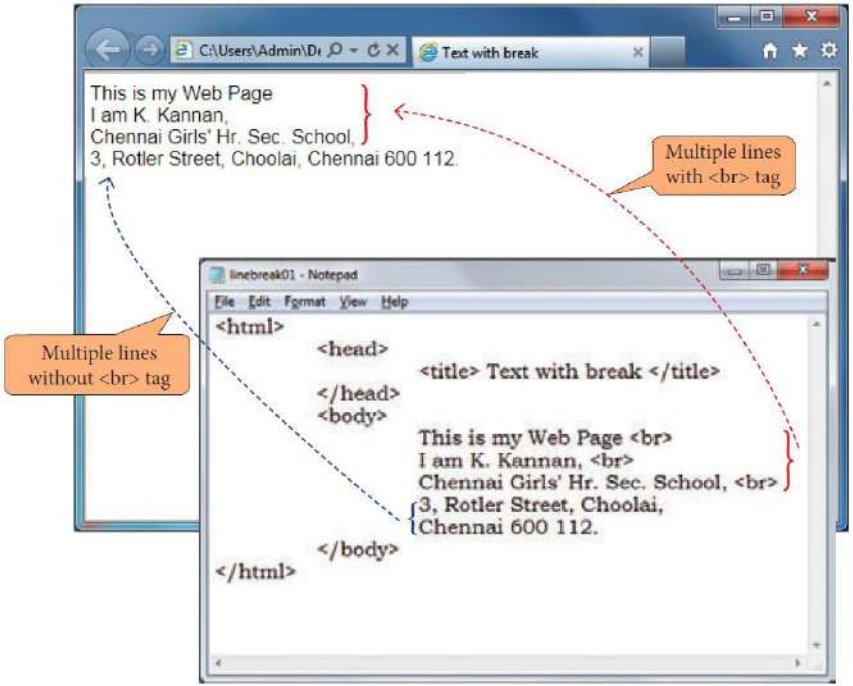


Figure 10.15 Usage of <br> tag

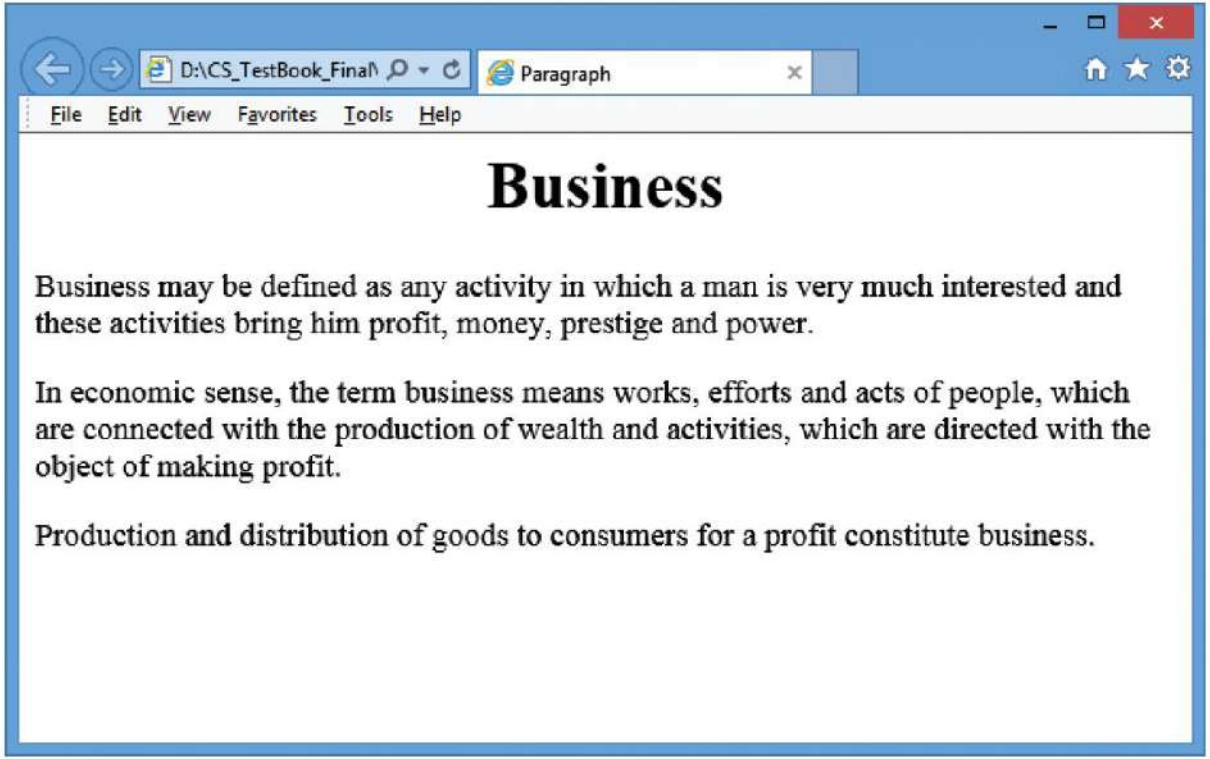
Paragraph Tag

- In HTML, paragraphs are created using the tag.
- The content what you type between and is identified as a paragraph and display as a paragraph by the browser. Because, the browser does not recognize returns (Pressing “Enter” Key).
- Remember that in word processors, pressing “Enter” key is identifying a paragraph.

HTML Code to create a paragraph


```
<html>
        <head>
                <title> Paragraph </title>
</head>
<body>
        <h1 align=center> Business </h1>
<p> Business may be defined as any activity in which a man is very much interested and these activities bring him profit, money, prestige and power. </p> <p> In economic sense, the term business means works, efforts and acts of people, which are connected with the production of wealth and activities, which are directed with the object of making profit.</p> <p> Production and distribution of goods to consumers for a profit constitute business. </p>
</body>
</html>
```

Browser with paragraphs

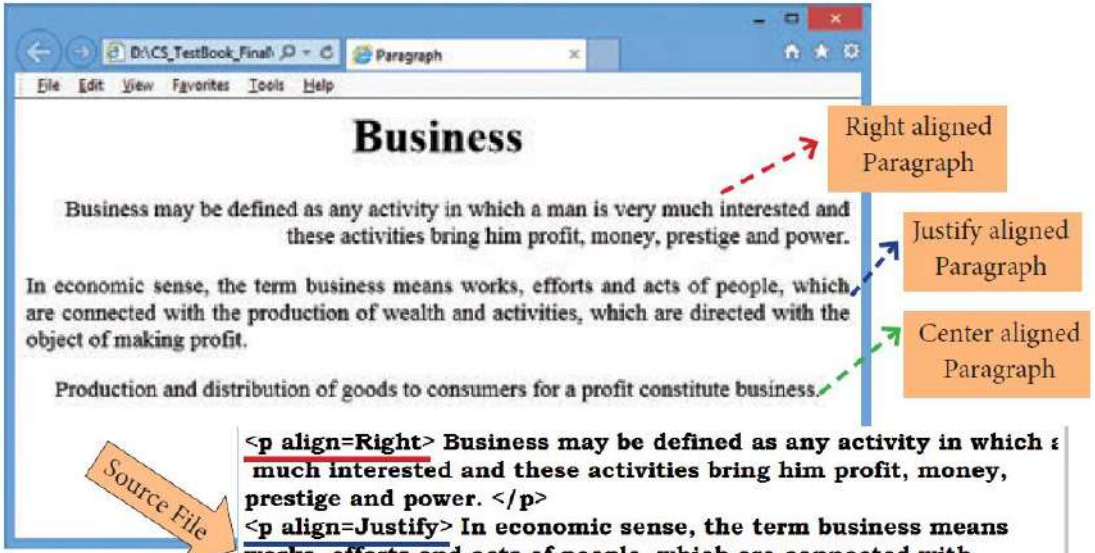


Changing Paragraph alignment

- In HTML documents more are four paragraph alignments viz. Left, Right, Center and Justify.
- The text that you type between and is by default aligned to left.
- To change the alignment of a paragraph align attribute can be used with tag.
- The tag to specify the alignment to paragraphs:

  ** **

- Where alignment can either be Right, Center or Justify.


D:\CS_TestBook_Final\
Paragraph
File Edit View Favorites Tools Help
Business
Business may be defined as any activity in which a man is very much interested and these activities bring him profit, money, prestige and power.
In economic sense, the term business means works, efforts and acts of people, which are connected with the production of wealth and activities, which are directed with the object of making profit.
Production and distribution of goods to consumers for a profit constitute business.
Right aligned Paragraph
Justify aligned Paragraph
Center aligned Paragraph
Source File
 Business may be defined as any activity in which a
much interested and these activities bring him profit, money,
prestige and power.
 In economic sense, the term business means
works, efforts and acts of people, which are connected with
the production of wealth and activities, which are directed with
the object of making profit.
 Production and distribution of goods
to consumers for a profit constitute business.

Comments

- Comments are used to describe the page or provide some kind of indication of the status of the page.
- The tag <!> is used to create comments.
- In HTML, the text what you type within this tag is considered as comments and it is ignored by the browser.
- Comments never show up onscreen.
- Comments can be placed anywhere in HTML document.
- The general form of comments:

  <! comments >

File Edit View History Bookmarks Tools Help

First Web page

file:///C:/Users/Dr.PV.Praveen Sundar/Desktop/Bcom/simple.html 200% Search

Welcome to B.Com Students

simple - Notepad

File Edit Format View Help

```
<html>
<head>
        <title> First Web page </title>
</head>
<body>
        Welcome to B.Com Students
        <! This is an Example for Comments>
</body>
</html>
```

Ln 1, Col 1 100% Windows (CRLF) UTF-8

Text Formatting Tags of HTML

- Formatting text is very important as well as interesting task in creating web pages.
- Formatting is purely based on the imagination and creativity of the programmer.
- Format the text such as making bold, italic, underline, changing font style, font size, font color and more.
- **<b>, <i>, <u>** are the tags to make the text as bold, italic and underline. These are all container tags.
- In addition to bold and italic tags, HTML provides , tags to make the text as bold and italics. These tags are container tags.

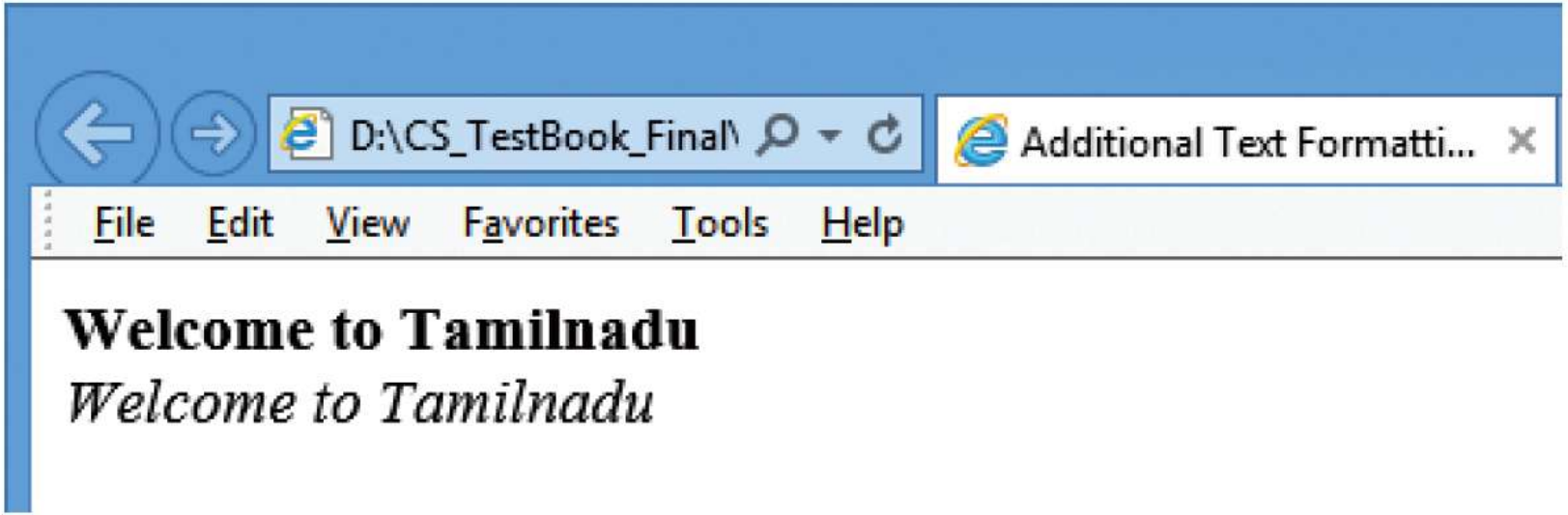
- ** : Important text**
- The tag is a phrase tag. It is used to define important text. This tag displays the text as bold.
- ** - Emphasized text**
- The tag is used to emphasize the text. That means, when you use this tag, the text will be in italics.
- Visually these two tags display the contents as very similar as <b> and <i> respectively. But, technically the meaning of and is “Important” not just bold and italics.
- The **<big>** tag is used to define the text bigger in size than the normal size. It is often used to call attention a text.
- The **<small>** tag is used to define the text smaller than the current size.

```
<html>
<head>
        <title> Text Formatting </title>
</head>
<body>
        <h1 align = center>  Kancheepuram </h1>
        <b> Kanchipuram is part of Tondaimandalam </b> <br>
        <i> Kanchipuram is 72 km away from Chennai </i>  <br>
        <u> It is the administrative headquarters of Kancheepuram District. </u>
<br>
        <b><i> Kanchipuram is well-connected by road and rail. </i> </b>
    <p> Chennai <b> International Airport </b> is the nearest domestic and
    international airport to the town, which is located at Tirusulam in Kanchipuram
    district. </p>
</body>
</html>
```


D:\CS_TestBook_Final\
Text Formatting
File Edit View Favorites Tools Help
Kanchipuram
Kancheepuram is part of Tondaimandalam
Kanchipuram is 72 km away from Chennai
It is the administrative headquarters of Kanchipuram District.
Kanchipuram is well-connected by road and rail.
Chennai International Airport is the nearest domestic and international airport to the town, which is located at Tirusulam in Kanchipuram district.

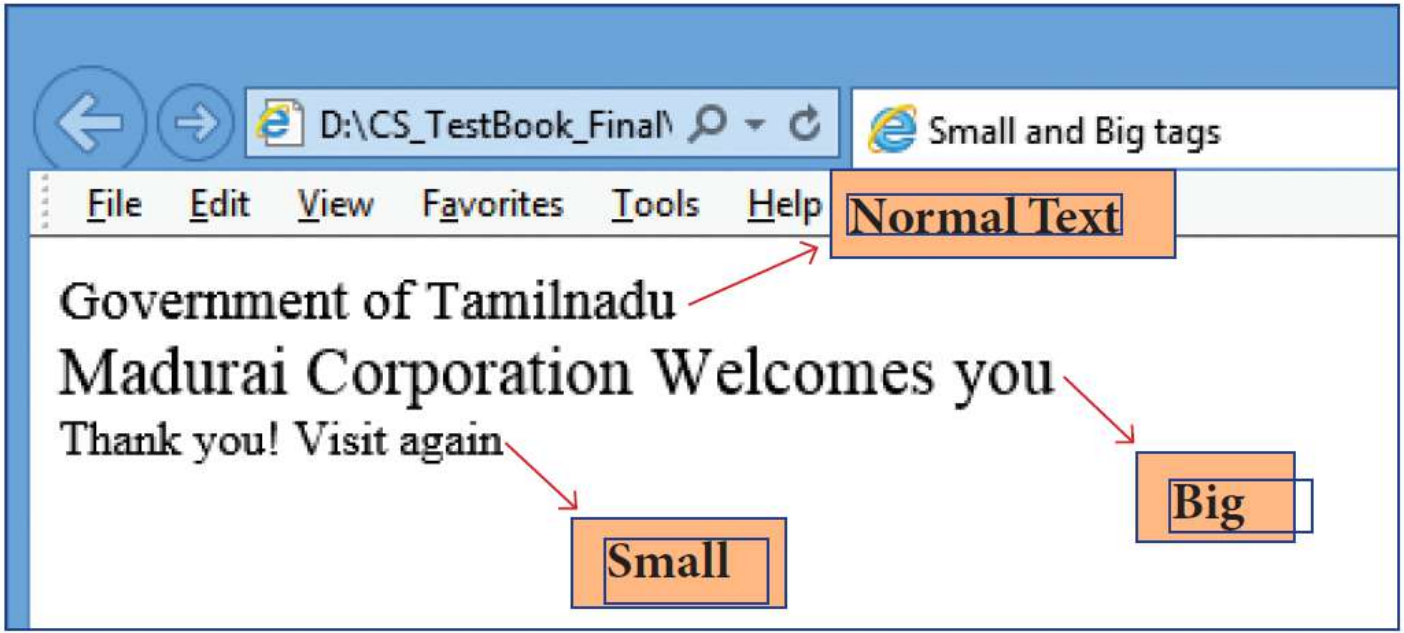
Usuage of Strong and em tag


```
<html>
    <head>
        <title> Additional Text Formatting Tags </title>
    </head>
    <body>
        <strong> Welcome to Tamilnadu  </strong> <br>
        <em> Welcome to Tamilnadu </em>
    </body>
    </html>
```


D:\CS_TestBook_Final\
Additional Text Formatti...
File Edit View Favorites Tools Help
Welcome to Tamilnadu
Welcome to Tamilnadu

Usage of <big> and <small>


```
<html>
<head>
<title> Small and Big tags </title>
</head>
<body>
        Govenment of Tamilnadu <br>
        <big>  Madurai Corporation welcomes you </big> <br>
        <small> Thank you! Visit again </small>
</body>
</html>
```

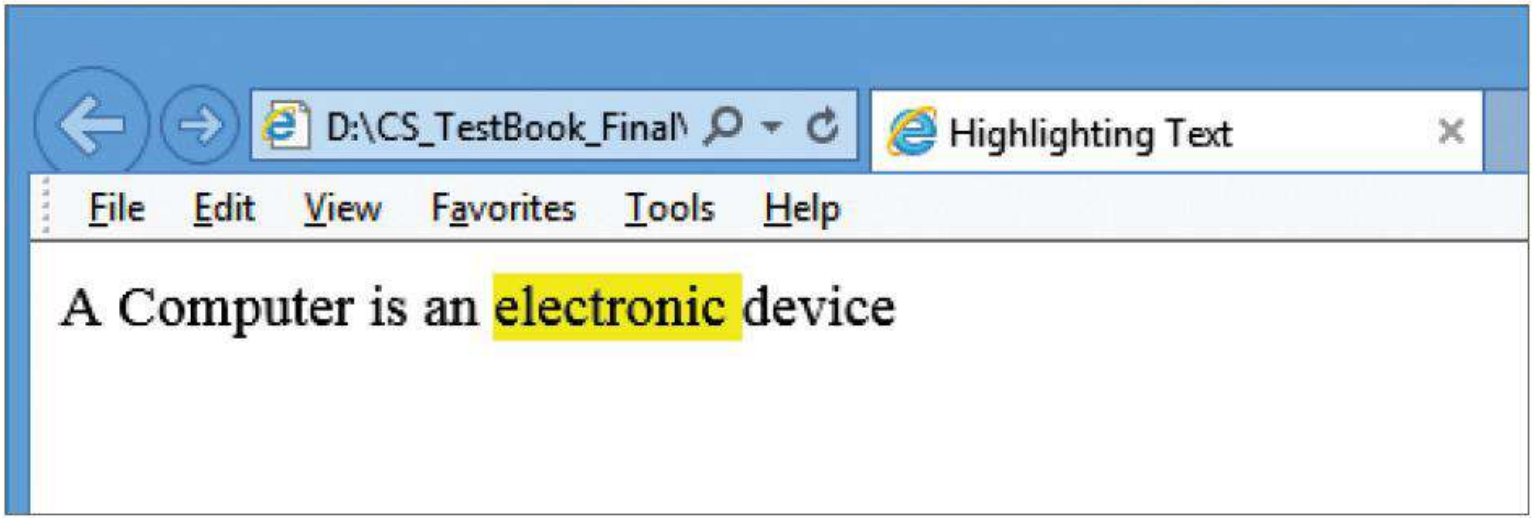

D:\CS_TestBook_Final\
Small and Big tags
File Edit View Favorites Tools Help
Normal Text
Government of Tamilnadu
Madurai Corporation Welcomes you
Thank you! Visit again
Big
Small

Highlighting Text

- Highlighting is an important formatting feature is used to call attention to the reader.
- The **<mark>** tag is used to highlight the text in HTML.
- This is also a container tag.
- Whatever the text given between <mark> and </mark> will be displayed as highlighting with default color (mostly yellow).

Usage of <mark>


```
<html>
<head>
<title> Highlighting text </title>
</head>
<body>
        A Computer is an <mark> electronic </mark> device
</body>
</html>
```

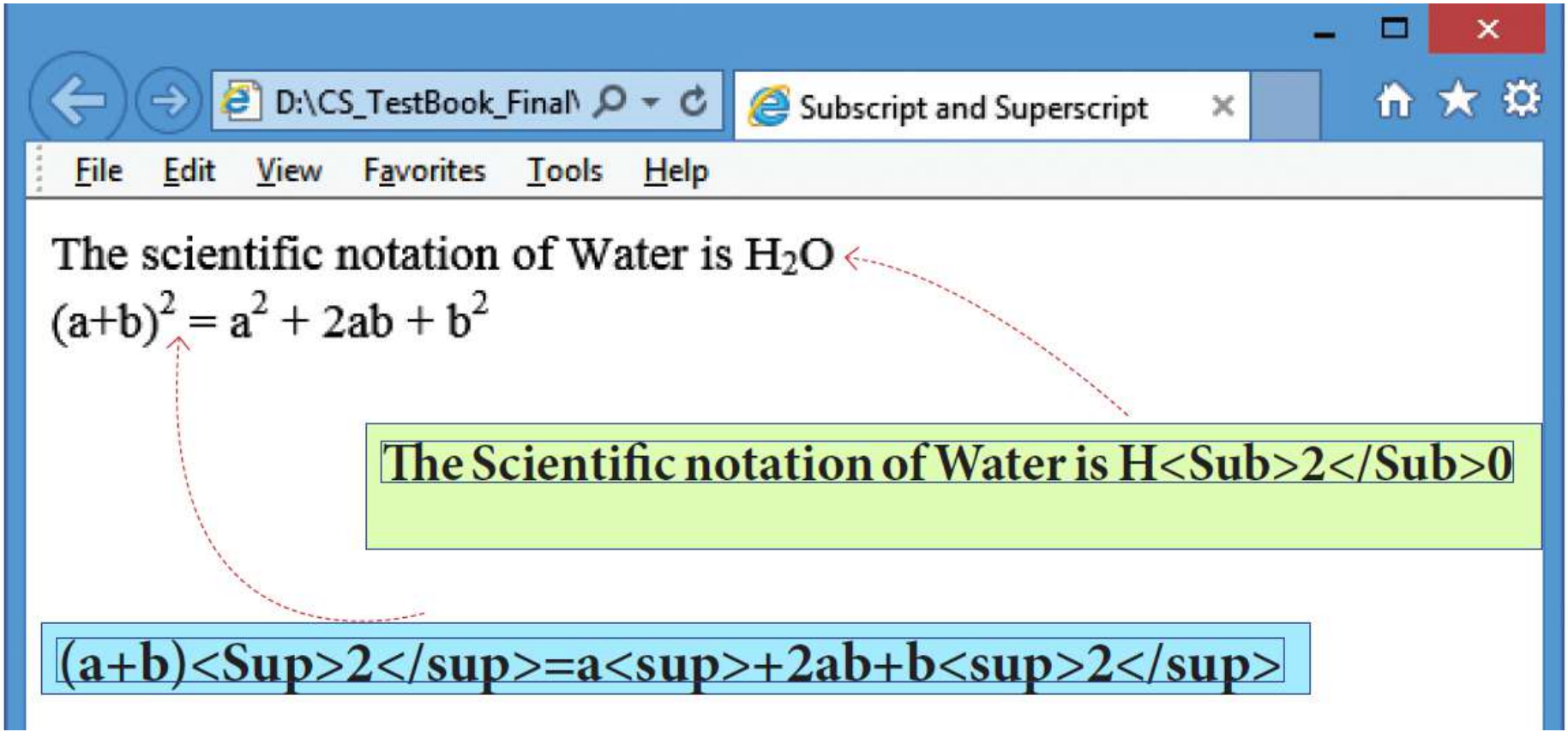

D:\CS_TestBook_Final\
Highlighting Text
File Edit View Favorites Tools Help
A Computer is an electronic device

Subscript and Superscript

- A Subscript is a way to display a character or a number below the normal line of type. For example: The scientific notation for water is H_2O. It should be written as H_2O. Here, 2 is appearing below the normal line. This is called **Subscript**.
- A Superscript is also a way to show a character or a number above the normal line of type. For example: The familiar algebra equation "a plus b the whole square" should be written as $(a+b)^2$. Here, the square value 2 is appearing above the normal line. This is called **Superscript**.
- Usually, the subscript and the superscript character or number is smaller than the rest of the text.
- In HTML, the <sub> and <sup> tags are used to create subscript and superscripts respectively.
- As like as other formatting tags, this is also a container tag.
- The text or number given between _{and} will be displayed as **Subscript**. Same as subscript, the text or number given between ^{and} will be displayed as Superscript.

Usage of <sub> and <sup>

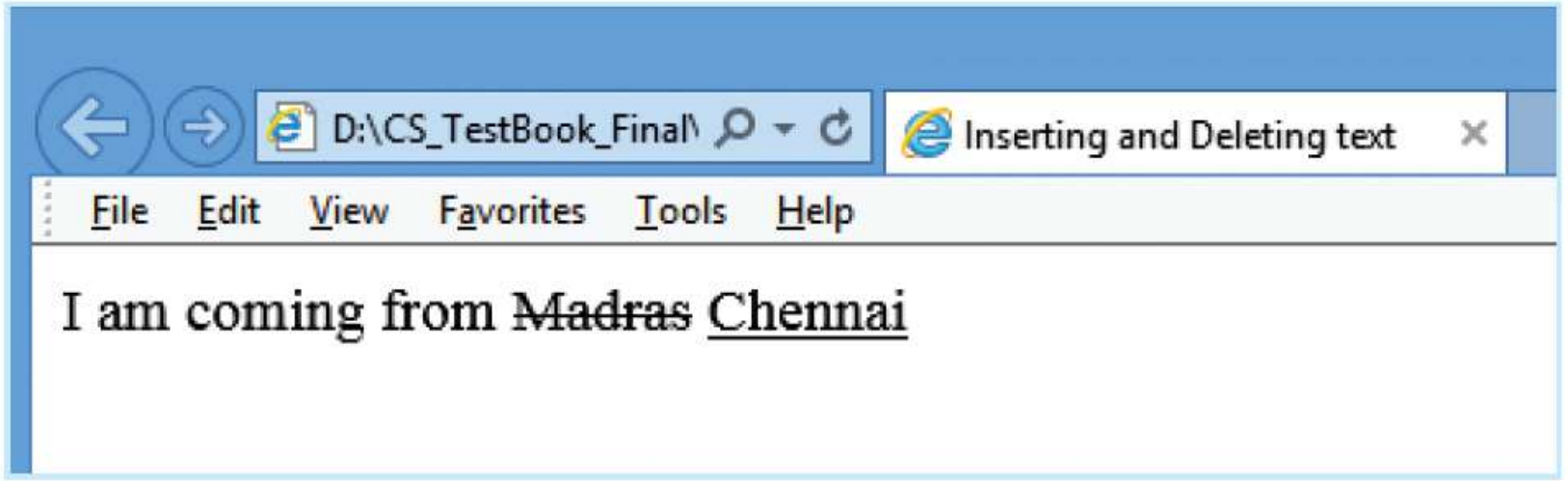

```
<html>
<head>
<title> Subscript and Superscript </title>
</head>
<body>
        The scientific notation of Water is H<sub>2</sub>O <br>
        (a+b)<sup>2</sup> = a<sup>2</sup> + 2ab + b<sup>2</sup>
</body>
</html>
```


D:\CS_TestBook_Final\
Subscript and Superscript
File Edit View Favorites Tools Help
The scientific notation of Water is H_2O
$(a+b)^2 = a^2 + 2ab + b^2$
The Scientific notation of Water is H₂0
(a+b)²=a^{+2ab+b²}

Inserting and Deleting

- **<del>** and **<ins>** tags are used to markup a segment of text as deleted or inserted respectively. These two tags are container tags.
- The text what you specify between <del> and </del> will be displayed as strike through.
- The text you specify between <ins> and </ins> will be shown as underlined.
- To display a text as wrong text, the **<s>** tag can be used to show the text as strike through style.
- The <s> and <del> tags are display the text in similar way. This is also a container tag.
- The text you specify between <s> and </s> will be display in strike through style.

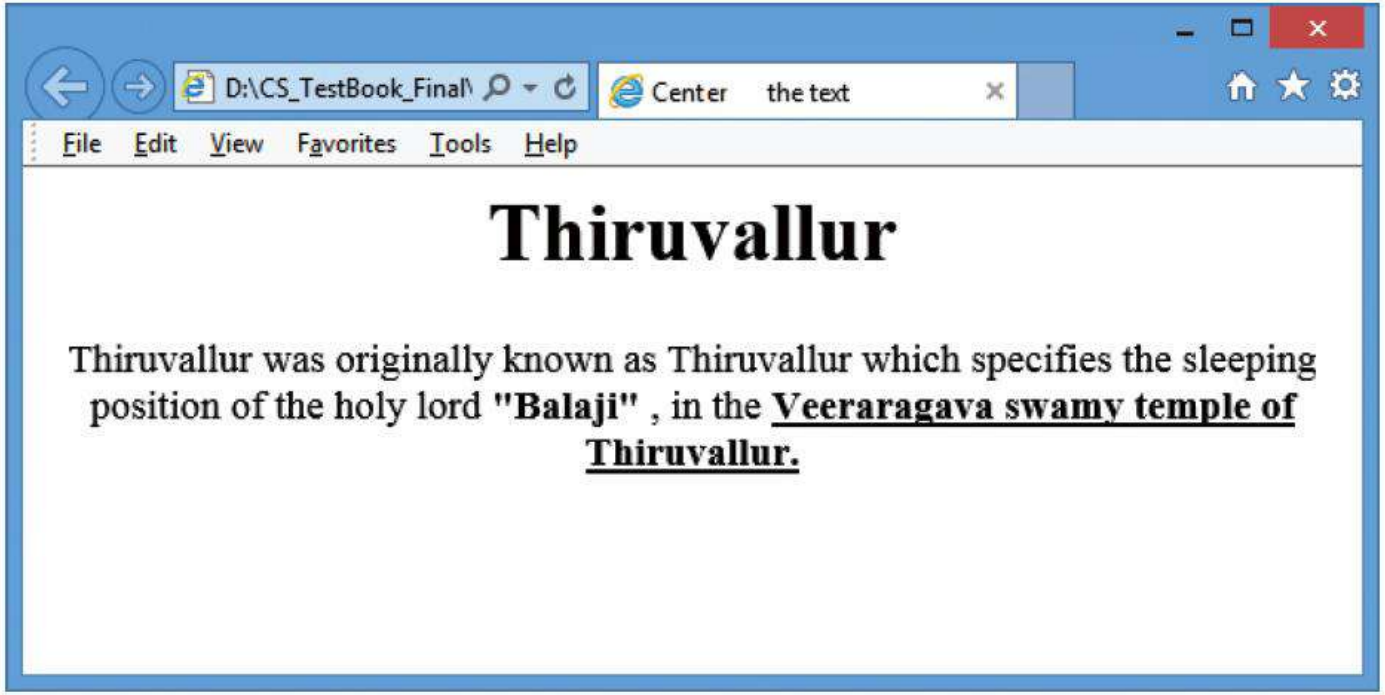
```
<html>
<head>
<title> Inserting and Deleting text </title>
</head>
<body>
                I am coming from <del> Madras</del>  <ins> Chennai </ins>
</body>
</html>
```


D:\CS_TestBook_Final\
Inserting and Deleting text
File Edit View Favorites Tools Help
I am coming from Madras Chennai

The Center Tag

- Paragraphs can be centered with Align attribute with <p> tag.
- For non-paragraph text contents can be centered with tag.
- The tag is used to centralize a segment of text.
- It is a container tag. That means, what you type between and will be displayed in the center of the browser.

```
<html>
    <head>
        <title> Center the text </title>
    </head>
    <body>
        <h1 align = center> Thiruvallur </h1>
    <center> Thiruvallur was originally known as Thiruvallur which specifies the
    sleeping position of the holy lord <b> "Balaji" <b>, in the
    <b> <u> Veeraragava swamy temple of Thiruvallur. </b> </u> </center>
</body>
</html>
```


D:\CS_TestBook_Final\
Center the text
File Edit View Favorites Tools Help
Thiruvallur
Thiruvallur was originally known as Thiruvallur which specifies the sleeping position of the holy lord "Balaji" , in the Veeraragava swamy temple of Thiruvallur.

Changing font style, size and color

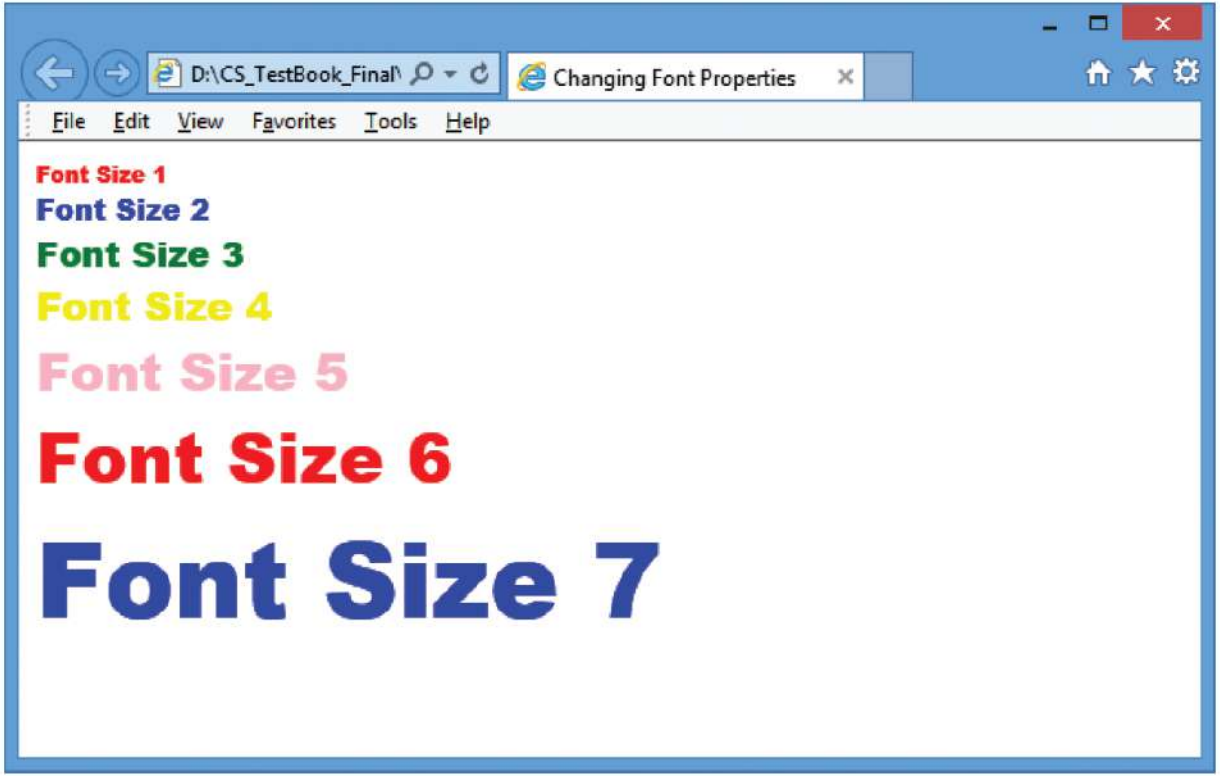
- The <font> tag is used to change the style, size and color of text.
- It is also a container tag.
- It is generally used for changing the appearance of a short segment of text.
- A font is a named set of certain style of character and number. Each font looks different from other fonts.
- Generally some fonts are used for specific purpose. For example, Times New Roman is a style of font usually used for preparing office documents. Arial is another font style which is used for publishing work. Variety of fonts available in internet at free of cost.
- Generally, a browser shows the contents as default system font setting. Every system has different font setting with another system.

- The general form of <font> tag with attributes:

```
<font face= “font_name” size=value color=color_name / color_code>
        Text to be displayed
</font>
```

- The **face** is an attribute to set different font style. The name of a font has multiple words it should be specified within double quote.
- The **size** attribute is used to set size of the text. The size can have an absolute value from 1 to 7. These predefined sizes are known as virtual size. Each virtual size is successively 20% larger than the previous one.
- The **color** attribute is used to set the color to the text. As you leant earlier color name or color code in hexadecimal may be used.

```
<html>
<head>
<title> Changing Font Properties </title>
</head>
<body>
        <font face="Arial Black" size=1 color=red> Font Size 1 </font> <br>
        <font face="Arial Black" size=2 color=blue> Font Size 2 </font> <br>
        <font face="Arial Black" size=3 color=green> Font Size 3 </font> <br>
        <font face="Arial Black" size=4 color=yellow> Font Size 4 </font> <br>
        <font face="Arial Black" size=5 color=pink> Font Size 5 </font> <br>
        <font face="Arial Black" size=6 color=red> Font Size 6 </font> <br>
        <font face="Arial Black" size=7 color=blue> Font Size 7 </font> <br>
</body>
</html>
```


D:\CS_TestBook_Final\
Changing Font Properties
File Edit View Favorites Tools Help
Font Size 1
Font Size 2
Font Size 3
Font Size 4
Font Size 5
Font Size 6
Font Size 7

Multiple fonts with face attribute:

- As discussed earlier, the face attribute of font tag is used to change font style of a segment of text. In face attribute, it is possible assign more than one font-name at a time within double quotes with comma.
- For example,

```
<font face = "Bookman old style1, Broadway1, Forte, Arial">
        Welcome to HTML
</font>
```

- Browser first tries to find out whether the font-name in the list is supported or not. If the first font is not supported by the browser, then it displays the text in second font, otherwise it will display next one. If no font in the list is supported, then the browser display the in the default font.

- In the above code, consider the font names “Bookman old style1” and “Broadway1” are not supported by any browser. (Because, the names has been changed).
- So, the text “Welcome to HTML” will be displayed in “Forte” style.
- If the browser does not supported “Forte” font, the text will be displayed in “Arial” font, otherwise the browser shows the text as in default font setting.
- In the case of Internet explorer, the “Times New Roman” is the default font to display the contents.

Section Break

- The <hr> (Horizontal Rules) tag, which is known as "Thematic Breaks" separate sections of an HTML document visually.
- It produces a horizontal line spread across the width of the browser. This is an empty tag, which means the tag has no closing tag.

Attributes of <hr> tag

- The <hr> tag having four attributes viz. size, width, noshade and color. These attributes are used to set size, width, 3D appearance and color to the horizontal line respectively.
- The general syntax of <hr> tag with attributes:
  - **<hr size=value width=value noshade, color=color_name/code>**

Size:

- Thickness of the horizontal line can be changed with size attribute.
- The size is given in terms of pixels. A pixel is one of the tiny dots that make up the display on computer.
- Generally, 72 pixels equal to an inch. Pixel is usually referred as points.
- For example: The code <hr size = 72> display a horizontal line with 1 inch thickness. The default size is 3 pixels.

Width:

- The width attribute specifies the horizontal width of the rule line.
- The default rule is drawn across the full width of the browser.
- The value of the width attribute may be the exact width of the rule in pixel or a certain percentage.
- Usually, the value of the width is specified as percentage. 100% is the default width.
- For example:
  - <hr width = 50%> display an half of a horizontal rule line on the browser window.

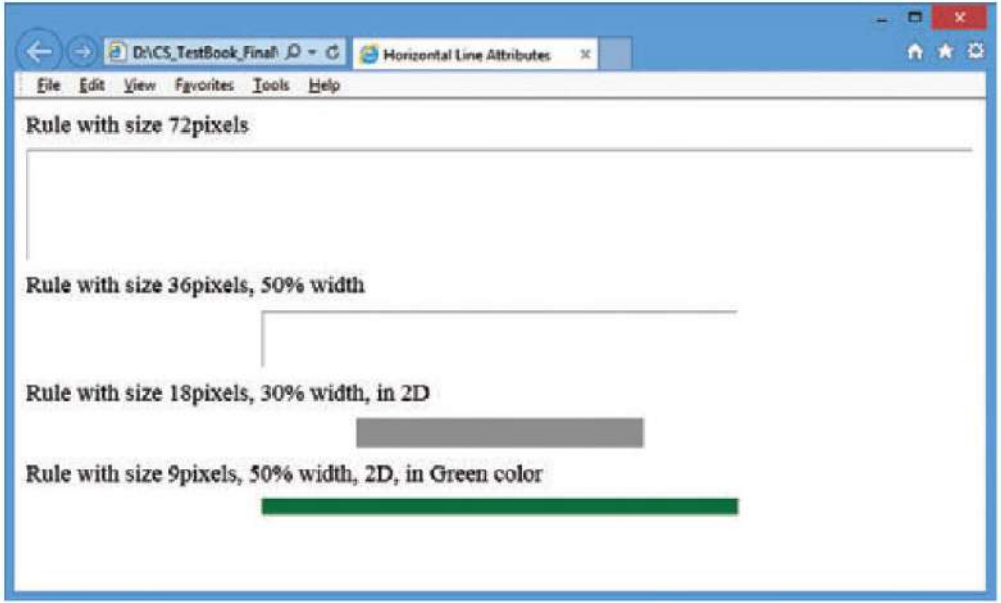
Noshade:

- The default view of a horizontal rule line is 3D. So, no need to specify the term “noshade” as an attribute with <hr> tag.
- If you specify the attribute “noshade” turn off 3D view, turns on 2D view. Noshade is a Boolean type attribute.

Color:

- The horizontal line is displayed in gray color by default.
- The color attribute is used to change is default color to desired color.

```
<html>
<head>
        <title> Horizontal Line Attributes </title>
</head>
<body>
        Rule with size 72pixels
        <hr size = 72>
        Rule with size 36pixels, 50% width
        <hr size = 36 width=50%>
        Rule with size 18pixels, 30% width, in 2D
        <hr size = 18 width=30% noshade>
        Rule with size 9pixels, 50% width, 2D, in Green color
        <hr size = 9 width = 50% noshade color=Green>
</body>
</html>
```


D:\CS_TestBook_Final\
Horizontal Line Attributes
File Edit View Favorites Tools Help
Rule with size 72pixels
Rule with size 36pixels, 50% width
Rule with size 18pixels, 30% width, in 2D
Rule with size 9pixels, 50% width, 2D, in Green color

Special Characters

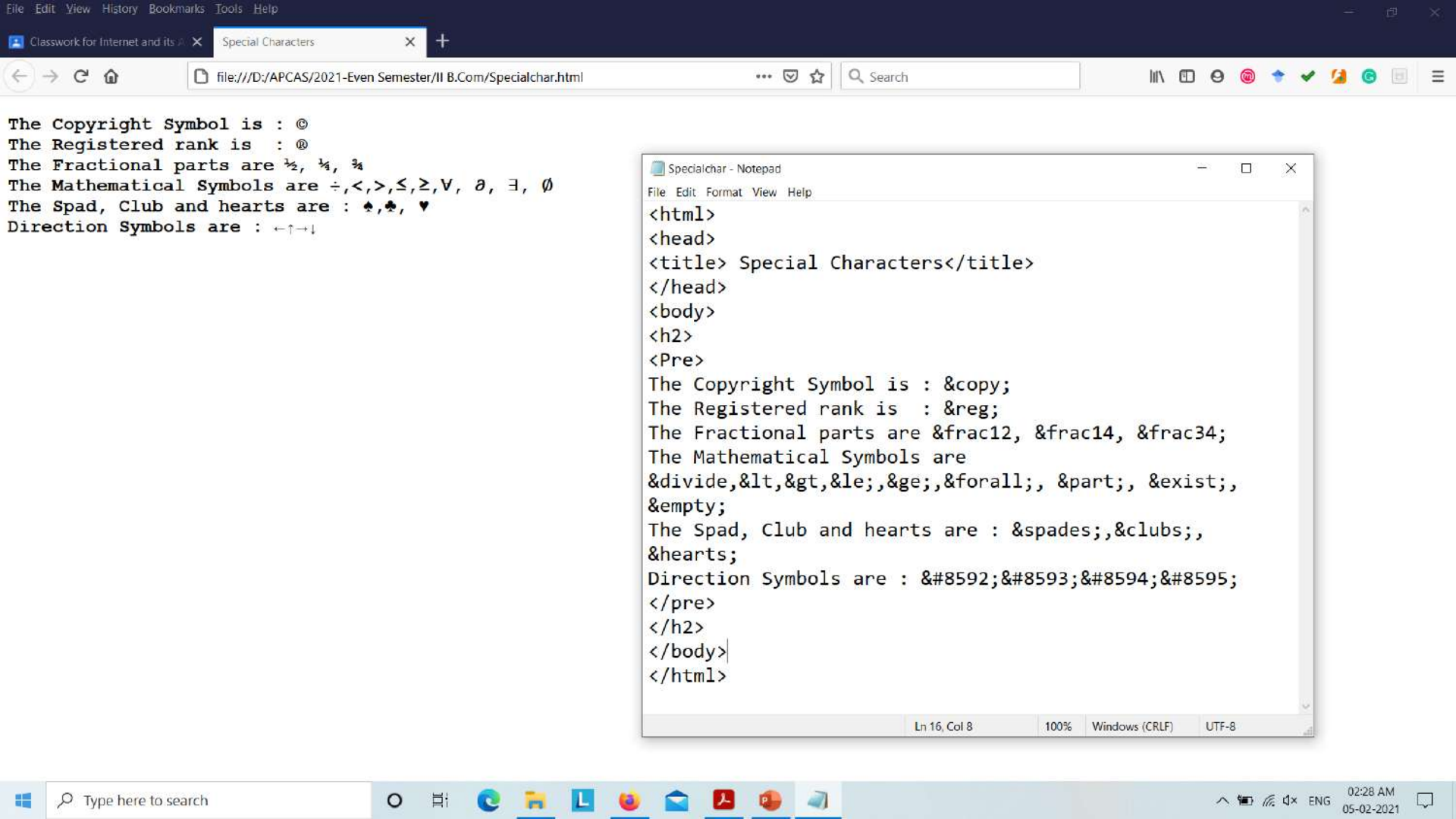
- In HTML, special characters are typically those that can't be easily typed into a keyboard or may cause display issues if typed or pasted into a web page.
- If you plan to use any of the special characters on this page, you should use either the HTML entity name or the HTML entity number. This will ensure that it displays correctly in most/all browsers.
- For example, if you want to display a copyright symbol "©", you should use either © or © in your code.
- All the special characters must be ended with semicolon. (;)
- For Complete references of Special characters refer the following url: https://dev.w3.org/html5/html-author/charref
- Following are some of the special characters.

Character	Entity Number	Entity Name	Description
"	"	"	quotation mark
'	'	'	apostrophe
&	&	&	ampersand
<	<	<	less-than
>	>	>	greater-than
∀	∀	∀	For All
∂	∂	∂	Partial Differential
∃	∃	∃	There Exists
∅	∅	∅	Empty Sets
∇	∇	∇	Nabla
∈	∈	∈	Element Of
∉	∉	∉	Not An Element Of
∋	∋	∋	Contains As Member
∏	∏	∏	N-ary Product
∑	∑	∑	N-ary Summation

Character	Entity Number	Entity Name	Description
Α	Α	Α	Greek Capital Letter Alpha
Β	Β	Β	Greek Capital Letter Beta
Γ	Γ	Γ	Greek Capital Letter Gamma
Δ	Δ	Δ	Greek Capital Letter Delta
Ε	Ε	Ε	Greek Capital Letter Epsilon
Ζ	Ζ	Ζ	Greek Capital Letter Zeta
©	©	©	Copyright Sign
®	®	®	Registered Sign
€	€	€	Euro Sign
™	™	™	Trademark
←	←	←	Leftwards Arrow
↑	↑	↑	Upwards Arrow
→	→	→	Rightwards Arrow
↓	↓	↓	Downwards Arrow
♠	♠	♠	Black Spade Suit
♣	♣	♣	Black Club Suit
♥	♥	♥	Black Heart Suit
♦	♦	♦	Black Diamond Suit

Character	Entity Number	Entity Name	Description
«	«	«	angle quotation mark (left)
¬	¬	¬	negation
			soft hyphen
¯	¯	¯	spacing macron
°	°	°	degree
±	±	±	plus-or-minus
²	²	²	superscript 2
³	³	³	superscript 3
´	´	´	spacing acute
µ	µ	µ	micro
¶	¶	¶	paragraph
·	·	·	middle dot
¸	¸	¸	spacing cedilla
¹	¹	¹	superscript 1
º	º	º	masculine ordinal indicator
»	»	»	angle quotation mark (right)

Character	Entity Number	Entity Name	Description
¼	¼	¼	fraction 1/4
½	½	½	fraction 1/2
¾	¾	¾	fraction 3/4
¿	¿	¿	inverted question mark
×	×	×	multiplication
÷	÷	÷	Division
			non-breaking space
¡	¡	¡	inverted exclamation mark
¢	¢	¢	cent
£	£	£	pound
¤	¤	¤	currency
¥	¥	¥	yen
¦	¦	¦	broken vertical bar
§	§	§	section
¨	¨	¨	spacing diaeresis


File Edit View History Bookmarks Tools Help
Classwork for Internet and its A
Special Characters
file:///D:/APCAS/2021-Even Semester/II B.Com/Specialchar.html
Search
The Copyright Symbol is : ©
The Registered rank is : ®
The Fractional parts are ½, ¼, ¾
The Mathematical Symbols are ÷,<,>,≤,≥,∀, ∂, ∃, ∅
The Spad, Club and hearts are : ♠,♣, ♥
Direction Symbols are : ←↑→↓
Specialchar - Notepad
File Edit Format View Help
<html>
<head>
<title> Special Characters</title>
</head>
<body>
<h2>
<Pre>
The Copyright Symbol is : ©
The Registered rank is : ®
The Fractional parts are &frac12, &frac14, ¾
The Mathematical Symbols are
&divide,&lt,&gt,≤,≥,∀, ∂, ∃,
∅
The Spad, Club and hearts are : ♠,♣,
♥
Direction Symbols are : ←↑→↓
</pre>
</h2>
</body>
</html>
Ln 16, Col 8
100%
Windows (CRLF)
UTF-8
Type here to search
ENG
02:28 AM
05-02-2021

Tables in HTML

- Table is grid of rows and columns.
- The tables were officially introduced with HTML 3.2.
- Tables are useful for the general display of tabular data. Representing table in HTML is heavy on tags.
- Tags to create table elements
- There are five core tags are used to create a table in HTML. They are,
  - **<table>** tag is used to create a table.
  - **<tr>** tag defines table rows
  - **<th>** tag defined table columns
  - **<td>** tag is used to specify the data in a cell
  - **<caption>** tag defines title for the table
- Apart from these five core tags, **<tbody>**, **<thead>** and **<tfoot>** tags are also used to define and control whole sections of table. All the above tags are container tags.

```
<html>
<head>
        <title> Creating Table </title>
</head>
        <body bgcolor="PaleGoldenRod">
        <Table border=1>
        <Caption> Books and Authors </Caption>
<TR>
        <TH> Book </TH>
        <TH> Author </TH>
        <TH> Publisher </TH>
</TR>
<TR>
        <TD> Foxpro 2.5 </TD>
        <TD> R.K. Taxali </TD>
        <TD> BPB Publications </TD>
</TR>
<TR>
        <TD> Visual Basic .NET </TD>
        <TD> Jeffrey R. Shapiro </TD>
        <TD> Tata McGraw Hill </TD>
</TR>
<TR>
        <TD> Core Java Vol 1 </TD>
        <TD> Horstmann Cornell </TD>
        <TD> Pearson </TD>
</TR>
</Table>
</body>
<html>
```

Creating Table

- In the above HTML code, the <Table border=1> tag creates a table structure with border.
- The code <Caption> Books and Authors </Caption> display the text specified between <Caption> as title to the table.
- The above code contains four set of <tr> blocks. First block of <tr> creates a table row with three column headings with the help of <th> tag.
- The <th> tag is used as Table heading, the column heading were aligned center and text becomes bold by default.
- Rest of the <tr> blocks display the contents what you specify within <td> tags.
- All the tags used with table were container tags. So, each and every tag should be closed with their closing tag.

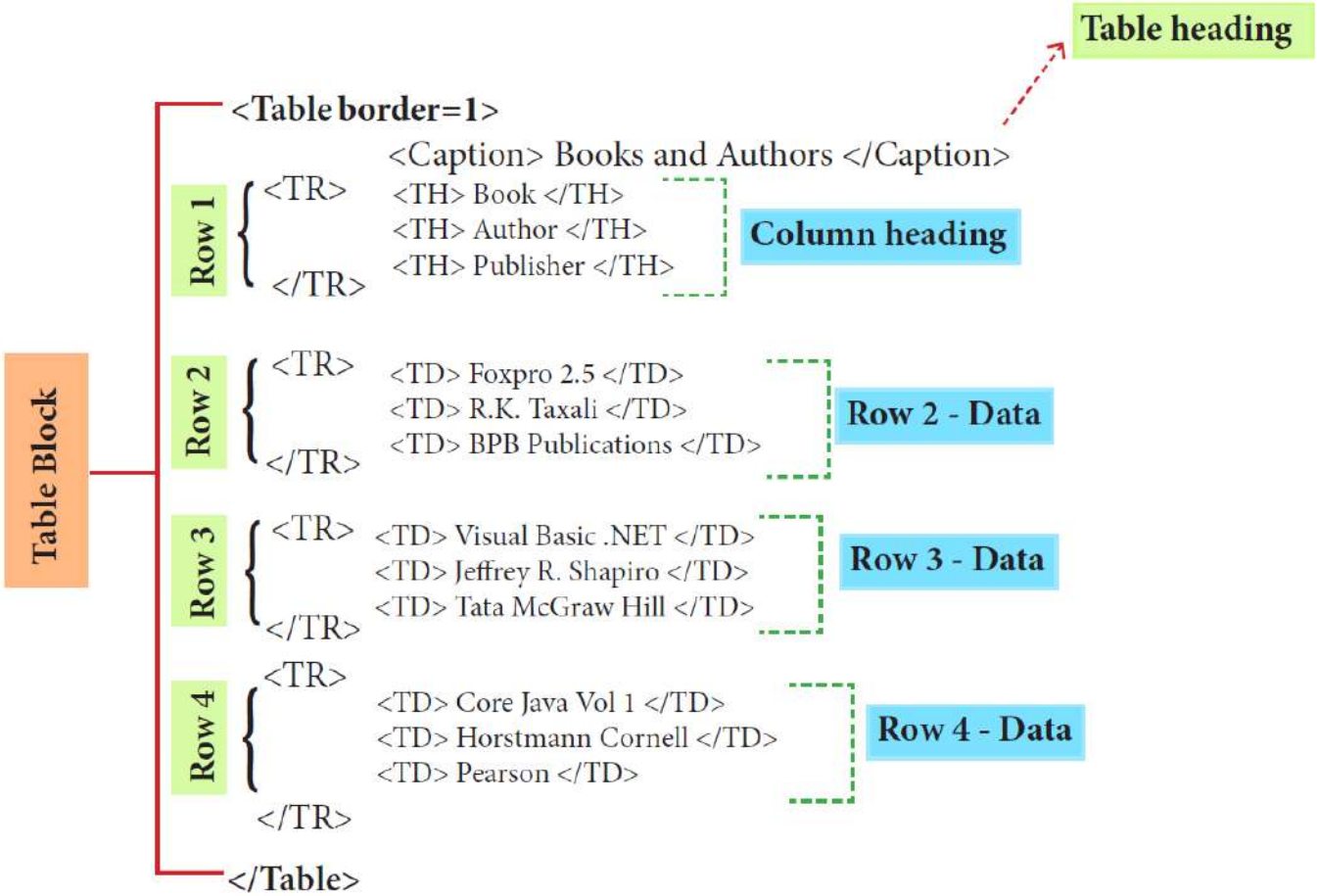
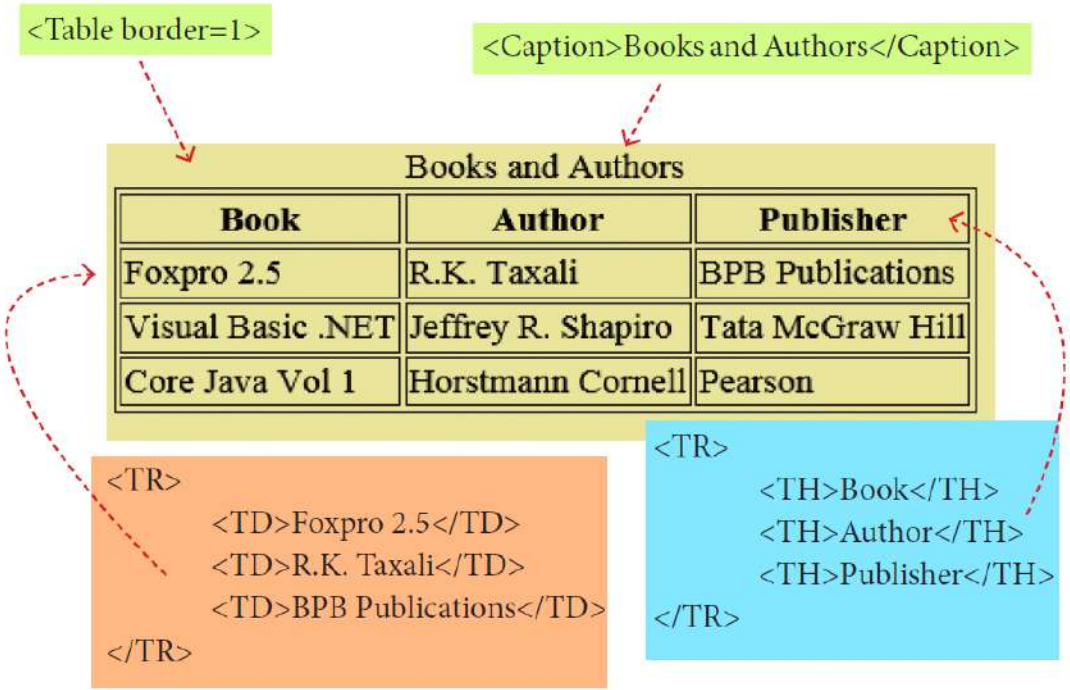


Table heading
<Table border=1>
<Caption> Books and Authors </Caption>
Row 1
<TR>
<TH> Book </TH>
<TH> Author </TH>
<TH> Publisher </TH>
</TR>
Column heading
Table Block
Row 2
<TR>
<TD> Foxpro 2.5 </TD>
<TD> R.K. Taxali </TD>
<TD> BPB Publications </TD>
</TR>
Row 2 - Data
Row 3
<TR>
<TD> Visual Basic .NET </TD>
<TD> Jeffrey R. Shapiro </TD>
<TD> Tata McGraw Hill </TD>
</TR>
Row 3 - Data
Row 4
<TR>
<TD> Core Java Vol 1 </TD>
<TD> Horstmann Cornell </TD>
<TD> Pearson </TD>
</TR>
Row 4 - Data
</Table>

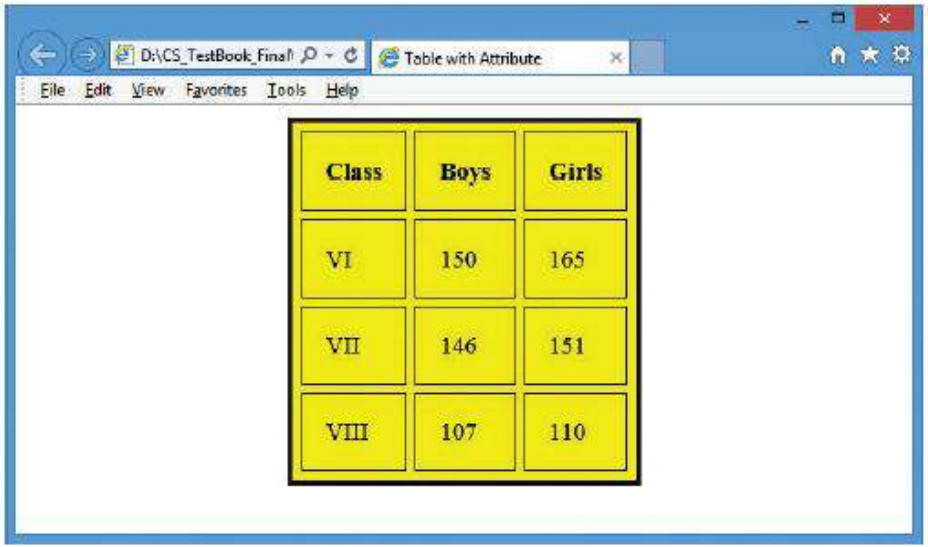

<Table border=1>
<Caption>Books and Authors</Caption>
Books and Authors
Book
Author
Publisher
Foxpro 2.5
R.K. Taxali
BPB Publications
Visual Basic .NET
Jeffrey R. Shapiro
Tata McGraw Hill
Core Java Vol 1
Horstmann Cornell
Pearson
<TR>
<TD>Foxpro 2.5</TD>
<TD>R.K. Taxali</TD>
<TD>BPB Publications</TD>
</TR>
<TR>
<TH>Book</TH>
<TH>Author</TH>
<TH>Publisher</TH>
</TR>

Attributes of Table

The <table> is a container tag. There are several attributes to improve the layout of the table. They are listed below:

- **Cellspacing:** It is used to set the space between cells in a table. The value should be in pixels
- **Cellpadding:** It is used to set the space between the contents of a cell and its border. the value should be in pixels.
- **Border:** Border attribute with <table> tag is used to specify the thickness of the border lines around the table. The value of the border attribute should be a non zero value in pixels. If its value is zero, HTML displays the table without border.
- **Bordercolor:** It is used to apply the color to the border lines.
- **Align:** It is used to set the position of the table within the browser window. Left is the default position. Right or center may be the value of align attribute.
- **Bgcolor:** It is used to apply background colour to the table.
- **Height and Width:** These two attributes are used to specify the height and width of a table in terms of pixels or percentage.

```
<html>
<head>
<title> Table with Attribute </title>
</head>
<body>
<table cellspacing=5 cellpadding=15 border=4 bordercolor=blue align=center
bgcolor=yellow>
<TR>
        <TH> Class </TH>
        <TH> Boys </TH>
        <TH> Girls </TH>
</TR>
<TR>
        <TD> VI </TD>
        <TD> 150 </TD>
        <TD> 165 </TD>
</TR>
<TR>
        <TD> VII </TD>
        <TD> 146 </TD>
        <TD> 151 </TD>
</TR>
<TR>
        <TD> VIII </TD>
        <TD> 107 </TD>
        <TD> 110 </TD>
</TR>
</table>
</body>
</html>
```


D:\CS_TestBook_Final\
Table with Attribute
File Edit View Favorites Tools Help
Class
Boys
Girls
VI
150
165
VII
146
151
VIII
107
110

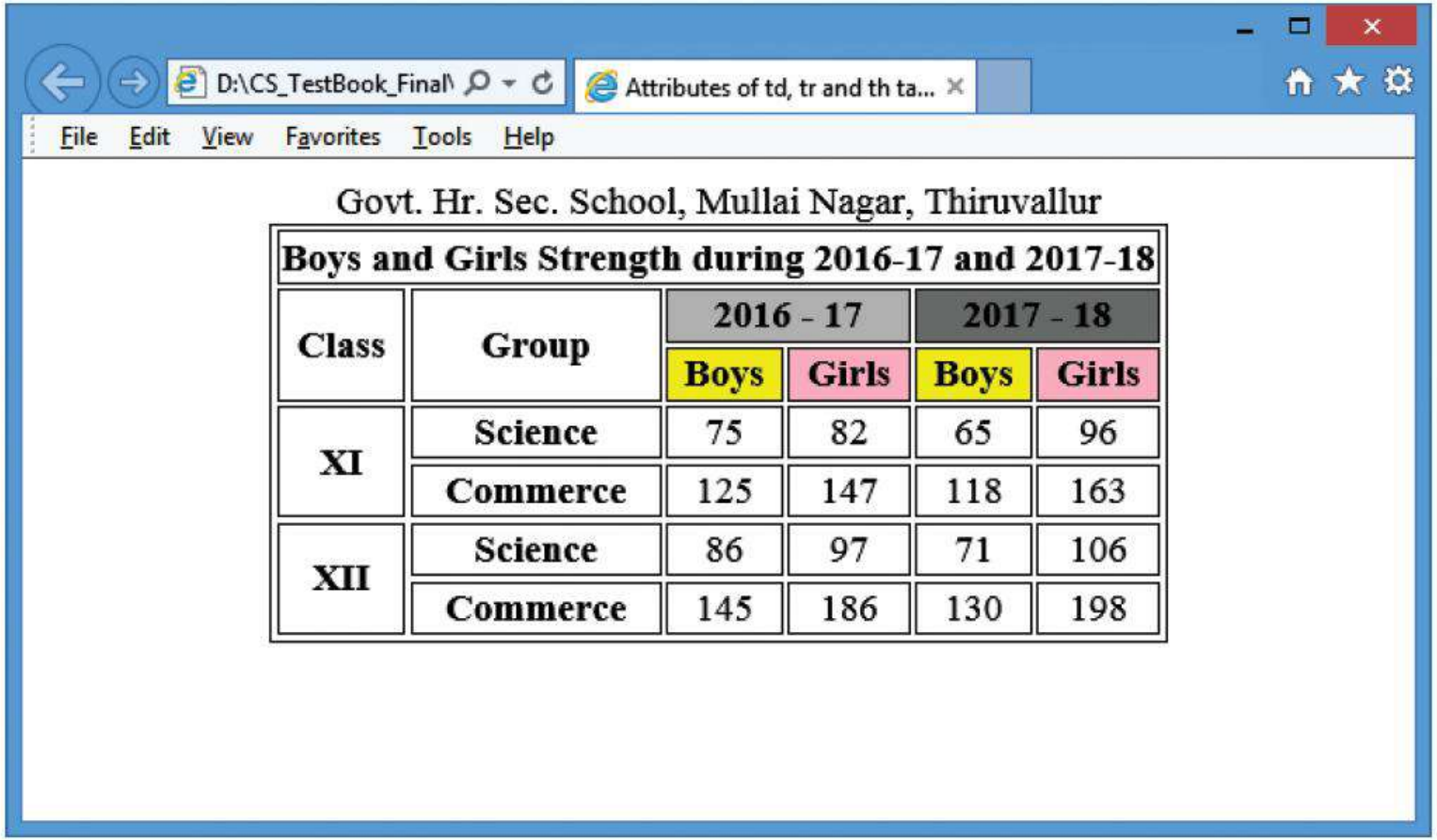
Attributes of <TD>, <TH> and <TR> tags:

- **Align:** Used to specify the horizontal alignment of content within a cell. Left is the default alignment. Possible values are Right and Center.
- **VAlign:** Used to specify the vertical alignment of the contents within a cell. Bottom is the default alignment. Possible values are Top and Middle
- **Width:** Used to specify the width of a cell in terms of pixels or percentage.
- **Bgcolor** attribute is used to apply a particular colour to the background of a cell.
- **Background** attribute is used to apply an image or picture as background of a cell.
- **Rowspan** attribute is used to merge two or more cells in a row as a single cell.
- **Colspan** attribute is used to merge to two or more cells in a column as a single cell.

```
<html>
<head>
<title> Attributes of td, tr and th tags </title>
</head>
<body>
<table border align=center>
<Caption> Govt. Hr. Sec. School, Mullai Nagar, Thiruvallur
<tr>
<th colspan=6> Boys and Girls Strength during 2016-17 and 2017-18 </th>
</tr>
<tr align=center>
<th rowspan=2> Class </th>
<th rowspan=2> Group </th>
<th colspan=2 bgcolor=silver> 2016 - 17 </th>
<th colspan=2 bgcolor=gray> 2017 - 18 </th>
</tr>
<tr>
```

```
<th bgcolor=yellow> Boys </th>
<th bgcolor=pink> Girls </th>
<th bgcolor=yellow> Boys </th>
<th bgcolor=pink> Girls </th>
</tr>
<tr align=center>
<th rowspan=2> XI </th>
<th> Science </th>
<td> 75 </td>
<td> 82 </td>
<td> 65</td>
<td> 96 </td>
</tr>
<tr align=center>
<th> Commerce </th>
<td> 125 </td>
<td> 147 </td>
<td> 118 </td>
<td> 163 </td>
</tr>
```

```
<tr align=center>
<th rowspan=2> XII </th>
<th> Science </th>
<td> 86</td>
<td> 97 </td>
<td> 71</td>
<td> 106 </td>
</tr>
<tr align=center>
<th> Commerce </th>
<td> 145 </td>
<td> 186 </td>
<td> 130 </td>
<td> 198 </td>
</tr>
</table>
</body>
</html>
```



Govt. Hr. Sec. School, Mullai Nagar, Thiruvallur

Boys and Girls Strength during 2016-17 and 2017-18					
Class	Group	2016 - 17		2017 - 18	
		Boys	Girls	Boys	Girls
XI	Science	75	82	65	96
	Commerce	125	147	118	163
XII	Science	86	97	71	106
	Commerce	145	186	130	198

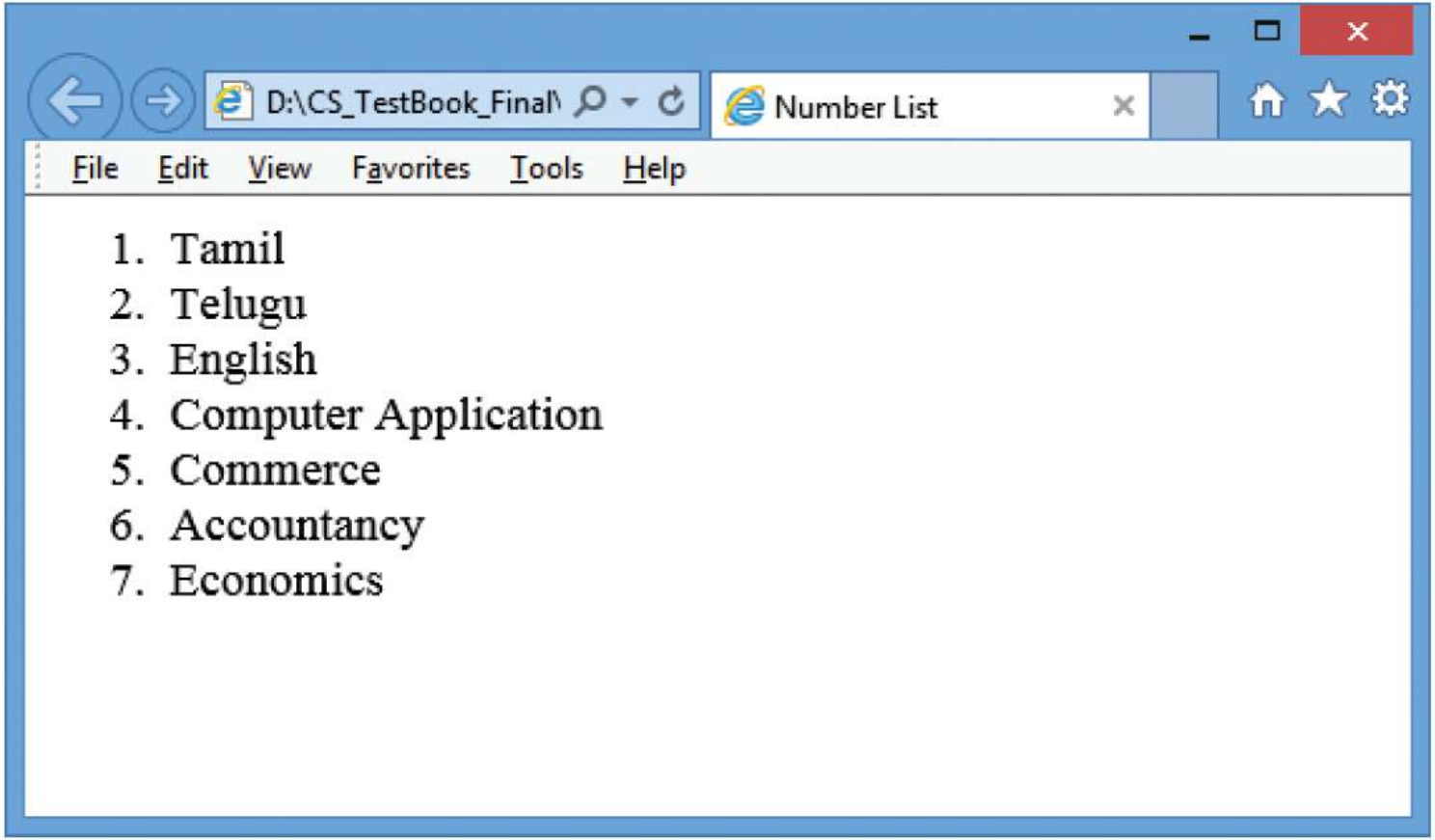
Lists in HTML

- HTML supports three types of lists viz. Numbered, Unnumbered and Definition.
- These lists are called as Ordered List, Unordered List and Definition List respectively.

Numbered List / Ordered List

- Numbered list is created within the tag pair <OL> ….. </OL> tag.
- The tag <LI> is used to present the list item in the list.
- Ordered list displays items in a numerical or alphabetical order. Both <OL> and <LI> tags are container tags.

```
<html>
<head>
<title> Number List </title>
</head>
<body>
<OL>
<LI> Tamil </LI>
<LI> Telugu </LI>
<LI> English </LI>
<LI> Computer Application </LI>
<LI> Commerce </LI>
<LI> Accountancy </LI>
<LI> Economics </LI>
</OL>
</body>
</html>
```

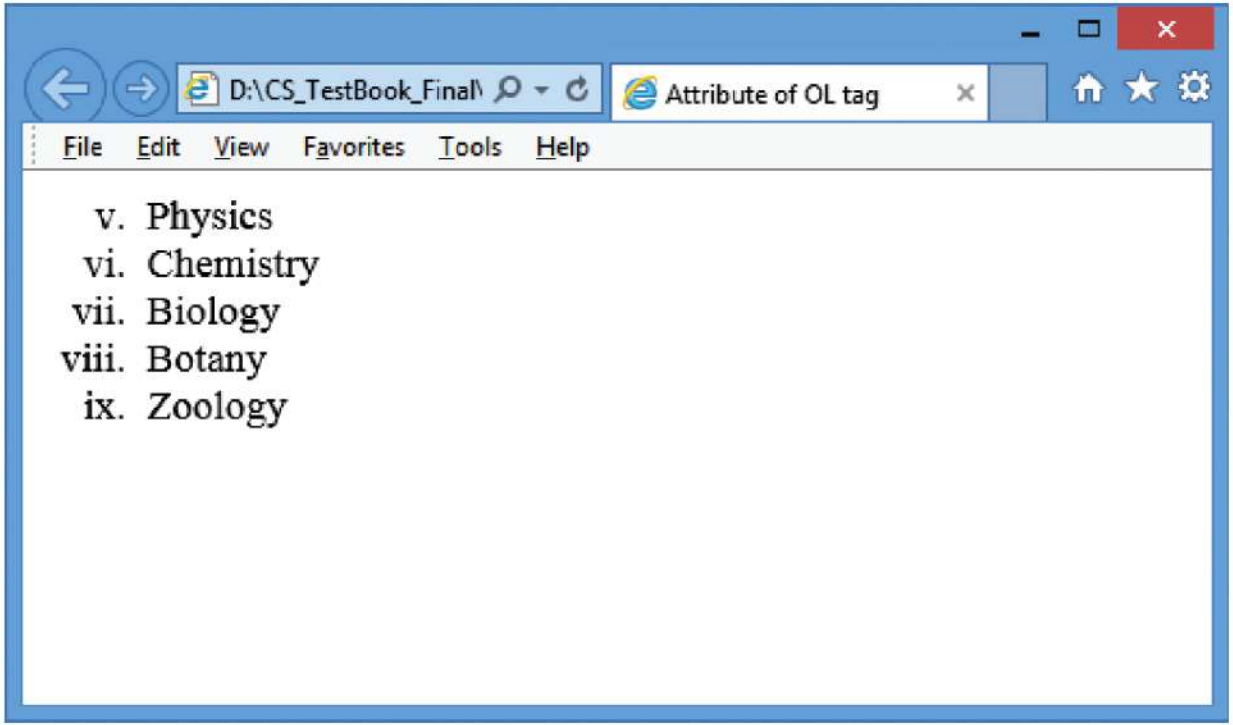

D:\CS_TestBook_Final\
Number List
File Edit View Favorites Tools Help
1. Tamil
2. Telugu
3. English
4. Computer Application
5. Commerce
6. Accountancy
7. Economics

Attributes of Ordered List:

- There are two attributes can be used to customize ordered list, they are
  - **Type** - changing numbering style
  - **Start** - changing numbering order.
- **Type** – is used to change the number style. The default number style is standard Arabic numerals (1,2,3,.....).
- **Start** – is used to specify the number of letter with which start the list. The default starting point is 1. The value of the start attribute should be a decimal number, regardless of the numbering style being used.

Type value	Numbering style
1	Standard Arabic Numerals 1,2,3,4,.....
a	Lowercase letters a, b, c, d, ...
A	Uppercase letter A, B, C, D .....
i	Lowercase Roman numerals i, ii, iii, iv, v .....
I	Uppercase Roman numerals I, II, III, IV, V .....

```
<html>
<head>
<title> Attribute of OL tag </title>
</head>
<body>
        <OL type=i start=5>
                <LI> Physics
                <LI> Chemistry
                <LI> Biology
                <LI> Botany
                <LI> Zoology
        </OL>
</body>
</html>
```

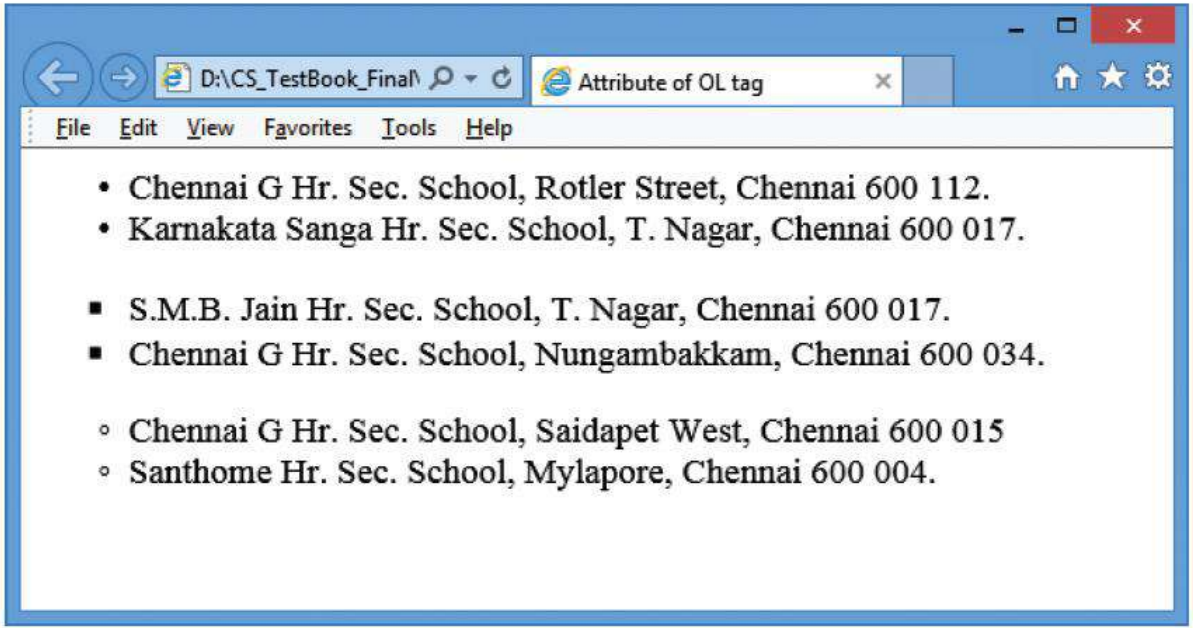

D:\CS_TestBook_Final\
Attribute of OL tag
File Edit View Favorites Tools Help
v. Physics
vi. Chemistry
vii. Biology
viii. Botany
ix. Zoology

Un-numbered List / Unordered List

- Unordered lists are often referred as bulleted lists.
- Instead of numbers, each element in the list has prefixed with a special bullet symbol.
- Unordered list is surrounded within <UL> ..... </UL> tags.
- As discussed earlier, each list element is defined by <LI> tag.
- **Attribute of Unordered List:** Like ordered list, type attribute is used to customize bullet style for the list of elements. By default, a solid circle is used as bullets.

Type value	Numbering style
Disc	• A solid circle
Square	■ A solid square
Circle	oAn unfilled circle

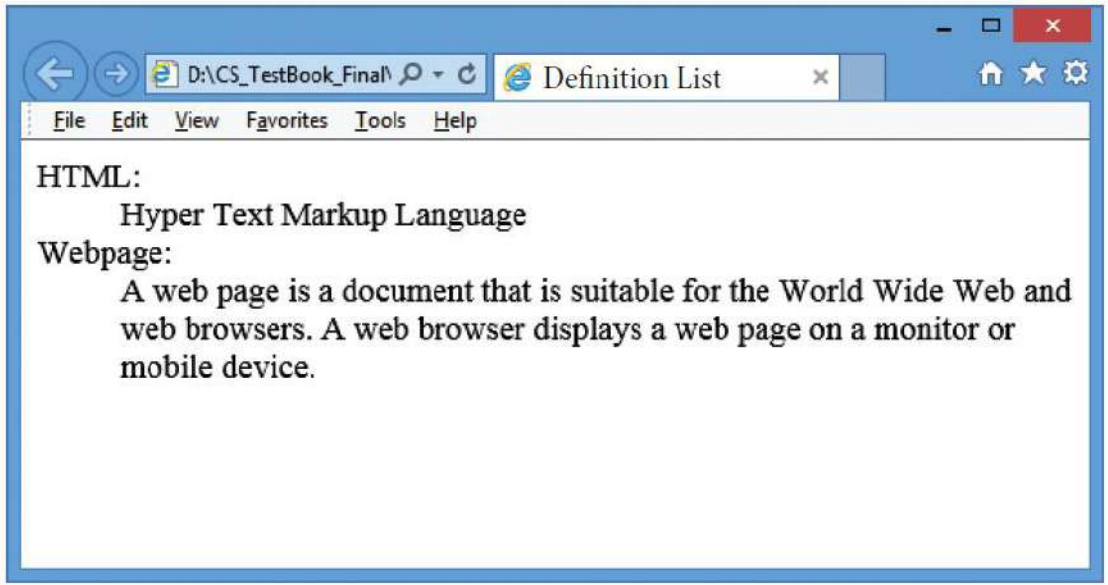
```
<html>
<head>
<title> Attribute of UL tag </title>
</head>
<body>
        <UL>
                <LI> Chennai G Hr. Sec. School, Rotler Street, Chennai 600 112.
                <LI> Karnakata Sanga Hr. Sec. School, T. Nagar, Chennai 600 017.
        </UL>
        <UL type=square>
                <LI> S.M.B. Jain Hr. Sec. School, T. Nagar, Chennai 600 017.
                <LI> Chennai G Hr. Sec. School, Nungambakkam, Chennai 600 034.
        </UL>
        <UL type=circle>
                <LI> Chennai G Hr. Sec. School, Saidapet West, Chennai 600 015
                <LI> Santhome Hr. Sec. School, Mylapore, Chennai 600 004.
        </UL>
</body>
</html>
```


D:\CS_TestBook_Final\
Attribute of OL tag
File Edit View Favorites Tools Help
Chennai G Hr. Sec. School, Rotler Street, Chennai 600 112.
Karnakata Sanga Hr. Sec. School, T. Nagar, Chennai 600 017.
S.M.B. Jain Hr. Sec. School, T. Nagar, Chennai 600 017.
Chennai G Hr. Sec. School, Nungambakkam, Chennai 600 034.
Chennai G Hr. Sec. School, Saidapet West, Chennai 600 015
Santhome Hr. Sec. School, Mylapore, Chennai 600 004.

Definition List

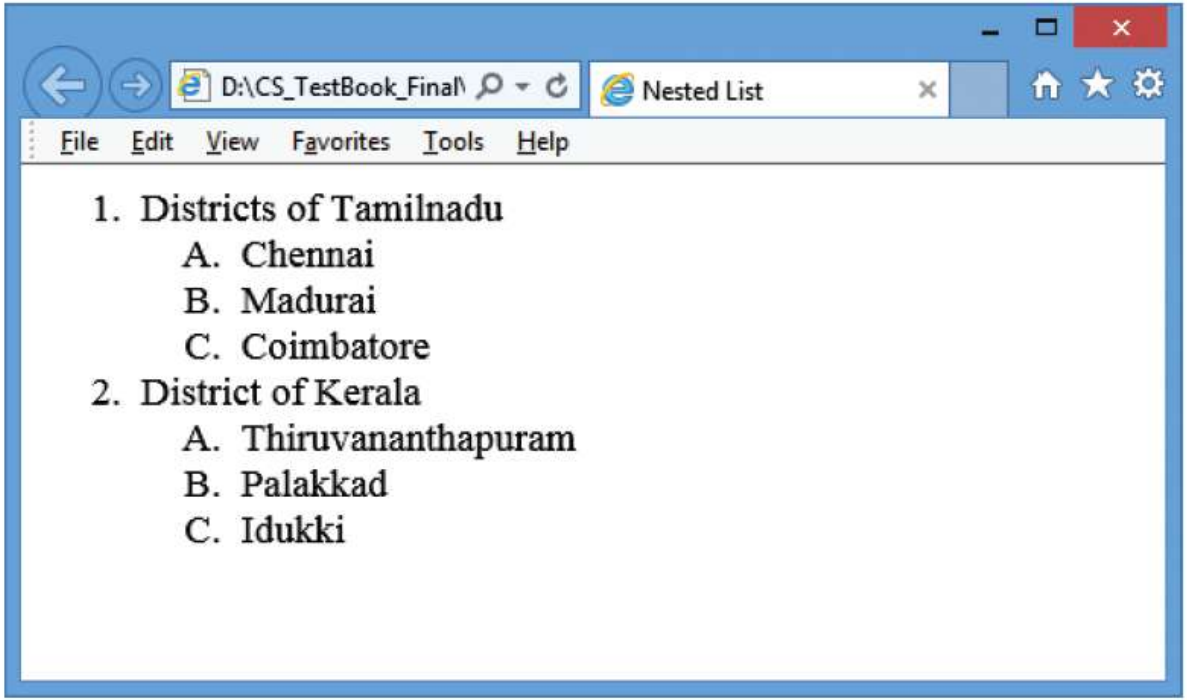
- Definition list is different from other two types of list. No bullet or number is provided for the list items. In this list type, the list element has two parts.
  - A definition term
  - The definition description
- Definition list is surrounded within <DL> ……. </DL> tags.
- Definition term is presented in between <DT> ….. </DT> tag and
- Definition description should be surrounded within <DD> …… </DD> tag.

```
<html>
<head>
<title> Definition List </title>
</head>
<body>
        <DL>
        <DT> HTML: </DT>
                <DD> Hyper Text Markup Language </DD>
        <DT> Webpage:
<DD> A web page is a document that is suitable for the World Wide Web and
web browsers. A web browser displays a web page on a monitor or mobile device.
</DD>
        </DL>
</body>
<html>
```


D:\CS_TestBook_Final\
Definition List
File Edit View Favorites Tools Help
HTML:
Hyper Text Markup Language
Webpage:
A web page is a document that is suitable for the World Wide Web and web browsers. A web browser displays a web page on a monitor or mobile device.

Nested Lists

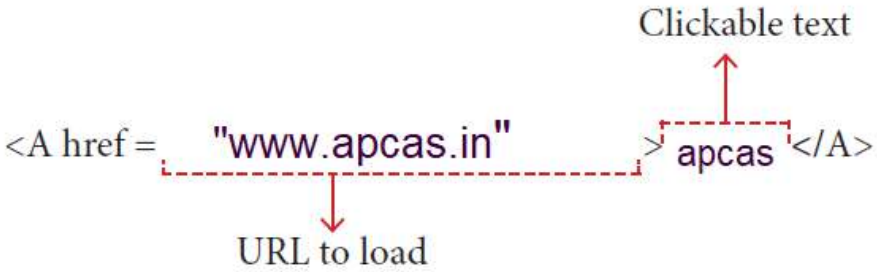

```
<html>
<head>
<title> Nested List </title>
</head>
<body>
<OL>
        <LI> Districts of Tamilnadu
        <UL type=A>
                <LI> Chennai
                <LI> Madurai
                <LI> Coimbatore
        </UL>
        <LI> District of Kerala
        <UL type=A>
                <LI> Thiruvananthapuram
                <LI> Palakkad
                <LI> Idukki
        <UL>
        </OL>
<body>
<html>
```


D:\CS_TestBook_Final\
Nested List
File Edit View Favorites Tools Help
1. Districts of Tamilnadu
A. Chennai
B. Madurai
C. Coimbatore
2. District of Kerala
A. Thiruvananthapuram
B. Palakkad
C. Idukki

Links:

- Link is an important feature of HTML to connect web resources.
- Link in HTML is used to create hyperlinks to web content.
- Web content may be an HTML document or an external webpage or any multimedia content such as an image, video, audio, animation etc., or even a part of the current document.
- There are two important things needs to create a link in HTML,
  - The name of the file or URL to which you want to link
  - The text that will serve as the clickable link.
- The anchor tag **<A>** is used to create links along with **HREF** attribute. HREF is abbreviated as "Hypertext Reference".
- Structure of an anchor tag with href:
- **<A href = " Web content path / URL "> Text – Clickable link </A>**

Example:



- The above link code creates the target of the hyperlink to the website
- https://www.apcas.in. At the time the user clicks the link, the browser opens the home page of the URL.

- **Internal Links:**
  - Creating a link to a particular section of the same document is known as Internal Link.
  - To create an internal like, the attribute Name is used along with <A> tag.
  - The Name attribute of <A> tag establish the link to the content within the document.
- **External Link:**
  - Establish link with an external web page in known as external linking.
  - It is made possible by providing the URL of the external file in the HREF attribute of <A> tag of the current page.

```
<html>
<head>
<title> South India </title>
</head>
<body>
<h1 align = center> South India </h1>
<p> South India is the area encompassing the Indian states of
<A href = #AP> Andhra Pradesh, </A>
<A href = #KR> Karnataka, </A>
<A href = #KL> Kerala, </A>
<A href = #TN> Tamil Nadu </A> and Telangana as well as the union territories of Lakshadweep, Andaman and Nicobar Islands and Puducherry, occupying 19% of India's area (635,780 km2 or 245,480 sq mi). </p>
<A Name = AP><B> Andhra Pradesh </B> </A>
<p> Andhra Pradesh is one of the 29 states of India.  Situated in the south-east of the country, it is the eighth-largest state in India. The largest city in Andhra Pradesh is Visakhapatnam. </p>
<A Name = KR> <B> Karnataka </B> </A>
<p> Karnataka is a state in the south western region of India. It was formed on 1 November 1956, with the passage of the States Reorganisation Act. Originally known as the State of Mysore, it was renamed Karnataka in 1973. The capital and largest city is Bangalore (Bengaluru). </p>
<A Name = KL> <B> Kerala </B> </A>
<p> Kerala is a state in South India on the Malabar Coast. It was formed on 1 November 1956 following the States Reorganisation Act by combining Malayalam-speaking regions. It is divided into 14 districts with the capital being Thiruvananthapuram.</p>
<A Name = TN> <B> Tamilnadu </B> </A>
<p> Tamil Nadu literally 'The Land of Tamils' or 'Tamil Country' is one of the 29 states of India. Its capital and largest city is Chennai (formerly known as Madras). </p>
</body>
</html>
```

South India

South India is the area encompassing the Indian states of Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and Telangana as well as the union territories of Lakshadweep, Andaman and Nicobar Islands and Puducherry, occupying 19% of India's area (635,780 km2 or 245,480 sq mi).

Andhra Pradesh

Andhra Pradesh is one of the 29 states of India. Situated in the south-east of the country, it is the eighth-largest state in India. The largest city in Andhra Pradesh is Visakhapatnam.

Karnataka

Karnataka is a state in the south western region of India. It was formed on 1 November 1956, with the passage of the States Reorganisation Act. Originally known as the State of Mysore, it was renamed Karnataka in 1973. The capital and largest city is Bangalore (Bengaluru).

Kerala

Kerala is a state in South India on the Malabar Coast. It was formed on 1 November 1956 following the States Reorganisation Act by combining Malayalam-speaking regions. It is divided into 14 districts with the capital being Thiruvananthapuram.

Tamilnadu

Tamil Nadu literally 'The Land of Tamils' or 'Tamil Country' is one of the 29 states of India. Its capital and largest city is Chennai (formerly known as Madras).

Welcome to

Adhiparasakthi College of Arts and Science,Kalavai

external link - Notepad

File Edit Format View Help

```
<html>
<head>
<title> Links </title>
</head>
<body>
<h1 align=center>
Welcome to <br>
<A href = "https://www.apcas.in">
Adhiparasakthi College of Arts and Science,Kalavai </A>
</h1>
</body>
</html>
```

Inserting Images

- Images are essential element to make an HTML presentation as more attractive manner.
- Moreover images are used to depict many complex concepts in simple way.
- To make more attractive and communicative web pages, images should be added in the appropriate places.
- Images displayed on the web page should be converted to universally supported format.
- Most of the browsers supports, GIF, JPEG and PNG images formats. HTML-5 introduces SVG images.

Inserting Images with HTML document

- The <IMG> tag along with the attribute src (Source) is used to add images in HTML document.
- General format:

  <img src = image_name_with_extension>

  (OR)

  <img src = URL>

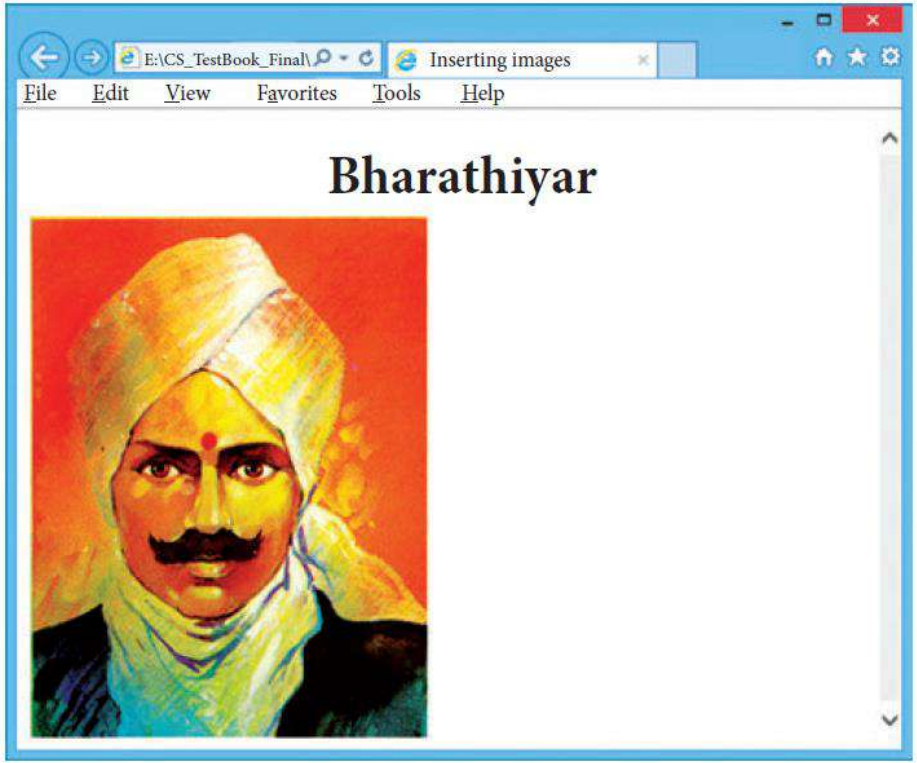
- Example:

  <img src = image1.gif>

- Src attribute is the main attribute used to specify the file name of the image to be inserted. If the image is not in the current working folder, the image file name should clearly specify with the path of the file or URL, where the file is available.
- Example:

  <img src = “D:\images\animals\cat.jpeg”>

```
<html>
<head>
<title> Inserting Images </title>
</head>
<body>
        <h1 align = center> Bharathiyar </h1>
        <img src = bharathiyar.gif>
</body>
</html>
```


E:\CS_TestBook_Final\
Inserting images
File Edit View Favorites Tools Help
Bharathiyar

Other Attributes of <img> tag:

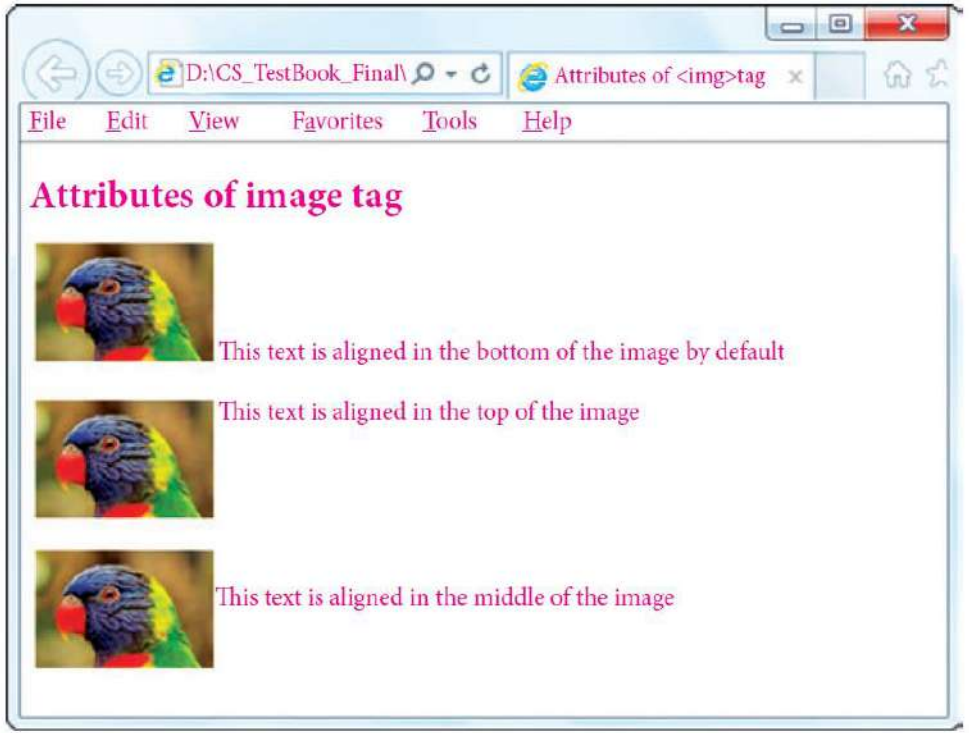
- Other than src, the <img> tag has many attributes the enable to control how the image is presented on the page.
- **Alt (Alternative Text):** The alt attribute within <img> tag is used to describe the image, so that some text is conveyed even when the image cannot be displayed.

  Example: **<img src = bharathiyar.gif alt = "National Poet of India">**
- **Width and Height:** Width and Height attributes are used to set the width and height of an image. The values of these attributes should be either pixels or percentage of its actual size. If these attributes are not specified, the browser displays the image in its original size.
- **Vspace (Vertical Space) and Hspace (Horizontal Space):** Vspace and Hspace attributes are used to set Vertical and Horizontal space between the images.

```
<html>
<head>
<title> Inserting Images </title>
</head>
<body>
<h1 align = center> Mahakavi Bharathi </h1>
<img src = bharathiyar.gif alt = "National Poet of India" Width = 20%  Height = 25%
vpace = 20  Hspace = 20>
<img src = bharathiyar.gif alt = "National Poet of India" Width = 20%  Height = 25%
vpace = 20  Hspace = 20>
<img src = bharathiyar.gif alt = "National Poet of India" Width = 20%  Height = 25%
vpace = 20  Hspace = 20> <br>
<img src = bharathiyar.gif alt = "National Poet of India" Width = 20%  Height = 25%
vpace = 20  Hspace = 20>
<img src = bharathiyar.gif alt = "National Poet of India" Width = 20%  Height = 25%
vpace = 20  Hspace = 20>
<img src = bharathiyar.gif alt = "National Poet of India" Width = 20%  Height = 25%
vpace = 20  Hspace = 20> <br>
</body>
</html>
```

- **Align:** The align attribute used to aligns the image with respect to the base line of the text. This attribute has the following values.
  - **Bottom –** Aligns the bottom of the image with the baseline of the text. This is the default setting.
  - **Middle –** Aligns the middle of the image with the baseline of the text.
  - **Top –** Aligns the top of the image with the baseline of the text.
  - **Left and Right** values of Align attribute:
- Using left and right values with align attribute, displayed the image on the left and right side of the text.

```
<html>
<head>
        <title> Attributes of <img> tag </title>
</head>
<body>
<h2> Attributes of image tag </h2>
        <img src="D:\Images\Bird.jpg" alt="Parrot Image">
        This text is aligned in the bottom of the image by default  <br> <br> <br>
        <img src="D:\Images\Bird.jpg" alt="Parrot Image" align=top>
        This text is aligned in the top of the image <br><br>
        <img src="D:\Images\Bird.jpg" alt="Parrot Image" align=middle>
        This text is aligned on the middle of the image
</body>
</html>
```


D:\CS_TestBook_Final\
Attributes of <img>tag
File Edit View Favorites Tools Help
Attributes of image tag
This text is aligned in the bottom of the image by default
This text is aligned in the top of the image
This text is aligned in the middle of the image

Scrolling text using <Marquee>

- In HTML, a piece of text or image can be moved horizontally or vertically by using <marquee> tag. This feature makes a web page as more attractive.

General format: **<marquee> Text or image to be scroll </marquee>**

Attributes of <marquee>

- **Height and Width:** These attributes are used to set height and width of the marquee. The values should be either in pixels or in percentage of browser window.
- **Direction:** This is used to specify the direction of the movement of text or image. The text or image will move towards right to left by default. So, the default direction is left. The Possible values are 'up', 'down', 'left' or 'right'.
- **Behaviour:** This attribute is used to specify the type of scrolling. The values are 'scroll', 'slide' and 'alternate'.
- **Scrolldelay:** This attribute is used to define the time delay between each jump. The time unit should be in seconds.

- **Scrollamount:** This is used to define the speed of the scroll.
- **Loop:** This is for defining how many times the marquee element should repeat on the screen. The default value is 'infinite', which means the marquee element scrolls endlessly.
- **Bgcolor:** This is used to specify the background color to the marquee elements.
- **Hspace and Vspace:** This is for defining the horizontal and vertical space around the marquee. The value can be in pixels or percentage.

File Edit View History Bookmarks Tools Help

:: INTRODUCTION :::

file:///C:/Users/Dr.PV.Praveen Sundar/Desktop/Bcom/Marquee.html

Search

Marquee - Notepad

File Edit Format View Help

```
<html>
<head>
<title>::: INTRODUCTION ::::</title>
</head>
<body bgcolor="#FF00FF">
<marquee bgcolor="#87CEFA" loop= "3" scrolldelay= "10"
vspace="500"> Department of Computer Science & Computer
Applications</marquee>
</body>
</html>
```

Ln 1, Col 1 100% Windows (CRLF) UTF-8

Type here to search

ENG 06:12 PM 05-11-2020

FRAMES

- HTML frames are used to divide your browser window into multiple sections where each section can load a separate HTML document.
- A collection of frames in the browser window is known as a frameset.
- The window is divided into frames in a similar way the tables are organized: into rows and columns.
- Frames are used to show one or more html documents in a one window.
- Present documents in multiple views.
- To use frames on a page we use <frameset> tag instead of <body> tag.
- The <frameset> tag defines, how to divide the window into frames.
- The rows attribute of <frameset> tag defines horizontal frames and cols attribute defines vertical frames. Each frame is indicated by <frame> tag and it defines which HTML document shall open into the frame.

Attribute	Value	Description
frameborder	1. (No) 2. (Yes)	Specifies whether or not to display a border around a frame
longdesc	*URL*	Specifies a page that contains a long description of the content of a frame eg: longdesc = "framedescription.htm"
marginheight	*pixels*	Specifies the height of the space between the top and bottom of the frame's borders and its contents.
marginwidth	*pixels*	Specifies the width of the space between the left and right of the frame's borders and the frame's content.
name	*text*	Specifies the name of a frame
noresize	noresize	Specifies that a frame is not resizable
scrolling	Yes, no, auto	Specifies whether or not to display scrollbars in a frame
src	*URL*	Specifies the URL of the document to show in a frame

Eg:1

```
<html>
<title> Frames </title>
<frameset rows="30%,70%">
<frame src="introduction.html"
name="top">
<frame src="hobbies.html"
name="Bottom">
</frameset>
</frame>
</html>
```

Eg:2

```
<html>
<title> Frames </title>
<frameset cols="25%,*,25%">
 <frame src = "nested tables.html" >
<frame src = "tables.html">
<frame src = "hobbies.html">
</frameset>
</html>
```

Advantages and Disadvantages of HTML

Advantages	Disadvantages
1. The first advantage it is widely used. 2. Every browser supports HTML language. 3. Easy to learn and use. 4. It is by default in every window so you don't need to purchase extra software. 5. You can integrate HTML with CSS, JavaScript, php etc.	1. It can create only static and plain pages so if we need dynamic pages then HTML is not useful. 2. Need to write a lot of code for making a simple webpage. 3. Security features are not good in HTML. 4. If we need to write long code for making a webpage then it produces some complexity

POINTS ABOUT HTML:

- HTML is used to create web pages.
- HTML used many tags to make a webpage. So it is a tag-based language.
- The tags of HTML are surrounded by the angular bracket.
- It can use wide ranges of colors, objects, and layouts.
- Very useful for beginners in web designing field.

Monthly savings

Firstname	Lastname	Age
Jill	Smith	50
Eve	Jackson	94

My Favorite Hobbies

Hobbies

1. Listening Music
2. Reading Books
3. Developing Mobile Apps
4. Long drive in Bike
5. Writing blogs in Blogger

"Education is not the learning of facts, but training of the mind to think". - *Albert Einstein.*

Home

index - Notepad

File Edit Format View Help

```
<html>
<title> :::: Header and Footer :::: </title>
<frameset rows="15%,*,40%" frameborder=0 >
<frame src="header.html">
<frameset cols="30%,*,30%">
<frame src="likes.html">
<frame src="dislikes.html">
<frame src="myhobby.html">
</frameset>
<frame src="footer.html">
</frameset>
</html>
```

Ln 12, Col 8 100% Windows (CRLF) UTF-8

Type here to search

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About Myself

Date: 06 / 01 / 2020

Likes

1. Natural Places
2. Holy bath in Rivers
3. Time with childrens
4. Shreya Ghoshal Voice
5. Tandoori Dishes

Dislikes

i. Noise
ii. Polution
iii. Irresponsible peoples
iv. Cheating people
v. Smoking

My Favorite Hobbies

Hobbies

- Listening Music
- Reading Books
- Developing Mobile Apps
- Long drive in Bike
- Writing blogs in Blogger

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INFORMATION SYSTEMS

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II BCom

Information.

- Information can be defined as meaningfully interpreted data. If we give you a number 1-212-290-4700, it does not make any sense on its own. It is just a raw data. However if we say Tel: +1-212-290-4700, it starts making sense. It becomes a telephone number. So, from a system analyst's point of view, information is a sequence of symbols that can be constructed to a useful message.
- Information could be classified on the basis of the purpose for which it is utilized, into three main categories:
  - **Strategic Information:** it is required by the managers at the strategic level of management for the formulation of organizational strategies.
  - **Tactical Information :** information in this category is used in short term planning and is of use at management control level.
  - **Operational Information:** it applies to short periods which may vary from an hour to a few days.

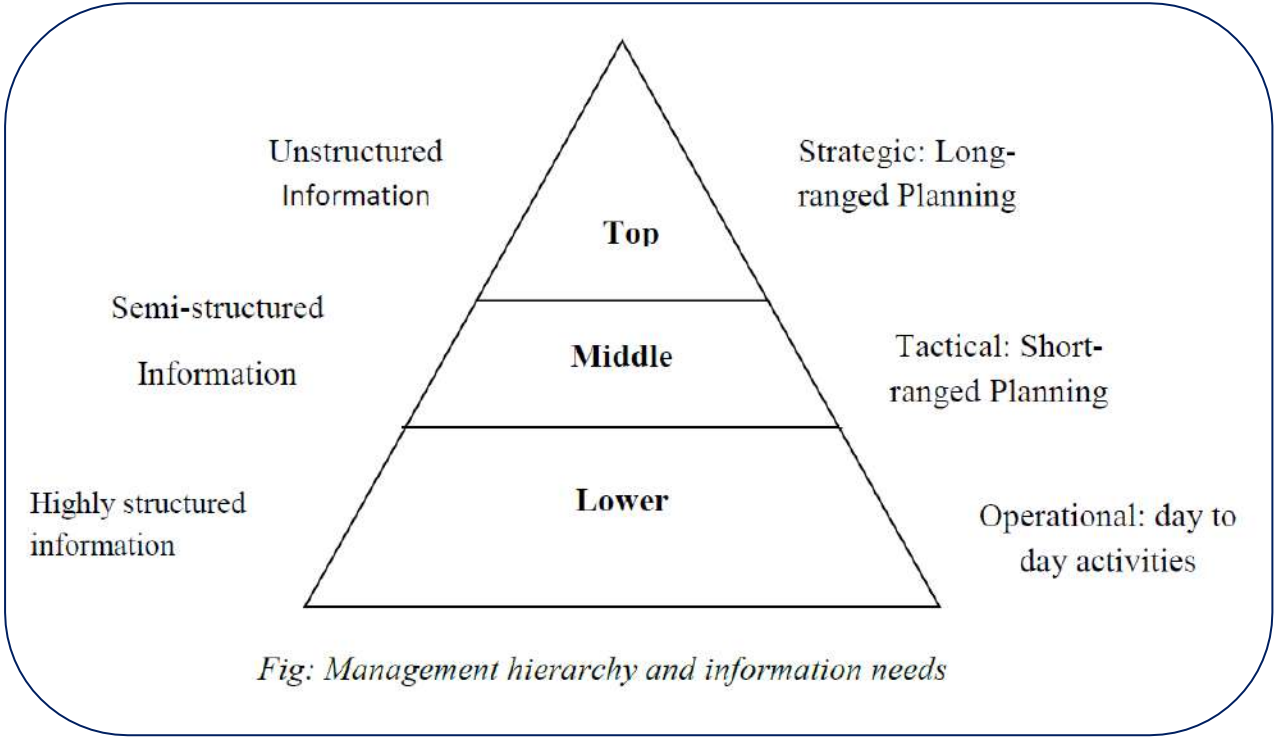


Fig: Management hierarchy and information needs

- An **Information System** is a system that gathers data and distributes information with the sole purpose of providing information to its users. The main object of an information system is to provide information to its users. Information systems vary according to the type of users who use the system.
- A **Management Information System** is an information system that evaluates, analyzes, and processes an organization's data to produce meaningful and useful information based on which the management can take right decisions to ensure future growth of the organization.
- Information system, an integrated set of components for collecting, storing, and processing data and for providing information, knowledge, and digital products.
- Business firms and other organizations rely on information systems to carry out and manage their operations, interact with their customers and suppliers, and compete in the marketplace.
- Information systems are used to run interorganizational supply chains and electronic markets. For instance, corporations use information systems to process financial accounts, to manage their human resources, and to reach their potential customers with online promotions.

- Many major companies are built entirely around information systems.
  - These include **eBay**, a largely auction marketplace;
  - **Amazon**, an expanding electronic mall and provider of cloud computing services;
  - **Alibaba**, a business-to-business e-marketplace; and
  - **Google,** a search engine company that derives most of its revenue from keyword advertising on Internet searches.
  - **Governments** deploy information systems to provide services cost-effectively to citizens.
  - **Digital goods**—such as electronic books, video products, and software—and online services, such as gaming and social networking, are delivered with information systems.
  - Individuals rely on information systems, generally Internet-based, for conducting much of their personal lives: for socializing, study, shopping, banking, and entertainment.

Functions of Information Systems

- One of the mostly widely used bases for organizing activities in almost every organization is the business function.
- Business activities are grouped around functions such as production, marketing, finance and personnel etc.
- Resulting in the respective department or an area of the business organization.
- These departments or functional areas are commonly known as the functional areas of business.
- There is no standard classification of such sub-system in an organization, but a typical set of functions in a manufacturing organization includes:
  - **P**roduction
  - **M**arketing
  - **F**inance and accounting
  - **M**aterials and **P**ersonnel systems

- **Production:**
  - Production planning and control
  - Engineering standards
  - Quality control
  - R & D etc
- **Finance and Accounting:**
  - Financial planning
  - Budgeting
  - Cost accounting
  - Asset accounting
  - Accounts receivable
  - Payroll
  - Accounts payable, etc...

- **Marketing:**
  - Sales order
  - Forecasting
  - Sales analysis
  - Billing
  - Distribution
  - Stock availability
  - Sales quota control
  - Pricing
  - Product promotion

- **Materials:**
  - Material planning
  - Bill of material
  - Cost estimate
  - Warehousing planning etc...
- **Personnel:**
  - Employee recruitment
  - Employee selection
  - Employee development
  - Employee transfers
  - Employee retirements etc...

Components of Information Systems

- The main components of information systems are
  - Computer Hardware
  - Software,
  - Telecommunications,
  - Databases and data warehouses,
  - Human resources, and Procedures.
- The Hardware, Software, and Telecommunications constitute information technology (IT), which is now ingrained in the operations and management of organizations.

- **Telecommunications:** Telecommunications are used to connect, or network, computer systems and portable and wearable devices and to transmit information. Connections are established via wired or wireless media. Wired technologies include coaxial cable and fiber optics. Wireless technologies, predominantly based on the transmission of microwaves and radio waves, support mobile computing.

Databases and Data warehouses

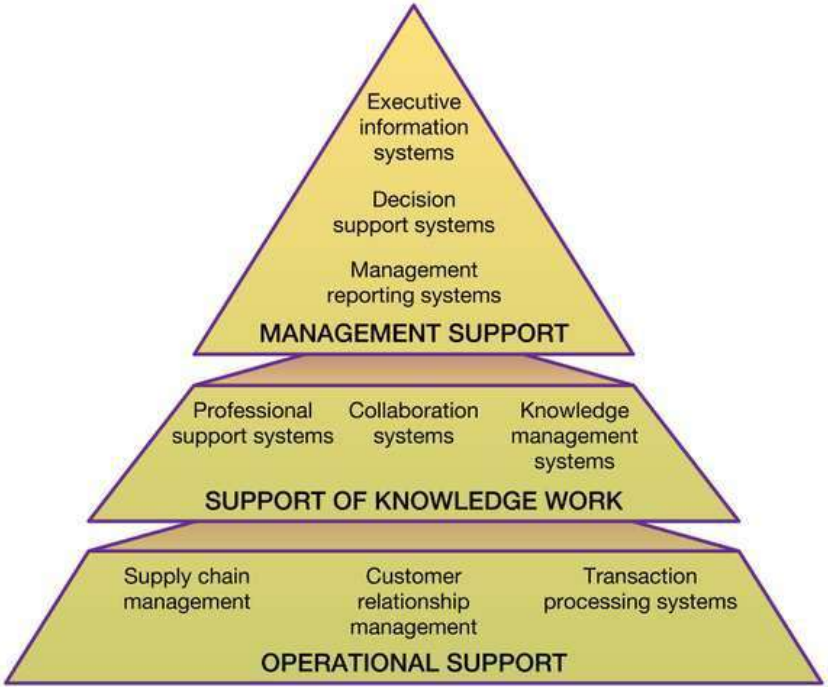
- A **Database** is a collection of interrelated data organized so that individual records or groups of records can be retrieved to satisfy various criteria. Typical examples of databases include employee records and product catalogs. Databases support the operations and management functions of an enterprise.
- **Data warehouses** contain the archival data, collected over time, that can be mined for information in order to develop and market new products, serve the existing customers better, or reach out to potential new customers.
- Massive collection and processing of the quantitative, or structured, data, as well as of the textual data often gathered on the Web, has developed into a broad initiative known as "**Big data.**" Many benefits can arise from decisions based on the facts reflected by big data.

Human Resources and Procedures

- Qualified people are a vital component of any information system. Technical personnel include Development and Operations Managers, Business Analysts, Systems Analysts And Designers, Database Administrators, Programmers, Computer Security Specialists, And Computer Operators.
- In addition, all workers in an organization must be trained to utilize the capabilities of information systems as fully as possible. Billions of people around the world are learning about information systems as they use the Web.
- Procedures for using, operating, and maintaining an information system are part of its documentation. For example, procedures need to be established to run a payroll program, including when to run it, who is authorized to run it, and who has access to the output. In the autonomous computing initiative, data centers are increasingly run automatically, with the procedures embedded in the software that controls those centers.

Types of Information Systems

- Information systems support operations, knowledge work, and management in organizations.
- Information systems that support a specific organizational function, such as marketing or production, have been replaced in many cases by cross-functional systems built to support complete business processes, such as order processing or employee management.
- Such systems can be more effective in the development and delivery of the firm's products and can be evaluated more closely with respect to the business outcomes.


Executive information systems
Decision support systems
Management reporting systems
MANAGEMENT SUPPORT
Professional support systems
Collaboration systems
Knowledge management systems
SUPPORT OF KNOWLEDGE WORK
Supply chain management
Customer relationship management
Transaction processing systems
OPERATIONAL SUPPORT

- Information systems consist of three layers:
  - Operational support,
  - Support of knowledge work, and
  - Management support.
- **Operational Support** forms the base of an information system and contains various transaction processing systems for designing, marketing, producing, and delivering products and services.
- **Support of Knowledge work** forms the middle layer; it contains subsystems for sharing information within an organization.
- **Management Support**, forming the top layer, contains subsystems for managing and evaluating an organization's resources and goals.

Classification of Information System

- The discipline of MIS is in its evolutionary stage. MIS is a concept, which is a matter of degree rather than an absolute one.
- The classifications of information system are
  - **T**ransaction **P**rocessing **S**ystem.
  - **M**anagement **I**nformation **S**ystem.
  - **D**ecision **S**upport **S**ystem.
  - **E**xecutive **S**upport **S**ystem.
  - **O**ffice **A**utomation **S**ystem.
  - **B**usiness **E**xpert **S**ystem.

Transaction Processing System

- It represents the automation of the fundamental, routine process used to support business operations.
- It does not provide any information to the user for his/her decision making.
- Previously Transaction processing system was known as MIS.
- Prior to computers, data processing was performed manually or with simple machines.

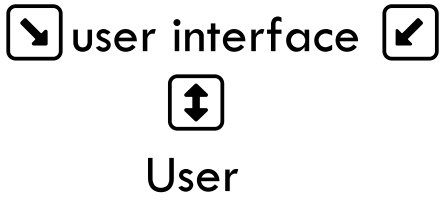
(INPUT) DATA→PROCESSING→DATA (OUTPUT)

Management Information System

- MIS is an information system which process data and converts it into information.
- A MIS uses TPS for its data inputs.
- The information generated by the information system may be used for control of operations, strategic and long range planning, short range planning, management control and other managerial problem solving.
- It has some functional business areas. They are
  - **M**arketing
  - **P**roduction
  - **H**uman resources
  - **F**inance Accounting etc...
- TPS→DATA→INPUT→PROCESSING→OUTPUT→INFORMATION

Decision Support System

- The Decision support system (DSS) is an information system application that assist decision making.
- Decision support systems tend to be designed primarily to serve management control level and strategic planning level managers.
- The data in the database typically is a combination of master files (internal corporate data) and from external sources.
- Database←----------→model base



Executive Support System:

- Executive Support System (ESS) is an extension of the management information system which is a special kind of DSS.
- An ESS is specially tailored for the use of chief executive of an organization to support his decision making.
- An ESS is designed to provide the information needs of a chief executive keeping in view not only his requirements but also taking into account his personality and style of functioning etc.,

Office Automation System

- Office automation refers to the application of computer and communication technology to office functions.
- Office automation systems are meant to improve the productivity of managers at various level of management by providing secretarial assistance and better communication facilities.
- Office automation systems are the combination of hardware, software and people in information systems, that process office transactions and support office activities at all levels of the organization.
- These systems include a wide range of support facilities, which include Word Processing, Electronic Filing, Electronic Mail, Message Switching, Data Storage, Data And Voice Communication etc...
- In the first category, the following is a list of activities. Typing, Mailing, Scheduling of meetings and conferences, Calendar keeping and Retrieving documents
- In the secondary category, Conferencing, Production of Information, Controlling Performance.

Business Expert System

- Business expert system (BES) is a knowledge based information system that uses its knowledge about a specific, complex application area to act as an expert.
- This system is one of the Knowledge Based Information System.
- Expert system provides decision support to managers in the form of advice from an expert in a specific problem area.
- Expert systems find application in diverse areas, ranging from medical, engineering and business.
- Knowledge base←----------→inference engine

  ↘ user interface ↙

Management Concepts

- Every business unit has some objectives of its own. These objectives can be achieved with the coordinated efforts of personnel. The works of a number of persons are properly coordinated to achieve the objectives through the process of management.
- Management is a vital aspect of the economic life of man, which is an organized group activity. It is considered an indispensable institution in the modern social organization marked by scientific thought and technological innovations.
- One of the other forms of management is essential wherever human efforts are to be undertaken collectively to satisfy wants through some productive activity, occupation, or profession.

- It is management that regulates man's productive activities through the coordinated use of material resources. Without the leadership provided by management, the resources of production remain resources and never become production.
- Management is the integrating force in all organized activity. Whenever two or more people work together, to attain a common objective, they have to coordinate their activities. They also have to organize and utilize their resources in such a way as to optimize the results.
- Management is usually defined as planning, directing, and controlling business operations. Management is the process of allocating an organization's input including human and economic resources by planning, organizing, directing, and controlling for the purpose of producing goods or services desired by customers so that organizational objectives are accomplished.

Functions of Management

- Management has been defined as a process of getting things done through others. This process is identified in a set of functions performed by managers to accomplish the goals. A manager is thus someone who defines, plans, guides, helps out, and assesses the work of others, frequently people for whom the manager is accountable in an organization.
- The following mentioned management functions will involve creative problem solving.
- **Planning:** According to Terry and Franklin, "planning is selecting information and making assumptions concerning the future to put together the activities necessary to achieve organizational objectives." Planning includes both the broadest view of the organization, e.g., its mission, and the narrowest, e.g., a tactic for accomplishing a specific goal.

- **Organizing:** Organizing is the classification and categorization of requisite objectives, the grouping of activities needed to accomplish objectives, the assignment of each grouping to a manager with the authority necessary to supervise it, and the provisions for coordination horizontally and vertically in the organization structure. The focus is on separation, coordination, and control of tasks and the flow of information inside the organization. It is in this function that managers allocate authority to job holders.
- **Directing:** Direction is telling people what to accomplish and seeing that they do it to the finest of their capability. It includes making assignments, corresponding procedures, seeing that mistakes are corrected, providing on the job instruction and, of course, issuing orders." The purpose of directing is to control the behavior of all personnel to accomplish the organization's mission and objectives while simultaneously helping them accomplish their own career objectives.

- **Staffing:** The staffing function requires recognition of human resource needs, filling the organizational structure, and keeping it filled with competent people. This function includes recruiting, training; evaluating, and compensating are specific activities.
- **Controlling:** "Control is the course of action that measures present performance and guides it towards some predetermined goal. The quintessence of control lies in checking existing actions against some desired results determined in the planning process."

Levels of Management

- According to the expert there are three types of level of management:
  - Top Level Management
  - Middle Level Management
  - Low Level or Operative Management

Top Level Management

- Top level management consists of board of directors, managing directors or executive committee members.
- Objectives of Top Level Management include the following.
  - Setting key objectives, policies and identifying factors essential for the development of the organization.
  - Making appointments to the top position of the organization such as managers department heads etc.
  - Reviewing the work of different personnel in various levels.

Middle Level Management

- Middle level management consists of managers of various departments such as productions, sales, marketing, resource, finance etc.

Objectives of Middle Level Management include the following.

- Follow the rules and policies formulated by the top level management.
- Motivating personnel for higher productivity.
- Collecting detail analysis reports from the various departments.
- Mutual understanding with other departments in the organization.
- Recommendations to the top level management.

Low Level Management

- Low level management consist of supervisors, daily workers etc. Follow the rules and guidelines made out by the top level authentic of the organization.
- Some of the functions of Lower Level Management include the following.
  - To issue orders and instructions to the workers and to supervise and control their work
  - To classify and assign jobs to the workers
  - To direct and guide the workers about work procedure
  - To arrange for the necessary tools, equipment, materials etc., for the worker
  - To solve the problems of workers
  - To inform the management about the problems of workers which are not solved at this level?
  - To maintain discipline among the workers and to develop in them the right approach to work.
  - To maintain good human relations.
  - To build a high group morale among the workers.

Management Information Systems

- **Management :** Management covers the planning, control, and administration of the operations of a concern. The top management handles planning; the middle management concentrates on controlling; and the lower management is concerned with actual administration.
- **Information:** Information, in MIS, means the processed data that helps the management in planning, controlling and operations. Data means all the facts arising out of the operations of the concern. Data is processed i.e. recorded, summarized, compared and finally presented to the management in the form of MIS report.
- **System:** Data is processed into information with the help of a system. A system is made up of inputs, processing, output and feedback or control.
- Thus MIS means a system for processing data in order to give proper information to the management for performing its functions.
- **Definition:** Management Information System or 'MIS' is a planned system of collecting, storing, and disseminating data in the form of information needed to carry out the functions of management.

Objectives of MIS

- The goals of an MIS are to implement the organizational structure and dynamics of the enterprise for the purpose of managing the organization in a better way and capturing the potential of the information system for competitive advantage.
- Following are the basic objectives of an MIS −
  - **Capturing Data** − Capturing contextual data, or operational information that will contribute in decision making from various internal and external sources of organization.
  - **Processing Data** − The captured data is processed into information needed for planning, organizing, coordinating, directing and controlling functionalities at strategic, tactical and operational level. Processing data means −
    - Making calculations with the data, Sorting data, Classifying data and Summarizing data
  - **Information Storage** − Information or processed data need to be stored for future use.
  - **Information Retrieval** − The system should be able to retrieve this information from the storage as and when required by various users.
  - **Information Propagation** − Information or the finished product of the MIS should be circulated to its users periodically using the organizational network.

Characteristics of MIS

- Following are the characteristics of an MIS −
  - It should be based on a long-term planning.
  - It should provide a complete view of the dynamics and the structure of the organization.
  - It should be planned in a top-down way, as the decision makers or the management should actively take part and provide clear direction at the development stage of the MIS.
  - It should be based on need of strategic, operational and tactical information of managers of an organization.
  - It should also take care of exceptional situations by reporting such situations.
  - It should be able to make forecasts and estimates, and generate advanced information, thus providing a competitive advantage. Decision makers can take actions on the basis of such predictions.
  - It should create linkage between all sub-systems within the organization, so that the decision makers can take the right decision based on an integrated view.
  - It should allow easy flow of information through various sub-systems, thus avoiding redundancy and duplicity of data. It should simplify the operations with as much practicability as possible.

Characteristics of Computerized MIS

- Following are the characteristics of a well-designed computerized MIS −
  - It should be able to process data accurately and with high speed, using various techniques like operations research, simulation, heuristics, etc.
  - It should be able to collect, organize, manipulate, and update large amount of raw data of both related and unrelated nature, coming from various internal and external sources at different periods of time.
  - It should provide real time information on ongoing events without any delay.
  - It should support various output formats and follow latest rules and regulations in practice.
  - It should provide organized and relevant information for all levels of management: strategic, operational, and tactical.
  - It should aim at extreme flexibility in data storage and retrieval.

The Role of Management Information Systems

- Management Information System (MIS) has become very necessary due to the emergence of high complexity in business organizations. It is all to know that without information no Organization can take even one step properly regarding the decision-making process. Because it is a matter of fact that in an organization decision plays an essential role in the achievement of its objectives and we know that every decision is based upon the information. If gathered information is irrelevant then the decision will also incorrect and the organization may face big loss & lots of difficulties in surviving as well.
- Two main roles are played by the decision making of the managers. First it helps the managers to take decision based on the information being prepared. Second when the decision making and decisions are fixed and only the input data change, it is as a suitable repeating to support different types of manager's decisions.

- **Helps in Decision making:-** Management Information System (MIS) plays a significant Role in Decision making Process of any Organization. Because in Any organization decision is made on the basis of relevant information and relevant information can only be Retrieving from the MIS.
- **Helps in Coordination among the Department: -** Management Information System also helps in establishing a sound Relationship among every person of the department to the department through proper exchanging of Information's.
- **Helps in Finding out Problems: -** MIS provides relevant information about every aspect of activities. Hence, if any mistake is made by the management then Management Information Systems (MIS) Information helps in Finding out the solution to that problem.

- **Helps in Comparison of Business Performance: -** MIS store all Past Data and information in its Database. That why management information system is very useful to compare Business organization Performance. With the help of Management information system (MIS) Organization can analyze his Performance means whatever they do last year or Previous Years and whatever business performance in this year and also measures organization Development and Growth.

Planning for a Management Information System (MIS)

- Below is a list of steps to follow when planning to adopt an MIS.

Define Outcomes

- Management information systems can help strengthen your organization, but there are limited resources. Make a clear articulated case to secure funding and prioritize the effort.
  - Identify tangible benefits that an MIS will bring to your organization
  - Define the scope of the MIS (organizational level, regional level, country level)
  - Develop measurements to assess whether MIS is successful.

Form your team

- The successful implementation of an MIS requires a combination of people and technology.
  - Determine resources and skills needed for each of the three phases of an MIS (develop, scale, and sustain)

Define what your system needs to do

Documenting system requirements and communicating them well is a crucial. Lack of understanding between the users of a system and the people who design it is one of the main causes of frustration, delays and cost overruns in IT projects.

- Conduct a self-inventory to map out what information systems and reporting relationships already exist
- Establish common benchmarks, and harmonize reporting requirements
- Describe high-level business requirements and how key types of individuals (e.g. managers, directors, auditors, donors) will use the MIS data.
- Determine technical requirements for your specific context. E.g., if electricity and/or Internet connectivity is a problem in your context, plan for:
  - Offline data entry
  - Automatic transmission of data to a central database when communication networks are available
- Identify how newly computerized processes link to retained manual and paper-based processes

Find the right solution

- There is a range of potential solutions depending on your resources and needs. This includes buying or building your system, selecting open-source or proprietary systems.
- Identify the best system for your organization depending on your resources and expected use. Software models can range from custom-developed software (i.e. build a software system from scratch) to Software as a service (SaaS) (i.e. a database and application hosted on remote servers, and software is sold (or offered freely) as a service that can be contracted per user and per month or year).
- SaaS applications are particularly useful because they:
  - Eliminate need to invest in local servers
  - Eliminate need for in-house IT staff o Incorporate on-demand training and support
  - Often incorporate a pay by the drink cost model (obviate large up front investments)
  - Easier to transfer to local institutions

Estimate implementation and operating costs

- Estimate project cost for pilot, scale up, and maintenance
- **Pilot:** the functional, technical, and organizational complexity of the project drives costs. Costs do not vary significantly for a large or a small country.
- **Scale:** the number of future users and the cost per user to deploy it are the most important variables. The cost per user depends on the way in which users will access the system (for example, desktop computer, mobile phone, paper) and their training needs.
- **Sustain:** Apart from the number of users, the selected technology is critical here. For example, any solution that requires local software installation and maintenance will be more expensive than a centralized system, such as a web-based or cloud system.

- **Create an implementation plan**
  - Define work plan for development, pilot. and scale up.
  - Don't forget to include training of MIS users.
  - Track milestones
- **Understand and manage project risks**
- The seven steps above should lower project risk by aligning requirements to organizational objectives, understanding costs, planning appropriately, and choosing the right vendors. In addition, consider the following type of risks below.
  - Lack of governance: Many cite lack of leadership buy-in as the most important factor for project failure.
  - Poor management: The management team lacks the technical capacity or the organizational authority to provide the project the stability it needs.
  - Development risk: Relates to changing user requirements and a misunderstanding of the technology that is being used.
  - Deployment risk: Systems from a failure to manage the changes that will affect the organization because of the new information system.
  - Operational risk: Arises when the organization is not ready to support newly introduced technologies over the longer term.

Control Issues in Management Information Systems.

- Control is the process through which manager assures that actual activities are according to standards leading to achieving of common goals.
- The control process consists of measurement of progress, achieving of common goals and detects the deviations if any in time and takes corrective action before things go beyond control.
- Information systems operate in real world situations which are always changing and there are lots of problems. Information systems are vulnerable to various threats and abuses.
- **Security Control**
  - The resources of information systems like hardware, software, and data, need to be protected preferably by build in control to assure their quality and security.

- Types of Security Control:
  - Administrative control
  - Information systems control
  - Procedural control
  - Physical facility control
- **Administrative Control**
  - Systems analysts are actually responsible for designing and implementing but these people need the help of the top management in executing the control measure. Top executives provide leadership in setting the control policy. Without their full support, the control system cannot achieve its goal.
- **Information System Control**
  - Information system control assures the accuracy, validity and proprietary of information system activities. Control must be there to ensure proper data entry processing techniques, storage methods and information output. Accordingly management information system control are designed to see or monitor and maintain quality, security of the input process, output and storage activities of an information system.

Input Control

- As we know whatever we give to computer the computer processes that and returns the result to us. Because of this very fact, there is a need to control the data entry process. The types of input control are:
  - **Transaction Codes:** Before any transaction can be input into the system, a specific code should be assigned to it. This aids in its authorization.
  - **Forms:** a source document or screen forms should be used to input data and such forms must adhere to certain rules.
  - **Verification:** Source document prepared by one clerk can be verified by another clerk to improve accuracy.
  - **Control–totals:** Data entry and other system activities are frequently monitored by the use of control-total. For example, record count is a control-total that consist of counting the total number of source documents or other input records and compare them at other stage of data entry. If totals do not match, then a mistake is indicated.
  - **Check digit:** These are used for checking important codes such as customer number to verify the correctness.
  - **Labels**: It contains data such as file name, and date of creation so that a check can be made that correct file is used for processing.
  - **Character and field checking:** Characters are checked for proper mode – numeric, alphabetic, alphanumeric fields – to see if they are filled in properly.

Processing Control

- Input and processing data are so interrelated that we can take them as first line of defense. Once data is fed into the computer, controls are embedded in various computer programs to help, detect not only input errors but also processing errors. They are also used to ensure that data are not lost or do not go unprocessed.

Output Control

- These are developed to ensure that processed information is correct, complete and is transmitted to authorized user in a timely manner. The output control are mostly of same kind as input control e.g. Output documents and reports are thoroughly and visually verified by computer personnel and they are properly logged and identified with rout slips

Storage Control

- Control responsibility of files of computer programs and databases is given to librarian or database administrator. They are responsible for maintaining and controlling access to the information. The databases and files are protected from unauthorized users as accidental users. This can be achieved with the help of security monitor. The method includes assigning the account code, password and other identification codes. A list of authorized users is provided to computer system with details such as type of information they are authorized to retrieve or receive from it.

Procedural Control

- These methods provide maximum security to operation of the information system. Standard procedures are developed and maintained manually and built in software help display so that every one knows what to do. It promotes uniformity and minimize the chance of error and fraud. It should be kept up-to-date so that correct processing of each activity is made possible.

Physical Facility Control

- Physical facility control is methods that protect physical facilities and their contents from loss and destruction. Computer centers are prone to many hazards such as accidents, thefts, fire, natural disasters, destructions etc. Therefore physical safeguards and various control procedures are required to protect the hardware, software and vital data resources of computer using organizations.

Physical Protection Control

- Many type of controlling techniques such as one in which only authorized personnel are allowed to access to the computer center exist today. Such techniques include identification badges of information services, electronic door locks, security alarm, security policy, closed circuit TV and dust control etc., are installed to protect the computer center.

Limitations of MIS

- Even though MIS has many benefits it has its limitations. MIS is considered a solution for every problem within an organization. While MIS may solve some critical problems but it is not a solution to all problems of an organization.
- It cannot meet the special demands of each person. Mostly, the management information system doesn't provide exact information and the concept of a decision support system was created in response to such need.
- The limitations of MIS may be stated as, The MIS is as good as its design- MIS if designed in an improper manner does not serve the management and hence is of little relevance.
- The MIS is as good as its users-if the users do not know how to leverage the information available from MIS then MIS is of little use.
- The MIS is no good if the basic data is obsolete and outdated (for example, MIS will only facilitate garbage with information and in about garbage-out process)

The Challenges of Management Information Systems

- The major drawbacks and the reasons of failure and using MIS in public organizations are as following:

Humanistic factors

- The lack of information of the managers and users as they don't know exactly what they want and what their information needs are.
- The lack of understanding of the needs of the users by designers (the lack of correct definition of the needs and their analysis)
- The lack of participation of the managers and users in system design.
- The lack of information of most of the analysts and programmers (designers) with new system work environment.
- The lack of acceptance of the system executers and resistance against the change.
- The lack of accuracy in the data collected

Organizational factors

- The lack of good conditions for participation and collaboration of the managers, users and system directors
- The lack of consistency and complexity of the existing manual systems.
- The lack of existing systems and methods analysis before the system design
- The lack of evaluation of the existing power
- Bad condition of educating the specialized forces
- The lack of human resources with management and computer fields and other required specializations (the problems of absorbing human resources)
- Inadequate education of the users
- Inadequate and incomplete documentation
- Unsuitable implementation of the system

Decision Support Systems

- Decision support systems (DSS) are interactive software-based systems intended to help managers in decision-making by accessing large volumes of information generated from various related information systems involved in organizational business processes, such as office automation system, transaction processing system, etc.
- DSS uses the summary information, exceptions, patterns, and trends using the analytical models.
- A decision support system helps in decision-making but does not necessarily give a decision itself.
- The decision makers compile useful information from raw data, documents, personal knowledge, and/or business models to identify and solve problems and make decisions.

Programmed and Non-programmed Decisions

- There are two types of decisions - programmed and non-programmed decisions.
- Programmed decisions are basically automated processes, general routine work, where −
  - These decisions have been taken several times.
  - These decisions follow some guidelines or rules.
- For example, selecting a reorder level for inventories, is a programmed decision.
- Non-programmed decisions occur in unusual and non-addressed situations, so −
  - It would be a new decision.
  - There will not be any rules to follow.
  - These decisions are made based on the available information.
  - These decisions are based on the manger's discretion, instinct, perception and judgment.
- For example, investing in a new technology is a non-programmed decision.
- Decision support systems generally involve non-programmed decisions. Therefore, there will be no exact report, content, or format for these systems. Reports are generated on the fly.

Attributes of a DSS

- Adaptability and flexibility
- High level of Interactivity
- Ease of use
- Efficiency and effectiveness
- Complete control by decision-makers
- Ease of development
- Extendibility
- Support for modeling and analysis
- Support for data access
- Standalone, integrated, and Web-based

Characteristics of a DSS

- Support for decision-makers in semi-structured and unstructured problems.
- Support for managers at various managerial levels, ranging from top executive to line managers.
- Support for individuals and groups. Less structured problems often requires the involvement of several individuals from different departments and organization level.
- Support for interdependent or sequential decisions.
- Support for intelligence, design, choice, and implementation.
- Support for variety of decision processes and styles.
- DSSs are adaptive over time.

Benefits of DSS

- Improves efficiency and speed of decision-making activities.
- Increases the control, competitiveness and capability of futuristic decision-making of the organization.
- Facilitates interpersonal communication.
- Encourages learning or training.
- Since it is mostly used in non-programmed decisions, it reveals new approaches and sets up new evidences for an unusual decision.
- Helps automate managerial processes.

Components of a DSS

- Following are the components of the Decision Support System −
- **Database Management System (DBMS)** − To solve a problem the necessary data may come from internal or external database. In an organization, internal data are generated by a system such as TPS and MIS. External data come from a variety of sources such as newspapers, online data services, databases (financial, marketing, human resources).
- **Model Management System** − It stores and accesses models that managers use to make decisions. Such models are used for designing manufacturing facility, analyzing the financial health of an organization, forecasting demand of a product or service, etc.
- **Support Tools** − Support tools like online help; pulls down menus, user interfaces, graphical analysis, error correction mechanism, facilitates the user interactions with the system.

Classification of DSS

- There are several ways to classify DSS. Hoi Apple and Whinstone classifies DSS as follows −
- **Text Oriented DSS** − It contains textually represented information that could have a bearing on decision. It allows documents to be electronically created, revised and viewed as needed.
- **Database Oriented DSS** − Database plays a major role here; it contains organized and highly structured data.
- **Spreadsheet Oriented DSS** − It contains information in spread sheets that allows create, view, modify procedural knowledge and also instructs the system to execute self-contained instructions. The most popular tool is Excel and Lotus 1-2-3.
- **Solver Oriented DSS** − It is based on a solver, which is an algorithm or procedure written for performing certain calculations and particular program type.
- **Rules Oriented DSS** − Procedures are adopted in rules oriented DSS. Export system is the example.
- **Compound DSS** − It is built by using two or more of the five structures explained above.

Types of DSS

- Following are some typical DSSs −
- **Status Inquiry System** − It helps in taking operational, management level, or middle level management decisions, for example daily schedules of jobs to machines or machines to operators.
- **Data Analysis System** − It needs comparative analysis and makes use of formula or an algorithm, for example cash flow analysis, inventory analysis etc.
- **Information Analysis System** − In this system data is analyzed and the information report is generated. For example, sales analysis, accounts receivable systems, market analysis etc.
- **Accounting System** − It keeps track of accounting and finance related information, for example, final account, accounts receivables, accounts payables, etc. that keep track of the major aspects of the business.
- **Model Based System** − Simulation models or optimization models used for decision-making are used infrequently and creates general guidelines for operation or management.


Thank you