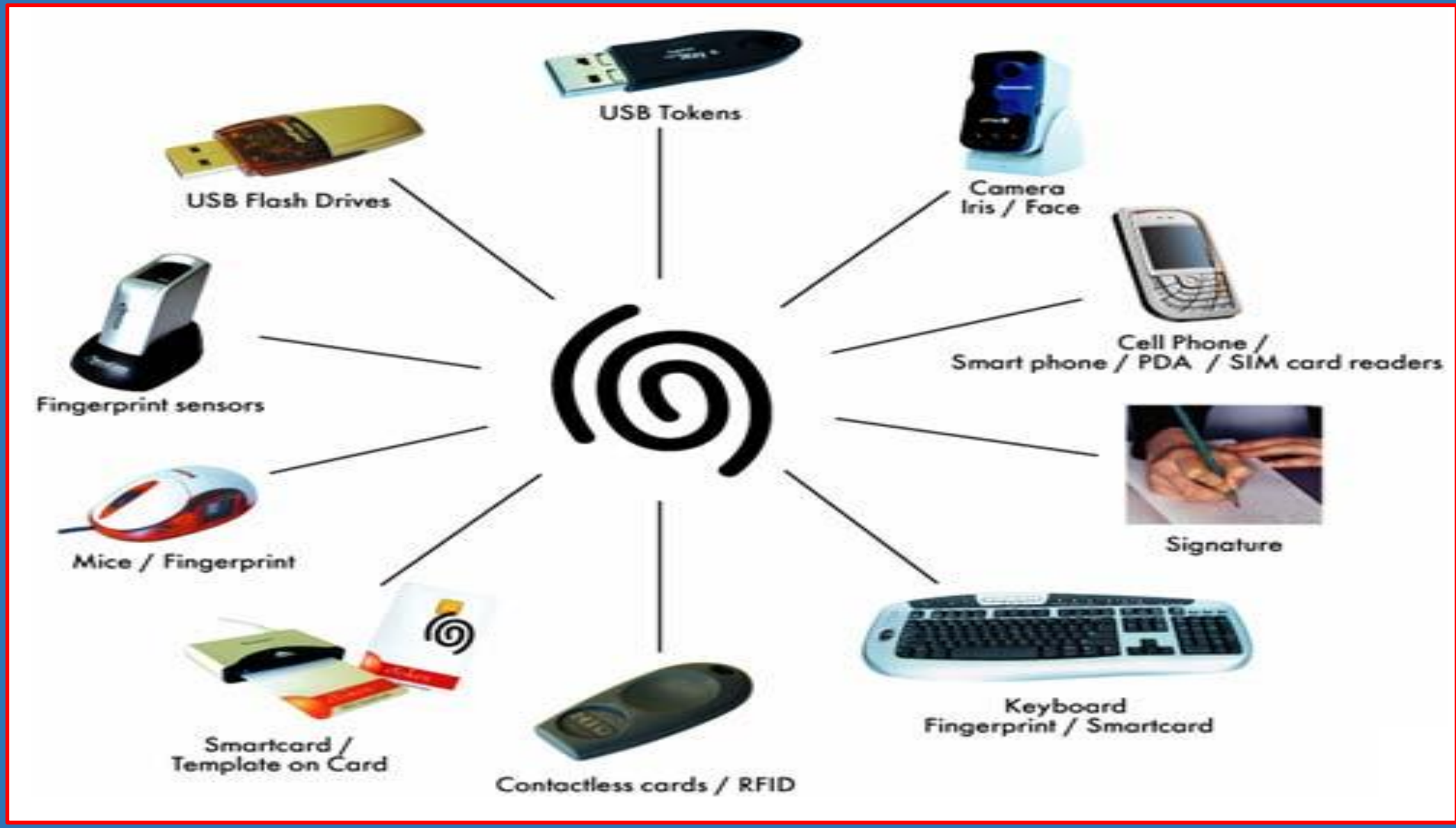
HARDWARE


USB Tokens
USB Flash Drives
Camera
Iris / Face
Fingerprint sensors
Cell Phone /
Smart phone / PDA / SIM card readers
Mice / Fingerprint
Signature
Keyboard
Fingerprint / Smartcard
Smartcard /
Template on Card
Contactless cards / RFID

IPOS CHART

INPUT

MOUSE
KEYBOARD
OCR
BCR
OMR
MICR
STYLUS
SCANNER
JOYSTICK
WEBCAM
LIGHTPEN
TRACKBALL
TOUCHPAD
BIOMETRICS
MICROPHONE
TOUCHSCREEN
QR CODE

PROCESS

MICRO PROCESSOR
RAM/ROM
MOTHERBOARD

OUTPUT

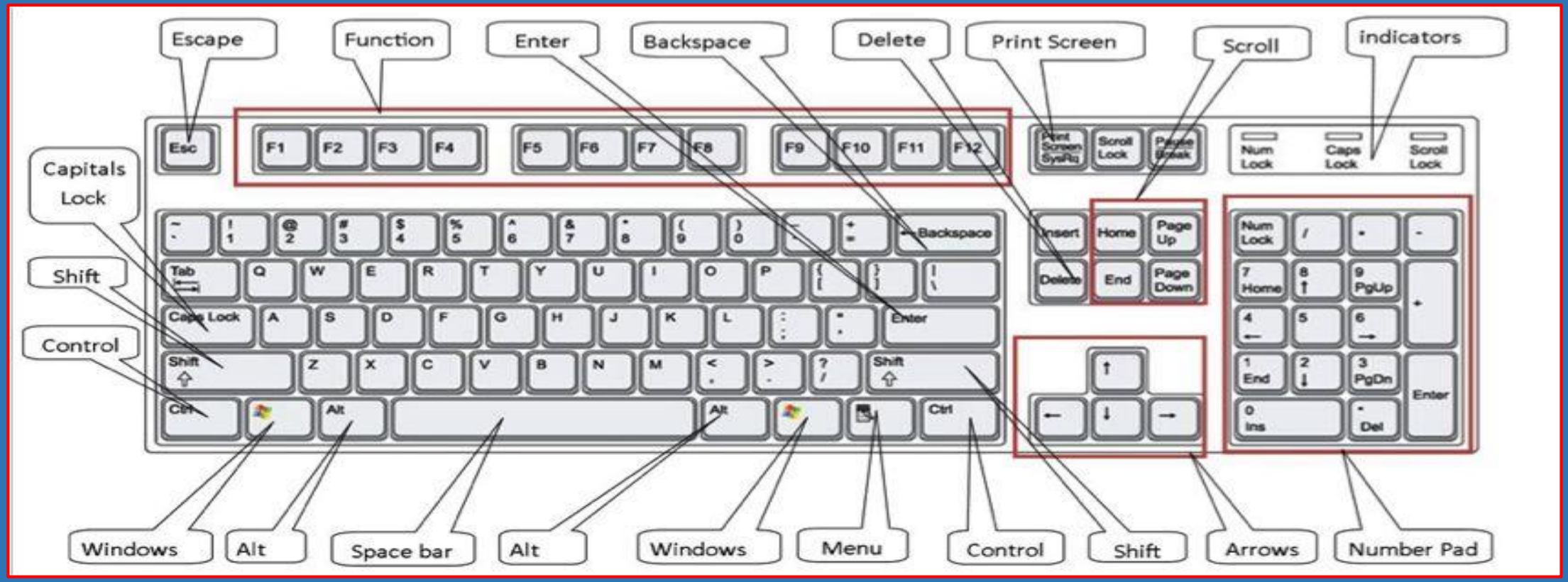
MONITOR
PRINTER
SPEAKER
PLOTTER
PROJECTOR

STORAGE

FLOPPY DISK
HARD DISK
OPTICAL DISC
(CD, DVD, BLU-RAY)
PEN DRIVE
ZIP DRIVE
TAPE DRIVE
MEMORY CARD

KEYBOARD

The computer keyboard is used to enter text information into the computer. The keyboard can also be used to type commands directing the computer to perform certain actions. This type of keyboard called **QWERTY** keyboard.

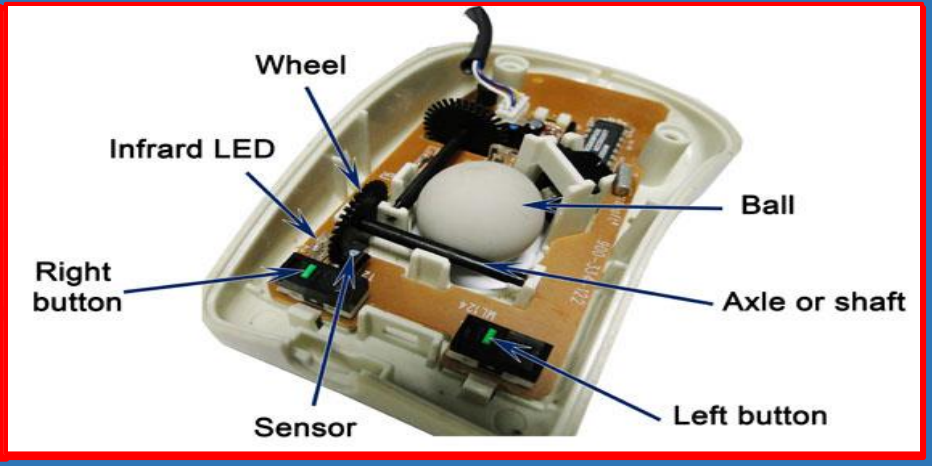


KEYBOARD

ADVANCE TECHNOLOGY KEYBOARD - BEE RAIDER KEYBOARD

MOUSE

- A cordless or wireless mouse communicates with the computer via radio waves (often using Bluetooth hardware and protocol) so that a cord is not needed.
- Pointing device that functions by detecting two-dimensional motion relative to its supporting surface.
- A mouse also includes one or more buttons (and possibly a scroll wheel) to allow users to interact with the GUI.

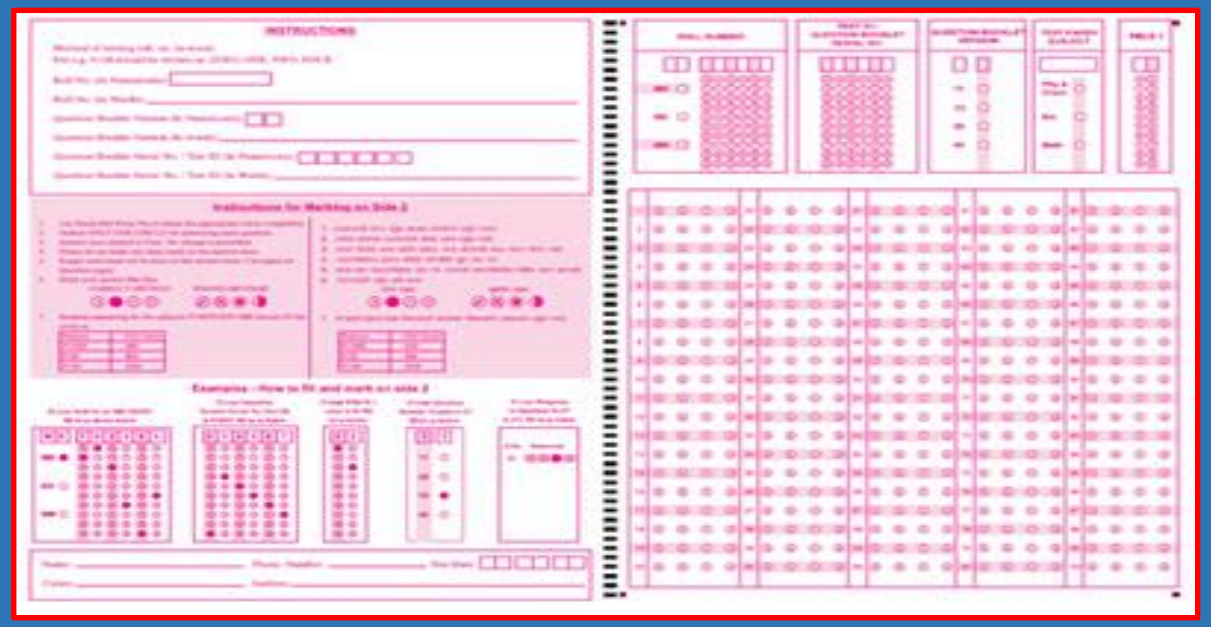


OCR- OPTICAL CHARACTER RECOGNITION

- Also known as **Optical Character Reader**.
- System that provides a full alphanumeric recognition of printed or handwritten characters at electronic speed by simply scanning the form. More recently, the term Intelligent Character Recognition (ICR) has been used to describe the process of interpreting image data, in particular alphanumeric text.

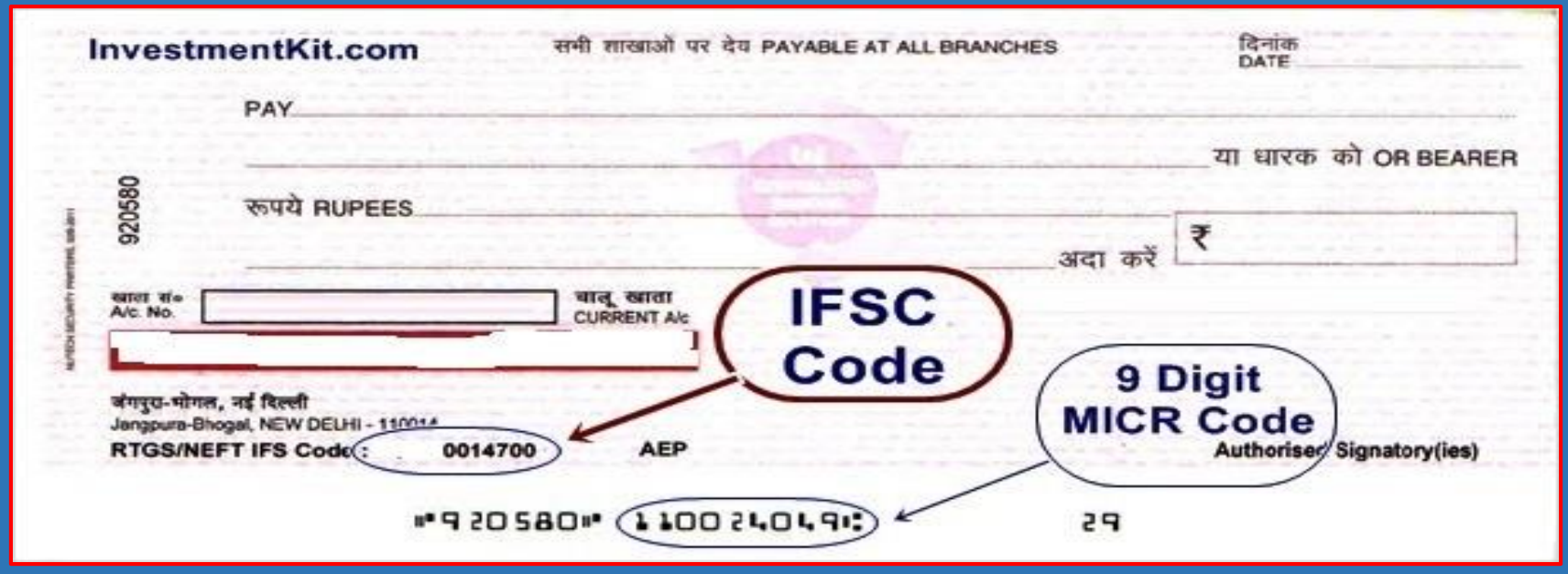
OMR-OPTICAL MARK RECOGNITION

- OMR enables the processing of hundreds or thousands of documents every hour automatically.
- OMR processing is popular for objective tests, where students receive a special card containing several empty circles and a packet that contains the questions and possible answers to each of the questions.



MICR-Magnetic Ink Character Recognition

- **MICR** is a character-recognition technology used mainly by the banking industry to ease the processing and clearance of cheques and other documents.
- The MICR encoding, called the MICR line, is at the bottom of cheques and other vouchers and typically includes the City code, bank code and branch code.

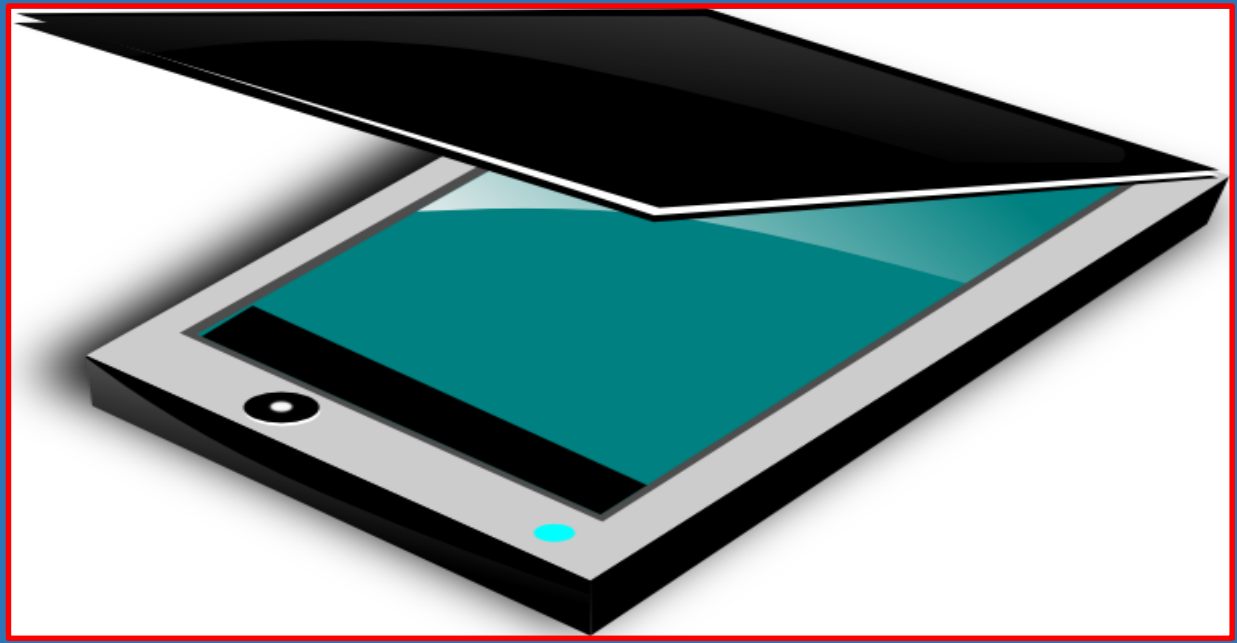


STYLUS

- A stylus is a writing tool that is typically long and stiff, like a ballpoint pen.
- In relation to a smartphone, a stylus is a small stick used to enter information or write on the touch screen of a phone.

SCANNER

- A scanner is a device that captures images from photographic prints, posters, magazine pages, and similar sources for computer editing and display.
- Scanners come in hand-held, feed-in, and flatbed types and for scanning black-and-white only, or colour.



JOYSTICK

- A joystick is an input device consisting of a stick that pivots on a base and reports its angle or direction to the device it is controlling.

WEBCAM

- A webcam is a hardware camera connected to a computer that allows anyone connected to the Internet to view either still pictures or motion video of a user or other object.
- Today, most webcams are either embedded into the display with laptop computers or connected to the USB port on the computer.

LIGHT PEN

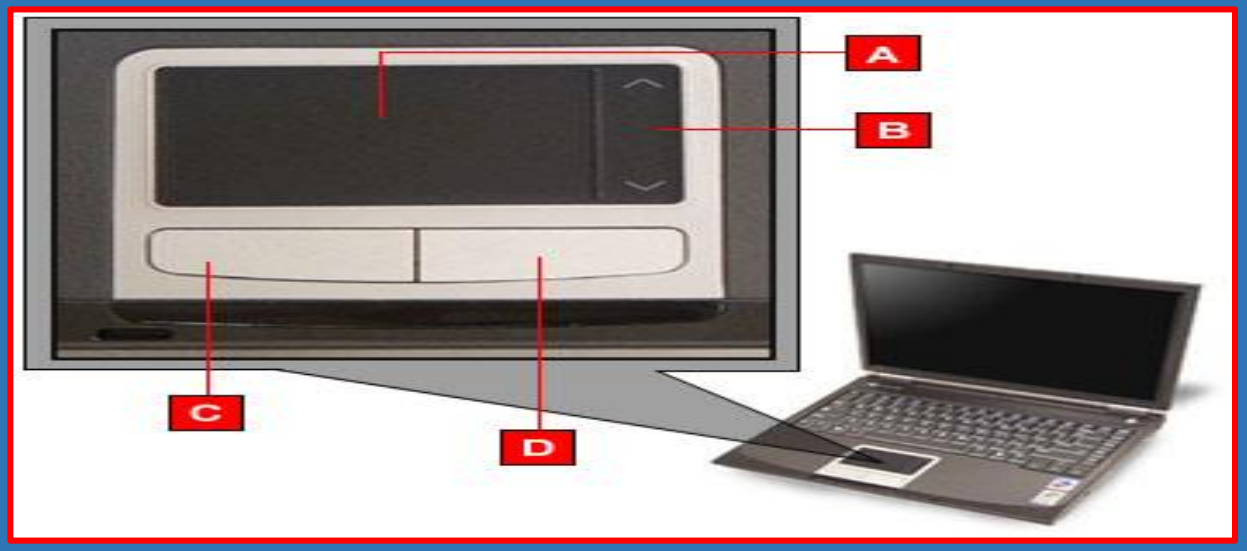
- An input device that utilizes a light-sensitive detector to select objects on a display screen.
- A light pen is similar to a mouse, except that with a light pen you can move the pointer and select objects on the display screen by directly pointing to the objects with the pen.

TRACKBALL

- A pointing device consisting of a ball held by a socket containing sensors to detect a rotation of the ball about two axes like an upside-down mouse with an exposed protruding ball.
- The user rolls the ball with the thumb, fingers, or the palm of the hand to move a pointer.

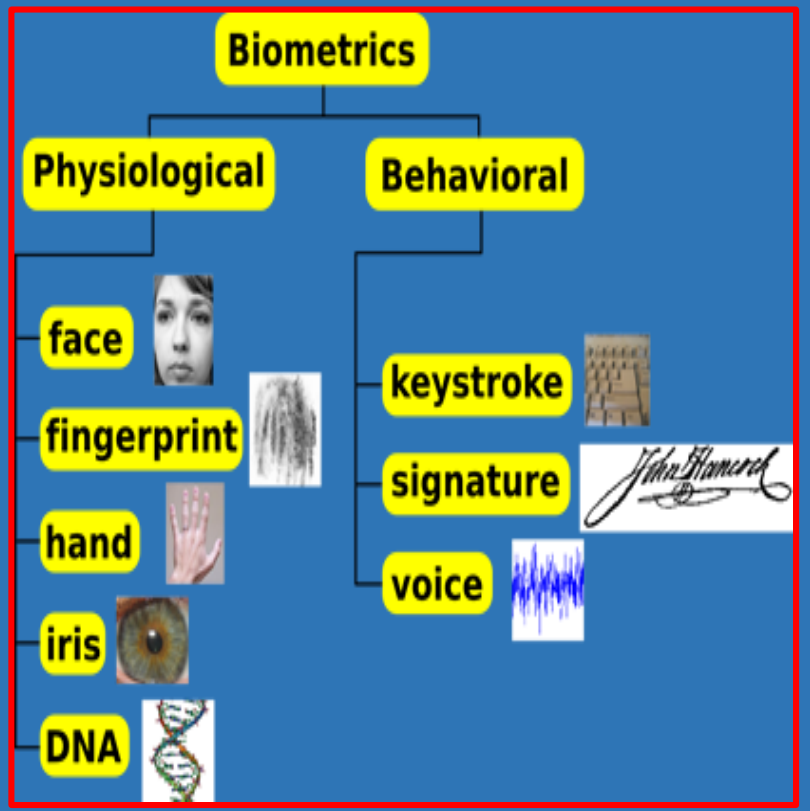
TOUCHPAD

- A **touchpad** or **track-pad** is a pointing device featuring a tactile sensor, a specialized surface that can translate the motion and position of a user's fingers to a relative position on the operating system that is outputted to the screen.
- Touchpads are a common feature of laptop computers, and are also used as a substitute for a mouse where desk space is scarce.



BIOMETRICS

- Biometrics is the science and technology of measuring and analyzing biological data.
- It refers to technologies that measure and analyse human body characteristics, such as fingerprints, eye retinas and irises, voice patterns, facial patterns and hand measurements for authentication purposes



MICROPHONE

- Sometimes abbreviated as **mic**, a **microphone** is a hardware peripheral originally invented by Emile Berliner in 1877 that allows computer users to input audio into their computers.
- Most microphones connect to the computer using the "mic" port on the computer sound card.

Uses of microphone-:

- VoIP
- Voice recognition
- Computer gaming
- Online chatting
- Recording voice for dictation, singing, and podcasts
- Recording musical instruments

TOUCH SCREEN

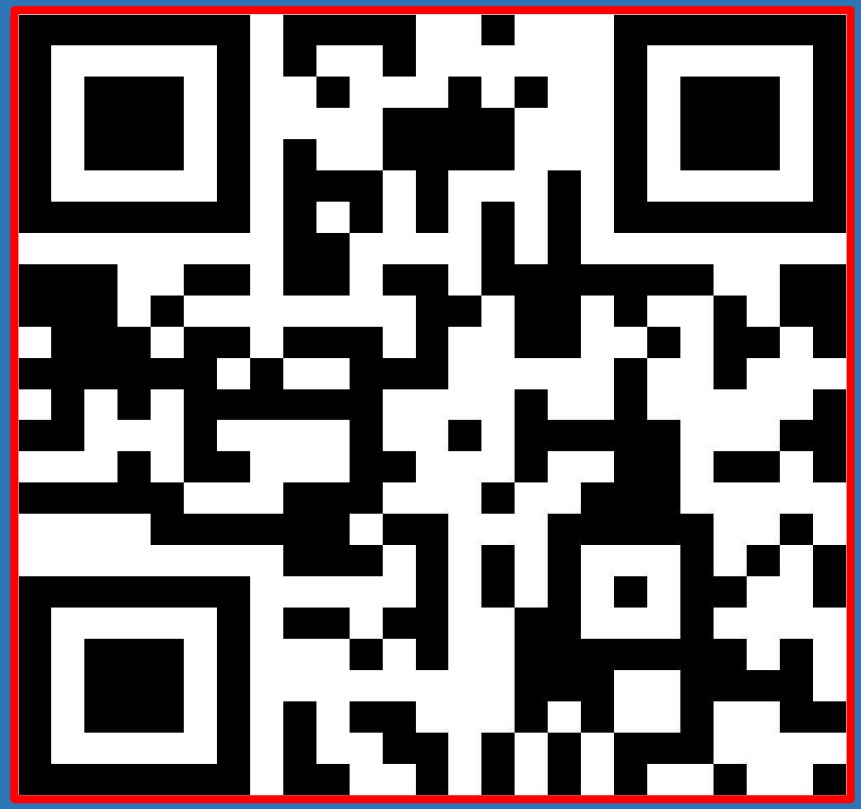
- A **touchscreen** is an electronic visual display that the user can control through simple or multi-touch gestures by touching the screen with a special stylus/pen and-or one or more fingers.
- Touchscreens are common in devices such as game consoles, all-in-one computers, tablet computers, and smartphones.

BAR CODE READER

- A **barcode** reader also called a price scanner or point-of-sale (POS) scanner is a hand-held or stationary input device used to capture and read information contained in a bar code.

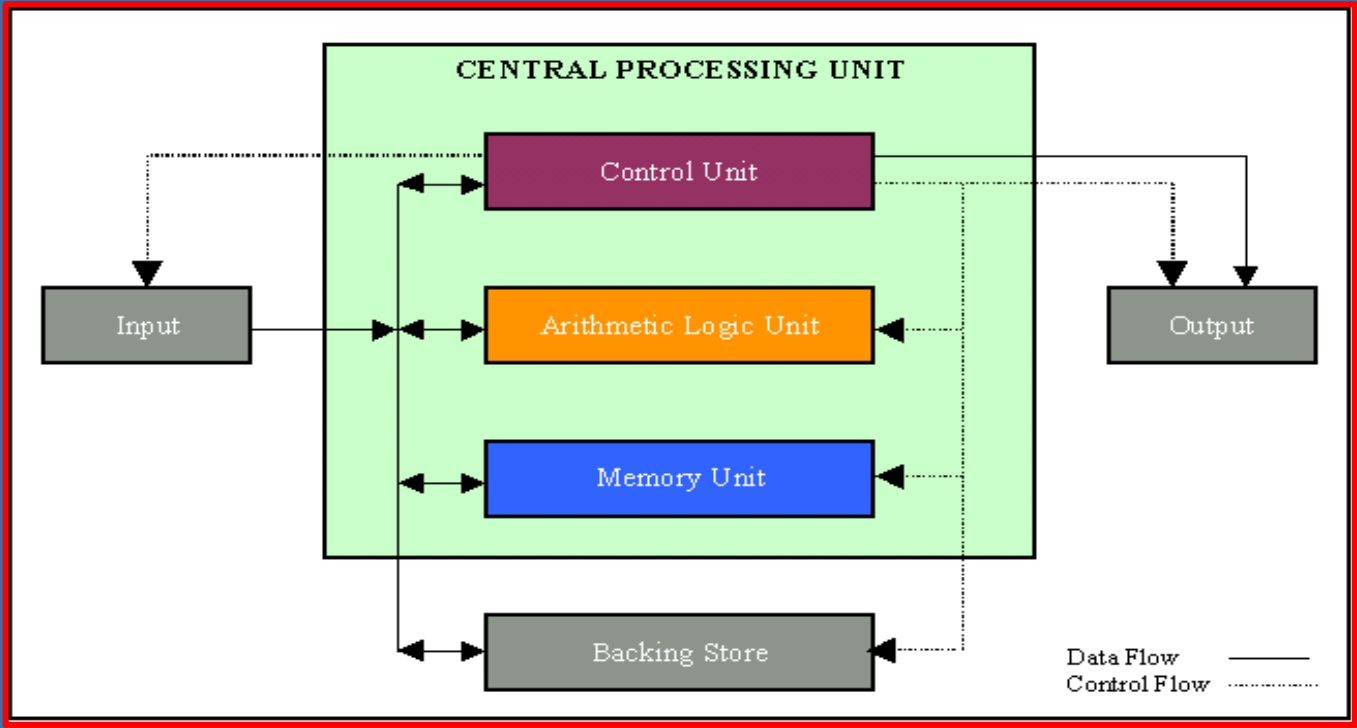
QR(Quick Response) CODE READER

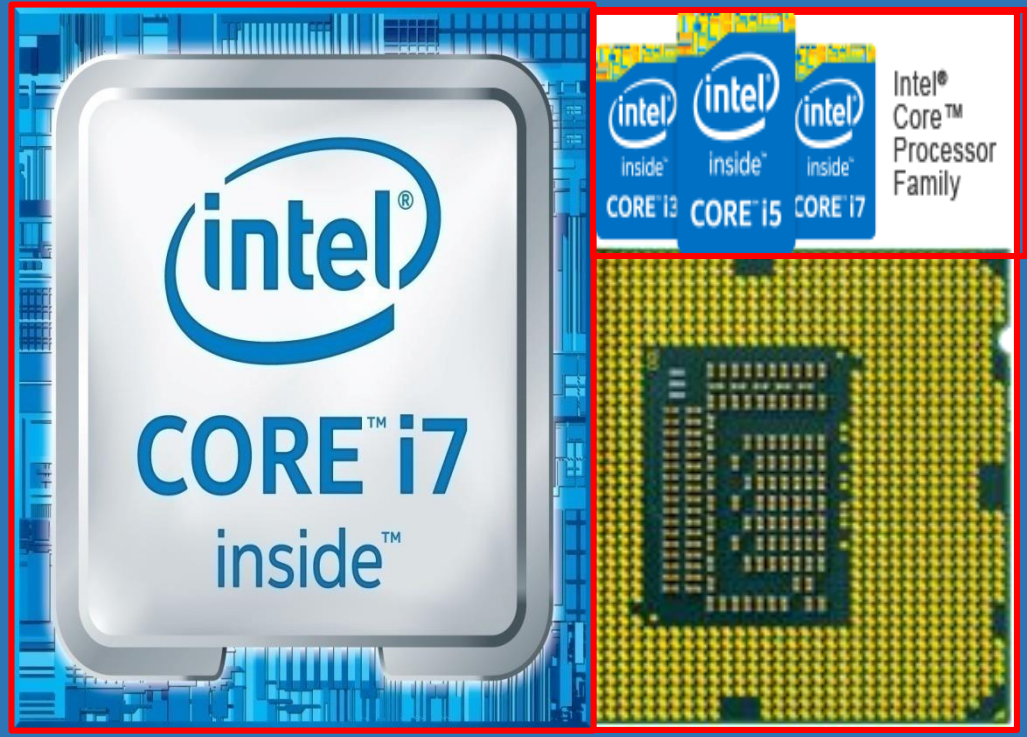
- A machine-readable code consisting of an array of black and white squares, typically used for storing URLs or other information for reading by the camera on a smart phone.



CPU – CENTRAL PROCESSING UNIT

- It is designed to perform arithmetic and logic operations that makes use of small number-holding areas called *registers*.
- Typical microprocessor operations include adding, subtracting, comparing two numbers, and fetching numbers from one area to another. These operations are the result of a set of instructions that are part of the microprocessor design.



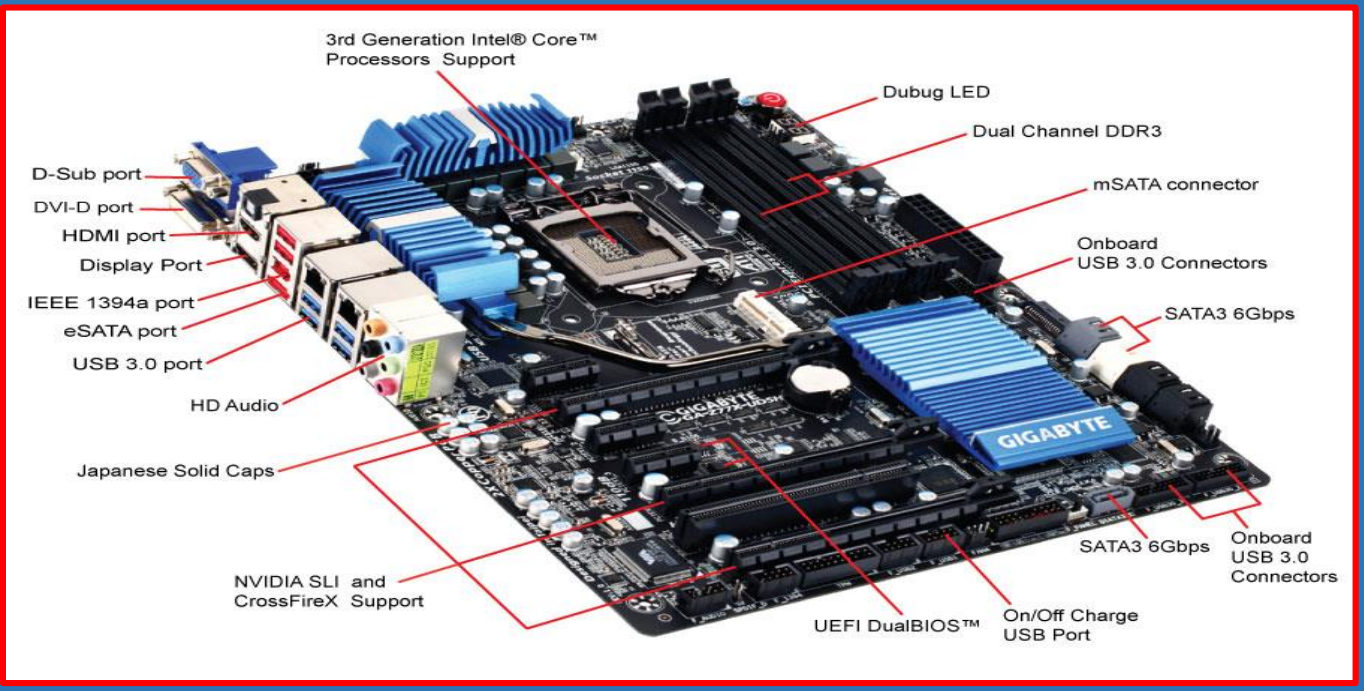


MOTHERBOARD

A **Motherboard** is the physical arrangement in a computer that contains the computer's basic circuitry and components. On the typical motherboard, the circuitry is imprinted or affixed to the surface. :

Components of mother board are :

- The microprocessor
- Memory
- Basic input/output system (BIOS)
- Expansion slot
- Interconnecting circuitry



OUTPUT DEVICES

It takes information within your computer and presents it to you in a form that you can understand.

In simple words, when data is given to user by processor devices are called output devices.

Ex. Monitor ,Printer ,Speaker ,Projector etc.

OUTPUT DEVICES : TYPES

Monitor

The monitor displays the video and graphics information generated by the computer through the video card. It is called VDU(Visual Display Unit).

Types of monitors:

1)CRT

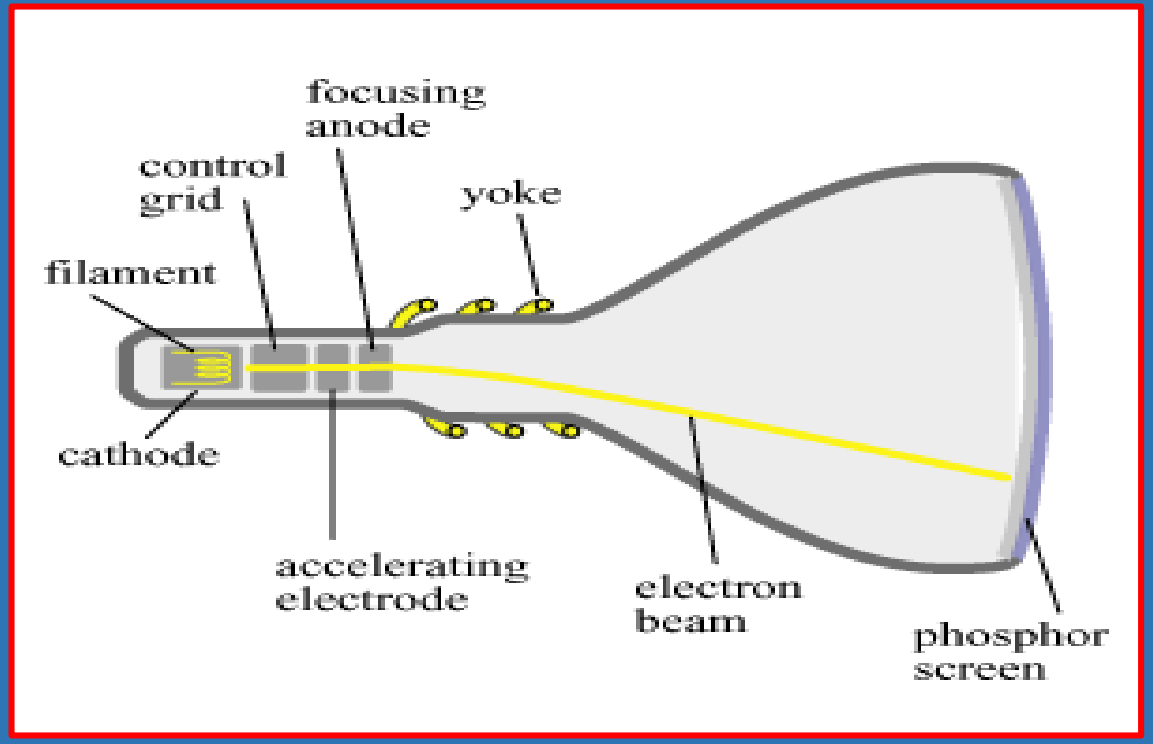
2)LCD/TFT

3)LED

Monitor: Types

CRT(Cathode ray tube):

The technology used in most televisions and computer display screens. A CRT works by moving an electron beam back and forth across the back of the screen.



Monitor: Types

LCD(Liquid crystal display) / TFT(Thin film transistor):

A type of display used in digital watches and many portable computers. LCD displays two sheets of polarizing material with a liquid crystal solution between them.

Monitor: Types

LED (Light Emitting Diode):

An LED lamp is a light emitting diode(LED) product that is assembled into a lamp for use in lighting fixtures. LED lamps have a lifespan and electrical efficiency that is several times better than incandescent lamps.

Difference between LCD and LED:

LCD/TFT

1) Contrast is not so good .
2) Color accuracy is less than LED.
3) LCD monitors consume less power than CRT.
4) LCD uses mercury so its harmful for environment.

LED

1) Contrast is better than LCD.
2) Color accuracy is better than LCD.
3) LED monitors consume less power than LCD.
4) LED do not uses mercury, it is environment friendly.

PRINTER

Printer is an output device. It converts soft copy into hard copy

Types of printers:

1) Impact printer

2)Non impact printer

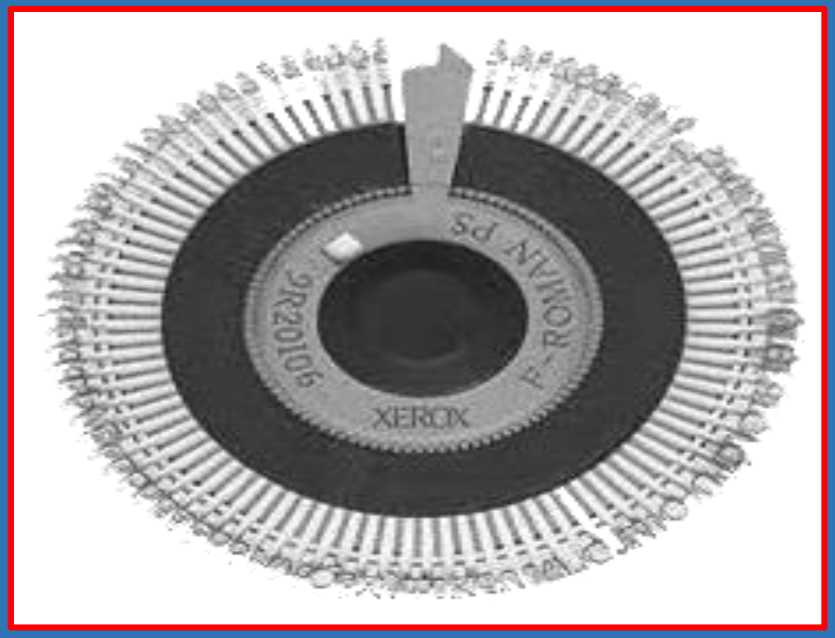
Difference Between Impact and Non Impact

Impact Printer	Non-Impact printer
1) Impact printer strikes paper directly while printing.	1) Non impact printer does not strike paper directly while printing.
2) These printers make noise while printing.	2) Non impact printers do not make noise.
3) Impact printers are economic.	3)Non impact printers are costly.

Printer : Impact

Daisy wheel printer:

Daisy wheel printer is an impact printer technology uses interchangeable pre-formed type elements to generate high-quality output comparable to premium typewriters.



Printer : Impact

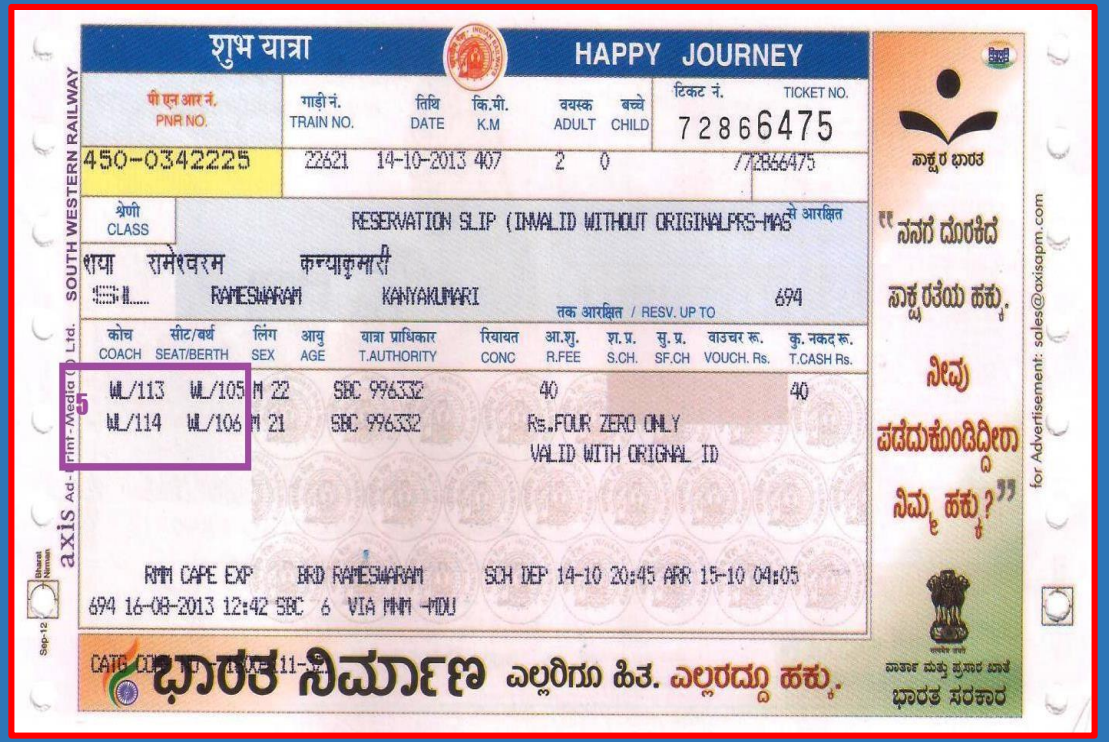
Teletypewriter printer:

A teletypewriter is a device that sends a typed message to another place. It has a typewriter keyboard and a printer.

Printer : Impact

Dot matrix printer:

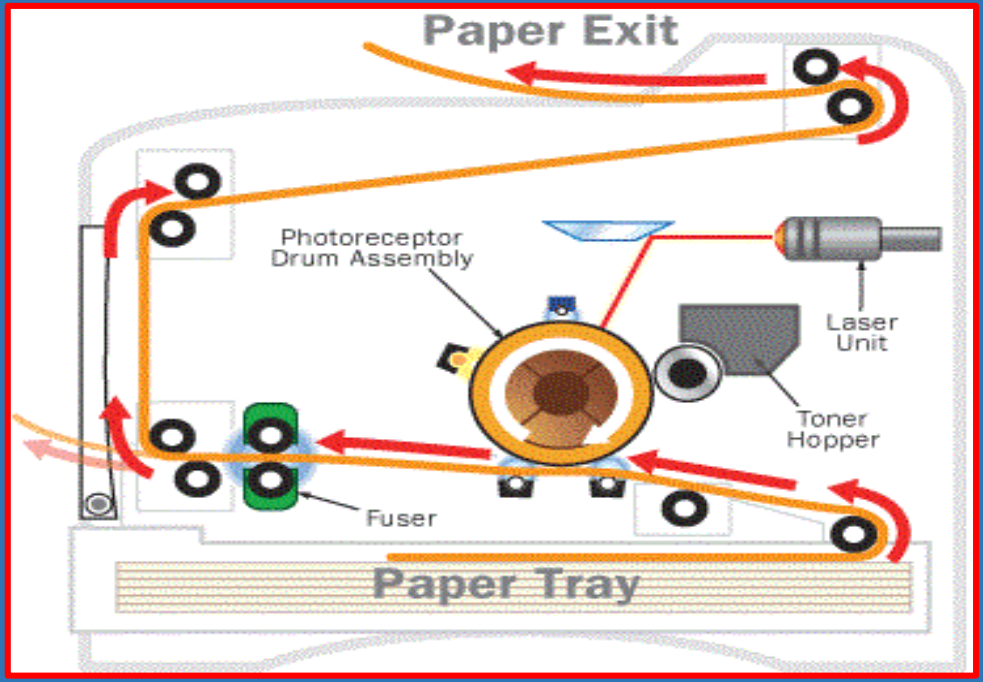
It is a printer which uses a print head that runs back and forth, or in an up and down motion, on the page and prints by impact, striking an ink-soaked cloth ribbon against the paper, much like the print mechanism on a typewriter.



Printer : Non Impact

Laser printer :

Laser printer is an electrostatic digital machine that rapidly produces high quality text and graphics by passing a laser beam over a charged drum to define a differentially charged image.



Printer : Non Impact

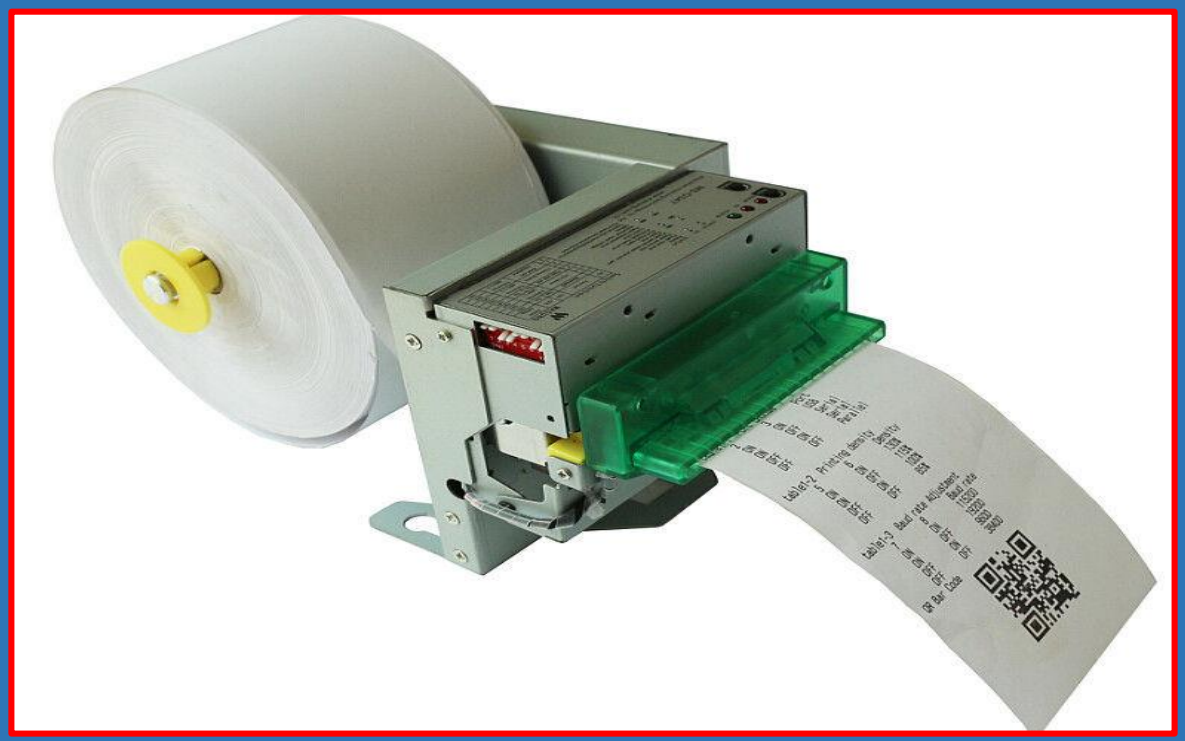
Inkjet printer:

Inkjet printing is a type of computer printer that creates a digital image by propelling droplets of ink onto paper, plastic, or other substrates. Inkjet printers are the most commonly used type of printer.

Printer : Non Impact

Thermal printer :

Thermal printing or **direct thermal printing**) is a digital process which produces a printed image by selectively heating coated as it is commonly known, when the paper passes over the thermal print head.



Printer : Non Impact

3 dimensional printer

3D printing or Additive manufacturing is a process of making a three-dimensional solid object of virtually any shape from a digital model.

Plotter

The **plotter** is a computer printer for printing vector graphics. In the past, plotters were used in applications such as computer aided design, though they have generally been replaced with wide-format conventional printers.

Projector

A **Projector** is a device designed to take an image from a video source and project it as faithfully as possible onto a screen or other surface.

Speaker

Computer speakers, or multimedia speakers, are speakers external to a computer, that disable the lower fidelity built-in speaker. They often have a low-power internal amplifier.

STORAGE

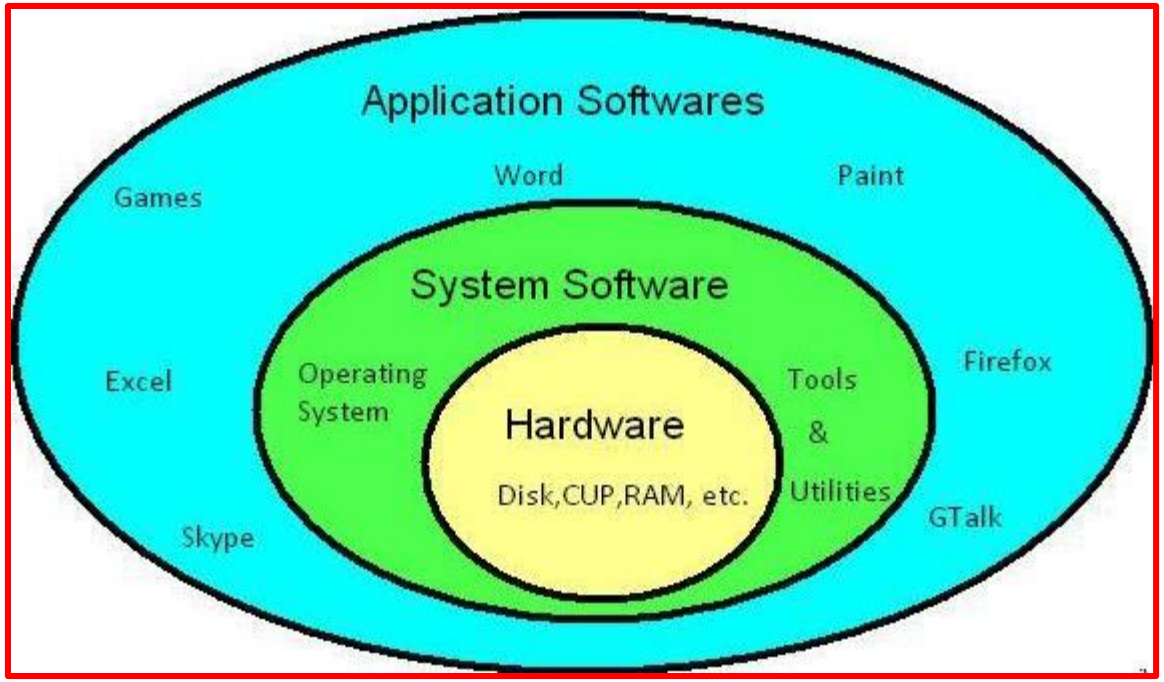
Backing storage is the permanent store of data on an internal hard drive, external hard drive, CD or DVD, memory stick, Zip disc, floppy disc, etc.

SOFTWARE

- Software is untouchable or intangible part of the computer.
- Software is a set of program that performs related task.

SOFTWARE : TYPES

- **Types of Software**
  - Application Software
  - Systems Software



SYSTEM SOFTWARE

- **System software**

  Programs that support the execution and development of other programs. These are compulsory software for the computer system,

  without which computer can not work.

  E.g.- Operating system, compiler, interpreter etc.

SOFTWARE : TYPES

- **Application Software:** Software which is used to do users tasks are called Application Software. Application Software includes programs that do real work for user. Example:

  Adobe Photoshop, Media Players, web browsers, Adobe Reader, Word Processor, Spreadsheet etc.

SYSTEM SOFTWARE : UTILITY SOFTWARE

Utility Software:

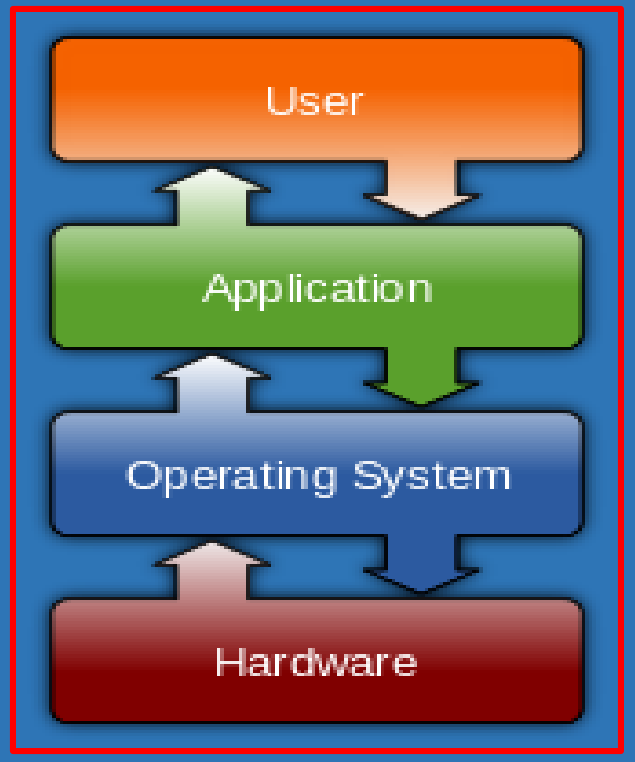
Small and useful programs which support all devices are called utility software.

Some Examples are -

- Device Driver
- Disk defragmentation
- Compression software
- Antivirus etc.

SYSTEM SOFTWARE : O.S.

Operating System: Operating system is a software which acts as an interface between user and the computer hardware.



OPERATING SYSTEM : EXAMPLES

- Windows
- Macintosh
- Linux
- UNIX
- Android

OPERATING SYSTEM : EXAMPLES

- **Windows :** Its widely used O.S. Its associated with Microsoft corp.

Inbuilt browser : Internet explorer

First version : windows1.0

Latest version: windows10

MICROSOFT EDGE browser use in window **10**.

OPERATING SYSTEM : EXAMPLES

- **Macintosh:** Mac O.S. is associated with Apple corporation.

  First version :1.0

  Latest version: Yosemite(10.10)

  Inbuilt browser: Safari

  Different versions of MAC: (Cheetah, puma, Jaguar, panther, Tiger, Leopard, Snow leopard, Lion, Mountain lion, Mavericks)

OPERATING SYSTEM : EXAMPLES

Linux:

Linus Torvalds has developed Linux O.S.

It is not associated with any company .

It is an open source software

First version :1.0

Examples: Red hat, Fedora, Ubuntu etc.

OPERATING SYSTEM : EXAMPLES

UNIX:

- UNICS(Uniplexed information and computing system)
- It is written in ‘c’ programming language.
- UNIX is multi user OS contains shell Programming.

OPERATING SYSTEM : EXAMPLES

- **Android :** It is associated with Google corporation.

First version: Alpha(1.0)

Latest version: Marshmallow(6.0

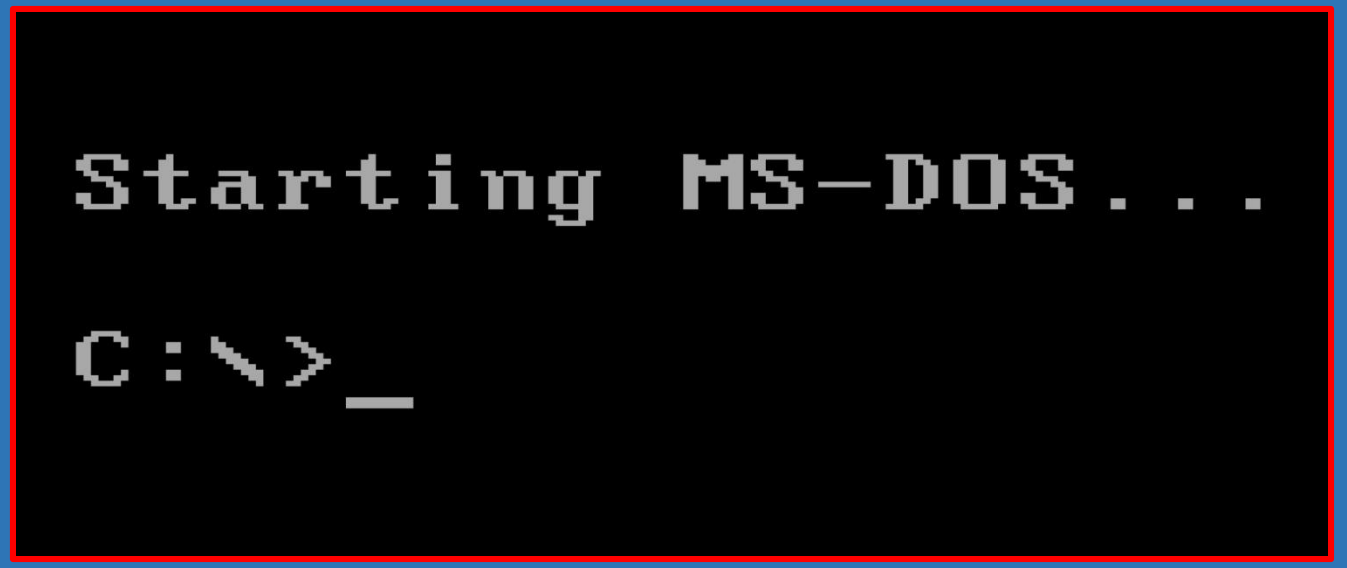
Different versions of Android:

Alpha(1.0),Cupcake, Donut, Eclair, Froyo, Jellybean, KitKat(4.4), Lollipop(5.2),Marshmallow(6.0)

OPERATING SYSTEM : TYPES

- A **single user operating system** only has to deal with the requests of the single person using the computer at that time.

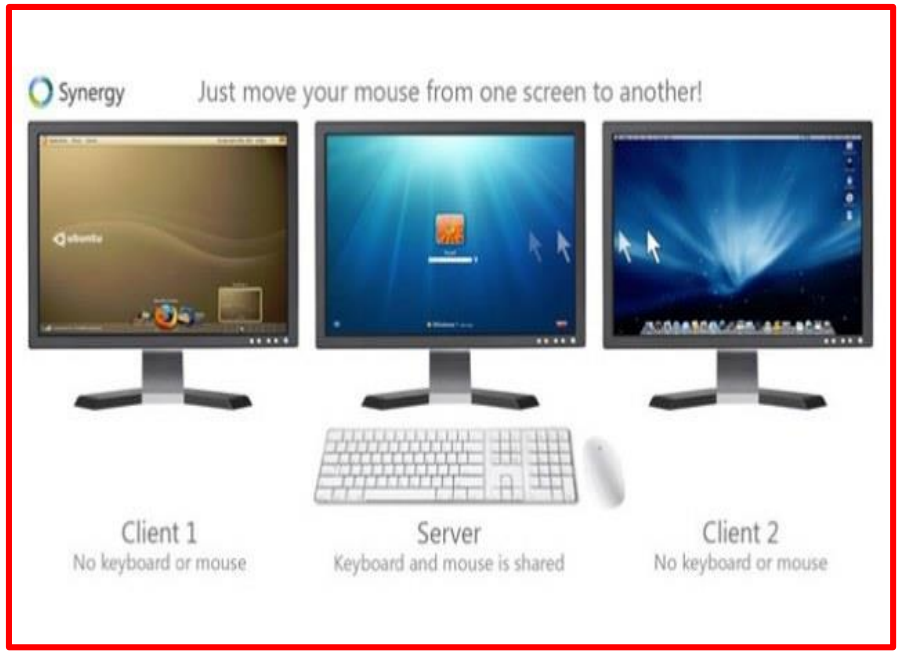
- Eg. MS-DOS, Windows, etc..



OPERATING SYSTEM : TYPES

- **Multi-user operating** system allows lots of people to access the resources of the mainframe computer.
- A multi-user operating system ‘slices up’ the mainframes resources and divides it out to the different users.

Eg.– UNIX,LINUX etc.



OPERATING SYSTEM : TYPES

- **Network operating system** is a type of multi-user operating system. An operating system that is designed for a server.

- Eg. Windows NT, Windows Server 2000 Windows Server 2003, Window Server 2013.

Windows Server®

OPERATING SYSTEM : TYPES

➢ **Multi-tasking operating system:**

Multi-tasking means to run more than one program at once.

This is commonly done when copying a picture from the Internet and pasting it into a document. In this case, the two programs running are the browser and the word processor.

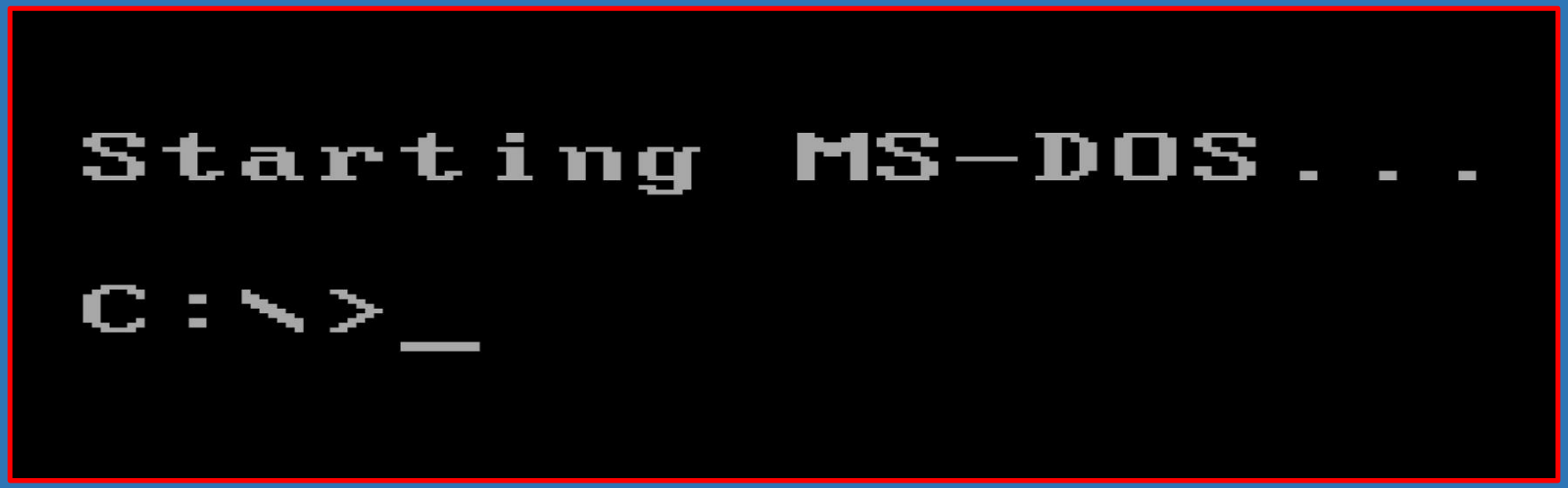
It is the operating system which manages this process.

Eg.- Windows XP, Windows Vista etc..

OPERATING SYSTEM : TYPES

- **Single-Tasking Operating System:**

  A single-tasking operating system can support only one task at a time. In such single tasking environment, the task execution is sequential. Eg. MS-DOS



OPERATING SYSTEM : TYPES

- **Real-time operating system:**

  Real-time operating systems are used to control machinery, scientific instruments and industrial systems.

  A very important part of an RTOS is managing the resources of the computer so that a particular operation executes in precisely the same amount of time, every time it occurs.

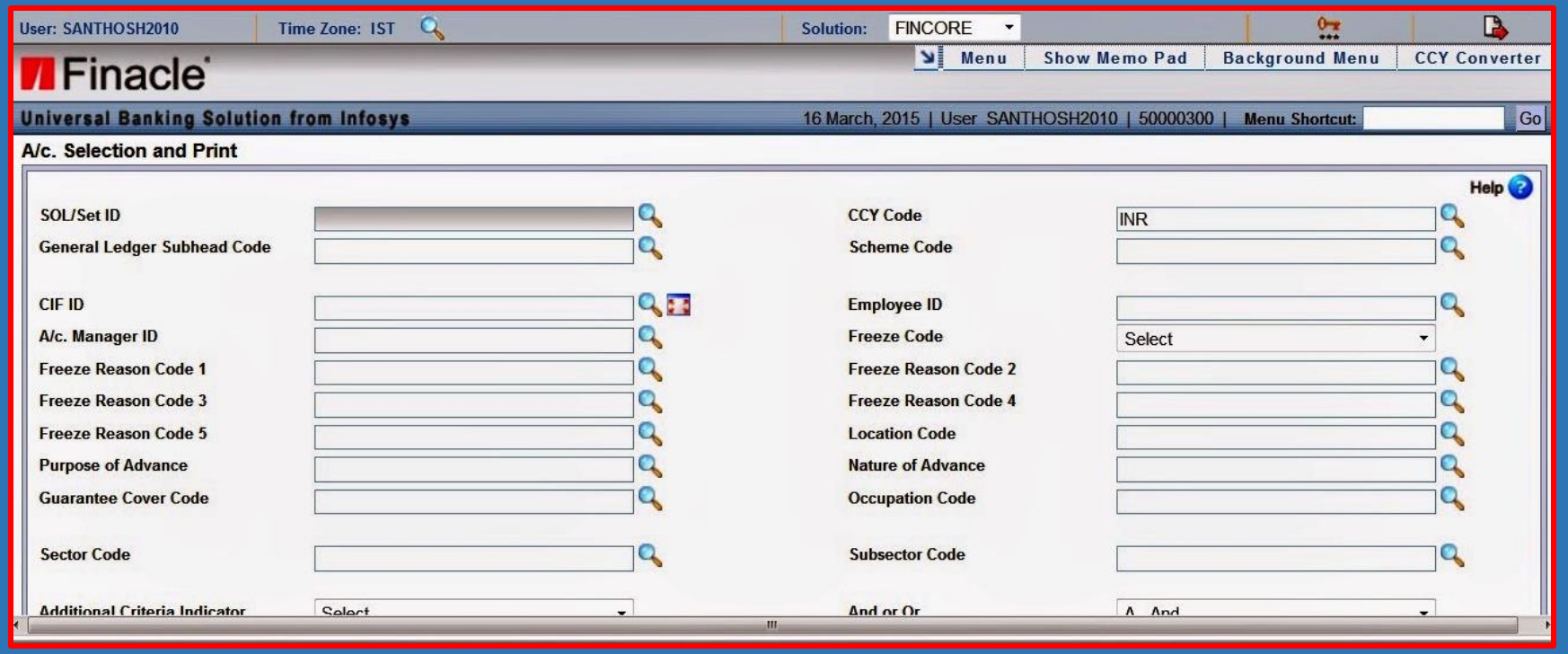
- Eg. Windows Embedded Compact(Windows CE)

APPLICATION SOFTWARE

- **Horizontal Software:** Those software which are being used widely i.e. from individual user to big organization is using the software like MS-office, Adobe Photoshop, Tally etc

APPLICATION SOFTWARE

- **Vertical Software-** Software which are developed for particular organization are known as vertical software. E.g. - Finacle, MIBS etc.



APPLICATION SOFTWARE

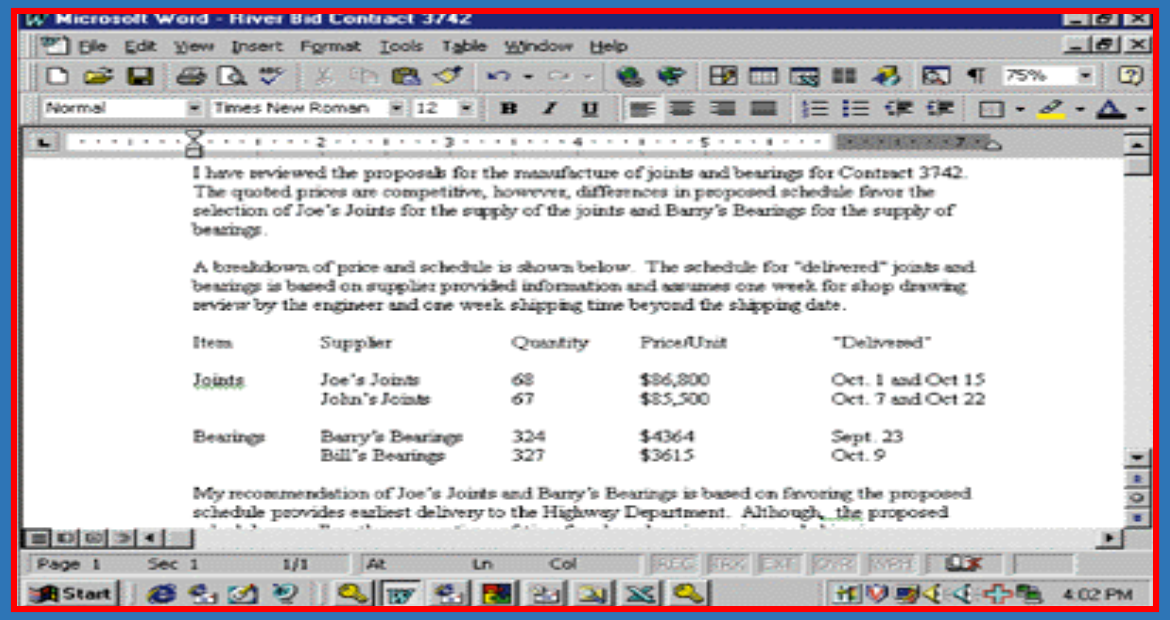
Application Suite: Collection of personal productivity software such as word processor, spreadsheet, and database.

Eg. MS office

APPLICATION SOFTWARE

Word Processing:

Provides assistance in formulating, formatting, and printing documents such as letters, memos and papers.

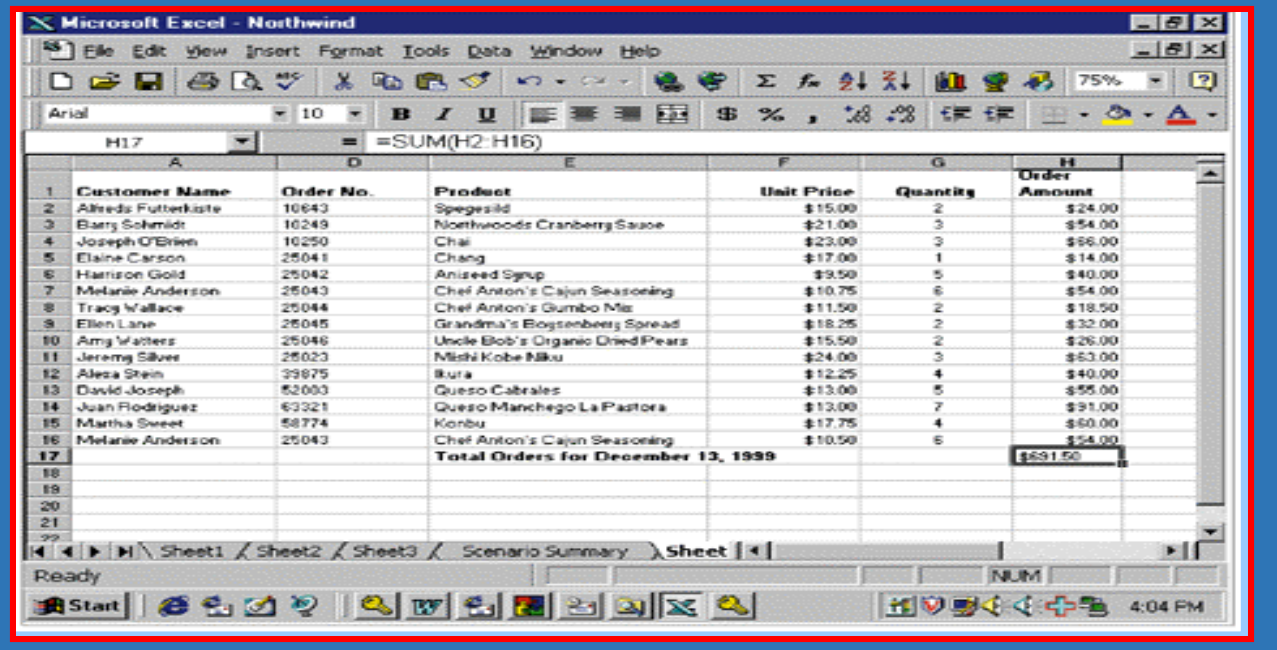


APPLICATION SOFTWARE

Spreadsheet:

Provides a wide range of built-in functions for

statistical, financial, logical, database, graphics, and data and time calculations.

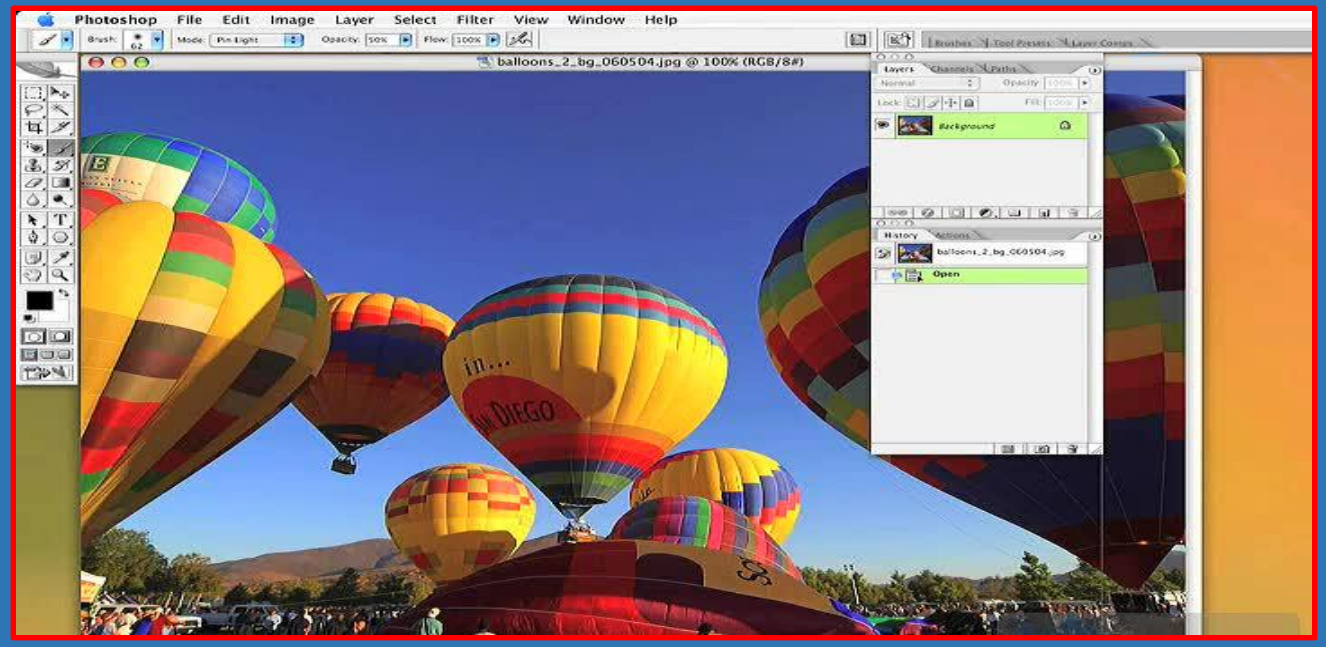


APPLICATION SOFTWARE

- Graphics:

  Graphics are used to represent anything in a better and easier way. By visualization we can learn it better.

  Eg. Adobe Photoshop



OTHER SOFTWARE CATEGORIES

- Open-source software**:** software freely available to anyone in a form that can be easily modified
- Examples: Linux , Android etc.

OTHER SOFTWARE CATEGORIES

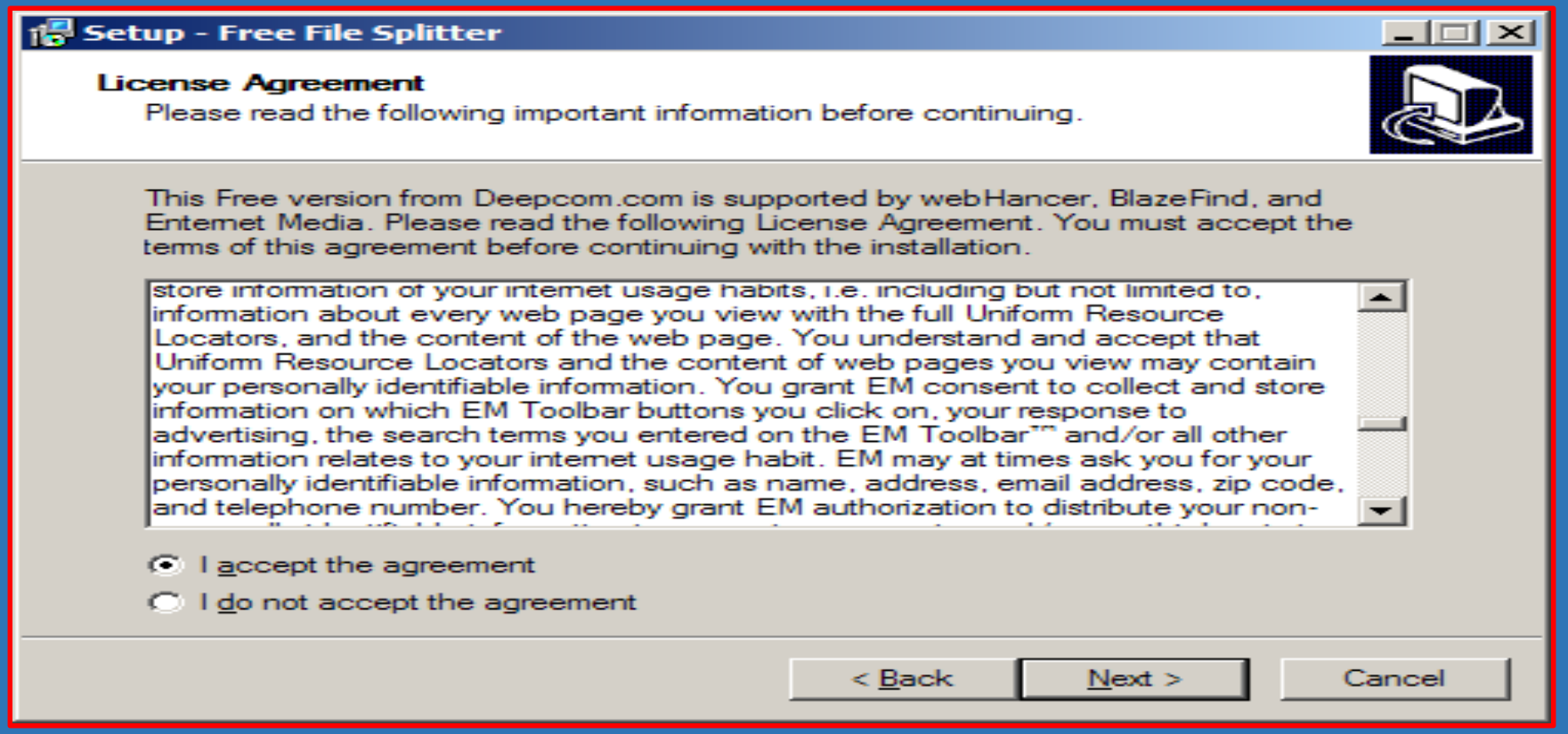
- FREEWARE- Freeware is software that is free to use. Unlike commercial software, it does not require any payment or licensing fee.
- Example: web browser etc.

OTHER SOFTWARE CATEGORIES

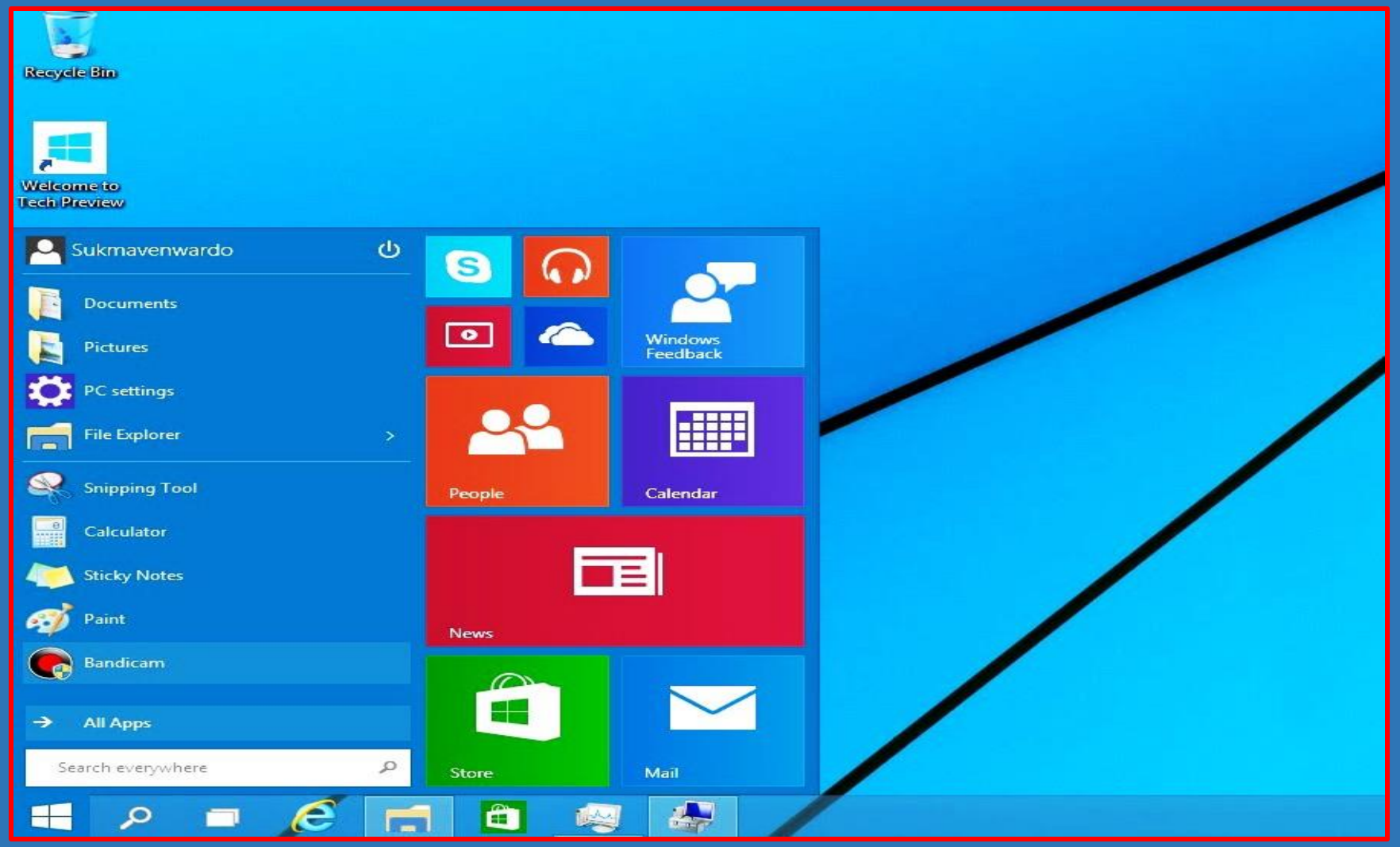
- SHAREWARE- Shareware is software that you can use on a trial basis before paying for it.
- Example : Antivirus etc.

SOFTWARE LICENCING

- EULA- An End User License Agreement (EULA) is a legal contract between a software application author or publisher and the user of that application.



Microsoft Windows And It’s Version

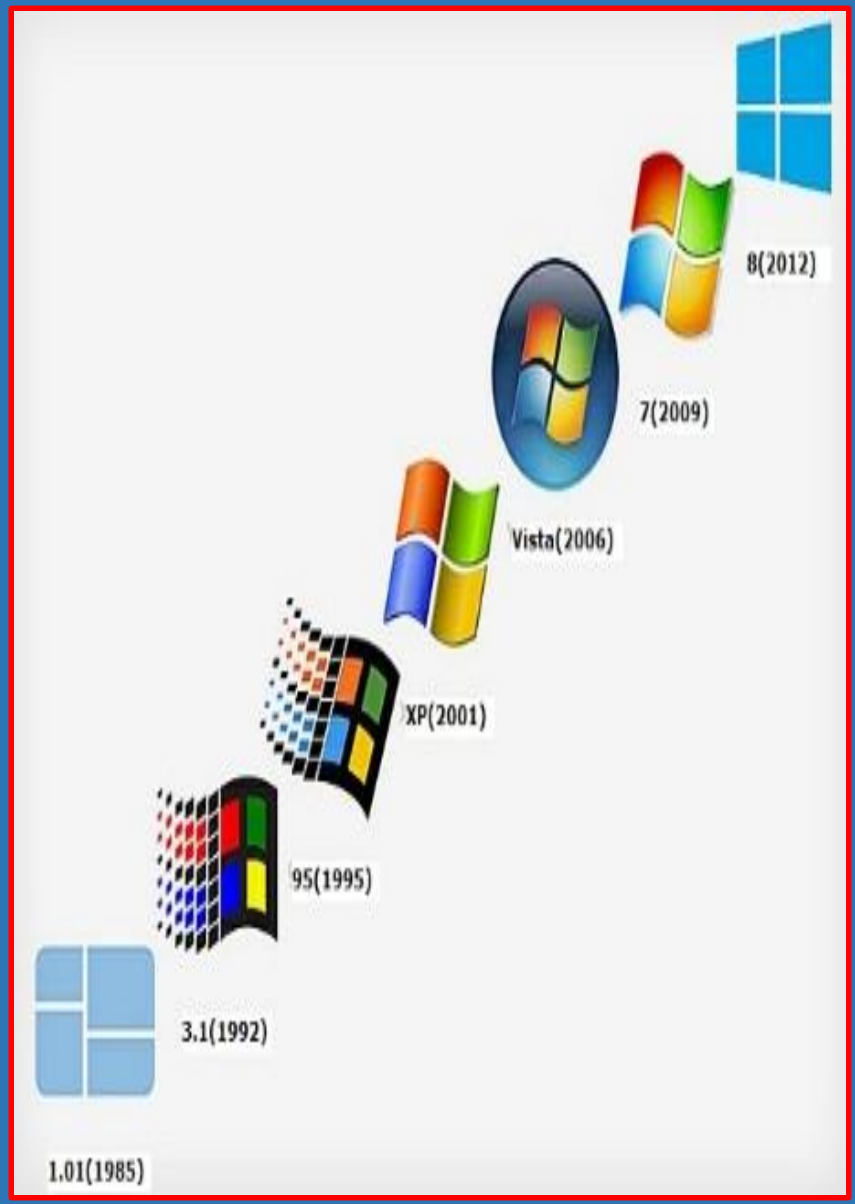


What Is Microsoft Windows?

Windows is a personal computer operating system from Microsoft that, together with some commonly used business applications such as Microsoft Word and Excel, has become a "standard" for individual users in most corporations as well as in most homes.

Windows Versions

Version	Release Date
Windows 10	29 July 2015
Windows 8.1	18 October 2013
Windows 8	26 October 2012
Windows 7	22 October 2009
Windows Vista	30 January 2007
Windows XP	25 October 2001
Windows ME	14 September 2000
Windows 2000	17 February 2000
Windows 98	25 June 1998
Windows 95	24 August 1995
Windows NT 3.1	27 July 1993
Windows 3.1	April 1992
Windows 1.01	20 November 1985



Starting the Computer

- **Booting** – The process of loading or reloading the **operating system** into the computer's memory.
- The booting processes are:
  - **Cold boot –** Loads the OS when the power is turned on.
  - **Warm boot –**Reloads the OS when the computer is already on.

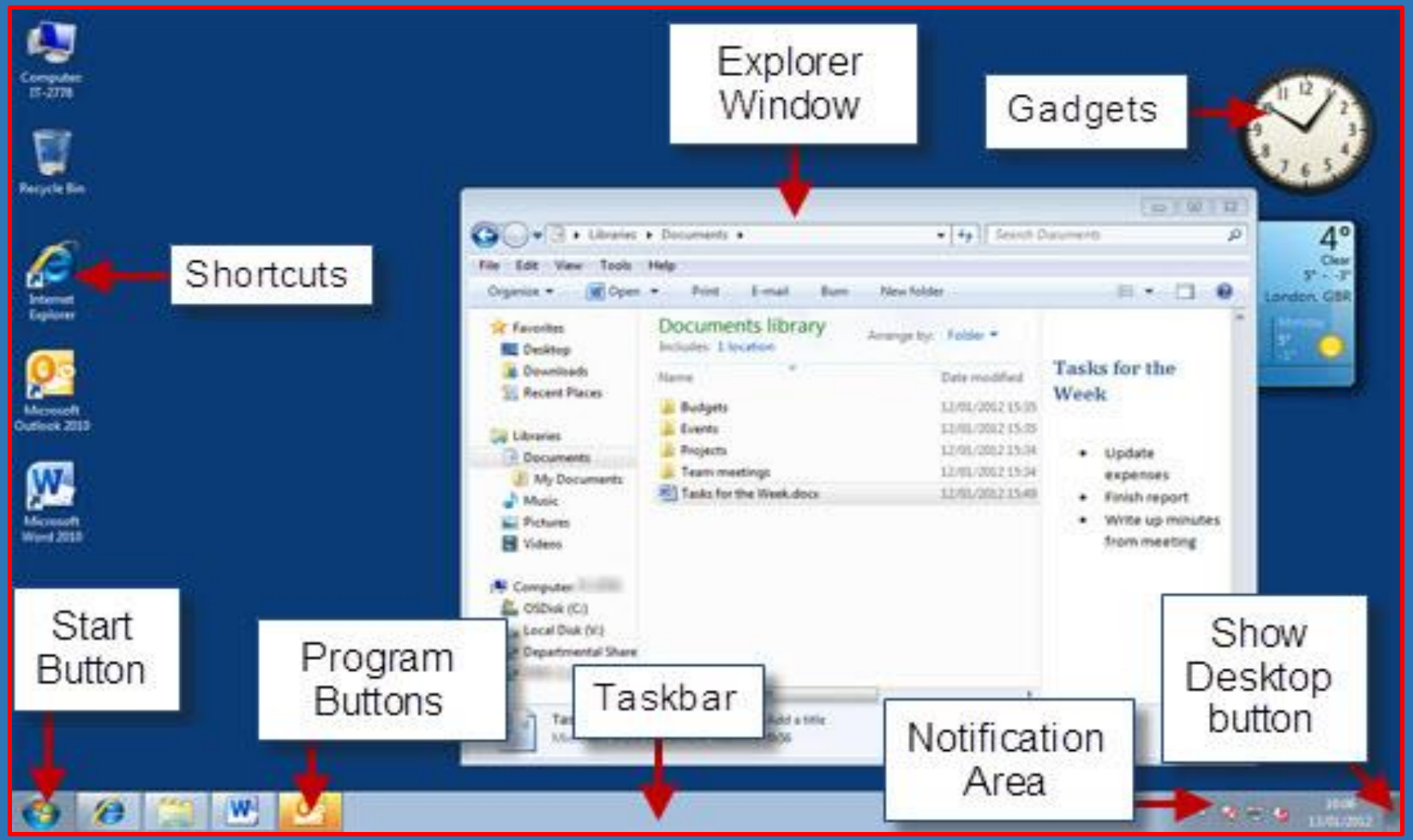
Tasks performed at boot up

- Runs a **Power-On Self Test (POST)** to check the devices that the computer will rely on, are functioning.
- Initializes CPU registers, device controllers and contents of the main memory. After this, it loads the OS.
- Hardware doesn't know where the operating system resides and how to load it.
- Needs a special program to do this job – **Bootstrap loader.**

Users Authentication

- Authentication or user login occurs.
  - User name
  - Password
- The user interface starts, enabling user interaction with computer programs.

Windows Screen

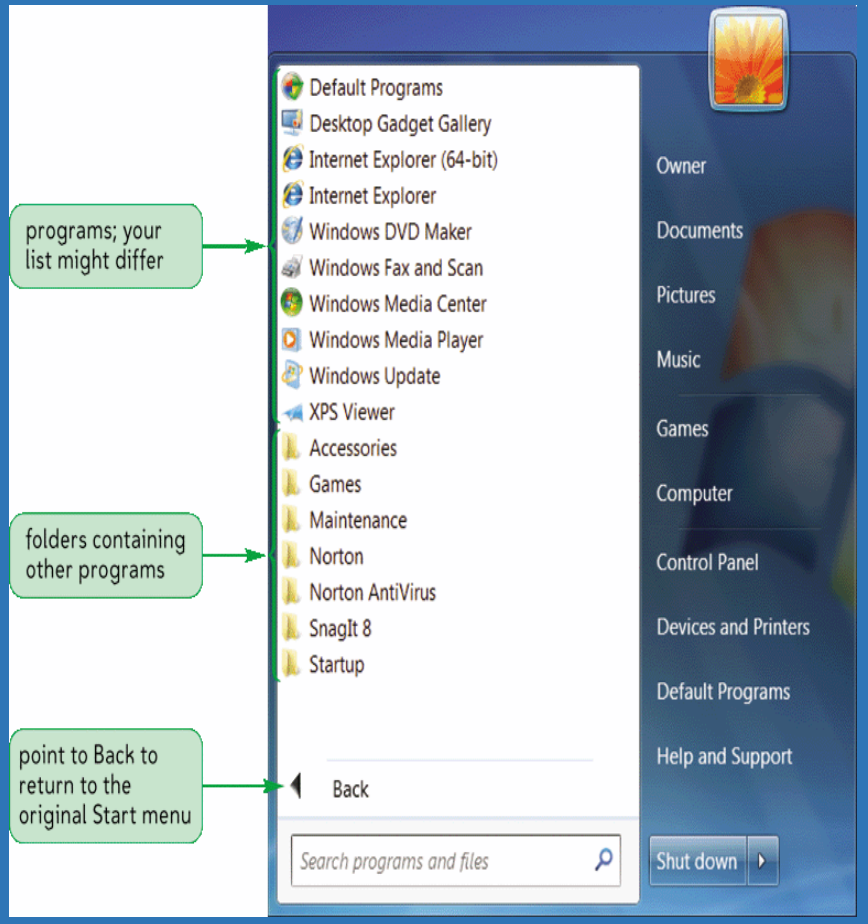


Windows Screen

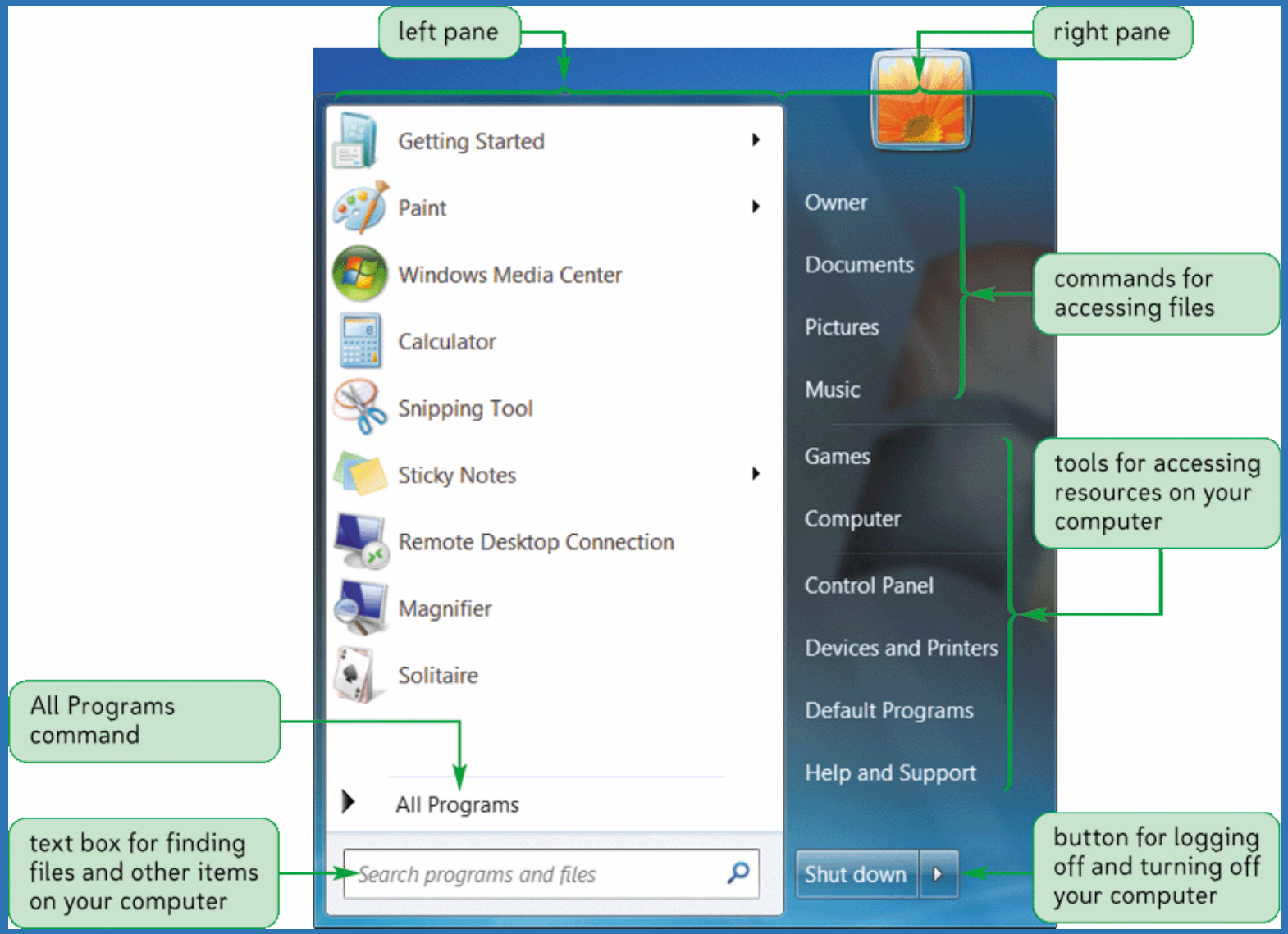
- ScreenTips
  - Use the mouse to point to the Start button

Windows Screen

- Start menu
  - Point to the Start button and then click the left mouse button



Exploring the Start Menu



Windows Screen

Icons

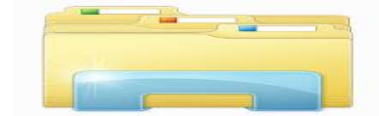
Folder

Shortcut

Recycle Bin

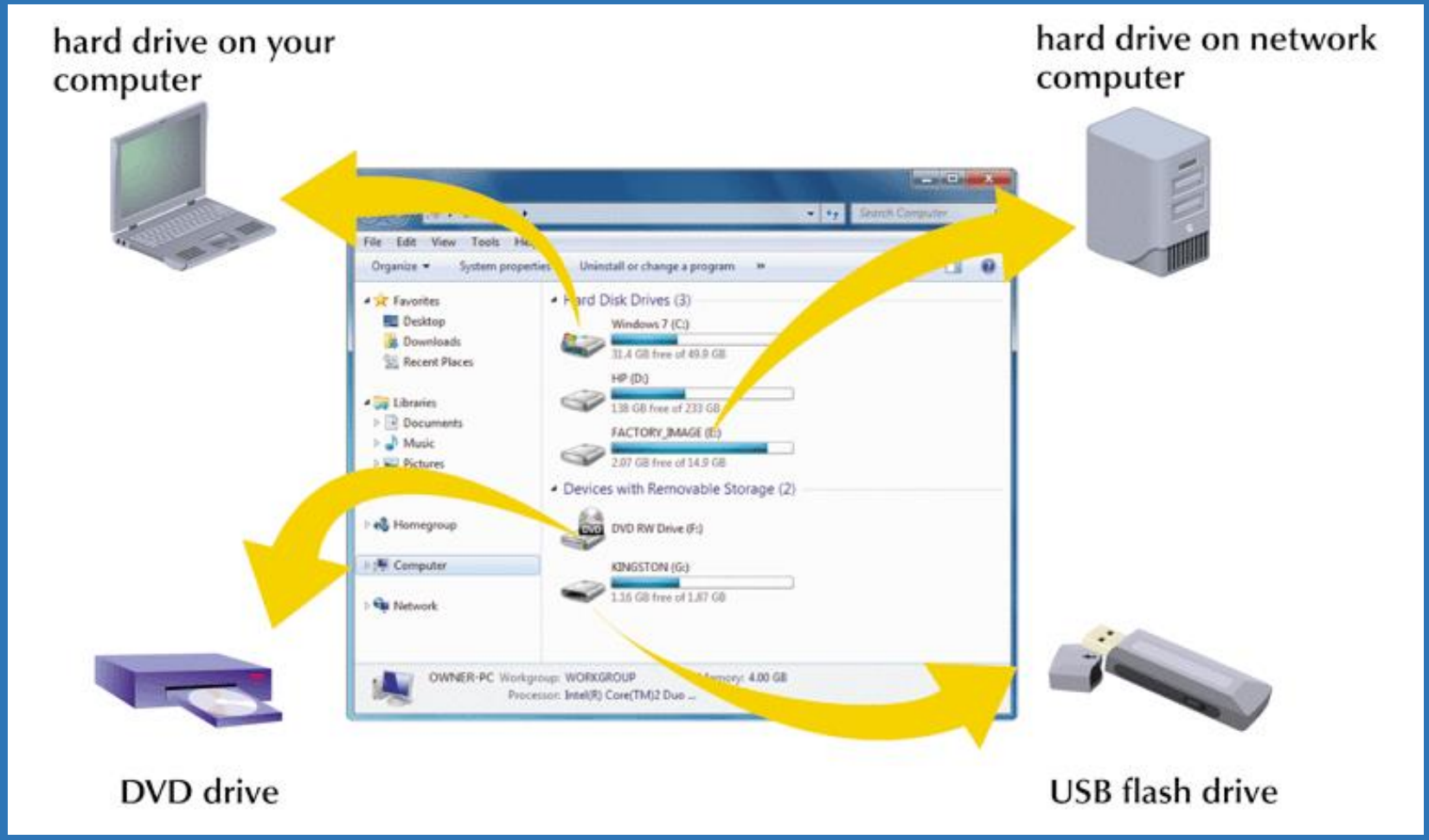
My Computer

My Documents



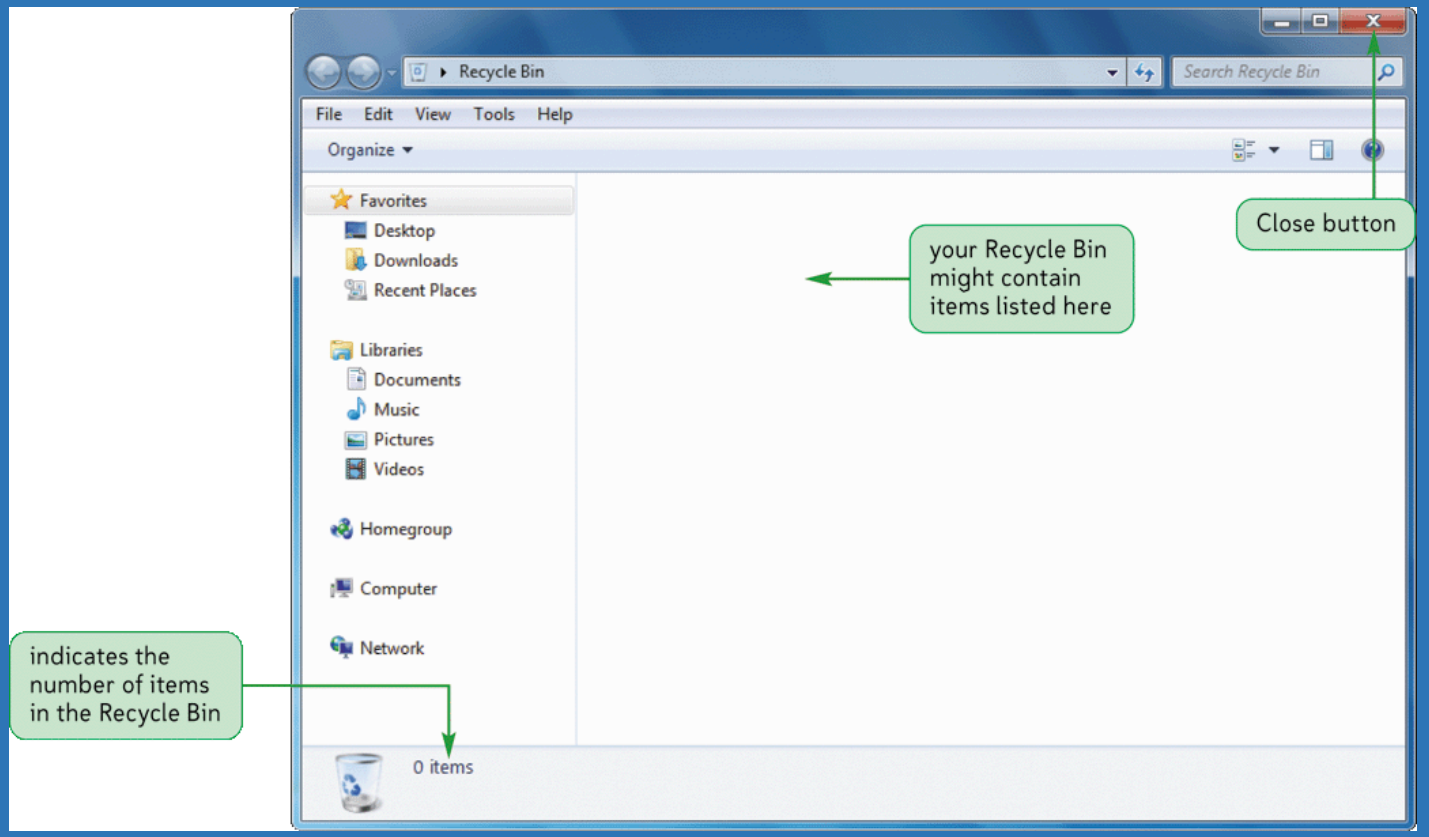
Control Panel

My Computer


hard drive on your computer
hard drive on network computer
DVD drive
USB flash drive

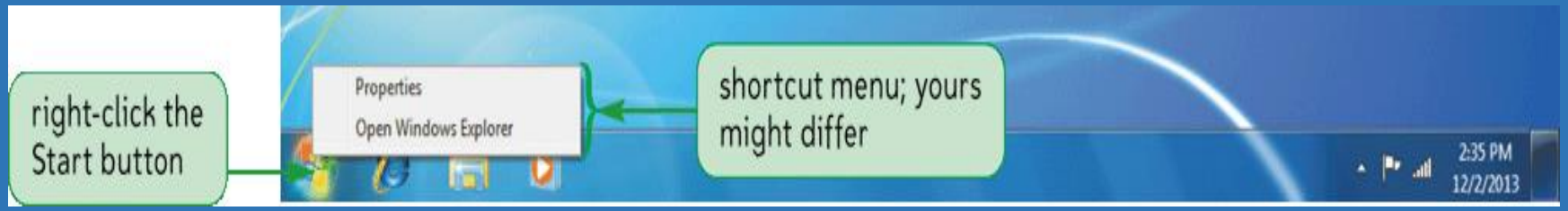
Recycle Bin

- Double-click the Recycle Bin icon to view the contents of the Recycle Bin

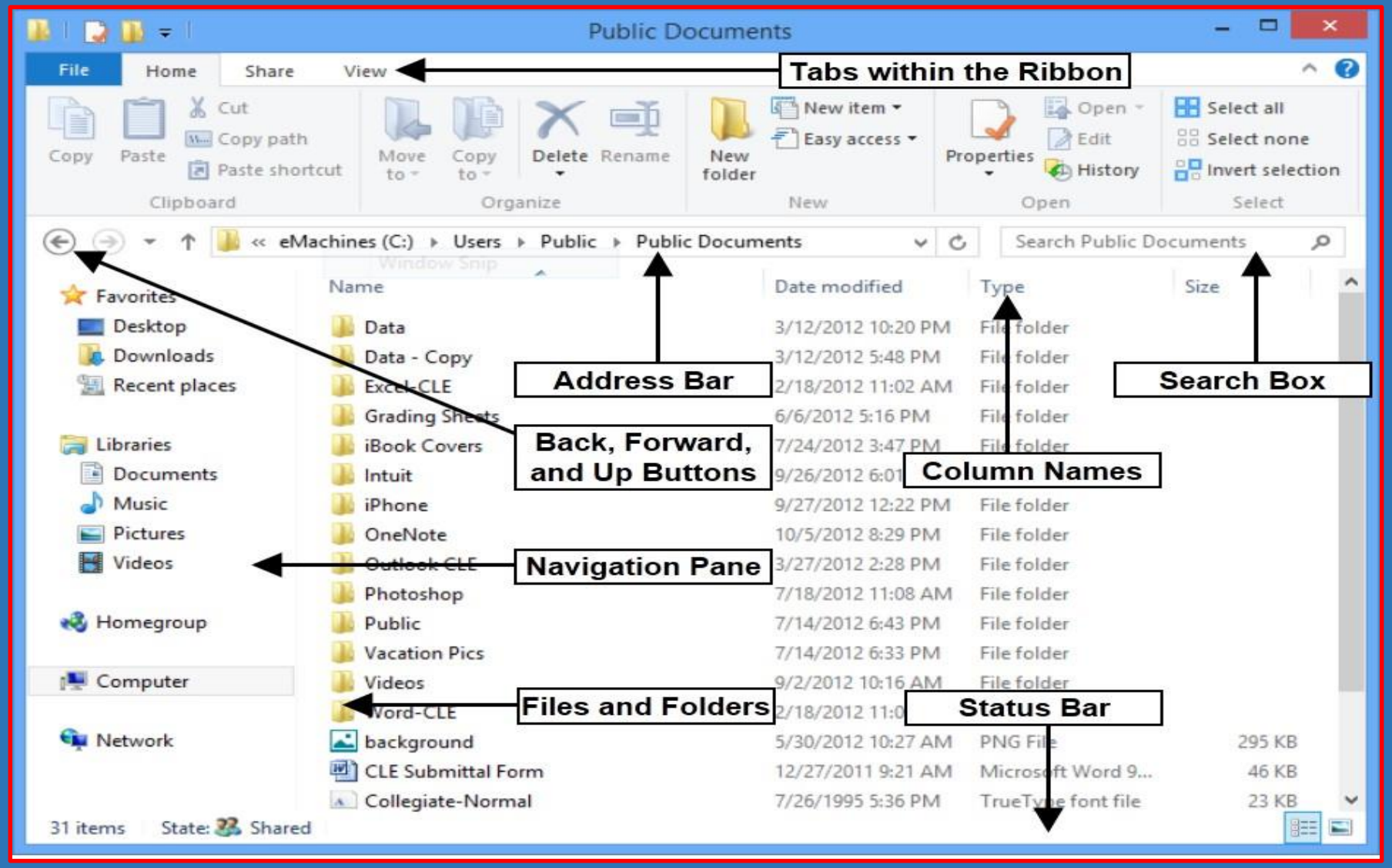


Opening Windows Explorer

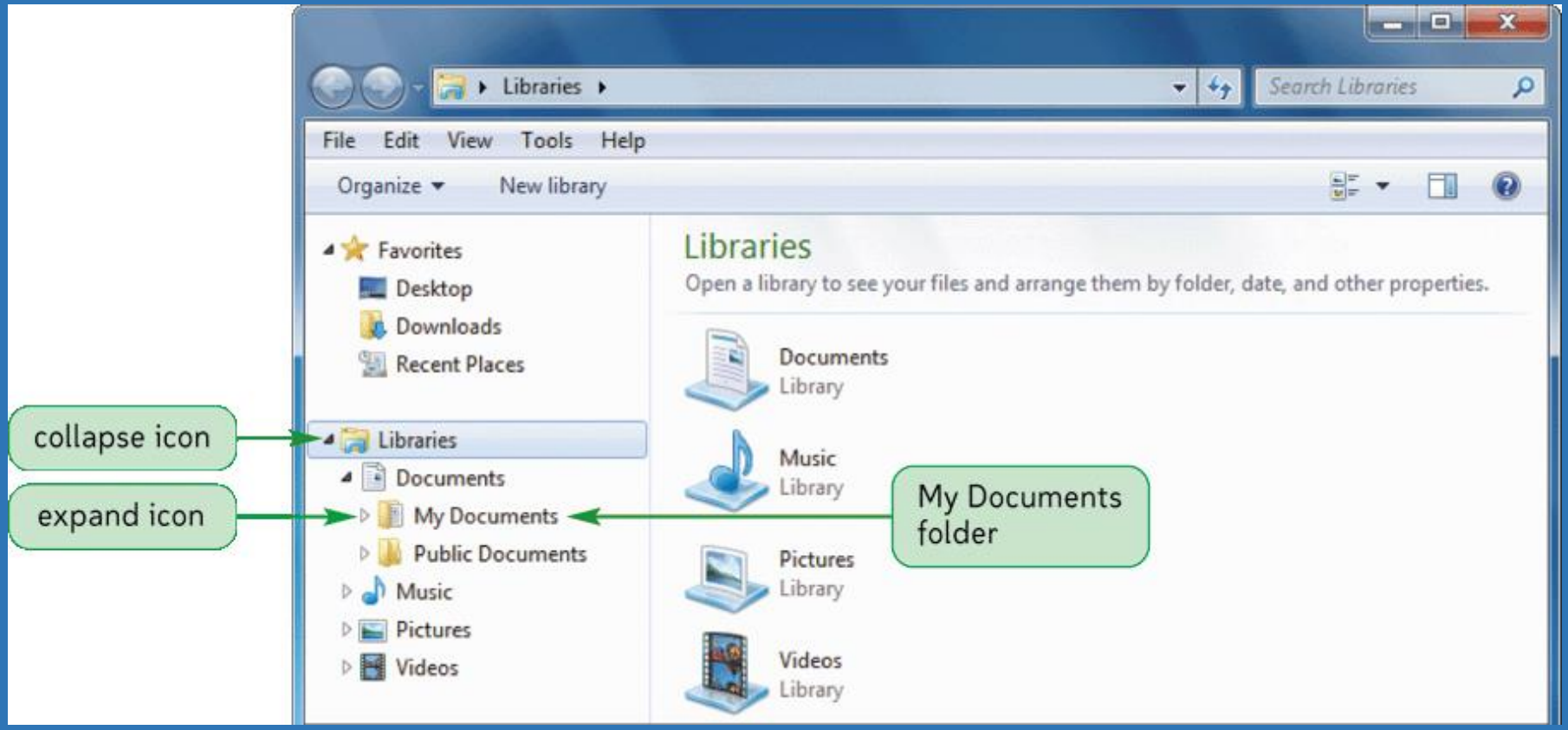
- Right-clicking an object opens its shortcut menu



Windows Explorer Screen

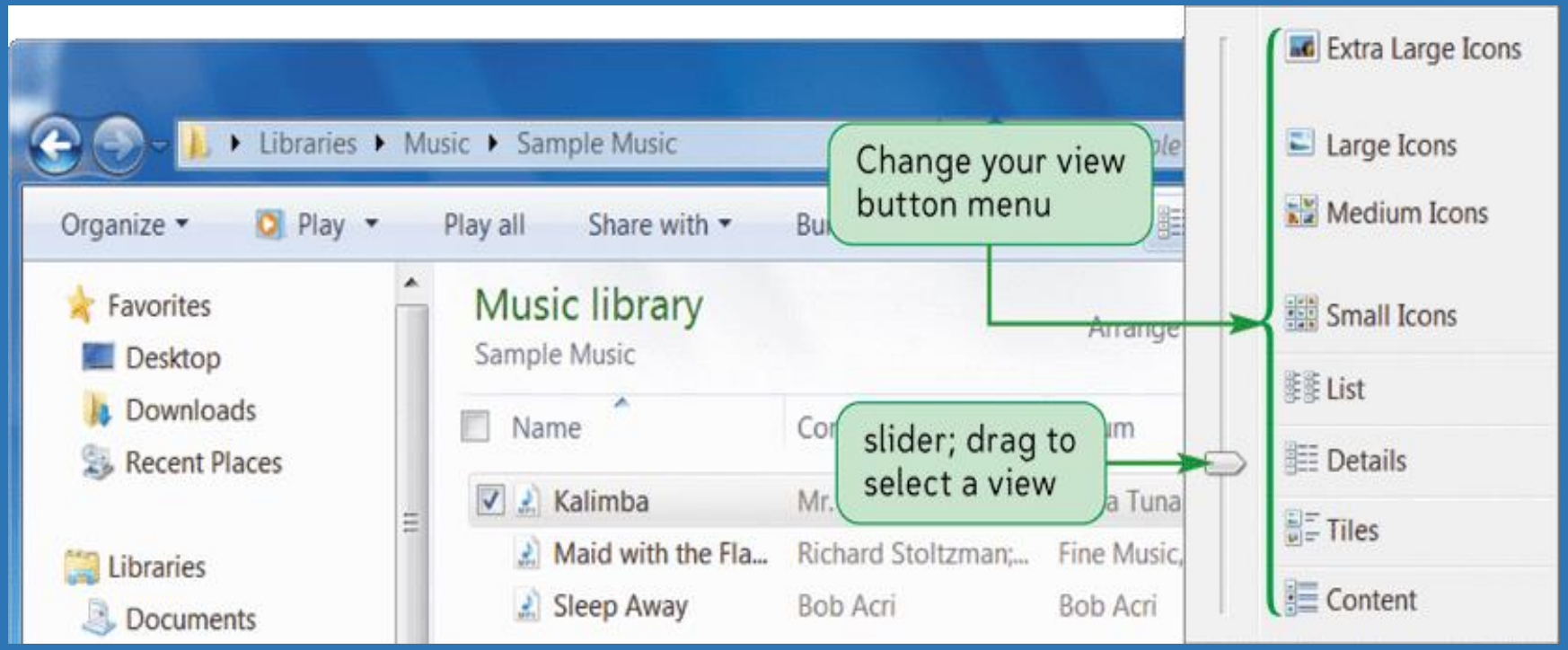


Navigating with Windows Explorer

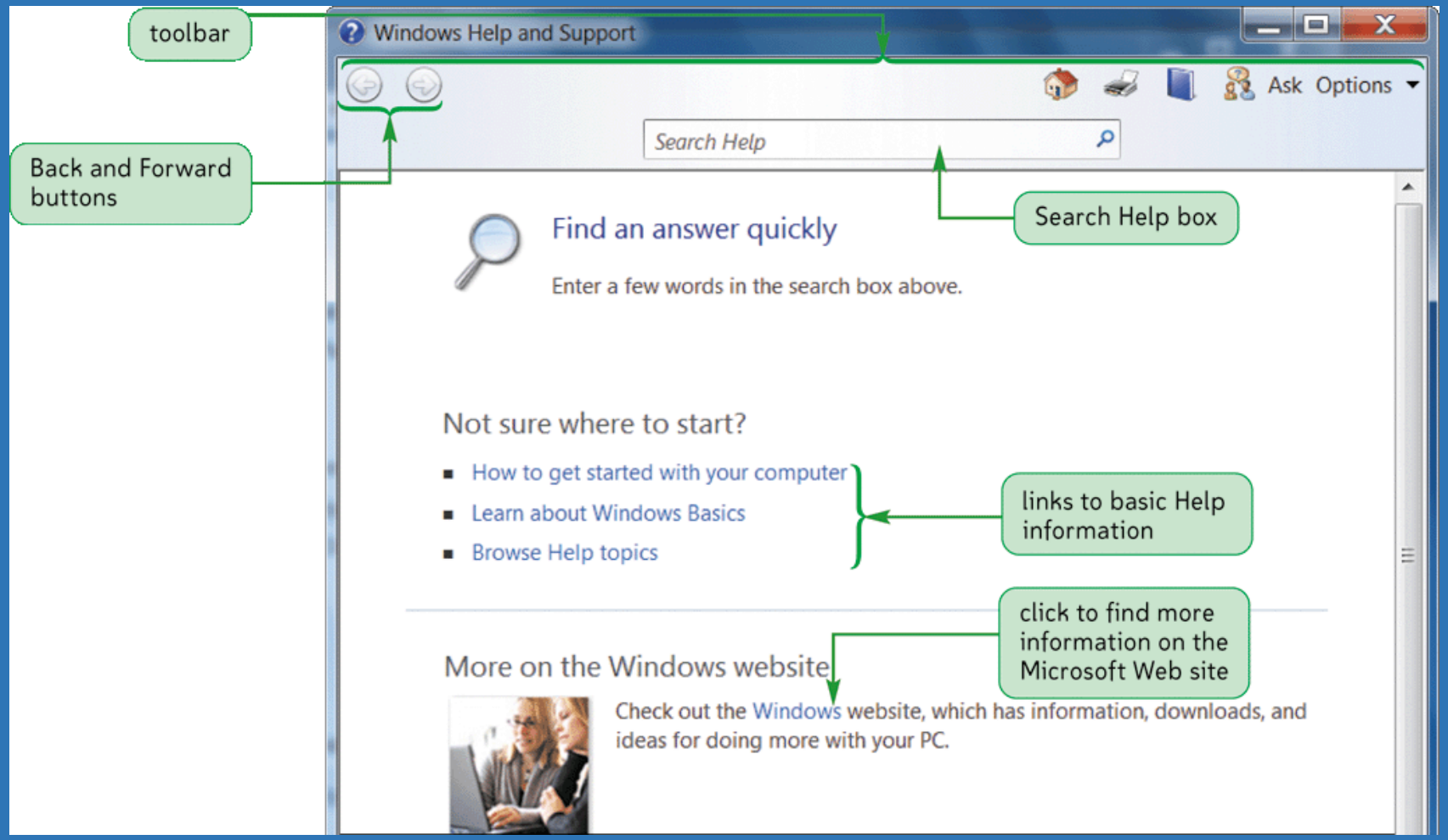


Exploring Windows

- Windows 7 provides at least eight ways to view the contents of a folder
  - Click the Change your view button arrow



Getting Help



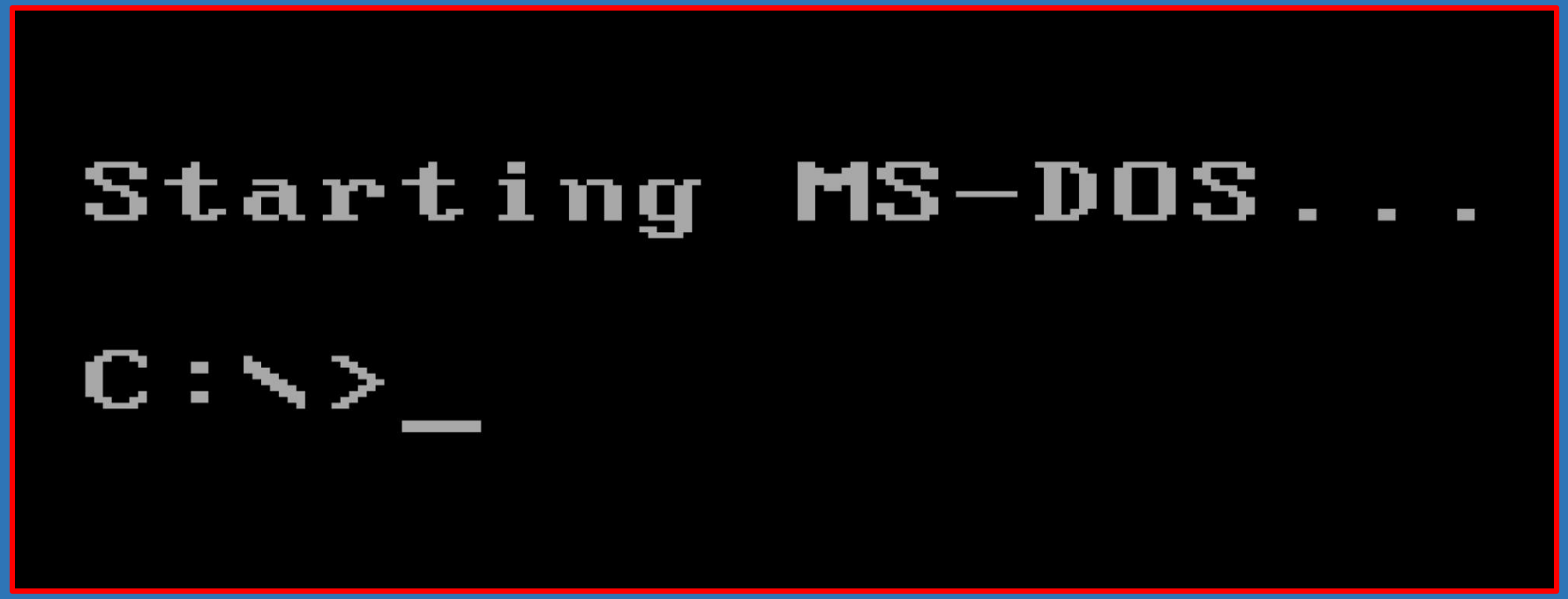
Microsoft Windows Related Terms

GUI(Graphical User Interface)-

In computing, a graphical user interface is a type of interface that allows users to interact with electronic devices through graphical icons and visual indicators such as secondary notation, as opposed to text-based **interfaces**, typed command labels or text navigation.

Microsoft Windows Related Terms

CUI(Command User Interface)-
Character user interface in which we use texts(words, numbers, symbols .. so on).
It is also called command line interface in programmers language.



Microsoft Windows Accessories

The Magnifier-

The Magnifier is a display utility that makes the computer screen more readable by people who have low vision by creating a separate window that displays a magnified portion of the screen.

On Screen Keyboard-

On-Screen Keyboard displays a visual keyboard with all the standard keys. You can select keys using the mouse or another pointing device

Disk Clean-up –

Disk Cleanup can delete Temporary Internet Files (associated with Internet Explorer), old downloaded program files, empty the Recycle Bin, and delete Temporary Files. Newer versions of Disk Cleanup (e.g. Windows XP and later) also allow users to delete Offline Webpages, Microsoft Error Reporting Temporary Files, Web Client/Publisher Temporary Files, Compress old files.

Microsoft Windows Accessories

Resource Monitor-
The Resource Monitor application offers a detailed look your computer's resource usage. You can view computer-wide CPU, disk, network, and memory graphics, or drill down and view per-process statistics for each type of resource.

Task Scheduler- A tool that allows you to view and customize the scheduled tasks on your computer, in addition to creating your own custom scheduled tasks.

Disk Defragmenter- It is the process of consolidating fragmented data on a volume (such as a hard disk or a storage device) so it will work more efficiently. Fragmentation happens to a volume over time as you save, change, or delete files.

Microsoft Windows Accessories

System Information-
The System Information utility allows you to view information about the current computer — everything from the model number of its CD-ROM drive to its attached peripherals, configured environment variables, and start-up programs.

Character Map-
can be used to copy and paste accented letters and other foreign language characters into any Windows application.

System Restore- System Restore is a recovery tool in Windows that allows you to reverse certain kinds of changes made to the operating system.

Windows Shortcut Keys

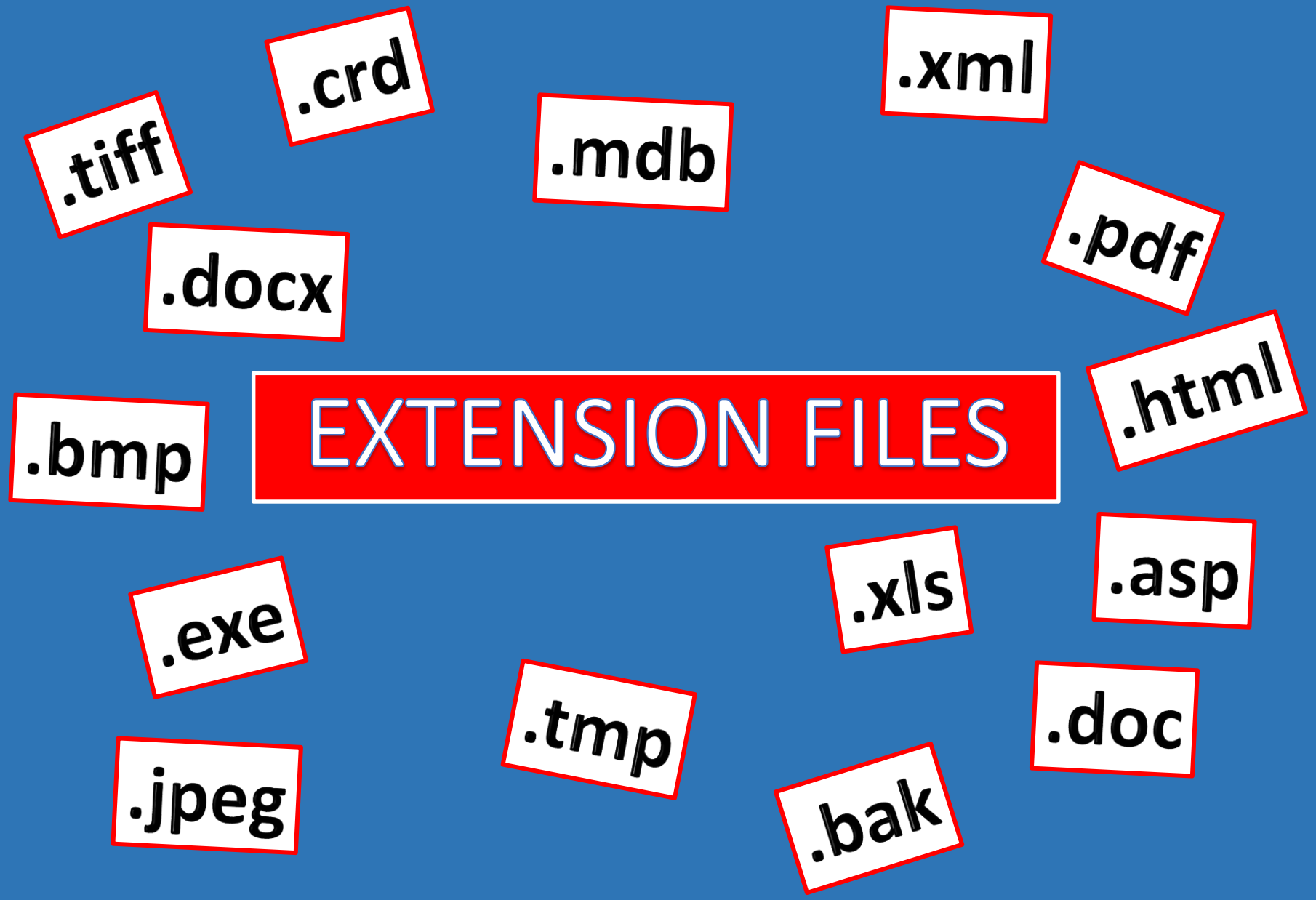
SHIFT + DEL	**To delete**
CTRL + C	Copy
CTRL + v	Paste
CTRL + x	Cut
ALT + F	File Menu Choice In The Current Program.
ALT + E	Edit Option Opens Current Program
CTRL + A	Selects all the matter in document
ALT + F4	Close Open application
CTRL + ESC	Open Start menu
Print screen	Screen Shot
ALT + TAB	Switch Among The Open Applications

Windows Shortcut Keys

F1	HELP
F2	RENAME
F3	SEARCH
F5	REFRESH
SHIFT+F10	OPENS A SHORTCUT MENU FOR THE SELECTED ITEM
F10	TO ACTIVATE THE MENU BAR
F11	TO VIEW THE FULL SCREEN
ALT + ESC	SWITCH THE APPLICATION ON THE TASK BAR
ALT+DOWN ARROW	OPENS A DROP-DOWN LIST BOX

Windows Shortcut Keys

Windows Logo	Start menu
Windows Logo+M	Minimize all
Windows Logo+D	Minimizes all open windows and displays the desktop
Windows Logo+E	Open Windows Explorer
Windows Logo+F	Find files or folders
Windows Logo+Break	System Properties dialog box
Windows Logo+L	LOCK THE COMPUTER


.crd
.xml
.tiff
.mdb
.pdf
.docx
.html
EXTENSION FILES
.bmp
.asp
.xls
.exe
.doc
.tmp
.jpeg
.bak

EXTENSION FILES

MS word	.doc
MS Excel	.xls
MS PowerPoint	.ppt
MS outlook	.pst
MS Access	.mdb
Paint	.bmp
Adobe Reader	.pdf
Adobe Photoshop	.psd
Notepad	.txt
Wordpad	.rtf
Temporary Files	.tmp
CorelDraw	.cdr
Backup File	.bak

EXTENSION FILES

IMAGE EXTENSION FILES

.jpeg	Joint Photograhic Experts Group
.gif	Graphic Interchange Format
.tif	Tagged Image File
.png	Portable Network Graphic

AUDIO EXTENSION FILES

.wma	Window Media Audio File
.ra	Real Audio File
.swa	Shockwave audio file

EXTENSION FILES

VIDEO EXTENSION FILES

.mpeg	Motion Picture Expert Group
.flv	Flash Video(encoded to run in a flash animation)
.3gp	The most common video format for cell phones
.avi	Audio Video Interleave

WEB EXTENSION FILES

.html	Hyper Text Markup Language
.xml	Extensible Markup Language
.asp	Microsoft Active Server Page
.jsp	Java Server Page

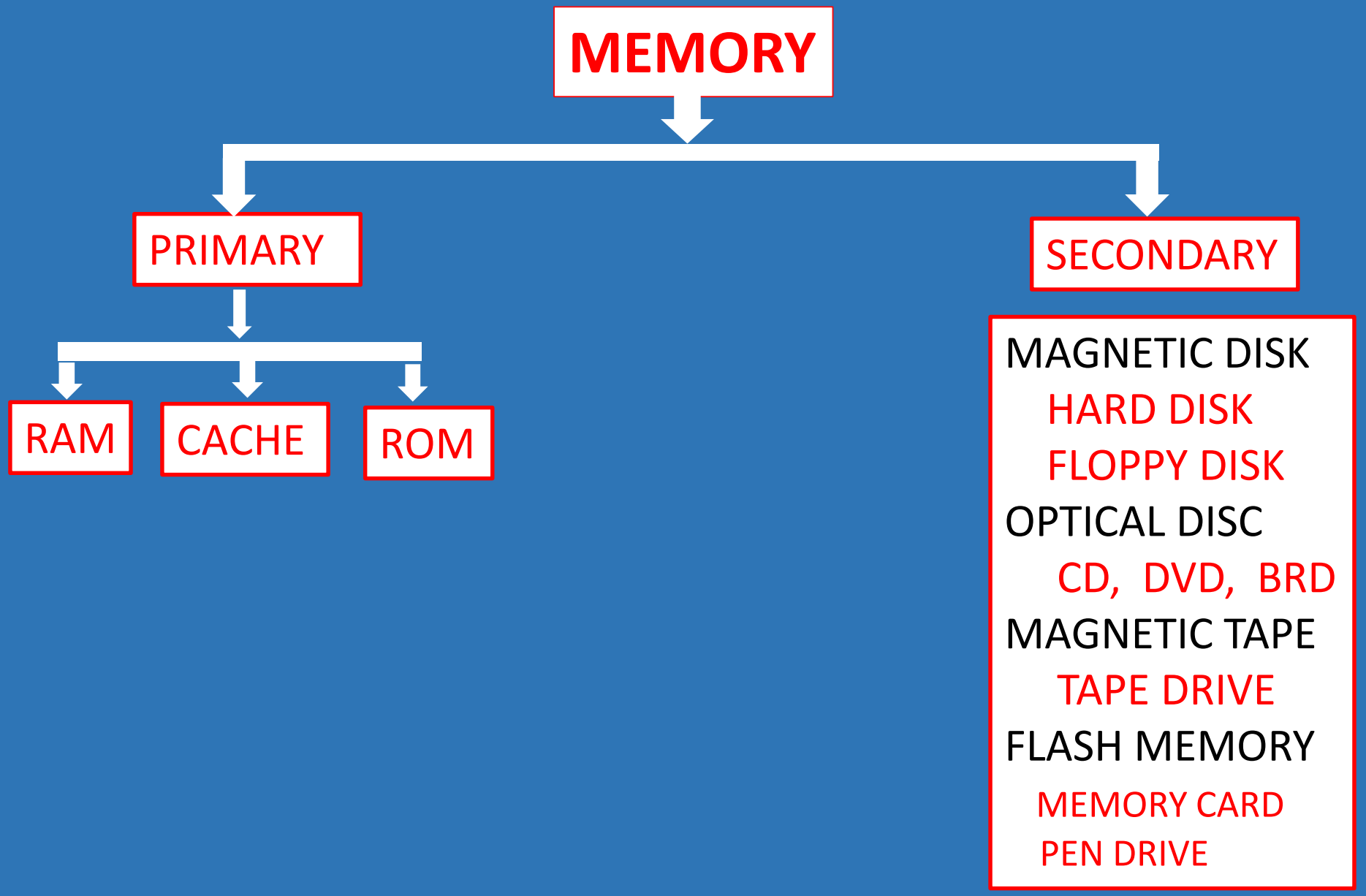
EXTENSION FILES

SOME OTHER EXTENSION FILES

.bmp	Bit Map Picture
.sys	System File
.pdf	Portable Document Format
.rtf	Rich Text Format
.torrent	Bit Torrent File
.rar	Rar Compressed Files
.zip	Extended zip file
.exe	Executable file

MEMORY

MEMORY CLASSIFICATION



MEMORY

Memory is just like a human brain. It is used to store data and instructions. Computer memory is the storage space in computer where data is to be processed and instructions required for processing are stored.

There are two type of nature in the memory device

- **Temporary / Volatile**
- **Permanent / Non volatile**

MEMORY

Volatile memory

- It is computer storage that only maintains its data while the device is powered on. RAM (random access memory) used for primary storage in personal computers as a volatile memory.

Non Volatile Memory

- It is a type of computer memory that has the capability to hold saved data even if the power is turned off. ROM(read only memory) is the example of non-volatile memory

RAM(Random-access memory)

RAM(Random-access memory):

Is a form of computer data storage. A random-access device allows stored data to be accessed directly in any random order.

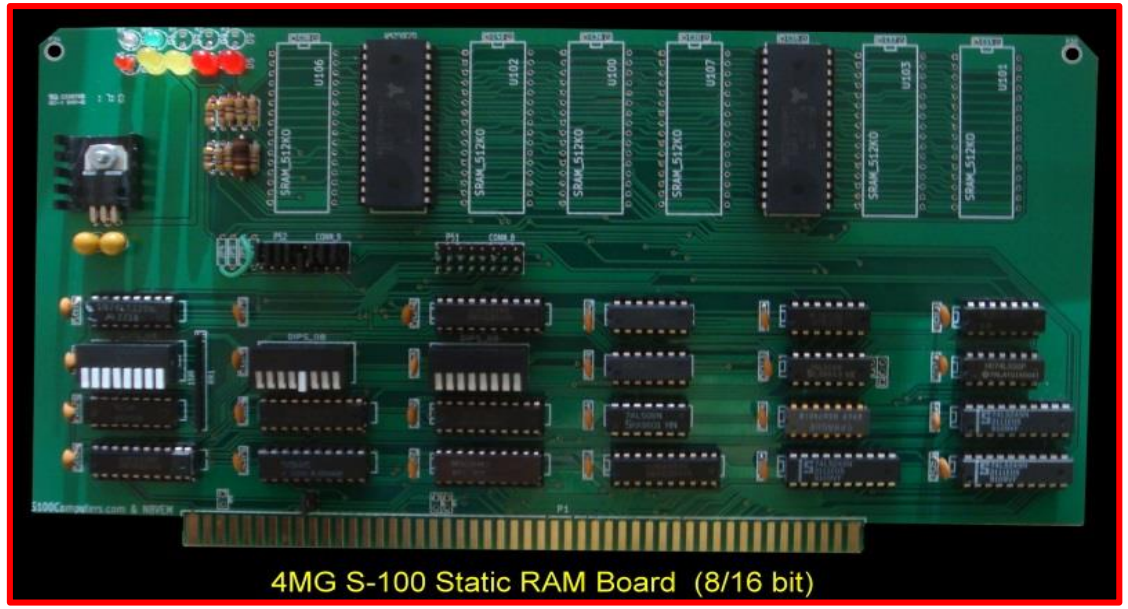
It is a volatile memory

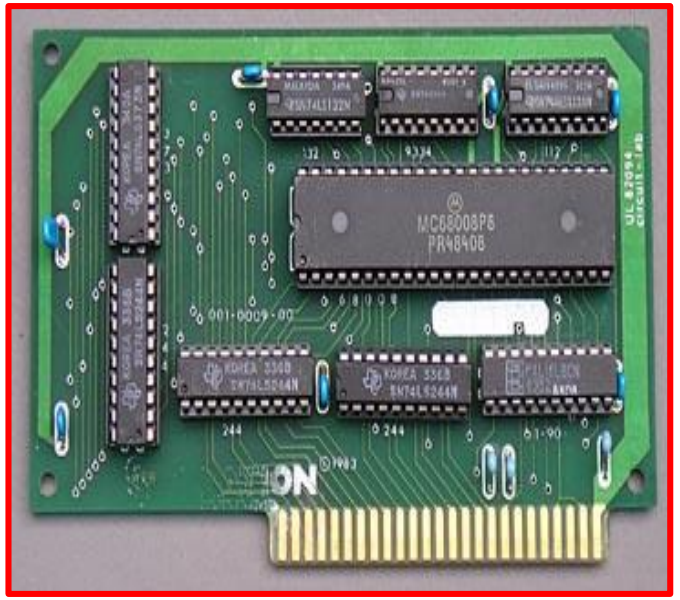
RAM(Random-access memory)

Types of RAM

Static RAM (Static Random Access Memory)

It is called static because it will continue to hold information without refreshment and it does not require refreshment.



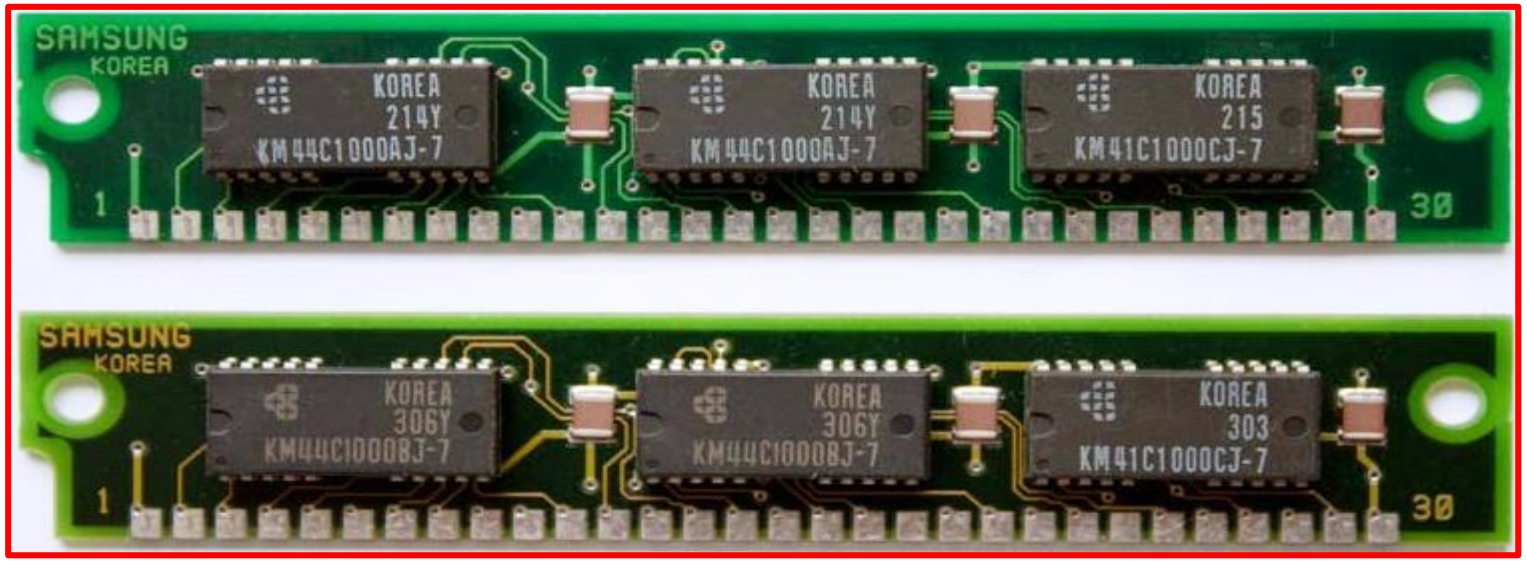


RAM(Random-access memory)

Dynamic RAM

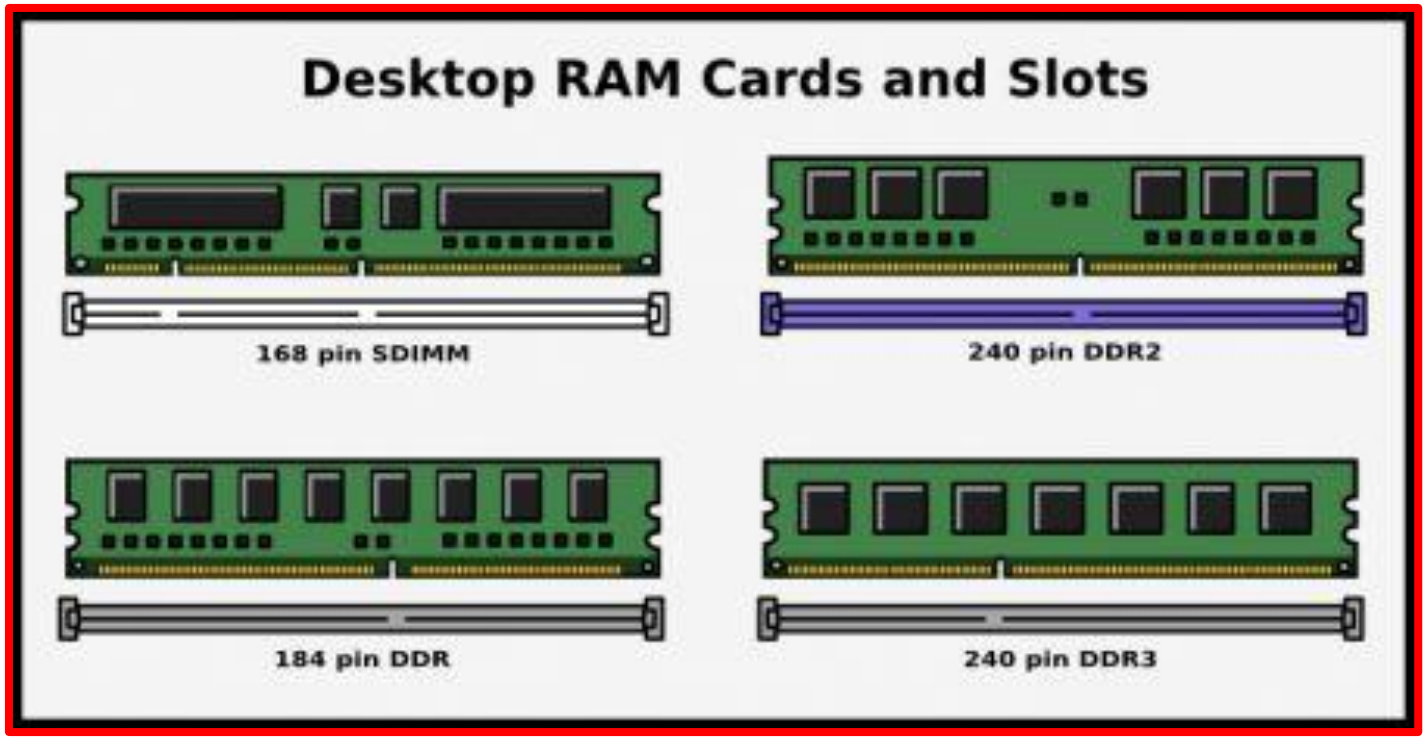
(Dynamic Random Access Memory)

It requires refreshment. It looses information with time.



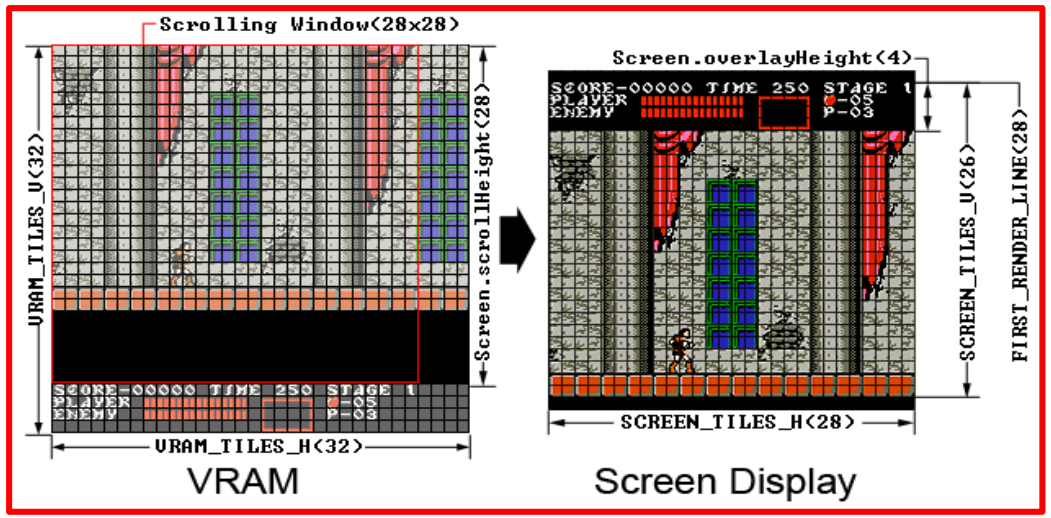
TYPES RAM

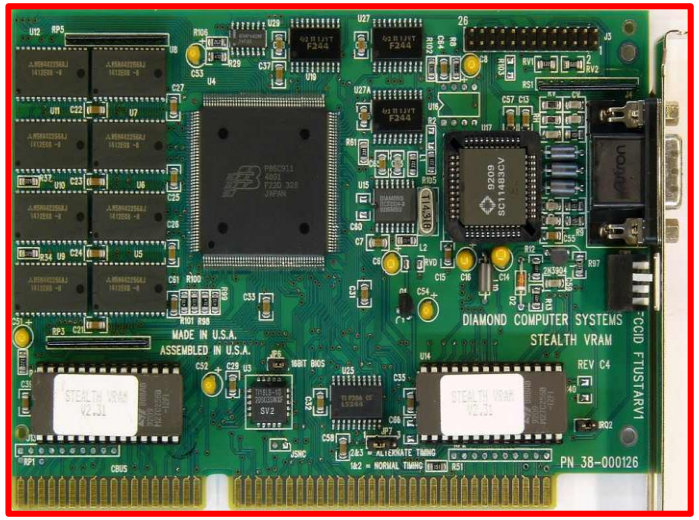
➢**DDR SDRAM**: Double data rate synchronous dynamic RAM is just like SDRAM except that is has higher bandwidth, meaning greater speed. EX- DDR1,DDR2,DDR3,DDR4



TYPES RAM

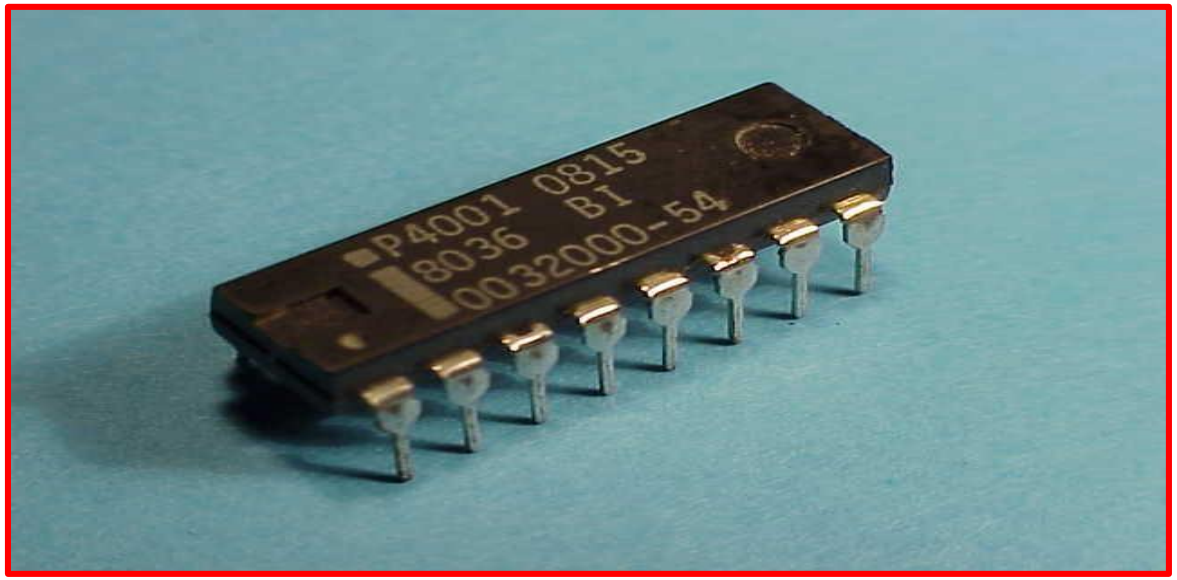
- **SDRAM: Synchronous dynamic random access memory** takes advantage of the burst mode concept to greatly improve performance.
- **VRAM**: **Video RAM**, also known as **multiport dynamic random access memory (MPDRAM),** is a type of RAM used specifically for video adapters or 3-D accelerators.





ROM(READ ONLY MEMORY)

- **ROM(READ ONLY MEMORY)**
  - It is non volatile memory that stores **BIOS** instructions as are required to start computer when electricity is first turned on.

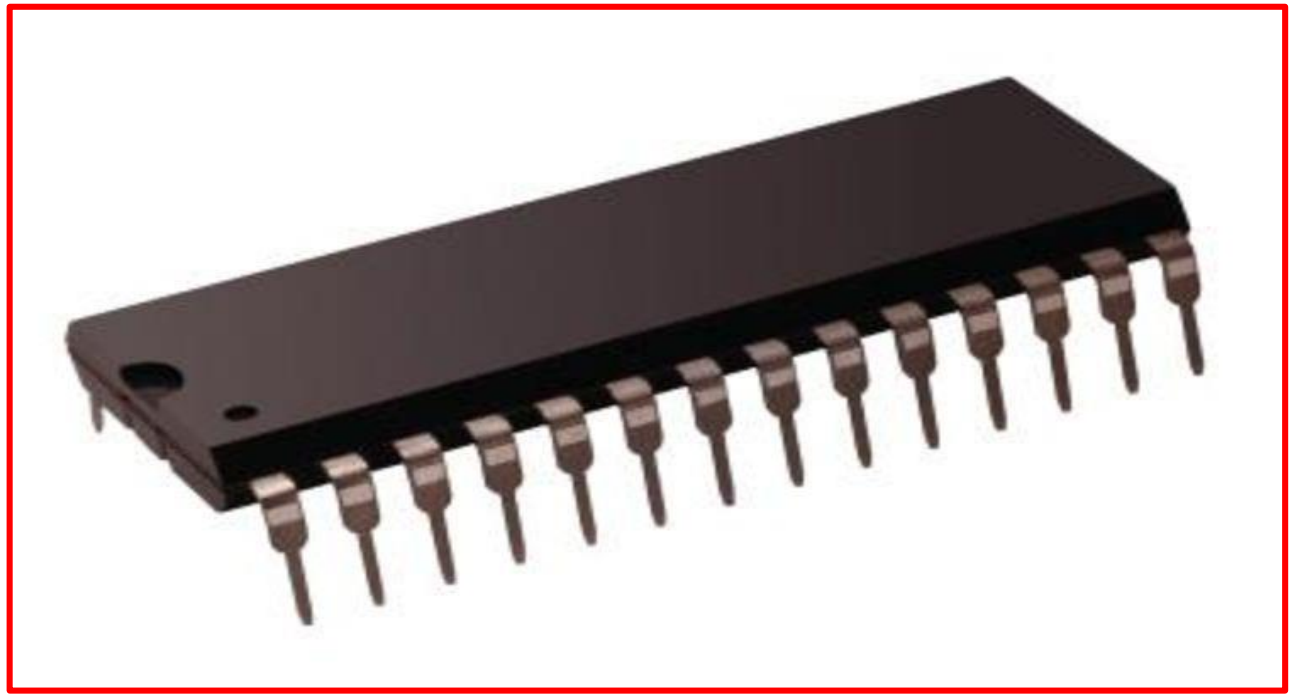


ROM(READ ONLY MEMORY)

Types Of ROM

- **PROM (Programmable Read only Memory)**

  PROM is read-only memory that can be modified only once by a user. It can be programmed only once and is not erasable.



ROM(READ ONLY MEMORY)

Types Of ROM

- **EPROM (Erasable and Programmable Read Only Memory)**

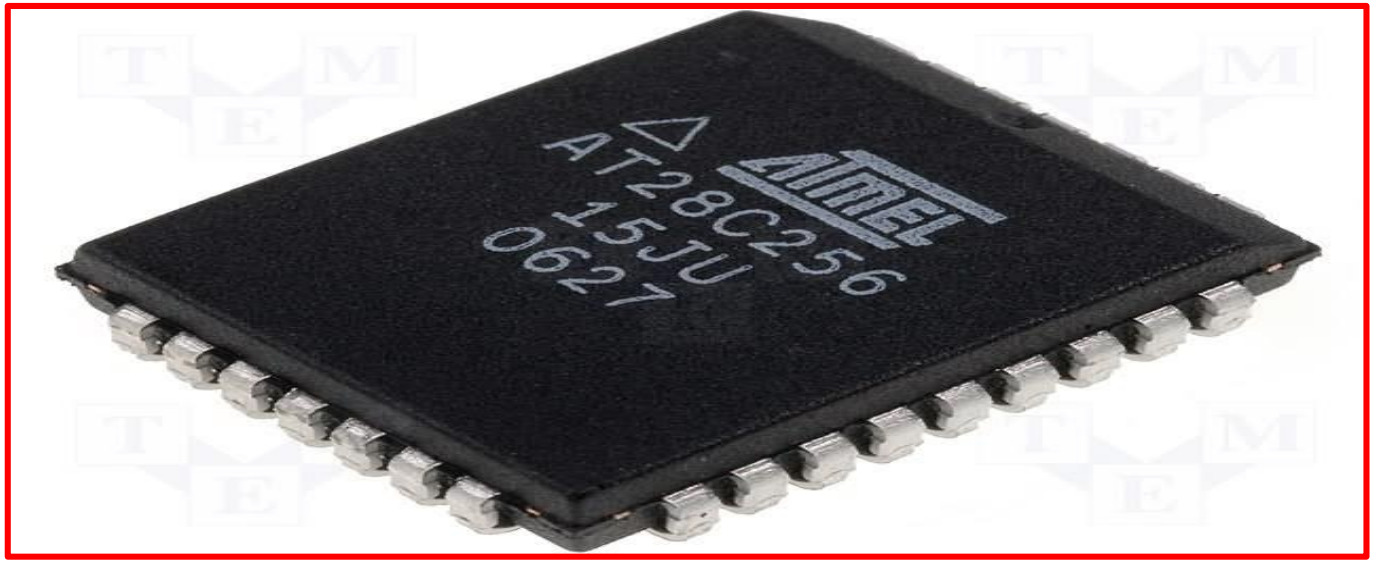
  The EPROM can be erased by exposing it to ultra-violet light then rewriting. It is also called ultra violet PROM.

ROM(READ ONLY MEMORY)

Types Of ROM

- **EEPROM (Electrically Erasable and Programmable Read Only Memory)**

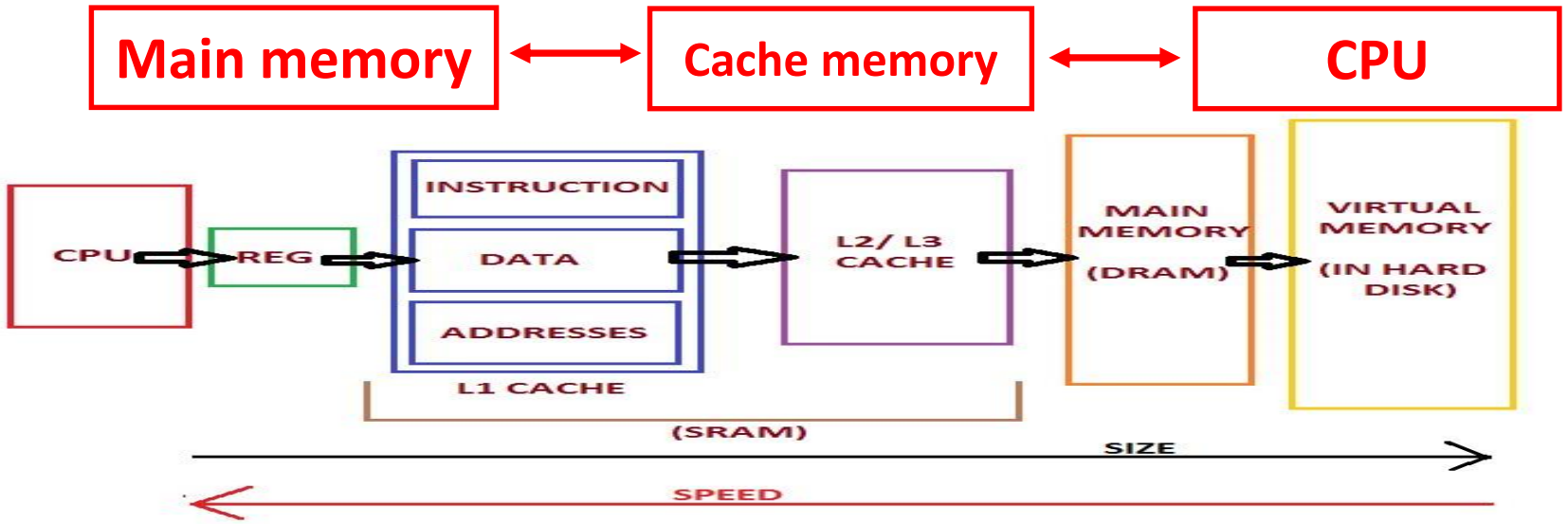
  The EEPROM is programmed and erased electrically. In EEPROM, any location can be selectively erased and programmed. EEPROMs can be erased one byte at a time, rather than erasing the entire chip.



CACHE MEMORY

Cache memory

- A cache used by the central processing unit (CPU) of a computer to reduce the average time to access memory.
- It is used in between the main memory and CPU.



SECONDARY STORAGE

It is used to store data for backup purpose.

Types of access :

- **Sequential access**
- **Direct/Random access**

Direct Access Vs Sequential Access

- **Hard drives, flash drives** and almost all other storage devices are direct access. This means that data stored anywhere on the device can be accessed in an equally short space of time.

- **Magnetic tape** is a serial access or sequential access device. This means that you have to wind through it to reach a piece of data that you require.

SECONDARY STORAGE

Magnetic Tape

- Magnetic tape consists of a plastic tape covered in a magnetic coating.
- Based on sequential access.

SECONDARY STORAGE : MAGNETIC DISK

HARD DISK

- Permanent/Non volatile storage device.
- Device used for storing and retrieving digital information using rapidly rotating disks coated with magnetic material.
- Data is read in a random access method.

SECONDARY STORAGE : MAGNETIC DISK

SOLID STATE DRIVE

- Solid-state drives actually aren't hard drive in the traditional sense of the term, as there are no moving parts involved. A traditional hard disk drive **(HDD)** consists of a spinning disk with a read/write head on a mechanical arm. An SSD, on the other hand, has an array of semiconductor memory organized as a disk drive, using integrated circuits (ICs) rather than magnetic or optical storage media

SECONDARY STORAGE : MAGNETIC DISK

FLOPPY DISK

- Floppy disk is also called Diskette.
- The **floppy disk** is a removable magnetic storage medium.

Size	Capacity
3.5 inch	1.44 MB
5.25 inch	1.2 MB
8 inch	768 KB

SECONDARY STORAGE : MAGNETIC DISK

Zip Disc

- A zip disc is like a large, chunky floppy disc.
- Zip discs have a hard plastic outer casing with a magnetic disc inside.
- Stores as much as 750Mb.

USB HDD

A disk enclosure is a specialized casing designed to hold and power disk drives while providing a mechanism to allow them to communicate to one or more separate computers.

SECONDARY STORAGE : OPTICAL DISC

In computing, an optical disc drive (ODD) is a disk drive that uses laser light or electromagnetic waves near the light spectrum as part of the process of reading or writing data to or from optical discs.

Optical storage refers to the storage of data on an optically readable medium.

- **CD (Compact disc)**
- **DVD (Digital versatile disc)**
- **BRD (blue ray disc)**
- **HVD (holographic versatile disc)**

SECONDARY STORAGE : OPTICAL DISC

Compact Disc

- CD is an optical medium. This means that data is written to it, and read from it using a laser.
- CDs have a capacity of about 700MB.

SECONDARY STORAGE : OPTICAL DISC

Compact Disc: Types

- CD-ROM:

CD-ROM already have the data written on them. They cannot be edited or erased.

- CD-R:

CD-Rs can be written to once only. After that, the data cannot be erased or edited, but can be read many times. These discs are also known as WORM discs (Write Once Read Many).

- CD-RW:

The data can be overwritten on this disc.

SECONDARY STORAGE : OPTICAL DISC

DVD (Digital Versatile Disc)

- It is an optical disc like the CD, but with much higher capacity. There are many different types, but the standard DVD can store about 4.7GB.
- DVDs can also be writable or re-writable.

SECONDARY STORAGE : OPTICAL DISC

BRD(Blu Ray Disc)

- **Blu-ray Disc** is a high-density optical disc format similar to DVD.
- It's capacity is up to **50GB to 100 GB**

SECONDARY STORAGE : OPTICAL DISC

HVD (Holographic Versatile Disc)

- The **Holographic Versatile Disc (HVD)** is an optical disc technology
- It's capacity is **6 TB**.

SECONDARY STORAGE : FLASH MEMORY

Flash memory

- Flash memory is an electronic non-volatile computer.
- It is a storage medium that can be electrically erased and reprogrammed.

Pen Drive

- It is a flash memory used to store data permanent.
- It is a portable storage device.

Memory card

- It is used to store data Non Volatile.
- They are commonly used in many electronic devices, including digital cameras, mobile phones, laptop computers, MP3 players and video game consoles. Latest version of memory card is class 10 ultra.

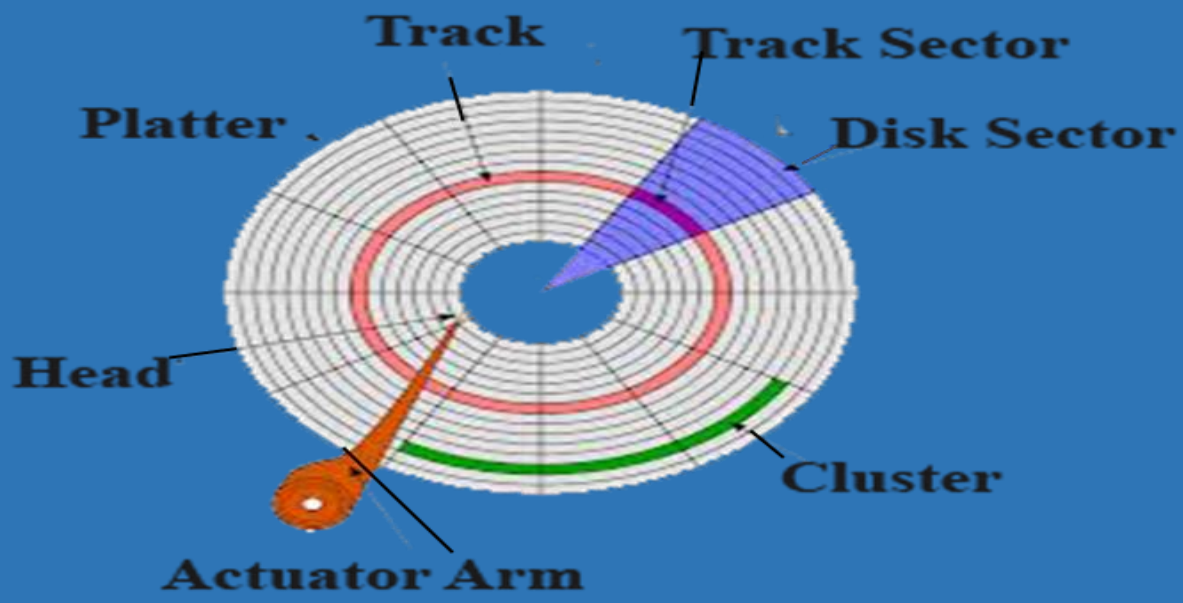
Disk Structures

- **Track**

  The disk is divided into no. of concentric circles called tracks.

- **Sector**

  Data storage are in one track multiple block is called sector

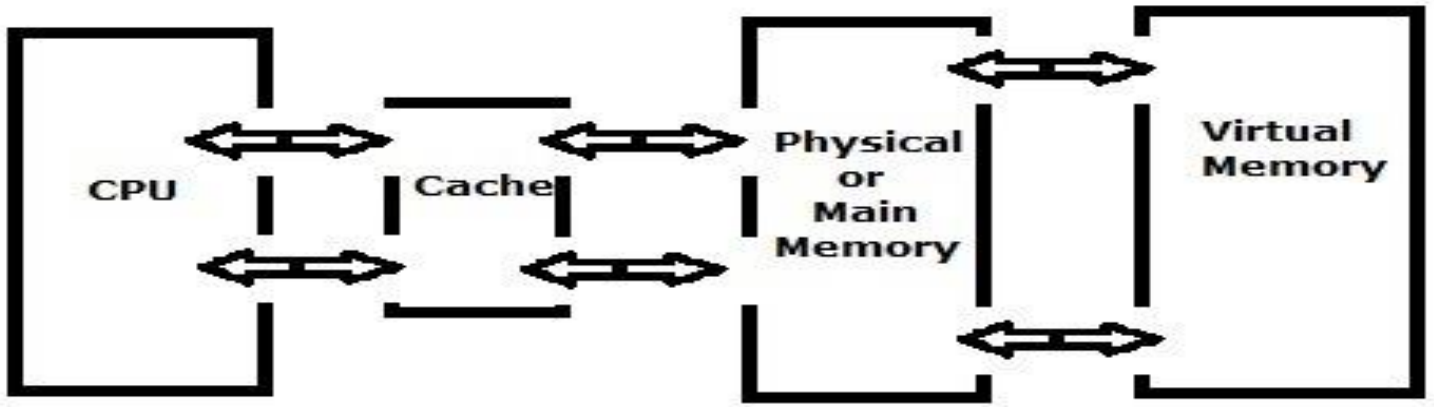


SECONDARY STORAGE

- File system in HDD
  - **FAT** (File Allocation Table)
  - **NTFS** (New Technology File System)

Virtual Memory

Virtual memory combines your computer's RAM with temporary space on your hard disk. When RAM runs low, virtual memory moves data from RAM to a space called a paging file. Moving data to and from the paging file frees up RAM so your computer can complete its work. It is also called Extended RAM



MEMORY UNIT

- Memory unit is used to measure the capacity of memory.
- Smallest memory unit is **Bit**(binary digits)
  - 0 is off state
  - 1 is on state

Point to be remember

- One Billion Byte is equal to 1 Giga Byte(approx)
- One Million Byte is equal to 1 Mega Byte(approx)

MEMORY UNIT

1 GB(**Geop Byte**) =1024BB

1 BB(**Bronto Byte**) =1024YB

1 YB(**Yotta Byte**) =1024 ZB

1 ZB(**Zeta Byte**) =1024 EB

1 EB(**Exa Byte**) =1024 PB

1 PB(**Peta Byte**) =1024 TB

1 TB(**Tera byte**) =1024 GB

1 GB(**Giga byte**) =1024 MB

1 MB(**Mega byte**)=1024 KB

1 KB(**Kilo byte**) =1024 Byte

1 **Byte** =8 bit

1 **Nibble** =4 bit

1 **bit** =0 or 1


United States-International
Thank You
shift