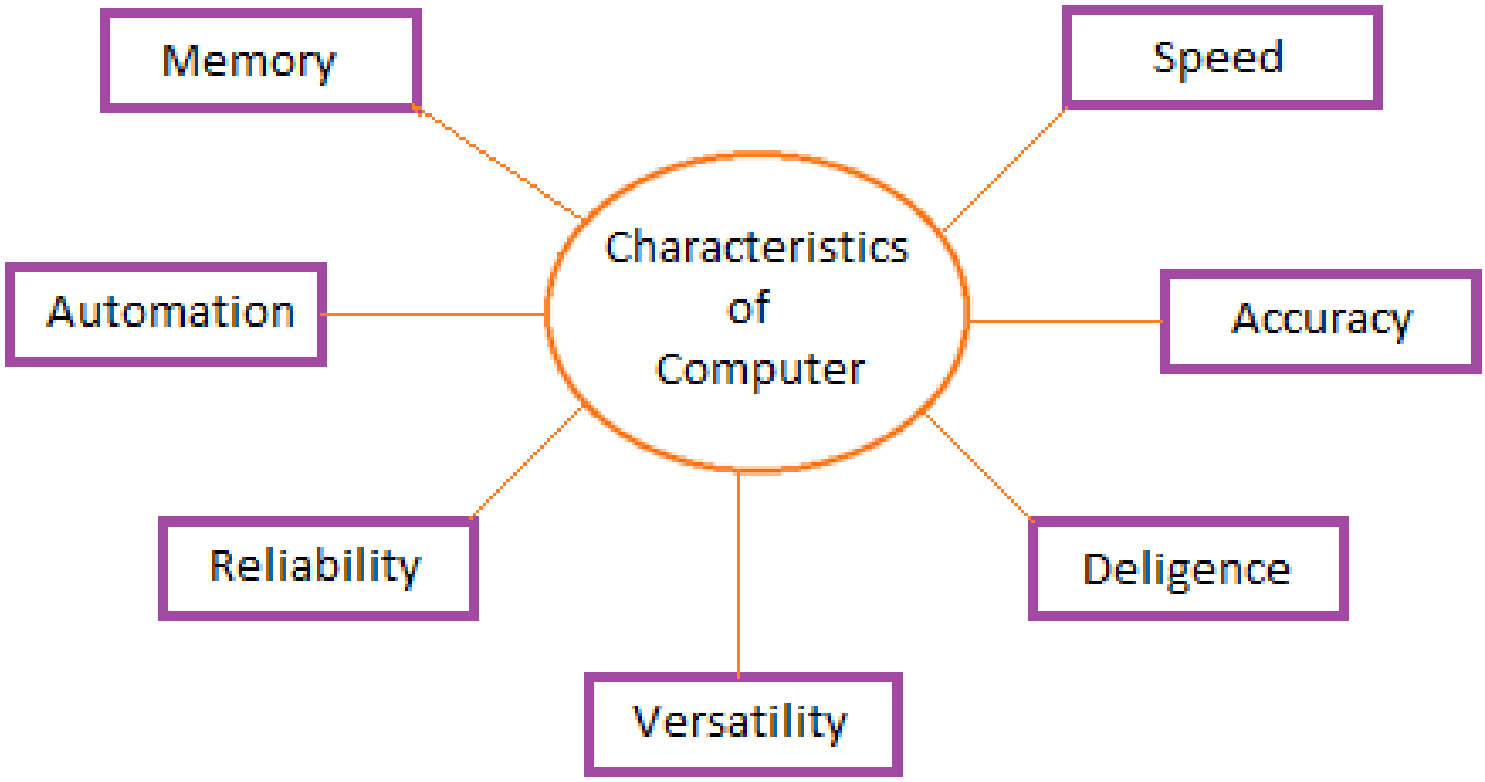
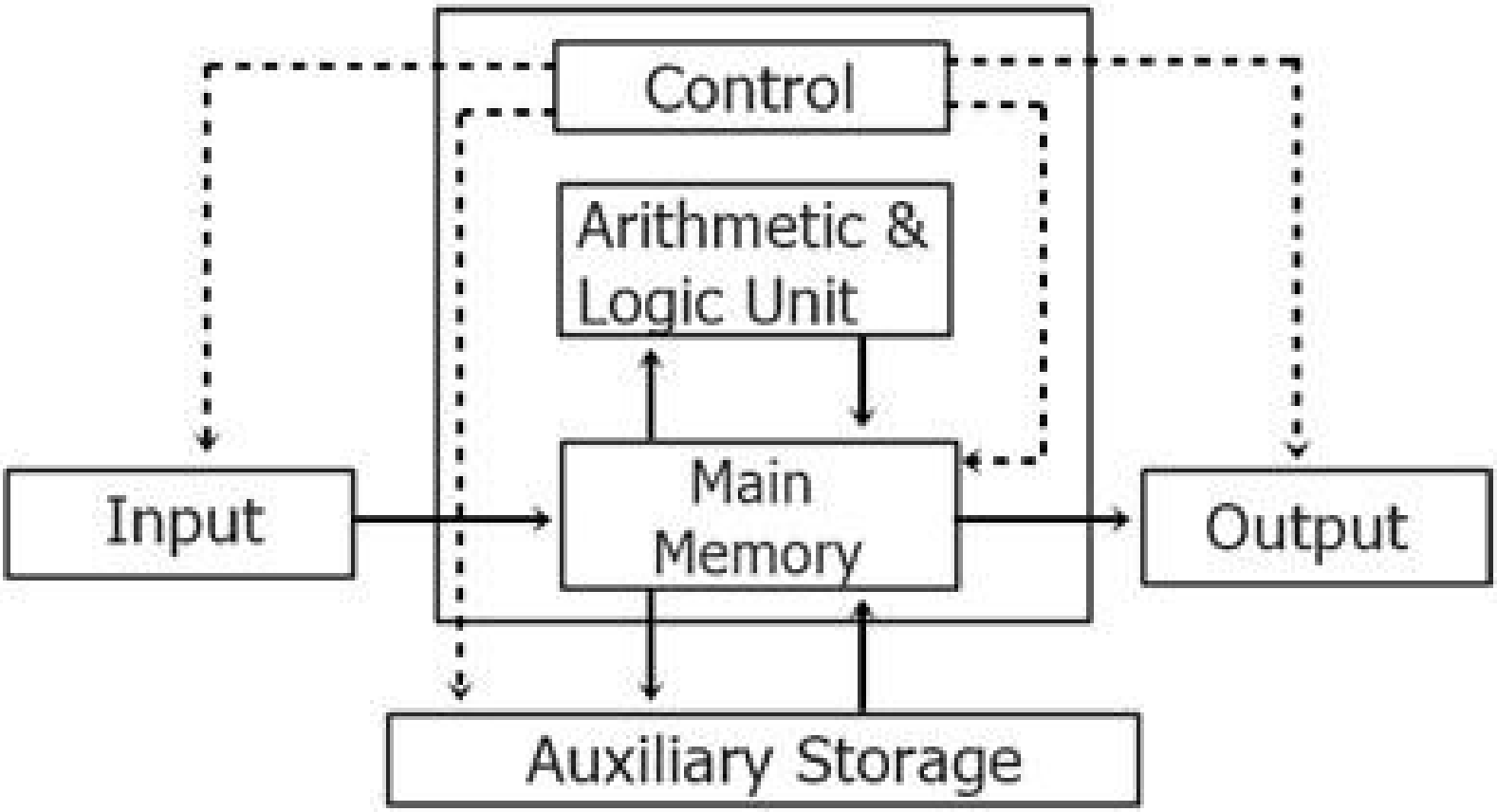
Introduction to computer

A computer is an electronic machine that manipulates data according to a list of instructions.

A computer is an electronic machine(device) that accepts input (data), processes it and gives (output)results (information)and save as an electronic file.

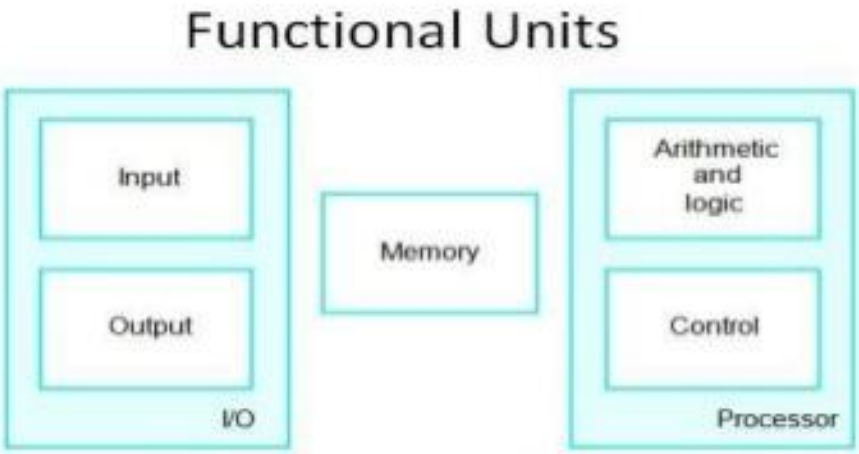

Memory
Speed
Characteristics of Computer
Automation
Accuracy
Reliability
Deligence
Versatility



Block Diagram of Computer

Functional units

- Functional units is a part of a CPU that performs the operations and calculations called for by the computer program.
- Computer consists of five main parts namely,
  - Input unit,
  - Central Processing Unit
    - Memory unit
    - Arithmetic & logical unit
    - Control unit
  - Output unit



1. Input Unit

- Input units are used by a computer, which read the data.

Ex : Key Board , Mouse

Arithmetic and logic unit:

- Most of all the operations of a computer are executed in the ALU of the processor.

- It perform arithmetic operations like addition, subtraction, multiplication, division and also the logical operations like AND, OR, NOT operations.

Control unit

- Control unit is used to coordinate the operations of the input, output, memory, ALU in some way. It coordinates the operation of all the units using control signals like timing signals.
- Timing signals are the signals determining the time when a given action must take place. A large set of control lines carriers the signals used for timing and synchronization of events in all units.

Memory unit

- Memory unit is used to store programs and data.

Two types of memory exist. they are,

- Primary storage, and
- Secondary storage

Primary storage:

- Primary memory contains a large number of semiconductor storage cells, capable of storing a bit of information.
- The bits of information are grouped into fixed size words.
- The word length of a computer is between 16-64 bits.
- Addresses are used to access the words from memory.
- Addresses are numbers that identifies locations.

- The memory is know as main memory in which program must resides.
- Cache is also a kind of memory which is used to access the data very soon. they are highly coupled with the processor.

Example: RAM,ROM.

Advantages:

- Small, and
- Fast

Disadvantages:

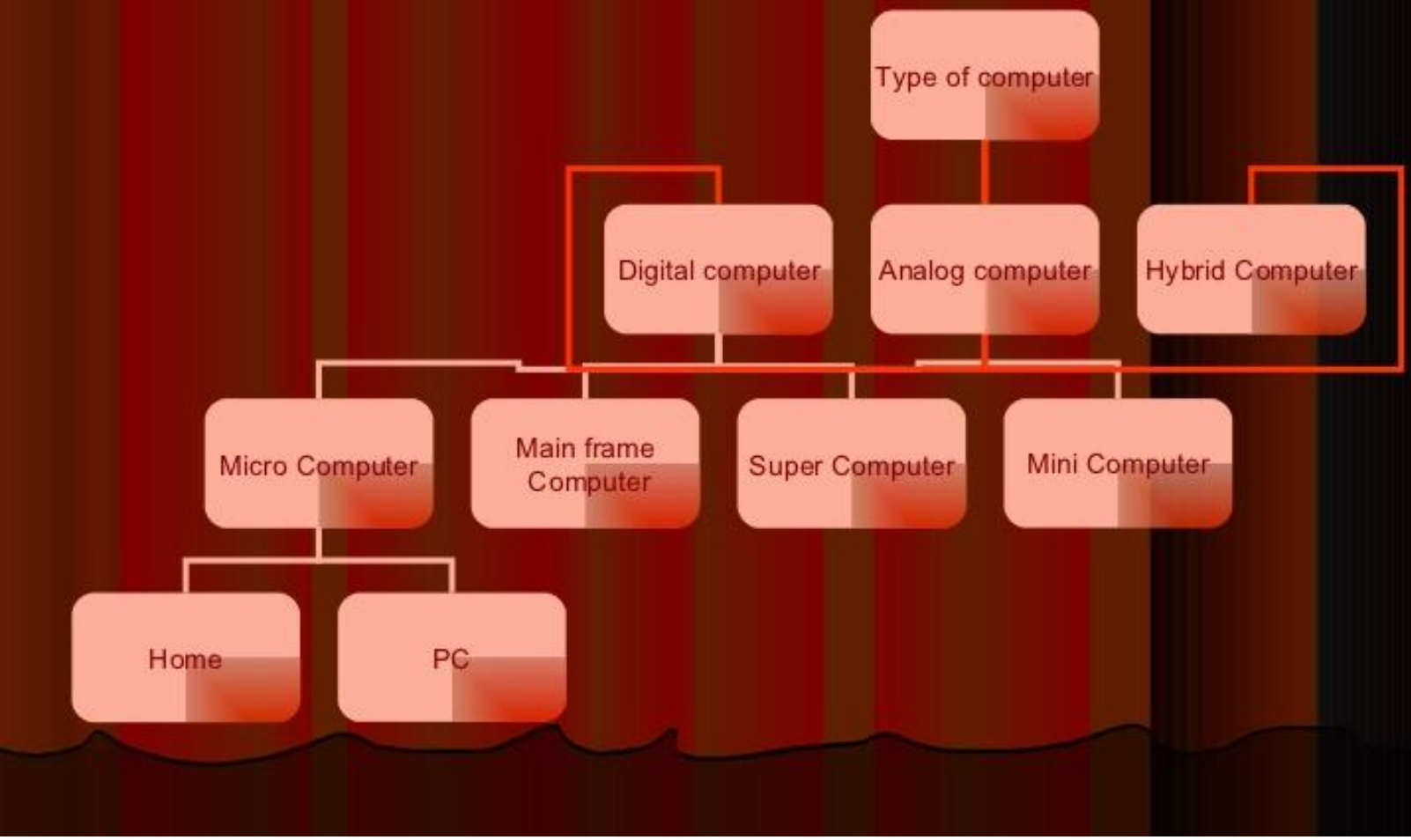
- less storage capacity, and
- costly

Output unit

- Output units are used to send the processed results to the user.
- Output devices display information in a way that you can understand. The most common output device is a monitor.
- Output devices are pieces of equipment that are used to get information or any other response out from computer. These devices display information that has been held or generated within a computer.

Ex : Printer , Monitor , Speaker

Types of computer



Classification of computer on the basis of its size are categorize into following types:

- Microcomputers
- Minicomputers
- Mainframe Computers
- Super Computers

Now let's define all the above types of computer on the basis of its size.

Microcomputers

Desktop computers, laptops, gaming consoles, sound and navigation system of a car, personal digital assistant (PDA), tablets and smartphones are all types of microcomputers.

The microcomputers are widely used and the fastest growing computers. These computers are the cheapest among the other three types of computers.

The microcomputers are specially designed for general purpose usage life entertainment, education, and work purposes.

Minicomputers

Minicomputers also called as mid-range servers, are more powerful computers than microcomputers in terms of processing power and capabilities.

Minicomputers are mainly multi-user systems where many user simultaneously work on the systems.

Minicomputers posses greater storage capacity and larger memories as compared to microcomputer. These are even capable of handling more input/output devices.

Examples of minicomputers are:

- PDP-11
- VAX
- 7500 MAGNUM

Mainframe computers

Mainframe computers are designed to handle huge volumes of data and information. These can support more than 100 users at same time. These very large and expensive computers have great processing speed and very large storage capacity and memory as compared to minicomputers.

These computers even posses and work with more than one processor at the same time. Thus one can say these are multi-user, multiprocessor systems.

For mainframe computers, very sophisticated operating systems are needed to control and supervise their operation.

Examples of Mainframe computers are:

- ICL39
- CDC 6600
- VAX 8842
- IBM 3090/600
- IBM 4381

Supercomputers

Supercomputers are the most powerful computers among digital computers. These consists of several processors running together thereby making them immensely faster and powerful.

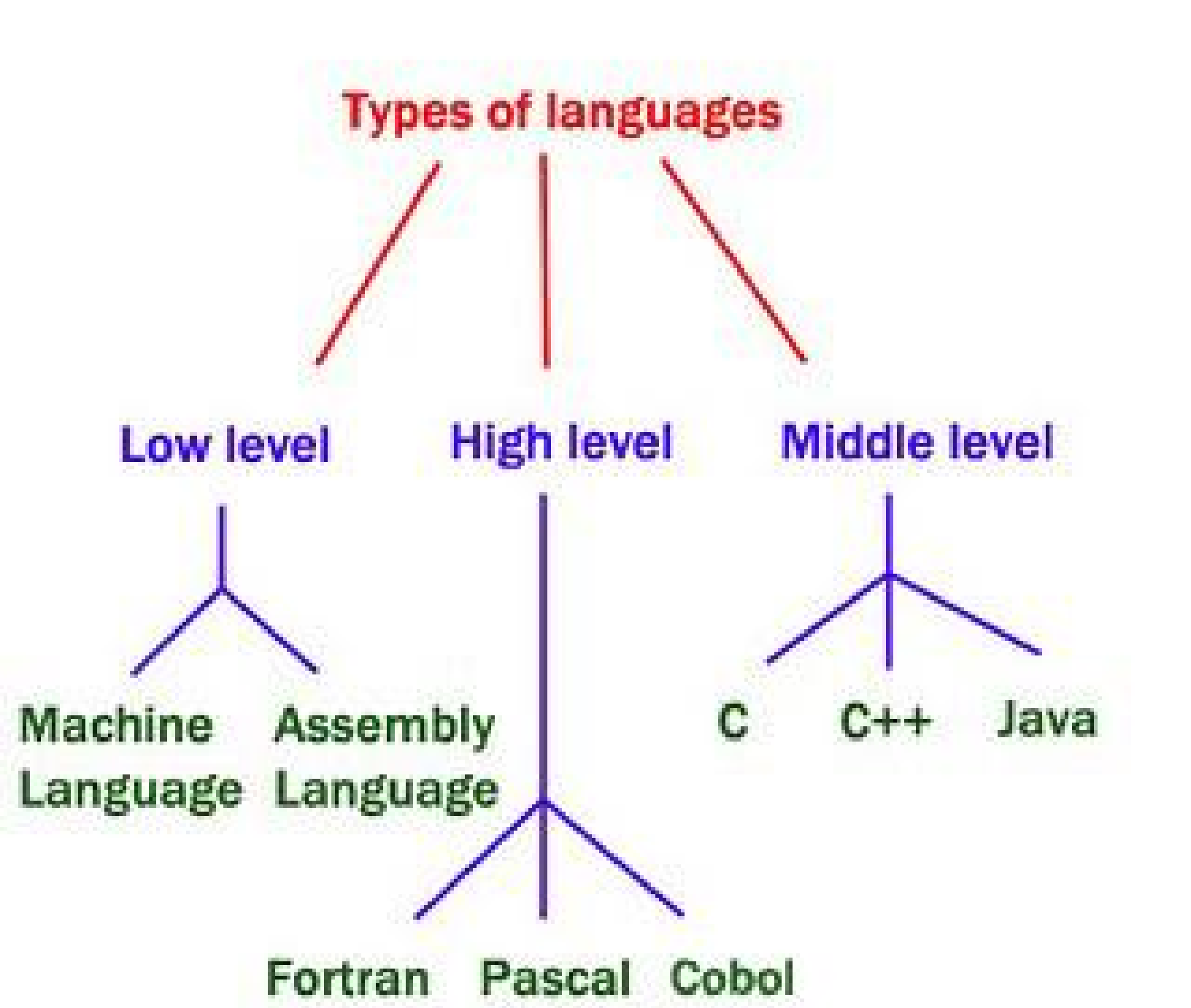
These computers are capable of handling huge amounts of calculations that are beyond human capabilities.

Super computers can perform billions of instructions per second. Some of the today's supercomputers have the computing capability equal to that of 40000 microcomputers.

A Japanese supercomputer has calculated the value of Pi to 16 million decimal places.

Supercomputers are mainly used in following purposes or applications:

- Weather forecasting
- Nuclear science research
- Aerodynamic modelling
- Seismology
- Metrology


Types of languages
Low level
High level
Middle level
Machine Language
Assembly Language
C
C++
Java
Fortran
Pascal
Cobol

Low Level Language	High Level Language
1. Low Level Languages are very close to CPU.	1. High Level Languages are easy to learn.
2. Programs in low-level languages are fast in execution.	2. Programs in high-level languages are slow in execution.
3. Programs in low-level languages are difficult to modify.	3. Programs in high-level languages are easy to modify.
4. Low level languages provide facility to interact at hardware level.	4. High level languages do not provide much facility to interect at hardware level.

What is a Drive ?

- Its is an electronic device which will control accurately the output of an electric motor in response to a controlling input.
- An AC Drive generates a variable voltage/frequency output from a fixed frequency supply
- Have inbuilt protection in case of failure of itself or the motor it controls
- To protect against motor overload, the Drive will limit the continuous current into the motor, but provide additional overload current for a finite time

Crompton Greaves
EVERYDAY SOLUTIONS

What is a File System?

- A file system provides an abstraction for storing, organizing and accessing persistent data
  - I.e., data survives after process that created the data has terminated, and after machines crashes, reboot
  - This data is stored on disks, tapes, solid-state drives (SSD) …
- File-system data is organized as objects called files
  - Need a way to find files, so files have names and are organized as directories
- Files are accessed via system calls
  - Files can be accessed concurrently by different processes

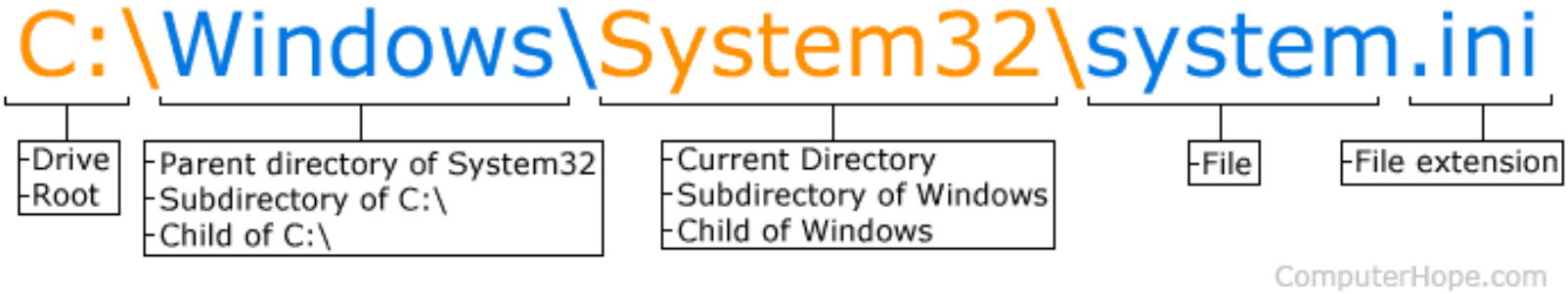
Directories

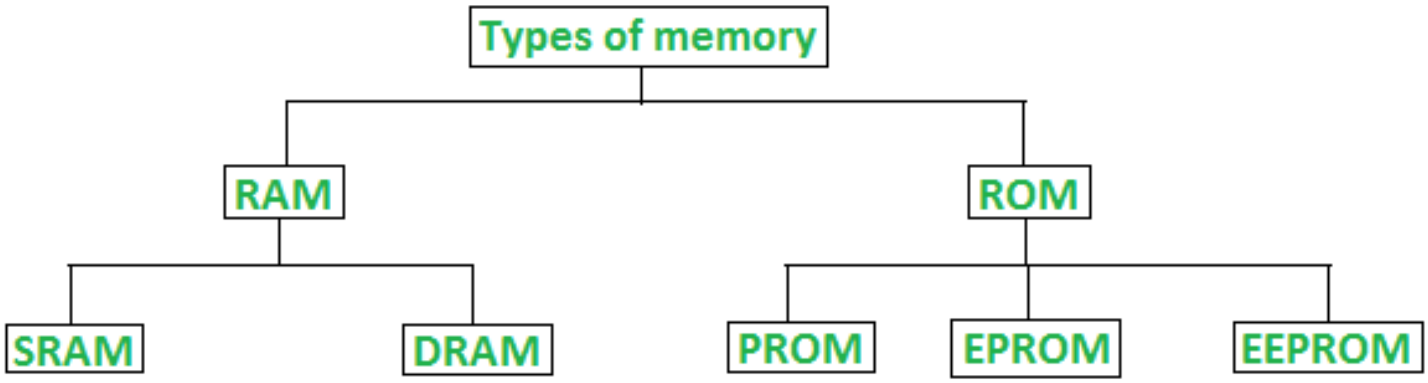
What are directories?

A listing of people or organizations in a systematic way. They cover all topics and geographic areas. They are available in print, CD-ROM, online databases, and files on the internet.

Why are directories important in the library?

They are used to locate, verify, and match people to organizations, institutions, and people. Directories may cover a wide range of topics and are available in many formats.





Classification of computer memory

RAM	ROM
1. Temporary Storage.	1. Permanent storage.
2. Store data in MBs.	2. Store data in GBs.
3. Volatile.	3. Non-volatile.
4.Used in normal operations.	4. Used for startup process of computer.
5. Writing data is faster.	5. Writing data is slower.

Difference between RAM and ROM

DRAM	SRAM
1. Constructed of tiny capacitors that leak electricity.	1.Constructed of circuits similar to D flip-flops.
2.Requires a recharge every few milliseconds to maintain its data.	2.Holds its contents as long as power is available.
3.Inexpensive.	3.Expensive.
4. Slower than SRAM.	4. Faster than DRAM.
5. Can store many bits per chip.	5. Can not store many bits per chip.
6. Uses less power.	6.Uses more power.
7.Generates less heat.	7.Generates more heat.
8. Used for main memory.	8. Used for cache.

Difference between SRAM and DRAM

PROM VS EPROM VS EEPROM

PROM	EPROM	EFPROM
A Read Only Memory (ROM) that can be modified only once by a users	A programmable ROM that can be erased and reused	A user-modifiable ROM that can be erased and reprogrammed repeatedly through a normal electrical voltage
Stands for Programmable Read Only Memory	Stands for Erasable Programmable Read Only Memory	Stands for Electrically Erasable Programmable Read-Only Memory
Developed by Wen Tsing Chow in 1956	Developed by Dov Frohman in 1971	Developed by George Perlegos in 1978
Reprogrammable only once	Can be reprogramed using ultraviolet light	Can be reprogramed using electrical charge

Storage Devices

Primary storage: is the storage provided by memory on a computer system.
e.g. ROM/RAM.

Secondary storage: is storage provided by peripheral devices other than memory.

Secondary storage: is required in a computer system for three reasons :

1. The content of memory is usually volatile, which means that if power is disconnected the data is lost.
2. The capacity in megabytes of memory is limited.
3. Memory is more expensive than secondary storage.

Several types of disks may be used for Secondary storage. E.g.

- Floppy disks
- Hard disks
- Optical disks (including CD-ROM, writeable CD, DVD
- Backup Storage Devices e.g. tape

PRINTER: A printer is any device that prints text or illustrations on paper.

There are many different types of printers.

- **Daisy-wheel**
- **Dot-matrix**
- **Ink-jet**
- **LCD & LED**
- **Line printer**
- **Thermal printer**

Difference Between Dot.Matrx, Inkjet and Laser Printer

✓ Dot Matrix

1. Very Cheep
2. Less quality
3. 20-30 sec-A4
4. Less Maintenance cost

✓ InkJet

1. More cost than Dot
2. Good quality
3. 5-10 Sec-A4
4. High Maintenance cost

✓ Laser

1. High Cost
2. Excellent quality
3. 1-2 Sec-A4
4. Low Maintenance cost

Dot matrix printer

Definition:

- Dot matrix printers are known as impact printers.
- They create an image on paper by striking pins against an inked ribbon.
- The ink is transferred to the paper as closely shaped dots that form each character.
- The more pins, the better the print quality. 24-pin dot matrix printers can print at near letter-quality.

Drum printer

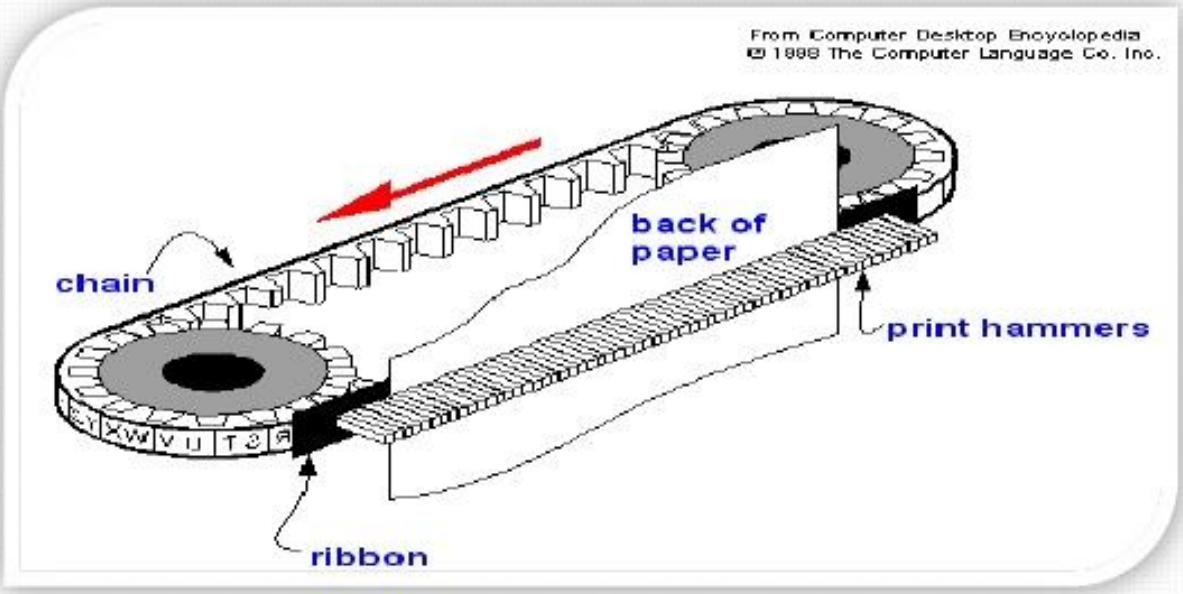
- In a typical **drum printer** design, a fixed font character set is engraved onto the periphery of a number of print wheels, the number matching the number of columns (letters in a line) the printer could print.
- The wheels, joined to form a large drum (cylinder), spin at high speed and paper and an inked ribbon is stepped (moved) past the print position.
-

Ink-Jet Printer

- Inkjet technology was developed in the 1960s, but first commercialized by IBM in 1976.
- Ink-jet printer is type of non-impact printer. It creates output on paper by spraying tiny drops of liquid ink.
- Inkjet printer has print-head that can spray very fine drops of ink. It consists of print cartridge filled with liquid ink and has small nozzles in form of m

Chain Printers

- An early line printer that used type slugs linked together in a chain as its printing mechanism. The chain spins horizontally around a set of hammers. When the desired character is in front of the selected print column, the corresponding hammer hits the paper into the ribbon and onto the character in the chain. Chain and train printers gave way to band printers in the early 1980s.



Comparing LCD and Plasma

LCD	Plasma
• For the LCD TVs, screens are available to a maximum diagonal size of 60 inches. • They are more expensive than the Plasma TVs. • LCD TVs don`t consume as much as the Plasma TV.	• There are displays with a size of almost 65 inch diagonal measurement. • They are cheaper than the LCD TVs. • Plasma display consumes much more energy than a LCD display.