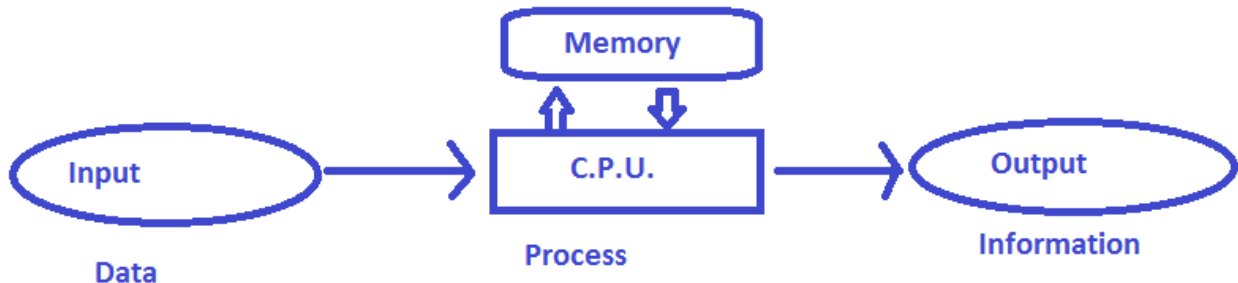


Computer System

Computer Definition:

A Computer is an electronic device that takes input as data and after processing in CPU it gives output in form of information. The information can be stored in memory for further processing.



Compter Simple Block Diagram

Data:

- Data are raw material
- Data are un-organized in nature
- Data are Meaning less
- Data take part in process
- Data can't use for decision making

Information:

- Information is real material
- Information is organized in nature
- Information is Meaningful
- Information is product of process
- Information used for decision making

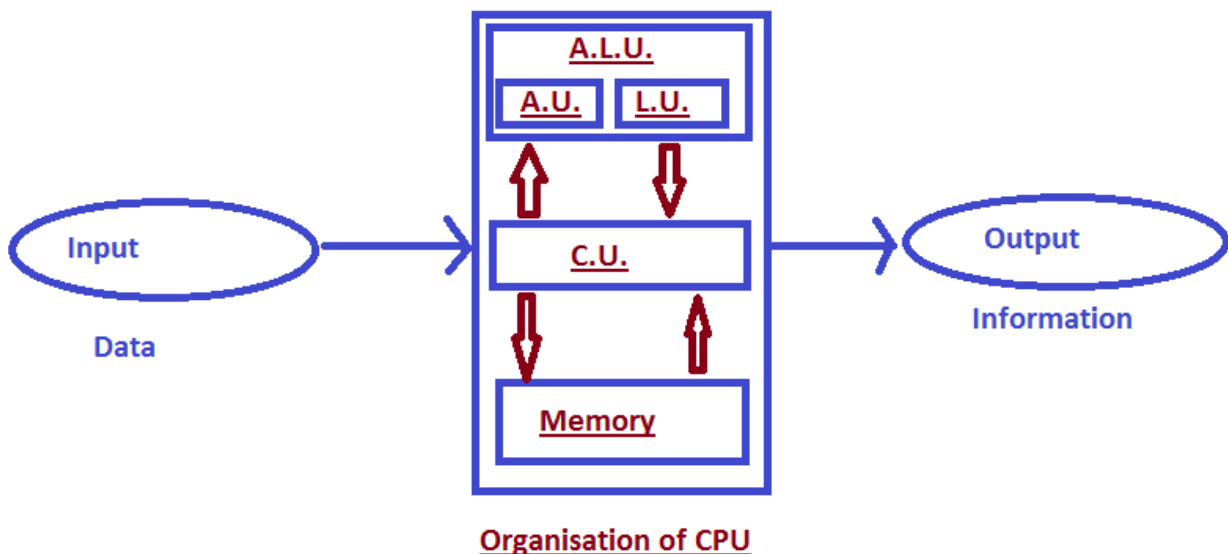
Process:

Process is smallest individual unit of work that converts data into information. Process completes in CPU part of computer.

Component / Structure of CPU

CPU is Central Processing Unit of Computer that control the all over functions of computer. CPU controls, guides, and monitor to the every activity of computer. The CPU has some other components.

1. CU (Control Unit)
2. ALU (Arithmetic Logic Unit)
3. Memory



1. Control Unit

The Control Unit of CPU controls & monitor all tasks performed in CPU. Like

- It Controls the input
- Flow of program execution
- Maintain synchronization among AU, LU and Memory units of computer.
- It also controls the input and output.

2. Arithmetic Logic Unit

Arithmetic Logic Unit is responsible for handling of **Mathematical and relational & Logical operations in CPU.**
ALU has two parts

A.U. (Arithmetic Unit): AU performs all the mathematical calculations.

Like addition (+), subtraction (-), Division (/),

Multiplication (*) etc.

L.U. (Logical Unit): The LU unit performs all the relational and logical tasks. The result of relational and logical tasks always be **either True or False.**

Relational Operations: <, >, <=, >=, !=

Logical Operations: AND, OR, NOT

Working of ALU: The CU detects the input and forward to ALU for further processing. If nature of input is arithmetic then it transfer to AU unit and if it is logical type then transfer to LU unit. After calculations, the result again send to CU.

3. Memory

Here Memory mean RAM (Random Access Memory) that is internal memory of Computer and it provides the space for performing all the activities in CPU. When the process over then the memory free up and that space is available for other process in CPU.

Various Memory Measurement Units

The Memory in Computer mean RAM and it is also known as Internal / Main / Primary Memory. There are various units for measurement of memory. The relationship among various units is given below

Smallest Unit is Bit		
1 Nibble	=	4 Bits
1 Byte	=	8 Bits or 2 Nibble
1 Kilo Byte (KB)	=	1024 Byte
1 Mega Byte (MB)	=	1024 KB
1 Giga Byte (GB)	=	1024 MB
1 Tera Byte (TB)	=	1024 GB
1 Penta Byte (PB)	=	1024 TB
1 Exa Byte (EB)	=	1024 PB
1 Zetta Byte (ZB)	=	1024 EB
1 Yotta Byte (YB)	=	1024 ZB

Types of Memory:

The Memory in Computer is categorized in two parts

1. Internal / Main / Primary Memory
2. External / Auxiliary / Secondary Memory

1. Internal / Main / Primary Memory

The Main Memory (RAM) of Computer is responsible for proving the space for all type of program functioning. The program loads in the main memory and then execute it. After completion of execution of program, the main memory free up and this space can utilized by other waiting programs. It is

volatile memory. That mean it stores programs as temporary and it became empty when power off or shut down computer.

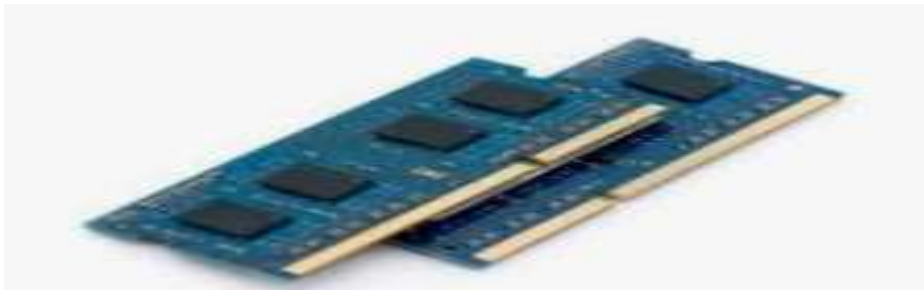
RAM has two categories:

- 1. Static RAM**
- 2. Dynamic RAM**

Example of main memory are:

- RAM (Random Access Memory)**
- ROM (Read Only Memory)**
- Registers**
- Cache Memory**

ROM (Read Only Memory):



The read only memory used for Reading purpose only. Once the data stored in ROM, can't write more and delete the data. It is slower than RAM. There are more variants of ROM are available now a day

PROM (Programmable ROM)- Write more than one time (Can't delete the data from PROM)

EPROM (Erasable PROM) –Write and Delete many times

EEPROM (Electronically EPROM)

Examples of ROM- CPU Chips, CD ROM

Cache Memory:

It is special type of high speed small type of memory that provides small chunk of storage space (in MB) near to processor for fast processing. It stores the data that frequently required by the processor for processing and hence it increase the processing speed of Computer.

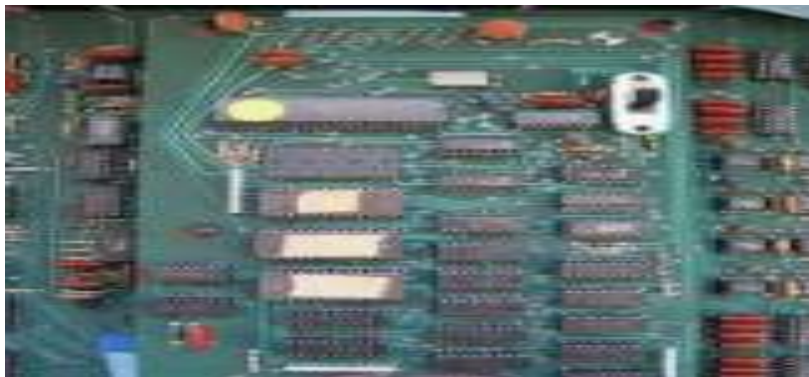
The cache memory either resides on mother board (near to processor) or on the processor. There are two types of cache memory in computer

- **L1 Cache (Resides with CPU, size in KB)**
- **L2 Cache (Resides on motherboard, size in MB)**
- **L3 Cache (Resides on motherboard, size bigger than L2)**



Registers:

Registers are the units those provides the small space for storing the data values. These data values are useful in further processing of various tasks by CPU.



2. External / Auxiliary / Secondary Memory

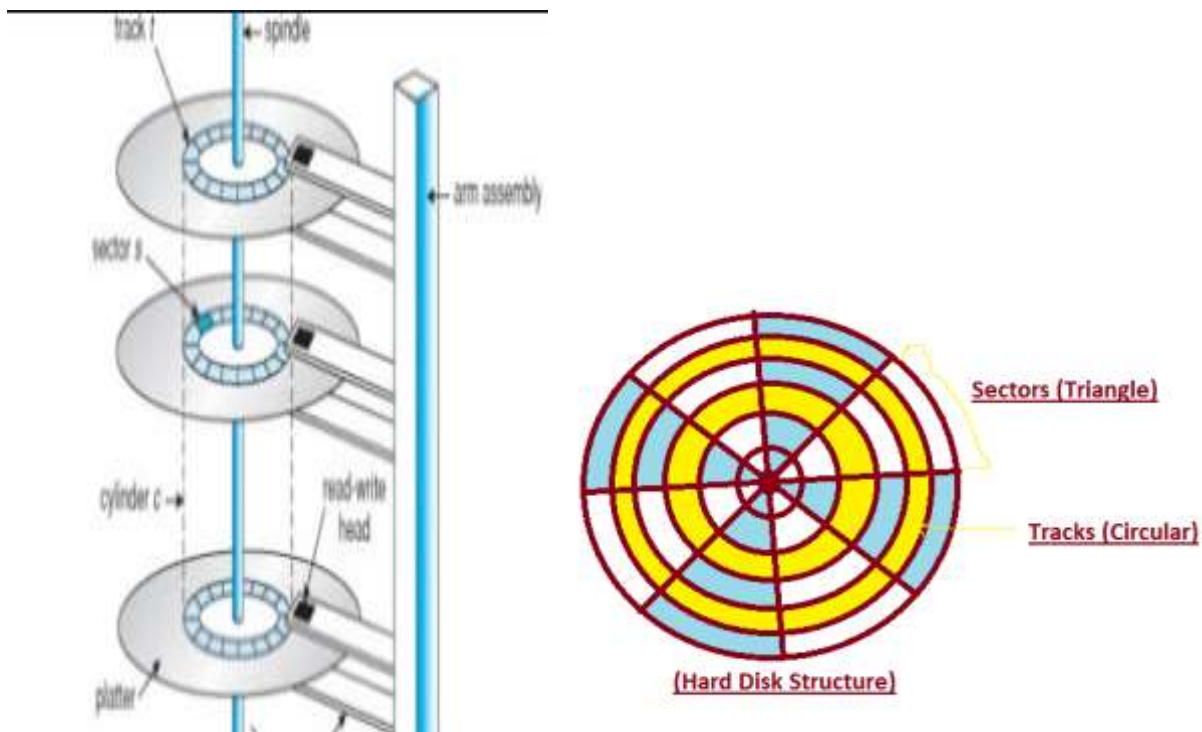
The Computer required a large space to store big data in memory permanently. The data stored in Secondary / external memory store permanently for long time and it persists in memory even after shut down of computer.

There are following types of Secondary Memory

Hard Disk, CD, DVD, BRD, External Hard Disk, Portable Flash Memory (Pen Drive), Memory Card (Solid State Drive), Floppy disk

Hard Disk

Hard Disk stores bulk of information, files permanently. It also stores the essential files of operating system. Hard disk is arrangement of many circular platters. Each platter has read and write head to read and write the information. Hard disk not required any separate driver to read / write information from it.



Blue Ray Disk (BRD)

BRD is one of Optical disk that used for stores high definition video for better quality. The read and write process performed with the help of Blue Violet Laser. Blue ray has short wavelength than red ray (red ray used for read / write in CD, DVD). It is easy and fast to read and write data by blue ray on BRD compare to general CD, DVD. It also store the information more tightly and hence same in size of CD and BRD store 700MB (in Cd) and 128 GB (in BRD) data respectively.

Note: CD, DVD requires separate drive to read/ write data with red ray. BRD requires driver to read / write data with blue ray.



Software

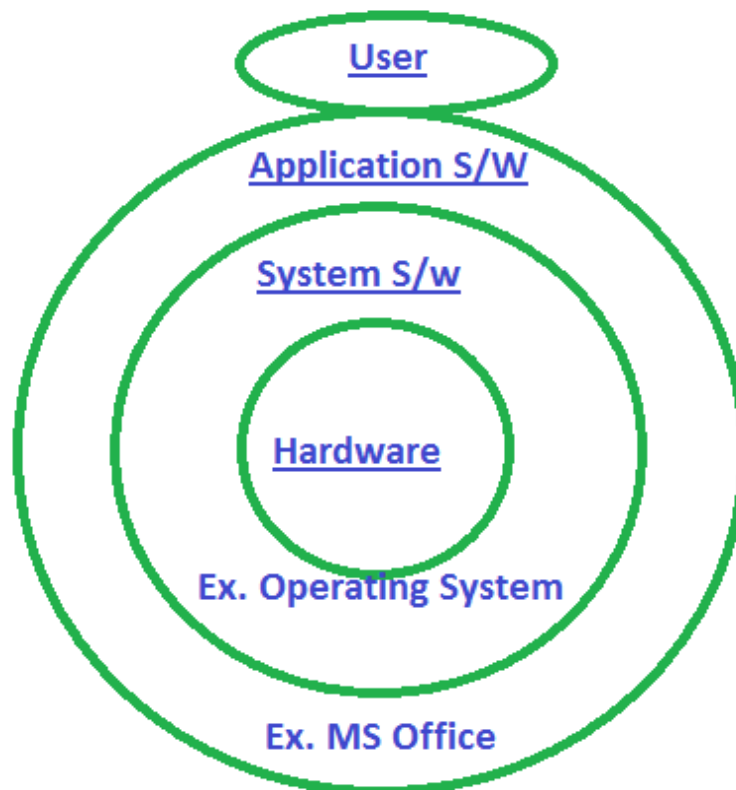
A function in computer is set of statements that designed to carry out specific output.

A program is set of functions that designed to carry out various specific outputs.

A software is set of programs that manage, control and govern the various operations of computer system. Software also manage the hardware and peripherals devices and make them run.

There are three broad categories of software

1. System Software
2. Application Software
3. Utility Software



System Software

The system software is responsible for controlling the all other software and hardware. It also controls the various internal operations performed in computer. All the Application software also controlled by the system software.

The example of System software are

- i. Operating System
- ii. Language Processor / Translator
- i. **Operating System (OS)**

The primary objective of operating system is to provide interface or environment where various applications can run and it also control the hardware. The major functions of operating system are:-

- A. Input- Output Management
- B. Process Management
- C. File Management
- D. Hardware Management
- E. Memory Management

The various examples of an operating system are

Windows, Unix, Linux, Macintosh, Mac, Android etc.

Types of operating system based on Interface

- A. **GUI (Graphical User Interface)**

It Supports Audio, Video, Text, Pictures, Graphics etc.

- B. **CUI (Character User Interface)**

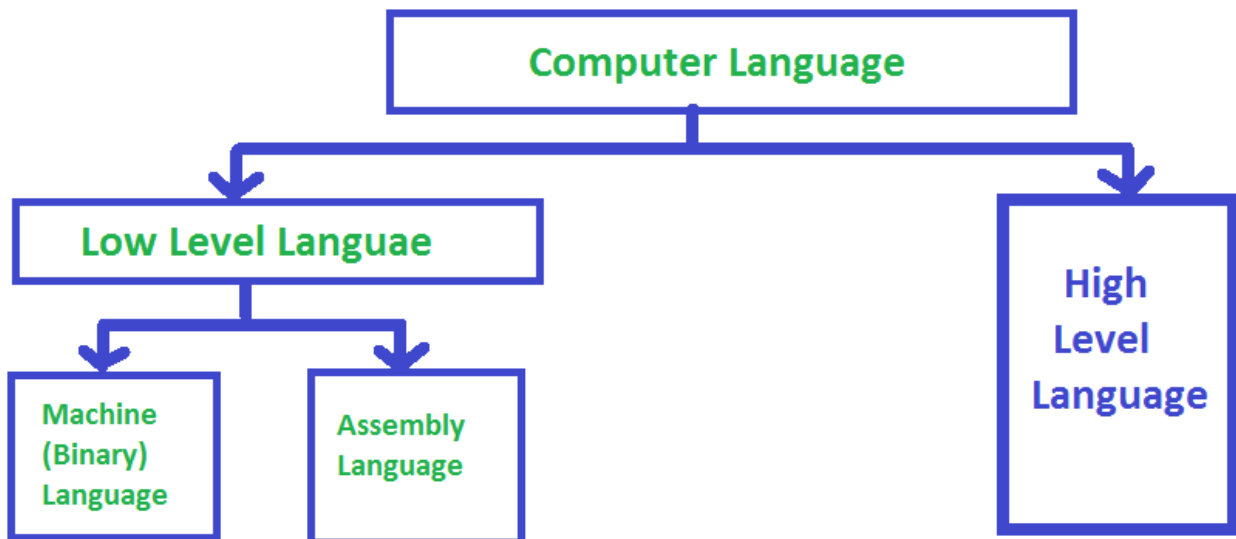
It only Supports Text and not supports graphics.

Types of operating system based on User

- A. Single User OS
- B. Multiuser OS
- C. Time Sharing OS
- D. Real Time OS
- E. Multiprocessing OS
- F. Distributed OS

ii. Language Processor / Translator

Language translator is used to convert one type of language into machine understandable language. Basically computer is based on machine (Binary) language so the language translator always convert any other language into machine language. There are two types of computer languages



Some of HLL: C, C++, Java, C#

According to language, there are three types of language translators, which converts the source code of one language into machine code so that the computer can understand the machine code. This machine code is also known as Object Code.

A. Assembler

This language translator converts the assembly language into machine language.



B. Interpreter

The Interpreter translator converts the HLL language into machine language.



C. Compiler

The Compiler translator also converts the HLL language into machine language.



Difference between Compiler and Interpreter

Compiler	Interpreter
Converts all lines of program in one go.	Converts line by line of program.
Speed of conversion is faster.	Speed of conversion is slower.
Easy to error detection and correction	Hard to error detection and correction

Utility Software

Utility softwares are some special type of softwares which closely related to system software. These utility softwares are used to maintain / manage the system softwares, memory and ensures the smooth working of computer.

Examples of Utility Softwares:

- i. **Disk Clean up**
- ii. **Disk Defragmentation**
- iii. **Backup and Restore**
- iv. **Check Disk**
- v. **Antivirus**
- vi. **Window Firewall**

Application Software

Applications are used for specific application and perform specific type of work. Some of the applications softwares are ...

- **MS word- Word Processing Application S/w**
- **MS Excel- Spread sheet Making Application S/w**
- **MS Access- Database Management Application S/w**
- **Photoshop- Image alteration Application S/w**

Types of Application Softwares

- (i) **General Purpose Software**
- (ii) **Customised Software**

General Purpose Software:

This category of application software used for some general purpose work. The scope of these softwares is wide and available in every computer for general purpose. These softwares are designed to fulfill the demands of all user. For example MS Office.

Some common application softwares are

- **Word Processing software- MS Word, Open Office, Writer**
- **Spreadsheet software- MS Excel, openoffice calc**
- **Database Magt. System- MS Access, MySQL**
- **Graphics, multimedia Software- Photoshop, Corel Draw, PowerPoint**
- **Web browsers- Mozilla, Firefox, Opera, chrome, Safari**

Customised Software:

These type of application softwares are designed to fulfill the specific type of requirement of user. Customised softwares designed according to the need of work or purpose. These softwares cannot use as general purpose softwares.

Some of areas where Customised softwares are used

- **In Medical or Hospitals**
- **In Space and Research**
- **Ticket booking software**
- **Petrol Pump Fuel Measurement**

Freeware:

The freeware has following characteristics.

- It is available free of cost
- It allow copying of software
- Distribution of software is allowed
- Source code is not available
- But Modification is not allowed

Free Software:

The free software has following characteristics.

- It is available free of cost
- It allow copying of software
- Distribution of software is allowed
- Source code is available
- Modification is allowed
- Distribution after modification is allowed but with no cost.

OSS and FLOSS

OSS mean Open Source software.

- It is available free of cost or nominal fees
- It allow copying of software
- Distribution of software is allowed
- Source code is available
- Modification is allowed
- Distribution after modification is allowed

FLOSS refers to Free Libre (Livre) Open Source Software

- It is open source and
- It is free software also

Example: MySQL, Python, OpenOffice, Linux etc.

Proprietary Software

- It is neither open nor freely available
- It is available with license with owner of software
- No distribution or copy allowed
- No modification is allowed
- The copy, distribution, modification is only allowed with the permission of owner.

Example: MS Window, Quick heal Antivirus, MS Office etc.

****Finish****