

COMPUTER FUNDAMENTAL

What is Computer?

A computer is an electronic device which accepts inputs and process it on according to instruction and generate the desired output.

Components of Computer

1. Hardware
2. Software
3. Data and Information

Hardware: Any physical device or equipment used in or with a computer system (anything you can see and touch).

Types of Hardware

External hardware: Any hardware device that is located outside the computer.

- **Input device:** A piece of hardware device which is used to enter information to a computer for processing.
Examples: keyboard, mouse, trackpad (or touchpad), touchscreen, joystick, microphone, lightpen, webcam, speech input, etc.
- **Output device:** A piece of hardware device that receives information from a computer.
Examples: monitor, printer, scanner, speaker, display screen (tablet, smartphone ...), projector, head phone, etc.

Internal hardware: Any piece of hardware device that is located inside the computer.

Examples: CPU, hard disk drive, ROM, RAM, etc.

Processor (CPU)

The component that processes and executes inputs received from hardware and software.

Motherboard

A mainboard that provides basic connection between all the other hardware components and devices (internal and external).

Memory (RAM)

A temporary data storage space that stores the information the CPU is actively using.

Memory (Hard Disk)

A storage device where data is stored on a permanent basis. It's slower but less volatile than the RAM.

Software: A set of instructions or programs that tells a computer what to do or how to perform a specific task (computer software runs on hardware).

Types of software

1. Application software
2. Systems software

Application software: A computer program that provides users with tools to accomplish a specific task.

Examples: Word processing, spreadsheets, presentation, database management, Internet browsers, email programs, media players, accounting, pronunciation, translation, desktop publishing, enterprise, etc.

System Software: It is designed to run a computer's hardware and application software, and make the computer system available for use. It serves as the interface between hardware, application software, and the user.

A computer functions through interactions between the user, applications, the operating system, and the hardware.

Example: Operating system, Device Driver, Utility software, programming software, etc.

Operating System (OS): A software that controls and coordinates the computer hardware devices and runs other software and applications on a computer. It is the main part of system software and a computer will not function without it.

Functions of an operating system:

- 1) Booting the computer
- 2) Managing system resources (CPU, memory, storage devices, printer, etc.)
- 3) Managing files
- 4) Handling input and output
- 5) Executing and providing services for application software, etc.

Examples of Operating System: Microsoft Windows, Apple iOS, Android OS, macOS, Linux, etc.

Device Driver: A software program that is designed to control a particular hardware device that is attached to a computer.

The main purpose of Device Driver:

It acts as a translator between the hardware device and operating systems or applications that use it. It instructs computer on how to communicate with the device by translating the operating system's instructions into a language that a device can understand in order to perform the necessary task.

Examples: printer driver, display driver, USB driver, sound card driver, motherboard driver, ROM driver, etc.

Utility Software: A type of system software that helps set up, analyse, configure, strengthen, maintain a computer and performs a very specific task.

Example: Antivirus software, Backup software, Memory tester, Screen Saver, etc.

COMPUTER LANGUAGES

What is Language?

The system of communication in speech and writing that is used by people of a particular country is called as Language.

What is Computer Language?

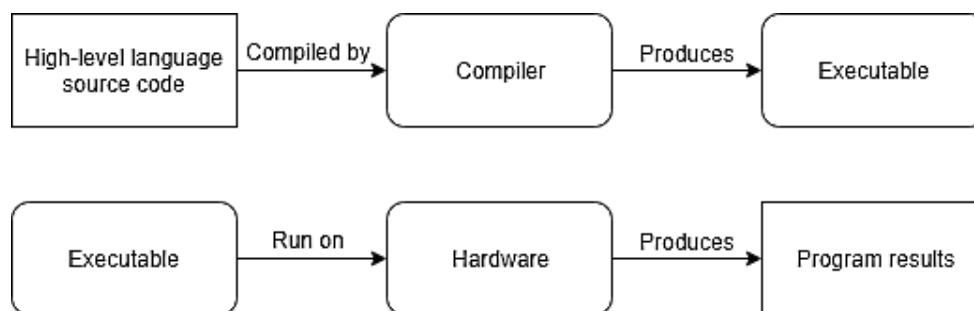
A Computer language includes various languages that are used to communicate with a Computer machine. Some of the languages like programming language which is a set of codes or instructions used for communicating the machine. Machine code is also considered as a computer language that can be used for programming.

Define Program, Programming, Programming Language

A set of instructions given to a computer to solve a particular problem is known as program and the task of developing program is known as programming, and the software in which you are writing program is known as programming language.

What is Compiler?

A Compiler is a special program that converts Source code (High Level Language) in to Machine code (Low Level Language).



What is Low Level and High Level Language?

Low Level Language		High Level Language
Machine Language	Assemble Language	
1. Use Symbol 1's and 0's	1. Use Operation code like ADD, MOVE, AL Etc.	1. Use words and some special character of English language.
2. Difficult to write, read and understand.	2. Easy as compared to machine language to write, read and understand.	2. Very easy to write, read and understand.
3. No need to convert.	3. Need to convert. (Assembler)	3. Need to convert. (Compiler and Interpreter)
4. Difficult to Maintain, Modify and Debug.	4. Easy as compared to machine lang. to Maintain, Modify and Debug.	4. Very easy to Maintain, Modify and Debug.
5. Less time and memory to execute.	5. More time and memory as compared to machine language.	5. More time and memory to execute.

Difference between Compiler and Interpreter

Compiler	Interpreter
Compiler takes whole program as input	Interpreter takes line by line program as input
Compiler shows list of error at the end of compilation	Interpreter show error on line in which they occur and never go on next line to interpret
Intermediate object code generated	No Intermediate object code generated
It can be translate fast if program contains loop	It can be slow if program contains loops
Example C, C++	Example BASIC, R etc.