

Class - XI (computer science)

Chapter 1

(computer overview)

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What is Computer?

A computer is an electronic device that can perform a variety of operation in accordance with a set of instruction called program

Computer is also known as data processor



Data vs. information

DATA:- data in computer means raw facts and figures. Data are processed to form information.

INFORMATION. It means what we get after processing data(meaningful data).

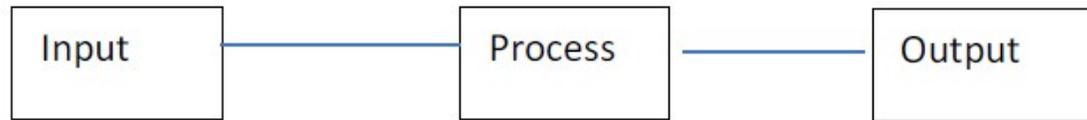
What goes into computer is DATA and what comes out from computer is INFORMATION.

Functioning of a computer

Computer follows I – P – O(input - process - output) cycle.

input device is used to take input from user.Process is the operation of data as per given instruction. It is totally internal process of the computer system.Output is the

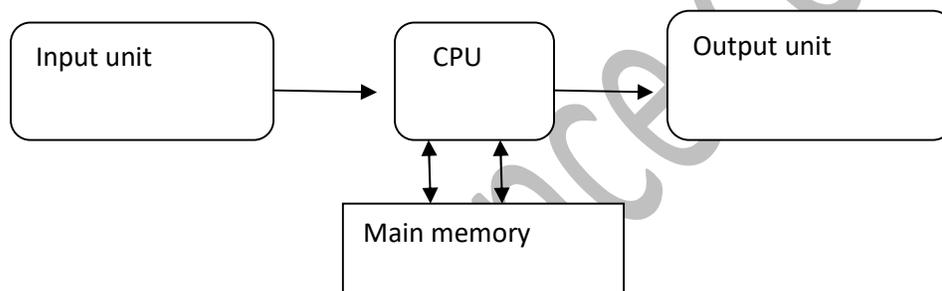
processed data given by computer after data processing. Output is also called as Result.



A computer has four functions:

- accepts data
- processes data
- produces output
- stores results

Input
Processing
Output
Storage



Functional component of computer

(While designing the Difference Engine and Analytical Engine Charles Babage has given the concept of these four units, Hence he is known as “Father of Computer”.)

Input unit: This unit is used to entered data from the users. The input units is responsible for converting the data into computer understandable form(binary code or machine language). Eg. Keyboard, scanner, microphone , digital camera etc.

Central processing unit:- the CPU is the main brain of the computer, all processing are done by the CPU.

A CPU has two main components

- ALU(arithmetic logic unit)
- CU(control unit)

ALU:- it performs all the four arithmetical(+,-,*,/) and some logical (<, >, =, <=, >=, <>) operation

CU:- it control and guide the flow of all data and information, it is also responsible for execution of the program.

Output unit: it is responsible to convert binary information into human understandable form, the output coming from CPU is in binary form so it must be converted so that we can understand easily.

Eg. Monitor, speaker, printer etc.

Main memory: it works as working place for the CPU. It holds the input and intermediate output during processing.

All the programs that are to be done must be loaded in computer memory

The unit of memory is byte

Bit is the smallest unit of the memory, it can be either 0 or 1.

A group of 8 bits are called byte

A group of 4 bits are called nibble.

| Units | Short name | Full name |
|-----------------|---------------|--------------|
| 1 Bit | Bit | Binary digit |
| 8 Bits | 1 Byte | Byte |
| 1024 Byte | 1 KB | Kilo Byte |
| 1024 KB | 1 MB | Mega Byte |
| 1024 MB | 1GB | Giga byte |
| 1024 GB | 1TB | Terra byte |
| 1024 TB | 1 PB | Peta byte |
| 1024 PB | 1 EB | Exa byte |
| 1024 EB | 1 ZB | Zetta byte |
| 1024 ZB | 1 YB | Yotta byte |
| 1024 YB | 1 bronto byte | Bronto byte |
| 1024 brontobyte | 1 Geop byte | Geop byte |

Primary memory:- it a volatile memory, it is also known as main memory.

Secondary memory:- it can store information permanently.

Hardware and software

Hardware

All the physical and tangible components of Computer are called Hardware. In other words all the components that we can touch come under the category of Hardware eg Keyboard, Mouse,

Peripherals: they are the devices that surrounds the computer system. Eg monitor, speaker, printer, keyboard, mouse etc.

A computer consist of five primary hardware components:

- Input devices
- CPU(central processing unit)
- Memory
- Output devices
- Storage devices

Software

Software represent the set of programs that govern the operation of a computer system and make the hardware run. Software can be classifies broadly into three categories:

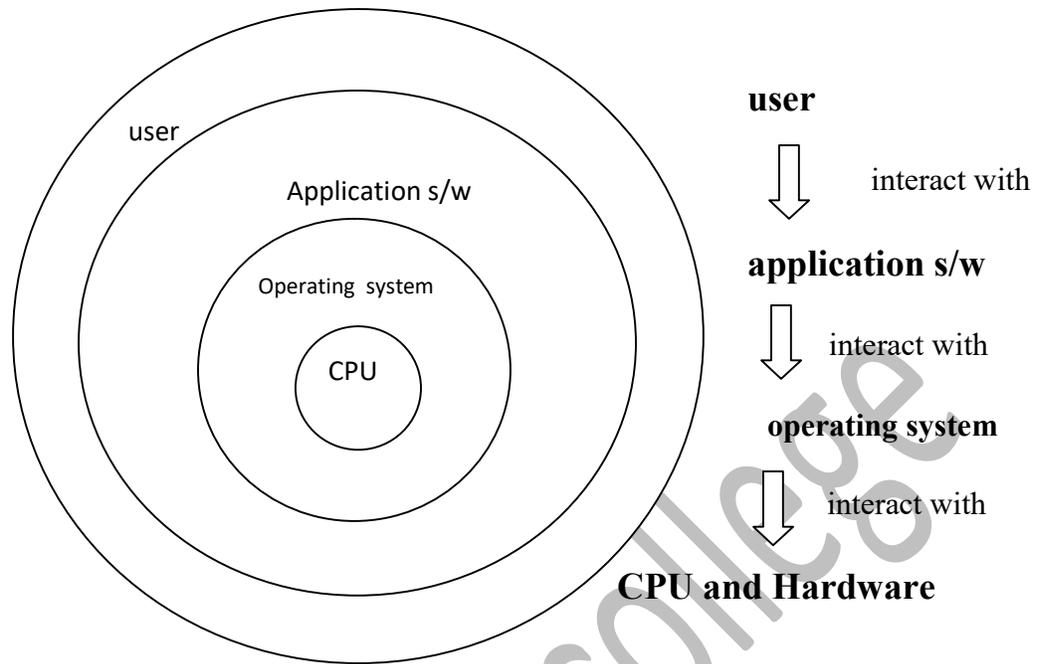
- Operating system
 - Language processor
 - Application software
- } together these two categories are called system software

Operating system:-

An operating system is a program which acts as an interface between a user and the hardware and control all other components of the computer system.

The operating system provides following functions:-

- provides the instructions to prepare user interface i.e, way to interact with user whether through typed command or through graphical symbol
- loads all necessary programs into computer memory
- coordinates how programs works with CPU, keyboard, mouse, printer and other hardware.
- Manage the way information is stored on and retrieved from disks.



Role of operating system

There are various Types of OS-

Single user OS:- it support single user at a time.

Multi user OS:- it support multiple user at a time

Batch processing operating system:- it processes the batch(groups) of jobs

Multipleprocessing OS:- it is capable of handling multiple CPU's at the same time

Language processor: it is a system software that convert HLL(high level language) into LLL(low level language)

There are three types of language processor

- (i) assembler
- (ii) compiler
- (iii) interpreter

(i) **assembler:-** it convert assembly language into machine language.

(ii) **Compiler:** it covert high level language into low level language in one go and reports all errors of the program along with the line number.

(iii) **Interpreter:-** : it covert high level language into low level language line by line. If any error occurs it must be first corrected.

Application software:-

This type of software perform a specific task, these software are designed to do a particular kind of task such as railway reservation, banking, accounting, etc.

It is divided into two sub categories:-

- 1) **Customized application software:-** it is also known as tailor made software, it is designed according to users requirement. The owner of this software is only one company.
- 2) **General application software:-** this type of software is developed to do any specific task. Many user can use this software at same time.

Strength of a computer:-

- **Speed:-** computer are very fast as compared to human being, they can perform the task in second which a human will do in years.
- **Accuracy:-** computer perform the work with very accuracy.
- **Reliability:-** computer are very reliable, they never feel tired as human being feel.
- **High storage capacity:-** computer can store very large information inside its memory.
- **Versatile:-** computer can perform repetitive jobs efficiently.

Weakness of a computer:-

- **Lack of decision making power:-** computer cannot decide on their own, they follow the decision of programmer.
- **Zero IQ:-** they don't have IQ, they must be teached everything.

Firmware

Instructions written/embedded on a hardware are known as firmware e.g., BIOS instruction on ROM chip are called Firmware.

Liveware

Persons or the users, using Computers in day to day activity are known as liveware.

Chapter continues.....