SP GROUP OF INSTITUTE

M1-R5.1 Information Tech. Tools & Networking basics

Chapter:1 Introduction to Computer

COMPUTER

The word 'Computer' originated from the word **compute** which means to calculate. A computer is defined as, "an electronic device that can accept, store, and process data under the control of a set of instructions."

A computer can, not only store and process data, but also retrieve data, i.e. gather data from its memory or storage as and when required. Thus, a computer in general term that refers to an electronic data processing machine used for wide range of activities.

CHARACTERISTICS OF COMPUTER

Speed:-

Computers can carry out instructions in less than a millionth of a second. As you know computer can work very fast. Computer is a very fast calculating device. Its speed is measured in terms of nanosecond and Pico seconds.

Computer की Speed को MIPS (Million of Instructions per Second) में मापा जाता है।

Accuracy:-

A computer works consistently with accuracy. If data and instructions supplied to a computer are correct then it surely will give accurate result. The errors in computer are due to human and inaccurate data.

Diligence:-

A computer can work for hours together and repeatedly without getting tired, bored and loosing concentration.

Storage Capacity:-

A computer can store a large amount of data and information in its primary and secondary memory.

Versatility:-

A computer can perform almost any kind of task that can be reduced to a series of logical steps. Computer performs multiple different tasks at the same time for e.g. playing music and drafting your document and even you can print a page.

Automation:-

Once a program execution starts, no human intervention is required till the program ends.

TYPES OF COMPUTER

Analog computer:-

Analog computers handle or process information which is of a physical nature as example. Temperature, pressure etc.

Digital computer:-

Digital computers process information which is essentially in a binary or two state form, namely zero and one, when talking about computers, we mostly refer to the digital type of electronic machine.

Micro computer:-

The processor is very small so that called Micro processor and device is called Micro Computer. Micro Computer is single user device. They are also known as PC. Example- Desktop, laptop, Palmtop, Notebook, PDA, Tablet PC.

Mini computer:-

The processor of Mini Computer is small but larger than Micro processor. Mini Computer is multi user device generally used in designing company for commercial use.

Mainframe computer:-

These are computers with high processing capability and speed. These are large, powerful, and expensive computers.

It has larger processor and multiuser device. Number of users is more than Mini Computer.

Super computer:-

These are most powerful computers in terms of speed and accuracy and are useful in problems that require complex mathematical calculations.

The processor is biggest that other computer and processing capacity is highest than other devices. It is Multi user fasted calculating device, generally used in nuclear science for calculation purpose.

Note:- Cray-l is the first super computer. India's first super computer is Param-8000.

Hybrid Computer:-

These computers are combination of Analog and Digital computers. These are sued in such fields where we have to show digital form of analog data. This is used there where it needs to calculate both the digital and analog data for e.g. in Hospitals

GENERATIONS OF COMPUTER

First Generation:- (1946-1954)

Vacuum Tube used (1906-John Ambrose fleming)

Machine Language used

1. ENIAC (Electronic Numerical Integrator And Calculator) - 1946, By John Mauchly and J. Presper Eckert

ii. EDVAC(Electronic Discrete Variable Automatic Computer)-1950

iii. Mark 1-1944

iv. EDSAC(Electronic Delay Storage Automatic Computer) -1949, By M.V. Wilkes

v. UNIVAC 1 (Universal Automatic Computer) -1951, By John Mauchly and Presper Eckert

vi. IBM-650

vii. IBM-701

Second Generation:- (1955-1964)

Transistors (1947- John Bardeen, Walter Brattain, William Shockely)

Language - Assembly language, COBOL, Fortran

i. IBM-1620

ii. IBM-7094

iii. IBM-1401 (mainframe computer)

iv. UNIAC-1108

v. CDC-3600 (Control Data)

Third Generation:- (1964-1977)

IC (Integrated Circuit) (1959-Robert Noyce, JS Kilby)

*High level language (Basic, COBOL, Pascal, Algol)

Remote processing, time sharing, real time, multi programming, OS

1. IBM-360

ii. VAX-750

iii. IBM-370

iv. ICL-1900

v. TDC-316

vi. HoneyWell-6000

vii. PDP (Personal Data Processor)

Fourth Generation:-(1977-1991)

Micro Processor, VLSI

Language-C, C**, DBASE

Time sharing, real time network, distributed OS

i. DEC-10

ii. STAR-1000

iii. PDP-11

iv. Apple-Macintosh

v. CRAY-1

vi. CRAY-X-MP

Fifth Generation :- (1991-Continue)

Al (John McCarthy), ULSI (Ultra Large Scale Integration)

Language- C, C++, Java, Net used

i. Desktop

ii. Laptop

iii. Note book

iv. Ultra book

v. Chrome book

HARDWARE AND SOFTWARE

Hardware:-

The physical component of a computer are known as hardware. Such physical components may be electronic, electrical, magnetic, and mechanical. some such parts are microprocessor, hard disk, CD Rom, floppy disk, keyboard, printer, mouse, monitor, Motherboard etc.

Motherboard

All the electronic components in a system are mounted on a piece of fiberglass called the motherboard. Fiberglass is used because it is a non- conductor of electricity and hence various components remain insulated from one other

Software:-

The set of computer programs, procedures and associated documentation related to the effective operation of a computer system are termed as software. A sequence of instructions given to a computer to perform a particular task is called software or a program.

Parts of a computer that we cannot touch but only feel are called software. Without software, a computer will remain just a metal. With software, a computer does all the work.

System software:-

System software or system packages, are sets of one or more programs that are basically designed to control the operation of the computer system. System software, thus make the operation of the computer system more effective and efficient.

There are some system software:-

1. Operating System.

2. Compiler

3 Interpreter

4 Assemblers

5 Linkers

6. Loaders

7. Device Driver

Complier:-

A program which translates high-level language program into a machine language program is known as a compiler.

b. Interpreter:-

An interpreter is a program which translates one statement of a high-level language program into machine codes and executes it.

c. Assemblers:-

An assembler is a type of computer program that interprets software programs written in assembly language into machine language, code and instructions that can be executed by a computer.

BUG: A software bug is the common term used to describe an error, flaw, mistake, failure, or fault in a computer program or system that produces an incorrect or unexpected result

Application Software:-

Application software packages provide to the need of the specific group of users, namely, software for scientists, for inventory control, for school administration, for library management, etc.

Utility Software:-

A utility program is a type of system software that is used to perform a specific task it is normally used to solve the common problems of software and hardware.

Utility software केउदाहरण

- Disk cleanup
- Disk deframenter
- Antivirus

4. **Open Source Software:-**

Open source software refers to the software which uses the code freely available on the Internet it means Open source software is free and openly available to everyone. The code can be copied, modified or deleted by other users and organizations.

Example:-Linux, Libre Office or Open Office, VLC media player, Mozilla Firefox, Anache web server Python और 1Query आदद

5. **Proprietary Software:-**

Proprietary software also known as "closed-source software" is non-free computer software for which the software's publisher or another person retains intellectual property rights usually copyright of the source code, but sometimes patent rights.

Example: macOS, Adobe Suite, Microsoft Windows, ms office, और photoshop आदद हैं।

COMPUTER MEMORY

Memory:

The memory is an essential component of a computer system. It is required by the computer system to store instruction and data. Memory can be divided into following two types.

1. Primary or main memory, which is directly connected to CPU or part of CPU in some pc's

2. Secondary memory or auxiliary memory

Types of Memory

- Primary Memory/ Main Memory
- Secondary Memory

- Cache Memory

Primary Memory (Main Memory):-

It is also called as the main memory or internal memory. It stores the data for processing and the program instructions. It is also the immediate access memory. It is temporary memory and of limited capacity.

1. RAM

2. ROM

1. RAM (Random Access Memory):-

RAM is a read/write memory. Information can be written into and read from a RAM. It is a volatile memory which means, that it retains the stored information as long as the computer is connected to a power Supply source. When power supply is switched off or interrupted, the stored information in the RAM is lost.

There are two types of RAM-

A. Static RAM
B. Dynamic RAM

2. ROM (Read Only Memory)-

ROM is a permanent type memory. Its contents are not lost when power supply is switched off. The user cannot write into a ROM, Its contents are written into at manufacturing time. ROM's store permanent programs and other types of Data which are needed by the computer to execute user programs.

There are many types of ROM-

i. PROM **ii. EPROM** **iii. EEPROM**

Secondary memory(auxiliary memory).

Secondary memory or secondary storage devices are permanent storage units used to store program and data. They use principle of magnetization for storing 0 and 1. Therefore the also called as magnetic memory. They are non- volatile. Contents are not lost when power is switch off.

Types of Secondary Memory:

a. Hard disk.

b. Floppy disk.
c. CD (compact disk)
d. DVD(Digital versatile/video disk)
e. Pen drive.

Cache Memory:-

Cache memory (pronounced as "cash Memory") is placed in between the CPU and the main memory. It is much faster than the main memory. Hence access time is much less than that of the main memory. Cache memory is a very high speed memory built in the processor and it is used between main memory (RAM) and the processor.

Levels of cache memory:

a. Level 1
b. Level 2
c. Level 3

Unit of Memory:

0-1	**1 bit**
4 bit	1 nibble
8 bit	1 byte (2 nibble)
1024 byte	1KB
1024 KB	1 MB
1024 MB	1GB
1024 GB	1TB
1024 TB	1PB

Input device

Input devices:

Data and instructions are entered into a computer through input devices.

Important Input devices are:

1. Keyboard	**2. Mouse**

3. Scanner	4. Joystick
5. Light Pen	6. Trackball
7. Graphic tablet	8. Microphone
9 MICR(magnetic ink character reader)	10. OCR(optical character reader)
11. BCR(Bar code reader)	12. OMR(Optical marks reader)
13. Digital camera	14. Touchpad
15. Touch screen	16. Card Reader
17 Webcam	18. Speech Recognition

Keyboard:

- Keyboard is an input device that is used to enter data into the computer through keyboard.
- There are 104 to 108 keys into keyboard.
- When a key is pressed from keyboard a code name(ASCII-American standard code for information interchange).

Mouse:

A mouse is a pointing device, which is held in one hand and moved across a flat surface.

Joystick

A joystick is also a pointing device. It is used to move the cursor position on a monitor screen.

Scanner

A scanner is a hardware device which is used to scan text or image into the computer.

Web cameras

Web camera allows to a computer to accept input just by focusing on an object.

Trackball

Trackball is also a pointing device and contains a ball which can rotate in any direction the user spins the ball in different directions to move the cursor on the monitor

Light pen

A light pen is a pointing device. It is used to select a displayed menu option on the monitor, It is a photo sensitive pen like device.

OMR (Optical Mark Reader):-

Optical Mark Readers are special scanners used for recognizing a pre-specified type of mark made by pencil or pen.

BCR (Bar Code Reader):-

Bar code readers are special devices used to read bar coded data Bar code is a specialized code used for fast identification of items.

MICR (Magnetic Ink Character Recognition):-

MICR detects the special encoded characters on bank cheques and deposit slips. After detecting the encoded characters, the MICR converts them into digital data for the computer.

OCR (Optical Character Reader):-

This device is capable of detecting alphabetic and numeric characters on a computer print-out containing complete pages of typed or hand-written text.

Output device

Output devices:

Device that are used to give the result of processing to the user are called output devices.

Monitor:-

This is the most important output device. It is just like a television screen and is also known as Visual Display Unit (V.D.U.). it measured diagonally from one corner of the screen to the opposite corner

Monitors come in three types

1. CRT (Cathode Ray Tube)

2 TFT/LCD (Thin film transitors/liquid crystal display)

3. LED (Light Emitting Diode)

Printer:-

Printers are the most popular output devices. They provide information in a permanent readable form. They produce printed outputs of results, programs and data. Printer quality is measured in dot per inch (DPI)

There are two types of printers.

i. Impact printers

ii. Non impact printers

Impact Printers:-

Impact printers use an electro-mechanical mechanism that causes hammers or pins to strike against a ribbon and paper to print the text. These printers are noisy, slow, cheap and poor quality output

Eg. DMP (Dot Matrix printer), Line printer, chain printer, daisy wheel printer, Drum printer.

Non Impact printer:-

Non impact printers don not use any electro-mechanical printing head to strike against ribbon and paper. Non impact type printer is faster than an impact type.

Eg. Inkjet printer, laser printer, desk jet printer, thermal printer.

Multimedia Projector:-

Multimedia projector is an output device connected to a PC and used to project information from a computer onto a large screen.

Speech synthesizer:-

Speech synthesizer is an output device than convert's textual data into spoken sentences.

Plotter:-

Plotter is an output device that is used to produce graphical output on papers. Plotter is used to print the maps and architecture of infrastructure.

Speaker:-

Speakers are also kind of output devices which is used to play a sound as output. It is used in multimedia applications to play or listen to sound or music.

CPU(Central Processing Unit)

Processing Device (CPU):-

The central processing unit (CPU) is the brain of any computer systern. In a human body, all major decisions are taken by the brain and all other parts of the body function as directed by the brain. In a computer system, all major calculations, manipulations and comparisons are made by the CPU.

The major parts of a CPU are:-

ALU (Arithmetic and Logic Unit)

ALUs are designed to perform the four basic arithmetic, operations-add subtract, multiply, divide and logic operations or comparisons, such a less than, equal to, or greater than

Control Unit (CU):-

Control Unit obtains instructions from the program stored in the main memory, interprets the instructions, and issues electrical signals that cause other units of the system to perform their functions.

Mobile Apps:

A mobile app is a piece of program intended to run on a mobile devices or tablets. Mobile apps were in the beginning planned for productivity assistance such as email, calendar, and contact databases, but the public demand for apps caused rapid expansion into other areas such as mobile games, factory automation, GPS, and location-based services, order-tracking, and ticket purchases, so that there are now millions of apps available.

Few most important mobile apps are as follows:

1. BHIM (Bharat interface for Money)

2. MyGov App
3. IRCTC Connect App
4. DigiLocker Apn
5. Voter Help line App
6. GARV (Grameen Vidyutikaran) App
7. mPassport Seva
8. Online RTI-App



IT gadgets and their applications

IT Gadgets:

A gadget is a small technological object that has particular function but is often thought of as a novelty. Gadget are invariably considered to be more unusually or cleverly designed than normal technological objects at the time of their invention, Gadgets are sometimes also referred to as gizmos.

In other words, a gadget is software widget or a small application that is designed to sit on a user's desktop screen in much the same way that apps reside on smart phones and tablets.

Let us see latest IT Gadgets available in market are listed below:



1. Smart Watch 360
2. Google Glass
3. Drone Camera
4. Pen with Camera
5. Headphones
6. Google Assistant
7. Smart speaker