

Computer Notes

Number System

- **Binary Number System** : **Base-2 system**
- **Octal Number System** : **Base-8 system**
- **Decimal number System** : **Base-10 system**
- **Hexadecimal number system** : **Base-16 system**

Binary Number System

This is base-2 system. It uses two digits 0 and 1.

- Lowest digit is “0”.
- Highest digit is “1”.
- A binary digit is termed as **bit**
- A string of four bits is termed a **nibble**
- A string of eight bits is termed as a **byte**
- 1 Kilobyte = 1024 byte (2^{10} byte)
- 1 Mega byte (MB) = 1024 KB
- 1 Giga Byte (GB) = 1024 MB
- 1 Tera Byte (TB) = 1024 GB
- Digital computer works on the principle of binary number system.

1's Complement

The 1's complement of a binary number is obtained by changing all its “**zeroes to one**” and “**ones to zeroes**”.

E.g. 1's complement of 1011011 is 0100100

2's Complement

The 2's complement of a number is obtained by adding 1 to its 1's complement

E.g. 2's Complement of 1010111 is 0101001

Basic Structure of Computer

- **Input Unit** : Computer accepts coded information through input units which read data. The main input units are Keyboard, Mouse, Joystick, trackball, touchpen, Scanner etc.
- **Output Unit** : Computer gives the result of the input data through output devices. The main output devices are Printers, Monitor (Vedeo display), Speaker, Plotters etc.
- **Memory Unit** : The function of memory unit is to store programs and data. There are two types of memory. Primary memory & Secondary memory.
- **Arithmetic and Logic Unit (ALU)** : All the arithmetic and logical operations are performed in this unit.
- **Control Unit** : The sequences of the programs executed are controlled in control unit. It is a part of memory unit and ALU.
- **Central Processing Unit** : It is the brain of the computer.

Light Pen

A light pen is a pointing device. It is a photosensitive pen-like device used to select menu options on the CRT (Cathode Ray Tube) / Monitor. We can draw pictures directly into CRT using a light pen.

Trackball

The trackball is a ball fixed on a shallow well on the keyboard. The rotation of the ball controls the movement of the cursor on the screen.

Joystick

The joystick is a short, pivoted stick that can be moved by hand to define an absolute point such as a cursor position. Its function is similar to that of a mouse.

Scanner

Scanners are capable of entering information directly into a computer. This provides faster and more accurate data entry. The main types of scanners are Optical Scanner and Magnetic-ink character reader.

Optical Scanner

Optical scanners are capable of reading information recorded on paper using a light source and light sensors. The commonly used optical scanners are Optical Character Reader (OCR), Optical Mark Reader (OMR) and Optical Barcode Reader.

MODEM

MODEM is Modulator Demodulator. It converts the signals from Telephone line to computer signals. It helps in connecting to internet.

Printers

Printers are used to produce hard copy of output data, text and images. Depending on the printing mechanism used, printers are classified into two.

1. Impact Printer

Impact Printers use mechanical printing technology

E.g. Dot-Matrix Printer & Letter Quality Printer.

2. Non impact Printer

Non impact printer uses optical, ink jet or electrostatic technology

E.g. Laser Printer & Ink Jet Printer.

Depending on the mode of printing , printers are classified into three.

1. Character Printer : Print one character at a time
2. Line Printer : Print one line at a time
3. Page Printer : Print one page at a time

Plotters

Plotters are output devices used in graphics and drawing with more precision and high quality.

Register

Registers are storage locations inside the CPU.

Operating System

Operating system is the software that drives a computer. It act as an interface between the user and computer.

E.g. Windows, Unix, Mac, Linux, MS-DOS

Booting

Booting is the process of loading operating system into memory.

Compiler

A compiler accepts a program written in a high level language as input and produces its machine language equivalent as output.

Loader

A loader is a program that places programs into memory and prepares them for execution.

Language

Language is the medium of writing programs. Commonly used programing languages are COBOL , BASIC , C , C++ , FORTRAN, VISUAL BASIC, Ada, Pascal, Python etc.

Memory

Any device that can store data is called a memory. There are two kinds of memory. Semiconductor memory and Magnetic memory

Semiconductor memory is faster, compact and lighter. It consumes less power. But magnetic memory is slow compared to semiconductor memory.

Main Memory

Programs and data they operate on are held in the main memory of the computer during execution.

Static Memory (SRAM)

Memories that consists of circuits that are capable of retaining thier state as long as the power is applied are known as static memories. SRAM is fast but expensive.

Dynamic Memory(DRAM)

Dynamic memory is capable of storing information for a few milliseconds. It stores information in the form of a charge on a capacitor.

Read Only Memory (ROM)

ROM is a nonvolatile memory. Only read oeration can be performaed in ROM. Data cannot be written to ROM using computer instructions. ROM is used for permanant storage of information.

Different types of ROM are available viz. 1. PROM 2.EPROM 3.EEPROM.

PROM :- Programmable read only memory.

EPROM :- Erasable Programmable read only memory.

EEPROM :- Electrically Erasable Programmable read only memory.

Flash memory

Flash memory offers the same volatility as PROM using semiconductor technology. It can be programmed and erased online.

Cache Memory

Cache memory is a fast and small unit placed between CPU and the main memory. It holds the currently active segments of a program and thier data.

Mapping

The transformation of data from main memory into cache memory is reffered to as a mapping process.

Bubble Memory

It is a nonvolatile magnetic memory without any moving part.

Secondary Memory (secondary Storage Devices)

Secondary memory is nonvolatile permanant storage device. They are used as repository for large amount of data and to transfer information from one machine to another. It is also termed *Auxillary Memory*.

Widely used secondary storage devices are Magnetic Disk Systems, Magnetic Tapes, Optical Storage Devices.

- Magnetic Disk Systems used for secondary storage are ***Floppy disks and Hard disks***
- 1.44 MB Floppy disks are most popular and available Magnetic Disk System
- 3.5 inch Floppy drives are popular
- Hard disks have large capacity to store data.
- 100 GB, 500 GB & 1 TB hard disks are now available.
- Magnetic tapes are most simple and efficient device for backing up large amount of data.
- Magnetic tapes are of low cost.
- In Optical storage devices read and write performed using **laser beams**
- There are three types of optical storage devices
 1. CD-ROM
 2. WROM
 3. Erasable Optical Disk
 4. HD DVD
 5. Blue Ray Disk
- The most common size of Cd-ROM is **650-750 MB** and it is **120 mm** in diameter.
- WROM is write once read many drive.
- Erasable optical disk serve as a secondary memory like hard disk. The disk can be erased and write with user data.
- DVD stands for Digital Versatile Disk. The most common DVD has **4.7 GB** Storage capacity.
- HD DVD stands for High Definition Digital Versatile Disk.
- Blue ray disk can store digital media including vedeos. It has a minimum capacity of 7.8 GB
- **Bus:-** A bus is a common path way across which data can travel within a computer

Abbreviations

- ◆ SQL - Structured Query Language
- ◆ DBMS - Data Base Management System
- ◆ RDBMS - Relational Data Base Management System
- ◆ COBOL - Common Business Oriented Language
- ◆ WWW - World Wide Web
- ◆ CRT - Cathode Ray Tube
- ◆ ALU - Arithmetic and Logic Unit
- ◆ DTP - Desktop Publishing
- ◆ DOS - Disk Operating System
- ◆ RAM - Random Access Memory
- ◆ ROM - Read Only Memory
- ◆ VIRUS - Vital Information Resourse Under Siege
- ◆ HTTP - Hyper Text Transfer Protocol
- ◆ MIS - Management Information System
- ◆ OOP - Object Oriented Programming
- ◆ CSMA - Carrier Sense Multiple Access
- ◆ LAN - Local Area Network
- ◆ URL - Uniform Resourse Locator
- ◆ HTML - Hyper Text Markup Language
- ◆ TCP - Transmission Control Protocol
- ◆ GUI - Graphical User Interface
- ◆ ENIAC - Electronic Numerical Integrator and Computer

Data Communication

Data Communication is the process of communicating information between two or more communicating points

The Common communication path arrangements are

1. Simplex - Data trnsmission across the path in one direction only
2. Half-Duplex - Data transmission across the path in both directions, but in only one direction at time

3. Duplex - Data transmission across the path in both directions simultaneously.

Modulation

Modulation is a process to combine a weaker signal (to be transmitted) with a comparatively stronger one.

Different types of modulation techniques are

1. Amplitude Modulation (AM)
2. Frequency Modulation (FM)
3. Phase Modulation

Multiplexing

The combining of two or information channels onto a common transmission medium is called Multiplexing.

Networking

Combining two or more computers with the help of communication channels is called Networking. This can be divided into

1. **Local Area Network (LAN)** :- Privately owned network within a single building or campus connects a limited number of machines.
2. **Metropolitan Area Network (MAN)** :- Basically a bigger version of LAN covers a group of near by corporate offices or city.
3. **Wide Area Network (WAN)** :- A Wide Area Network spans a large geographical area, often a country or continent. **Internet is a WAN**
4. **Intranet** :- Intranet is private internet like network specially designed for private office purposes.

Network Hardwares

The important hardware parts of a computer network are

Computers # Adapter Cards (Network Card) # Communication Channels

The different types of cables used for communication in a network are

1. **Coaxial cable** :- Coaxial cable is a group of specially wrapped and insulated wires. It consists of a central copper wire surrounded by an insulation oner which copper mesh is placed. It provides good protection from cross talk and outside noise. Two kinds of coaxial cables are

- Base Band Coaxial Cable
 - Broad Band Coaxial Cable
2. **Optical Fibre Cable** :- Optical fibre cables work on the principle of total internal reflection. It can transmit data for several kilometers with out data loss
 3. **Twisted Pair Wire** :- A twisted pair wire consists of two insulated copper wire of 1 mm thick, twisted together in helical form. The commonly used transmission medium is twisted pair wire. It has major application in telephone industry. It has a speed of 9600 bits/second in distance of 100m.

Hardware

Any parts of computer which can be touch and see can be called a Hardware.

E.g. Monitor, Mouse, Keyboard, Computer case etc.

Software

Softwares are programs which give instructions to comouter for a particular task. The two kinds of software are **System software** and **Application software**

System Software

The softwares which control the actions of a computer are called system software.

Operating system is a system software.

Application Software

Tha softwares developed for special purposes using computer are termed as Application softwares. ***MS Office is an application software.***

General Points on Computer

- Charles Babbage is known as “Father of Computer”.
- First computer virus is “Apple”.
- “INTEL” is the largest processor manufacturing company of the world.
- “WINDOWS 8” is the latest version of operating system by Microsoft.
- “Bangalore” is known as the silicon valley of India.
- Super computers are developed by “Seymour Cray”.
- Mouse invented by “Duglus Angel Bart”.
- GNU/Linux is a free Operating system.

- Creator of “WWW” is “Tim Bernersley”.
- Common internet browsing tools are Internet Explorer, Mozilla Firefox, Google Chrome , Opera etc.
- Yahoo & Google are the most popular search engines on internet.
- Electronic mailing is called e-mail.
- Sabir Bhattiya is the creator of “Hotmail”.
- Internet is called “Network of network”.
- Latest version of INTEL processor is “Core i 7”.
- The largest computer manufactures is “IBM”.
- Richard Stallman is known for “Free Software Foundation”.
- Open Office is the free software used instead of MS Office.

Best Wishes

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Kalavoor Branch