

# BASICS OF COMPUTER

# Meaning of computer

- Computer as an electronic devices.It accept the data and instructions, store it in its memory
- In 1802 Charles Babbage developed the analytical engine.
- Charles Babbage is the father of computer

# Three types of unit

- **Basics functional units of a computer**
- Input devices or unit
- Out device or unit
- System or unit

- **Input device** :- input unit an external device that is connected to the CPU.
  - Example of Input device are
    - Keyboard
    - Mouse
    - Scanner
- **Out device**:-This is used to display the result obtained after executing of a program.

- Example of out device are
- Monitor
- Printer
- Plotter
- Scanner etc.

- **System device** : Once the data and instructions are Received from the Input unit they are stored and processed in the system unit. The system unit further consists of mainly two sub units . They are

# 1. Central processing unit (CPU)

- Heart and Brain of computer. This is generally called the CPU. Once the data and instructions are received from the input devices, they are to be processed in this unit. CPU consists of two important functional units:
  1. Control unit
  2. Arithmetic & logic unit

2. Memory : memory is an important part of computer that stores the program or data that is under process that is processed or it is already processed.

- Two types of memory are
  1. Main or primary memory
  2. Secondary memory

### A. Main or primary memory

This is the place where the data and instructions supplied by the input devices are stored. This is a temporary memory because the data and instructions stored here are erased when the power goes off. This is also referred to as the primary memory. It consists of RAM and ROM.

### Examples of main memory

- A. Random Access Memory: -it is read and write memory. It is a temporary memory. It is a temporary memory because during power failure, the information stored in RAM will be erased. Sometime it is called volatile memory.

**B. Read only Memory**:-it is permanent memory. It is non- volatile memory will not be lost even if the power goes of . It is non- volatile memory

**2. Secondary memory** : For large storage of data, additional memory called the auxiliary or secondary memory is used . Data are stored in secondary storage in the same binary codes as in the main (primary memory) storage . Some of the devices of secondary storage are Floppy, Hard Dick , CD –ROM, DVD

- A. **Hard Disk** it is permanent storage device. The hard disk can hold more information than the floppy disk and the retrieval of information from hard disk is faster when compared to floppies or tope.
- B. **CD – ROM** : CD – ROM stands for compact disk read only memory . It I used to store a wide variety of information . To use a CD- ROM , a device called CD drive is needed
- C. **DVD** : DVD stands for Digital Versatile Disc . Because of their capacity , DVDs are generally used to store very large multimedia presentations and movies that combine high sound and graphic
- D. **Pen drive** : it is small portable device that can be used to store, access and transfer data



# Generations of computer

<b>Generations of computers</b>	<b>Generations timeline</b>	<b>Evolving hardware</b>
<b>First generation</b>	1946-1956	Vacuum tube based
<b>Second generation</b>	1956-1963s	Transistor based
<b>Third generation</b>	1963-1971s	Integrated circuit based
<b>Fourth generation</b>	1971s-present	Microprocessor based
<b>Fifth generation</b>	The present and the future	Artificial intelligence based

- The main characteristics of first generation of computers (1940s-1950s)
- Main electronic component – vacuum tube
- Main memory – magnetic drums and magnetic tapes
- Programming language – machine language
- Power – consume a lot of electricity and generate a lot of heat.
- Speed and size – very slow and very large in size (often taking up entire room).
- Input/output devices – punched cards and paper tape.
- Examples – ENIAC, UNIVAC1, IBM 650, IBM 701, etc.
- Quantity – there were about 100 different vacuum tube computers produced between 1942 and 1963.

## • Second Generation of Computers

- The main characteristics of second generation of computers (1950s-1960s)
- Main electronic component – transistor
- Memory – magnetic core and magnetic tape / disk
- Programming language – assembly language
- Power and size – low power consumption, generated less heat, and smaller in size (in comparison with the first generation computers).
- Speed – improvement of speed and reliability (in comparison with the first generation computers).
- Input/output devices – punched cards and magnetic tape.
- Examples – IBM 1401, IBM 7090 and 7094, UNIVAC 1107, etc.

# • Third Generation of Computers

- The main characteristics of third generation of computers (1960s-1970s)
- Main electronic component – integrated circuits (ICs)
- Memory – large magnetic core, magnetic tape / disk
- Programming language – high level language (FORTRAN, BASIC, Pascal, COBOL, C, etc.)
- Size – smaller, cheaper, and more efficient than second generation computers (they were called minicomputers).
- Speed – improvement of speed and reliability (in comparison with the second generation computers).
- Input / output devices – magnetic tape, keyboard, monitor, printer, etc.
- Examples – IBM 360, IBM 370, PDP-11, UNIVAC 1108, etc.

# Fourth Generation of Computers

- **The main characteristics of fourth generation of computers (1970s-present)**
- Main electronic component – very large-scale integration (VLSI) and microprocessor.
- VLSI– thousands of transistors on a single microchip.
- Memory – semiconductor memory (such as RAM, ROM, etc.)
  - RAM (random-access memory) – a type of data storage (memory element) used in computers that temporary stores of programs and data (volatile: its contents are lost when the computer is turned off).
  - ROM (read-only memory) – a type of data storage used in computers that permanently stores data and programs (non-volatile: its contents are retained even when the computer is turned off).
- Programming language – high level language (Python, C#, Java, JavaScript, Rust, Kotlin, etc.).
  - A mix of both third- and fourth-generation languages
- Size – smaller, cheaper and more efficient than third generation computers.
- Speed – improvement of speed, accuracy, and reliability (in comparison with the third generation computers).
- Input / output devices – keyboard, pointing devices, optical scanning, monitor, printer, etc.
- Network – a group of two or more computer systems linked together.
- Examples – IBM PC, STAR 1000, APPLE II, Apple Macintosh, etc.

# • Fifth Generation of Computers

- The main characteristics of fifth generation of computers (the present and the future)
- Main electronic component: based on artificial intelligence, uses the Ultra Large-Scale Integration (ULSI) technology and parallel processing method.
  - **ULSI** – millions of transistors on a single microchip
  - **Parallel processing method** – use two or more microprocessors to run tasks simultaneously.
- Language – understand natural language (human language).
- Power – consume less power and generate less heat.
- Speed – remarkable improvement of speed, accuracy and reliability (in comparison with the fourth generation computers).
- Size – portable and small in size, and have a huge storage capacity.
- Input / output device – keyboard, monitor, mouse, trackpad (or touchpad), touchscreen, pen, speech input (recognise voice / speech), light scanner, printer, etc.
- Example – desktops, laptops, tablets, smartphones, etc.

- **Data storage capacity units of measurement**
- **1 Nibble = 4 Bit**
- **8 Bits = 1 Byte**
- **1024 Bytes = 1 Kilobyte**
- **1024 Kilobytes = 1 Megabyte**
- **1024 Megabytes = 1 Gigabyte**
- **1024 Gigabytes = 1 Terabyte**
- **1024 Terabytes = 1 Petabyte**
- **1024 Petabytes = 1 Exabyte**
- **1024 Exabytes = 1 Zettabyte**
- **1024 Zettabytes = 1 Yottabyte**
- **1024 Yottabytes = 1 Brontobyte**
- **1024 Brontobytes = 1 Geopbyte**