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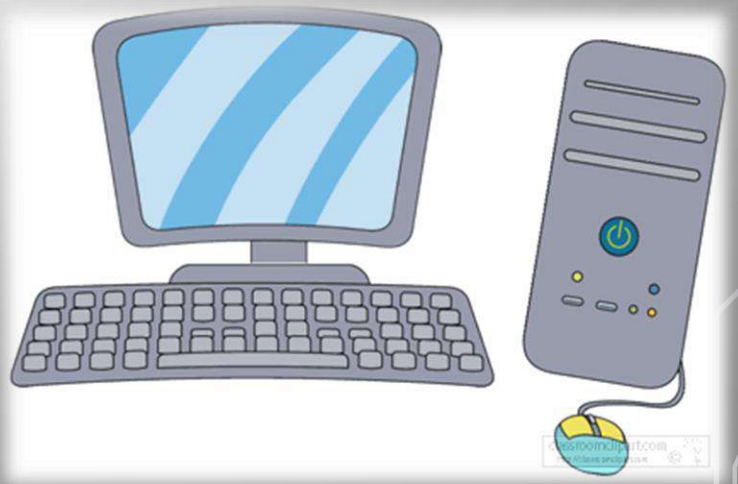
INTRODUCTION

- A computer is a machine that accepts data as input, processes that data using programs and outputs the processed data as information.
- Initially, computers were developed to perform mathematical operations, but later on, they were used to store the result of those operations, which with the time leads to the storage of other data or information.



INTRODUCTION (CONTD..)

- **Data** is a collection of unprocessed facts, figures, and symbols.

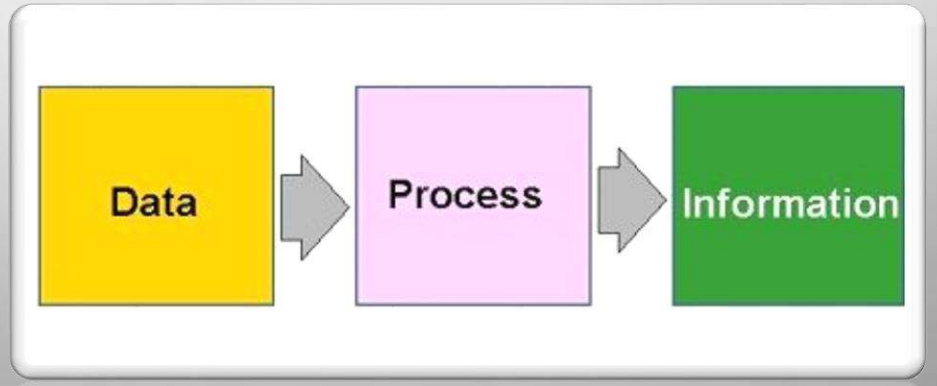
  e.g. Ram, age, 32, years, old

- **Information** is a processed form of data. It is organized, meaningful, and useful.

  e.g. Ram is 32 years old. *Or* Ram's age is 32 years.

INTRODUCTION (CONTD..)

- A computer can be defined as an advanced electronic device that takes raw data as input from the user. It uses a set of instructions (called program) to process the data and give the result (output). The result can be used immediately or saved for future use.



HARDWARE AND SOFTWARE

- In the process of converting data to information, a computer uses hardware and software. At the simplest level, all computers consist of these two basic components; the hardware and the software.

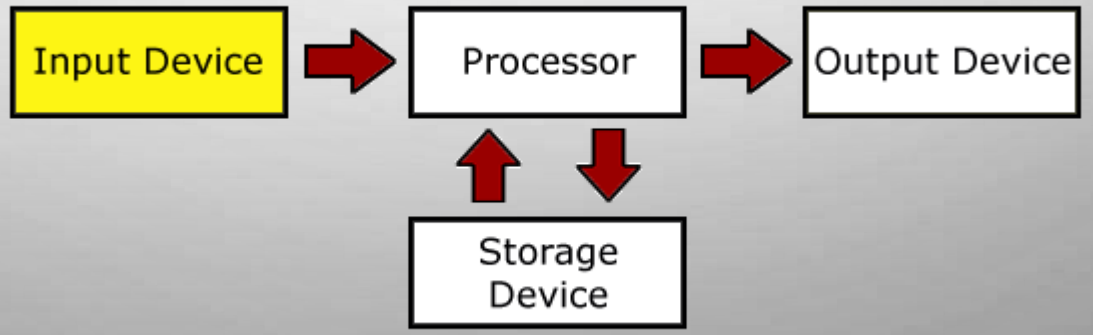
- **Hardware** is any part of the computer that has a physical structure that can be seen and touched, though some may be so tiny that they are invisible to the naked eye.

- **Software** is the instruction set that tells the computer how to perform tasks. Software is intangible i.e., that cannot be seen and touched, but its effect is clearly defined.

HARDWARE AND SOFTWARE (CONTD..)

HARDWARE AND SOFTWARE (CONTD..)

- Hardware components are classified into following categories:
  - Input Devices
  - Output Devices
  - Storage Devices



HARDWARE AND SOFTWARE (CONTD..)
INPUT DEVICES

- **Input devices** are the devices that allow a user to enter data and instructions into a computer such as keyboard, mouse, microphone, scanner, trackball, joystick, graphics tablet and digital camera.

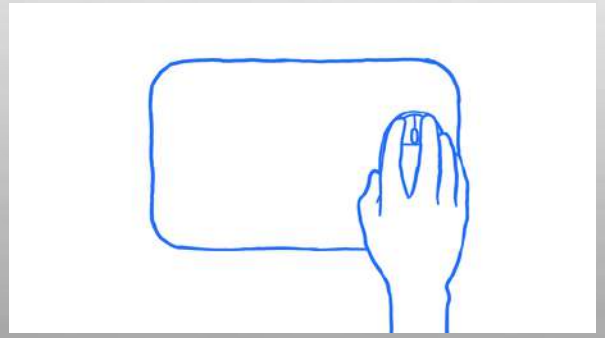
Or

- An **input device** is a piece of hardware used to provide data to a computer used for interaction and control. It allows input of raw data to the computer for processing.

HARDWARE AND SOFTWARE (CONTD..)
INPUT DEVICES

The various functions of input devices are:

- They accept data and instructions from the user.
- They convert these instructions and data from human readable form to machine readable form.
- They supply the converted instructions and data to the CPU for further processing.

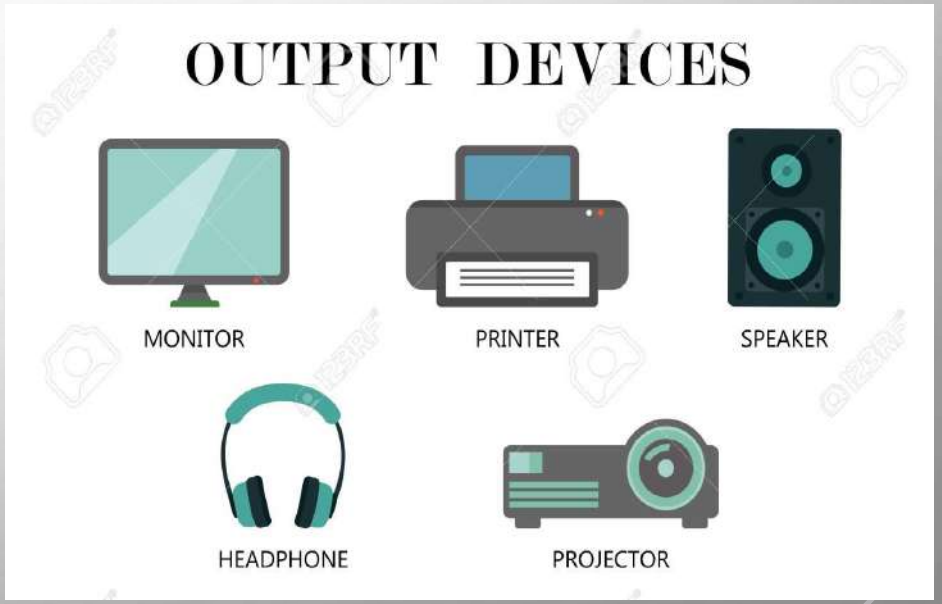


HARDWARE AND SOFTWARE (CONTD..)
OUTPUT DEVICES

- **Output devices** are used to display the result or information to the user through monitor or VDUs, LCDs, printers, plotters and speakers.

Or

- An **output device** is a piece of computer hardware that receives data from a computer and then translates that data into another form. That form may be audio, visual, textual, or hard copy such as a printed document.



HARDWARE AND SOFTWARE (CONTD..)
OUTPUT DEVICES

The various functions of output devices are:

- It accepts the results produced by the computer which is in the coded form or machine readable form.
- It converts these coded results into human readable form.
- It supplies the converted results to the user.

HARDWARE AND SOFTWARE (CONTD..)

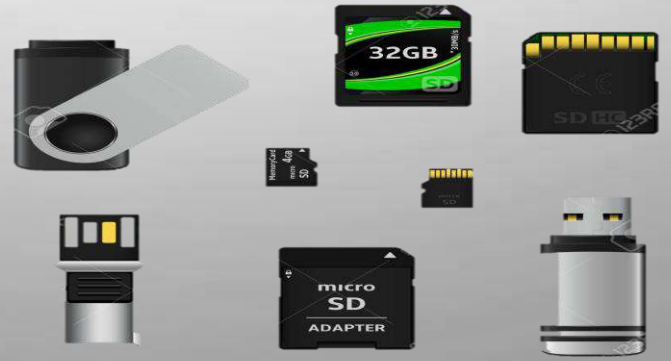
The key distinction between an input device and an output device is that an input device **sends** data to the computer, whereas an output device **receives** data from the computer.

HARDWARE AND SOFTWARE (CONTD..)
STORAGE DEVICES

Storage devices are the devices which are used to retrieved from and saved to the data and information such as hard drives, memory sticks (pen drives), compact discs, DVDs and tape drives.

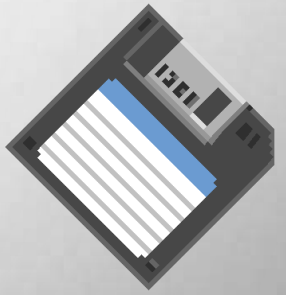
Or

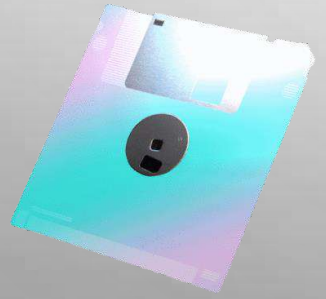
A **storage device** is a piece of computer hardware used for saving, carrying and pulling out data. It can keep and retain information short-term or long-term.



HARDWARE AND SOFTWARE (CONTD..)
STORAGE DEVICES

1. Floppy disks were developed in late 1960s. A floppy disk is made up of a circular thin plastic jacket coated with magnetic material. Its outer cover which is a hard plastic protects this plastic disk. It can hold 1.44 MB data. Nowadays, these disks are outdated.



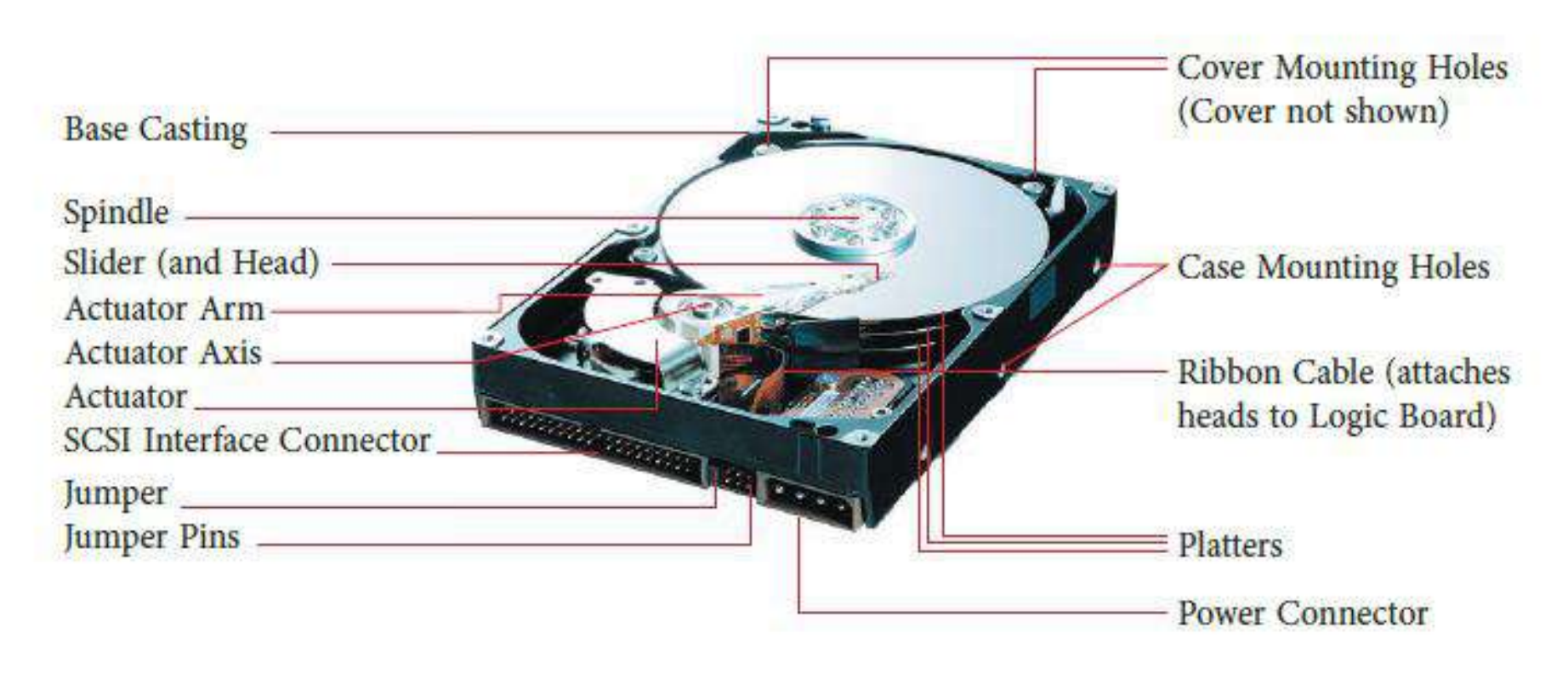


HARDWARE AND SOFTWARE (CONTD..)
STORAGE DEVICES

2. Hard Disk is made up of a metal disk and coated with a metal oxide used to store bulk of data. These disks can store more information than floppy disks, up to tens or hundreds of gigabytes.

- An internal hard drive is the main storage device in a computer.
- An external hard drive is also known as removable hard drive. It is used to store portable data and backups.

HARDWARE AND SOFTWARE (CONTD..)
STORAGE DEVICES
(HARD DISK)



HARDWARE AND SOFTWARE (CONTD..)
STORAGE DEVICES

3. Compact Disk – Read Only Memory or CD-ROM is a read only or read-write disk. It can store large amount of data which can be distributed to large number of users. It is inexpensive and fast, but its access time is longer than that of magnetic disk.

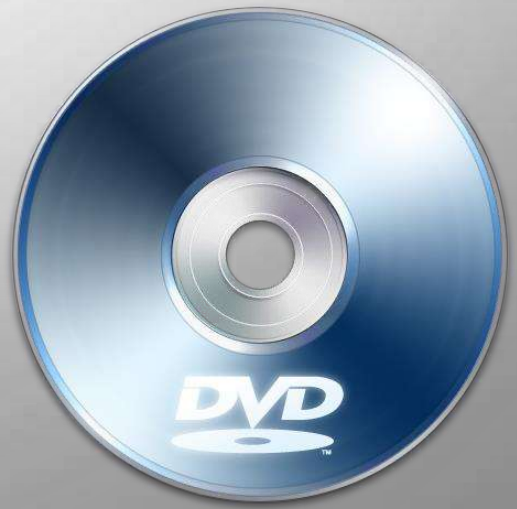
- There are two types of CDs:
- CD-R and CD-RW.

✓CD-R stands for Compact Disk – Recordable which can store 700 MB of data, but only once.

✓CD-RW stands for Compact Disk – ReWriteable which can read, write and erase data as many times.

HARDWARE AND SOFTWARE (CONTD..)
STORAGE DEVICES

4. DVD, short for Digital Versatile Disc, is an optical storage disc similar to CD-ROM, as this is double sided with dual layer disc and can hold 4.7 GB of data.



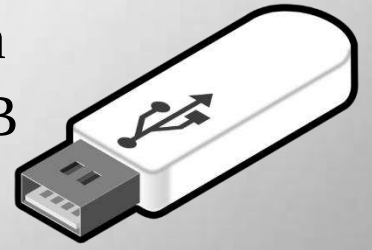
HARDWARE AND SOFTWARE (CONTD..)
STORAGE DEVICES

5. **Blue-Ray Disks** are used to store more than 25 GB of data with a very high speed in less amount of time. A single layer of BD can store 13 hours of video where as double layer BD can store more than 20 hours of video.

Blu-ray Disc

HARDWARE AND SOFTWARE (CONTD..)
STORAGE DEVICES

6. USB stands for Universal Serial Bus. It is a portable memory device which is used to store data that needs to be transferred to the other device using USB port of the system.



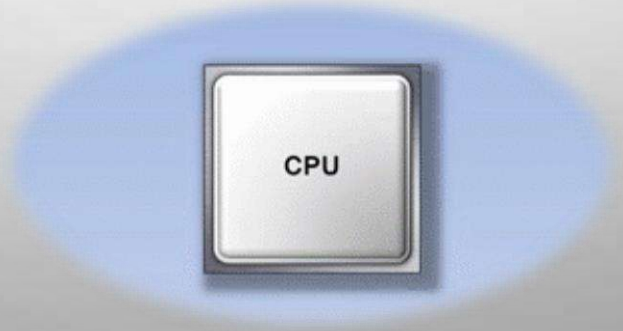
- Also known as a thumb drive, **pen drive**, flash-drive, memory stick, jump drive, and USB stick.
- Flash memory is generally more efficient and reliable than optical media, being smaller, faster, and possessing much greater storage capacity, as well as being more durable due to a lack of moving parts.

HARDWARE AND SOFTWARE (CONTD..)
STORAGE DEVICES

7. **Memory Card** or flash memory card is a memory device. It is used as an easy, fast and reliable medium to store and transfer data from one device to the other. It is used in digital cameras, game consoles, mobile phones etc.

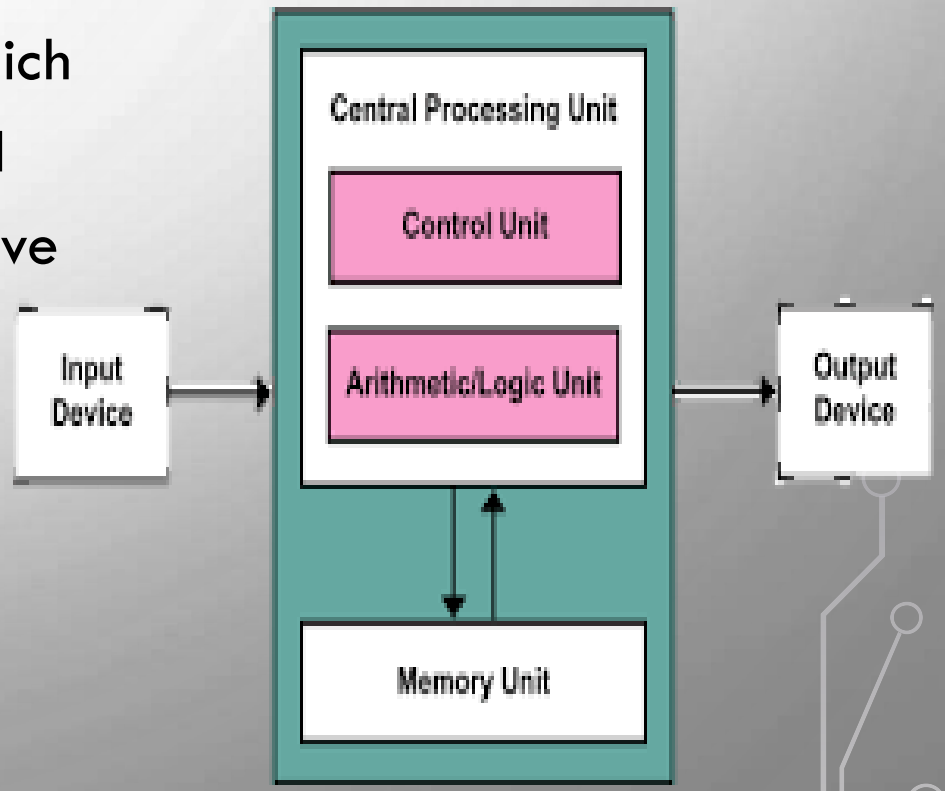
HARDWARE AND SOFTWARE (CONTD..)
CPU (CENTRAL PROCESSING UNIT)

- The **system unit** is the box that protects the internal electronic components from damage. It contains the central processing unit (CPU) and memory. The **CPU** interprets and carries out the basic instructions that operate the computer. **Memory** is where data and instructions are held.



HARDWARE AND SOFTWARE (CONTD..)
CPU (CENTRAL PROCESSING UNIT)

- The heart of the computer system is the processor unit. It consists of the **Arithmetic and Logic Unit** (ALU) which executes most computer operations (arithmetic and logical) and the **Control Unit** which acts as the nerve centre that sends control signal to all other units.

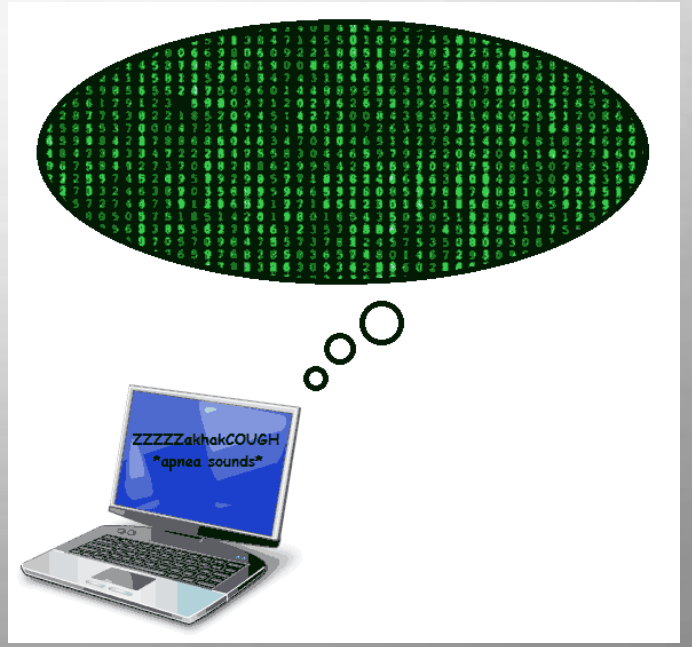


HARDWARE AND SOFTWARE (CONTD..)
CPU (CENTRAL PROCESSING UNIT)

- The control unit and ALU are usually many times faster than other devices connected to a computer system. This enables a single processor to control a number of external devices such as video terminals, magnetic tapes, disk memories, sensors, displays and mechanical controllers, since they are much slower than the processor.

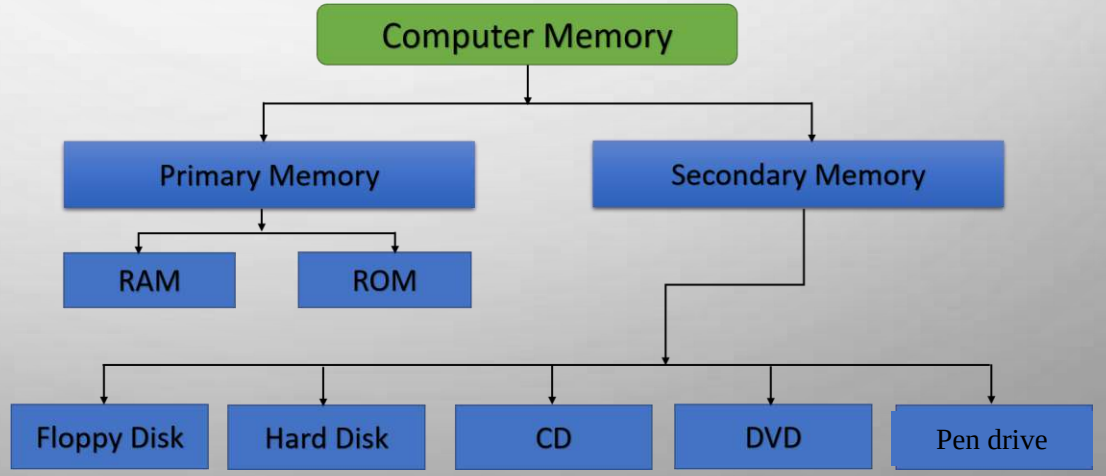
HARDWARE AND SOFTWARE (CONTD..)
MEMORY

- There are two categories of memory:
  - Primary memory and
  - Secondary memory (or external memory).



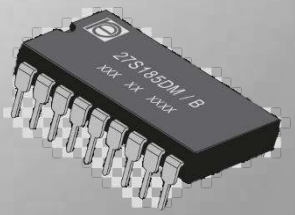
HARDWARE AND SOFTWARE (CONTD..)
MEMORY

Primary Memory is very fast as data and programs must be in the primary memory for execution. Random Access Memory (RAM) and Read Only Memory (ROM) are both primary memory.



HARDWARE AND SOFTWARE (CONTD..)
MEMORY

- **Random Access Memory** refers to memory that can be selected and used randomly. The information stored here disappears the very moment the machine is turned off. It is also referred to as volatile memory.
- **Read Only Memory** is permanently built into the computer at the time of production. The information from this memory can only be read and it is not possible to write fresh information into it. It permanently stores a set of instructions which instructs the computer how to work. After we switch on the computer, it uses instructions stored here to carry out a series of tasks automatically, before we can actually use the computer.

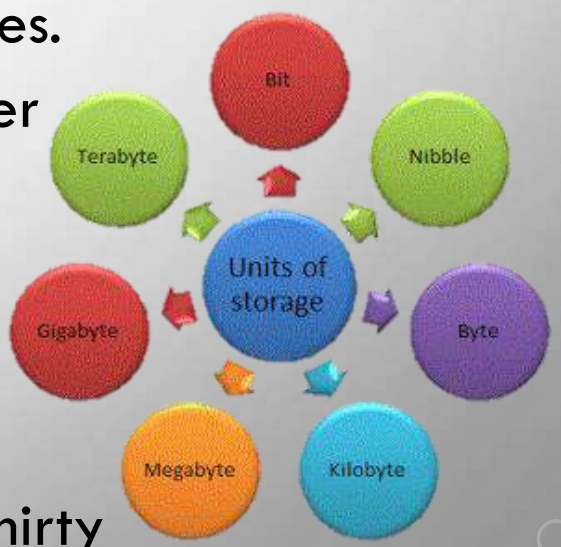


HARDWARE AND SOFTWARE (CONTD..)
MEMORY

- **Secondary Memory or Auxiliary Memory:** The content on the RAM is erased when electric power is switched off. So, it becomes necessary to store this data for future use, somewhere else. Since, primary storage is expensive too; we need a relatively cheaper form of backup storage which can store vast quantities of information. Thus, **Secondary Memory** devices become an important part of the computer.

HARDWARE AND SOFTWARE (CONTD..)
UNITS OF MEMORY

- Memory, storage, files and folder sizes are all measured in bytes. Computers work in the base 2 system, also called binary number system, using only the digits 0 and 1.
- A single numeric value using either 0 or 1 is called a **bit**.
- A sequence of 'bits' make a **byte**.
- Usually eight bits make a byte (sometimes it could be sixteen, thirty two or even sixty four). Bits are grouped into bytes to increase the efficiency of the computer.



HARDWARE AND SOFTWARE (CONTD..)
UNITS OF MEMORY

- For large capacities, the terms Kilobyte (KB), megabyte (MB), gigabyte (GB), terabyte (TB) and Petabyte (PB) are used.

1 nibble = 4 bits

1 byte = 8 bits

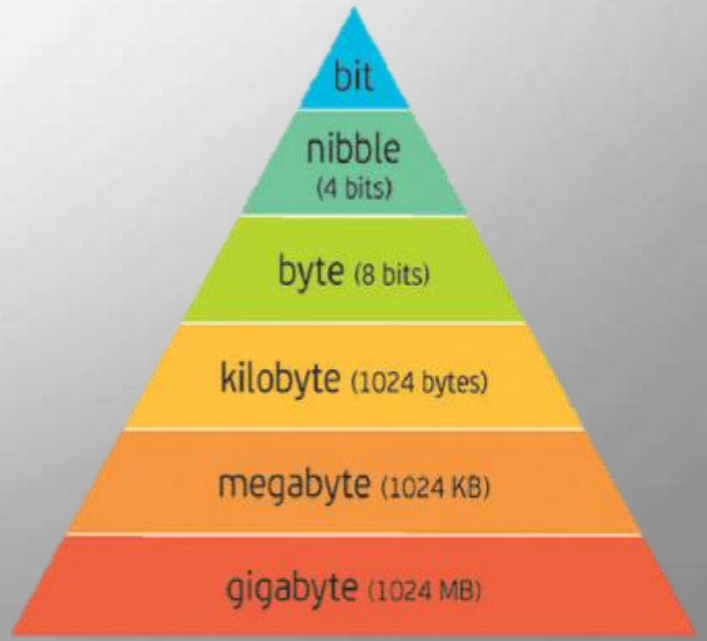
1 KB = 1024 bytes

1 MB = 1024 KB

1 GB = 1024 MB

1 TB = 1024 GB

1 PB = 1024 TB



COMPUTER AND IT'S COMPONENTS

1. Which part of the computer shows you information from the computer?
2. Which part of the computer is the brain of the computer?
3. Which computer part can you point and click with?
4. How big is megabyte?
5. Memory that loses its contents when power is lost?
6. What are the two kinds of main memory?