

LEARNING  
IN THIS  
CHAPTER

- Data and Information
- Data Storage Units
- Types of Memory
- Storage Devices

## DATA AND INFORMATION

Computer is an electronic device which accepts the data, processes it as per the instructions given, and gives back the output.

Data consists of set of characters, like alphabets, digits, or special characters that represent facts or figures. When this data is processed by the processing unit, i. e. CPU, it is known as **Information**. The data is processed by the computer as per the instructions given by the user.

Children, you should remember that unprocessed data is meaningless but when such data is organized and converted into meaningful information, it becomes useful.

### Example from our day to day life



Example

- Your father bought cloth from the market and gave it to the tailor to stitch a Kurta-Pyjama out of it.

In this example:

Cloth can be considered as Data and Kurta-Pyjama can be considered as Information. The cloth in its raw form is not useful until it gets converted into some dress.

### Examples in context to computers



Example

- Your teacher wants to find the highest and lowest scorers of your class. For this, she inputs marks scored by each student in all the subjects in the computer and gives the required instructions to it. In return, computer displays the highest and lowest scorers of the class.

Here marks, that were fed into the computer, represent Data and the result returned by the computer i.e., highest and lowest rankers, represents Information.

- While booking the railway ticket, you provide the details, like source station, destination, date of journey, and number of persons travelling, to the computer. This data is processed by the computer and you get the railway ticket.

In this case, the details, like source station, destination, date of journey, and number of persons travelling represent Data and the tickets which you get represent Information.

## DATA STORAGE UNITS

Whatever we feed into the computer, gets converted into a machine understandable code, called Machine code. A computer can understand only two states - ON (represented by 1) and OFF (represented by 0). These two digits - 0 and 1 are called **Binary digits** or **Bits**. The data is stored in the computer memory in the form of bits and is measured in Bytes.

### MEMORY SIZE

8 bits	=	1 Byte	1024 TB	=	1 Petabyte (1PB)
1024 Bytes	=	1 Kilobyte (1KB)	1024 PB	=	1 Exabyte (1EB)
1024 KB	=	1 Megabyte (1 MB)	1024 EB	=	1 Zettabyte (1ZB)
1024 MB	=	1 Gigabyte (1 GB)	1024 ZB	=	1 Yottabyte (1YB)
1024 GB	=	1 Terabyte (1 TB)			

## TYPES OF MEMORY

Every computer has a certain amount of memory. The memory capacity determines how much data and instructions can be stored in the computer, either temporarily or permanently.

The memory of a computer is of two types:

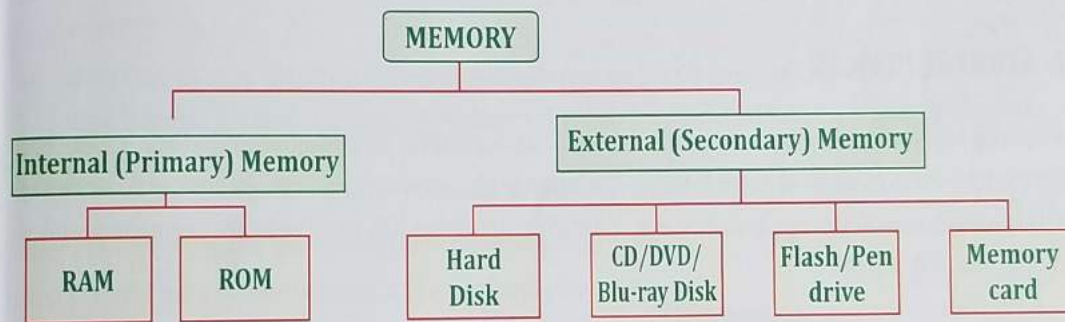


Figure 1.1: Types of Computer Memory

## INTERNAL MEMORY

Internal memory is also called **Primary memory** or **Main memory**. It is the built-in memory, designed to store data and instructions while the computer is working. The data stored in internal memory is erased when the computer is turned off. It is always easier to access data or programs from the internal memory as it is the fastest of all forms of computer data storage. Primary memory is of two types:

**RAM (Random Access Memory):** It stores the information temporarily and works like a blackboard that can be constantly overwritten with new data. The information stored in the memory is lost when you turn off the computer or when the power goes off.





It is like a calculator, where information exists till the calculator is on. The moment you turn off the calculator, all the data disappears.

**Example**

**ROM (Read Only Memory) :** It holds the start up instructions that prepare a computer for use. The instructions stored in ROM cannot be changed, but can only be read. It retains the stored information even when the power is switched off.



ROM is like an audio disk that can be played, but we cannot record anything on it, except in a few selected circumstances.

**Example**

## EXTERNAL MEMORY

It is used to store information for a longer period. Data is not lost in the external memory even when the computer is turned off. The external memory is essential, because the internal memory of a computer has a limited storage capacity. It is also called the **Secondary Memory**.

When we run a program, it is copied from the secondary storage into the internal memory. It takes more time to access data from the secondary memory as compared to the internal memory.

## STORAGE DEVICES

In our daily life, we use many storage devices, such as cupboard, book shelf, refrigerator, school bag, etc. to store various relevant items in them. A computer also uses various storage devices to store data in them which vary in storage capacity, e.g., hard disk, pen drive, CD, etc. These are permanent or non-volatile storage devices.

**Hard Disk:** It is the main storage medium for computers. It is made up of a collection of disks known as **platters**. It is fixed inside the CPU box. It can hold a large amount of data. Hard disks can store up to 8 TB of data. Nowadays, external hard disks are also available, which are small in size and can be carried anywhere.



**CD:** CD stands for Compact Disk. It is an optical storage device. A CD is a thin, shiny, circular disk that can store up to 700 MB of data and measures 4.7 inches in diameter. A CD can hold text, graphics, sound, images, and videos. It can be used for data back-up and holding software.

**DVD:** The full form of DVD is **Digital Versatile Disk** or **Digital Video Disk**. It is an optical storage device used for data storage and for recording movies with high video and sound quality. The storage capacity varies from 4.7 GB to 17 GB.



#### Let's Know More

CDs are generally of two types: CD-R and CD-RW. Data once written on CD-R (Compact Disc Recordable) cannot be erased, but only read. The CD-RW (Compact Disc Re-Writable) is a Disc erasable CD. Data written on it can be erased and rewritten many times.



**Blu-Ray Disk:** It is a new optical disk format that can store up to 128 GB of data. This disk is mainly used for storing high quality sound, games and movie data. The name Blu-ray disc is derived from the Blu-violet laser, that is used to read and write data on it.



## ACTIVITY ZONE

For Better Concept Clarity

### Using a CD/DVD

- Press the push button present on the CD/DVD drive. The tray will slide out.
- Place a CD/DVD in it and press the push button. The tray will move in.
- If the CD/DVD has **AutoPlay** program, the CD/DVD will start running automatically.
- If the CD/DVD does not play automatically, double-click on the CD drive icon in the **Computer** folder. It will display its contents. To open any file, just double-click on it.

**Flash Drive:** It is popularly known as Pen drive and the most popular data backup device. It is a plug and play device and can be connected to the USB (Universal Serial Bus) port. It is a small, light weight, and removable drive. It is used for copying and moving data from one computer to another. A Flash disk can store up to 2 TB of data.



#### Fact File



Hard Disk was invented by IBM team lead by **Rey Johnson**. He is considered as the father of the Disk Drive.

#### Let's Know More

In 1965, **James Russell** invented the Compact Disc. However, the Compact Disc did not become popular until launched and mass manufactured by **Philips** in 1980.



**Memory Card:** A memory card is a storage medium for portable devices, like mobiles, digital cameras and music players. It can be easily removed for access by a computer. These devices transfer images and music files into a computer

#### Let's Know More

The first Flash drive was manufactured in early 2000 by a company called **Trek Technologies**. Even IBM manufactured their first Flash drive at the same time by the name of **DiskOnekey**.

by using the memory card reader that can be connected to a computer through a USB cable. Nowadays, most of the laptops come with inbuilt card reader port.



### A multimedia card in a digital camera or mobile

**Example** A memory multimedia card is small in size; approximately the size of a postage stamp. Multimedia cards are available in various storage capacities ranging up to 512 GB.



- Computer is an electronic device which accepts the data, processes it as per the instructions given, and gives back the output.
- The devices which help us in storing the data permanently are called Storage Devices.
- A computer works with only two digits - 0 and 1. These digits are called binary digits or bits.
- Hard disks, CDs, DVDs, Blu-ray disks, and Memory cards are the examples of storage devices.
- The computer memory is of two types: Internal Memory and External Memory.
- Internal memory is the built-in memory, designed to store data and instructions while the computer is working.
- Internal (Primary) memory is of two types: RAM and ROM.
- External memory stores information for a longer period and the data stored in it is not lost even when the computer is turned off.
- Hard disks, CDs, DVDs, Blu-ray disks, and Memory cards are the examples of storage devices.

## Brain DEVELOPER

\* One word

### A. Fill in the blanks:

- The data which we put into the computer is processed by CPU.
- The processed data is known as information.
- The information in the computer is stored in the form of Binary digits.
- A Flash drive is popularly known as Pen drive.
- The information stored in RAM memory is lost when the power goes off.

#### HINTS

- Pen drive
- CPU
- RAM
- Information
- Binary

**B. State True or False:**

1. RAM stands for Random Access Memory. F
2. 1 Megabyte is equal to 1024 Gigabytes. F
3. The set of characters, like alphabets, digits, or special characters that represent facts or figures is known as Data. T
4. It is easy and faster to access data from Internal memory. T
5. External memory stores information for a longer period. T

**C. Application Based Questions:**

1. Aaryan could not finish his project work in the class. So, he wants to carry the softcopy of the project to his house in order to finish it. Which device will you suggest him to copy his work?  
.....
2. Raghav wants to copy 3 movies on a disk and wants to see them at his place. Which device will you suggest him to copy all the movies?  
.....

*ROM holds the startup instructions.*

**D. Multiple Choice Questions:**

1. The instructions stored in ROM cannot be changed but can only be read.  
a. RAM                      b. ROM                      c. Hard Disk
2. Name the CD on which data can be erased and re-written many times.  
a. CD-ROM                      b. CD-R                       c. CD-RW
3. A Flash drive can store upto 2 TB of data.  
a. 4 TB                      b. 2 TB                      c. 1 TB
4. Internal memory is also known as .....  
a. Main memory                       b. Primary memory                      c. Both a and b
5. The data stored in the computer memory is measured in Bytes.  
a. Bytes                      b. Points                      c. Pixels
6. Which storage device has the highest storage capacity?  
a. CD                      b. Pen Drive                       c. Hard Disk

