1 Know Your Computer

SNAP RECAP

1. A computer is an electronic device that accepts an input, processes it and gives the output or the result.
2. Input is the raw data given to the computer.
3. Process is the mathematical or logical calculation done on the raw data.
4. Output is the result or the information received after the data is processed.

LEARNING OBJECTIVES

You will learn about:

1. input devices – keyboard, computer mouse, joystick, scanner, barcode reader, light pen, touch screen, digital camera
2. processing device – central processing unit
3. output device – monitor, printer
4. primary and secondary memory
5. specific applications of computers
6. limitations of computers

Introduction

You use different parts of a computer to get information. The words you read on the computer screen are written using the signals from the keys you press on the keyboard. The file you save or open is on the hard disk. These are different parts of a computer. These are used to obtain different types of information required by us.

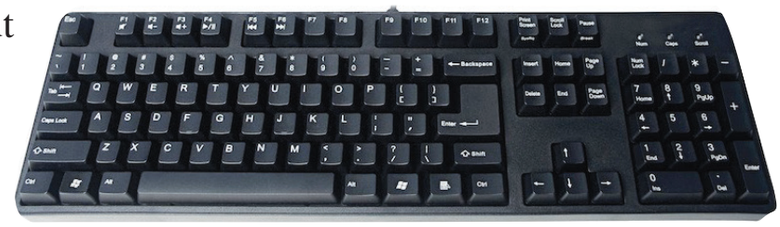
Let us learn more about the basic parts of a computer and their functions.

Input Devices

The devices that give data or instructions to the computer are called input devices. The most commonly used input devices are the keyboard and the computer mouse.

Keyboard

Keyboard is the most common input device used. It allows the user to input letters, numbers, and other characters into a computer. It operates like a typewriter, but has many additional keys. It can do many things that a typewriter cannot.



Keyboard

Fig. 1.1 *The pointer follows the movement of the mouse*

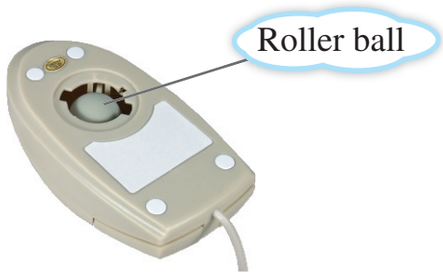
Computer mouse

Computer mouse is an input device. As you move the mouse on a mouse pad, a small arrow moves on the screen. The arrow you see on the screen is the pointer (Fig. 1.1). Thus, the mouse is also known as a **pointing device**. The pointer follows the movement of the mouse.

There are various types of computer mice. Here, you shall learn about two basic types of computer mice.

Mouse with roller ball: A roller ball allows the mouse to move on a flat surface as shown below.

Optical mouse: It uses light to detect the movement of the mouse. This in turn allows movement of the pointer on the screen.



Mouse with roller ball

Optical mouse

Joystick

Joystick is a vertical handle which can be moved forwards, backwards and sideways to control a machine. It is a pointing device that works like a computer mouse as it is used in moving the pointer on the computer screen. It provides a good control when you play computer games.

Joystick

Scanner

Scanner

Scanner is a device that transfers the data such as hand-drawn pictures or text, photographic prints, posters and magazine pages into the computer. It does so by converting the document image into a digital form which can then be fed into the computer.

The scanned data can then be edited or modified in the computer.

Barcode reader

A **barcode** is a set of lines of different thicknesses that represent a number. Most packed products in shops have barcodes on them.

A barcode reader is used to read the barcode given on a product and feed the information into the computer. The number is then used by the computer for preparing the bill with the relevant details of the item including name, quantity and price.

Barcode reader

Light pen

A light pen is a pointing device shaped like a pen and is used for pointing, drawing, writing or selecting something on a screen.

The structure of the light pen is such that its location is identified by the computer when it is placed on the screen.

Light pen

Digital Camera

Digital camera

A digital camera records images in a digital form which can be stored in a computer. These images in the camera can also be printed.

These days, digital cameras are also used for video recording.

Web Camera

A web camera is a camera which records moving pictures and sound, and allows these to be broadcasted on the Internet as they happen. It is used mainly for video chatting and video conferencing.

Web camera

FACT FILE

Unlike other keyboards, the Optimus Tactus keyboard does not have any physical keys and thus, has no fixed size and shape. Any part of the keyboard can be programmed to perform any function or display any image.

Output Device

The devices that display result or information are called output devices. This information is displayed on the monitor. It can also be printed on paper using a printer.

Monitor

Monitor

A monitor is also known as **Visual Display Unit** (VDU).

It is an output device that looks like a television. It displays both text and picture. The output that is displayed on the monitor is called the **soft copy**.

There are different types of monitors available in the market.

Printer

Fig. 1.2 *Hard Copy*

A printer gives the output on paper. The printer prints exactly what is seen on the screen.

The printout from the printer is called the **hard copy** (Fig.1.2).

Based on the technology used, the printers can be classified as **impact** or **non-impact printers**.

Impact printers: They use the typewriting printing mechanism where there is a direct contact between the paper and the print head, for example, dot-matrix and character printers.

Non-impact printers: They do not touch the paper while printing. They use chemical, heat or electrical signals to print the symbols on paper. For example, inkjet, deskjet, laser and thermal printers.

Let us learn about some commonly used printers.

Dot-matrix printer: It has a matrix of small pins that are pushed back-and-forth on the page to form a pattern of dots depending on the type of image or text to be printed.

Dot-matrix printer

Inkjet printers: It usually prints in color by spraying out small dots of ink onto the paper. It works faster than the dot-matrix printer and produces images of better quality.

Inkjet printer

Laser printer

Laser printer: It uses a laser beam to print on paper. This type of printer is very fast and images printed are of high quality.

Plotter: It is a device that draws pictures on paper based on the commands received from a computer. Plotters differ from other printers as they draw lines using a pen. As a result, they can produce continuous lines, whereas other printers can only print lines by printing a closely spaced series of dots. Large printouts of drawings are taken out on paper using plotters.

Plotter

Processing Device – Central Processing Unit

Once information is sent to a computer by one of the input devices, it is processed. The Central Processing Unit (CPU) is the brain of the computer. It processes the information.

CPU is basically divided into three parts:

1. **ALU** stands for **Arithmetic Logic Unit**. All mathematical and logical calculations are done by it.
2. **CU** stands for **Control Unit**. It controls the flow of information in the system. It works like a traffic policeman who controls the traffic on the road.

3. **MU** stands for **Memory Unit**. It holds the processed or unprocessed data. When you offer tea to a guest, it is served in a cup. The cup is a kind of a container for the tea that was offered to the guest. Similarly, memory is a container to hold the data of a computer.

Computer Memory

A computer has a huge storage capacity. The storage capacity of a computer is called its **memory**. It enables the computer to store data and instructions. Computer memory is measured in term of bytes. As you measure distance in kilometre, time in second, weight in kilogram, the memory is measured in bytes.

FACT FILE

Internally, data is converted into the smallest unit known as a bit. The computer understands only two types of bits, 0 and 1. Bits are usually assembled into a group of eight to form a byte.

8 Bits	=	1 Byte
1024 Bytes	=	1 Kilobyte (KB)
1024 KB	=	1 Megabyte (MB)
1024 MB	=	1 Gigabyte (GB)
1024 GB	=	1 Terabyte (TB)

There are two types of computer memory: primary memory and secondary memory (Fig. 1.3)

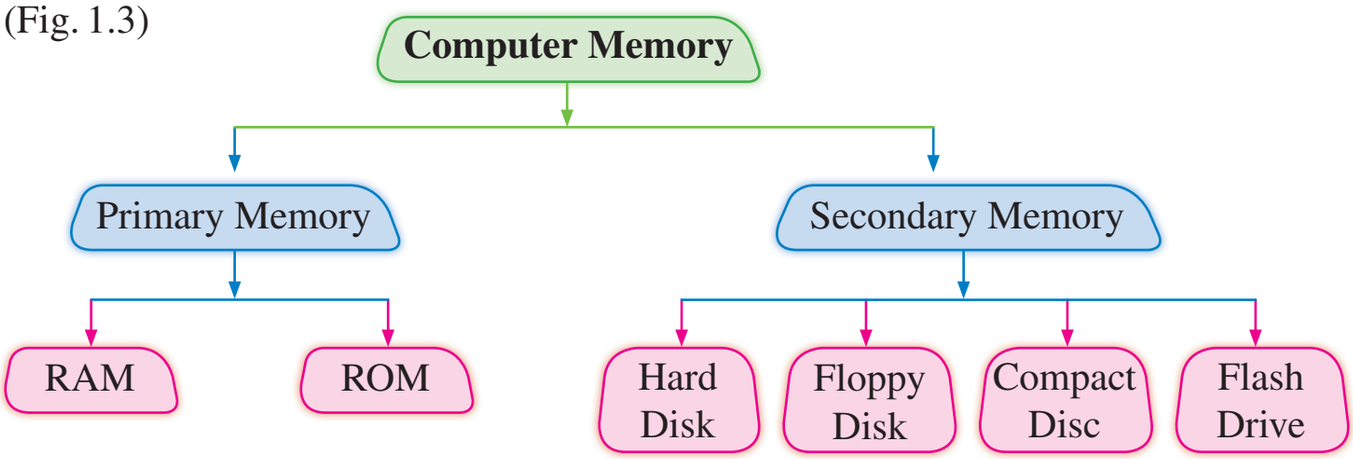


Fig. 1.3 *Classification of computer memory*

Primary memory

Primary memory is necessary for a computer to work. It is also called the **internal memory**. It is the main area where the data is stored. The stored data can be recalled and processed by the CPU. The end result is displayed on the output device. Primary memory is of two types: **RAM** and **ROM**.

RAM

RAM is **Random Access Memory**. It holds instructions for the computer, its programs, and the data. Information can be read on RAM and written or changed onto it. Hence, it is also known as read/write memory. *However, it is temporary in nature*. Thus, it is also called as the **volatile memory**. The stored data disappears when the computer is shut down. That is why you are always advised to save your work.

ROM

ROM is **Read Only Memory**. Information can only be read from and not written or changed onto it. The information it contains is the **Basic Input–Output System** or BIOS, which is used to start the operating system. ROM is the built-in memory of a computer. The storage data does not disappear even when the computer is shut down. *Thus, it is permanent in nature*. It is also called as the **non-volatile memory**.

Secondary Memory

When you work on a computer, it stores information temporarily. As soon as it is shut down, the information is lost. So you need a place where you can store data on a long-term basis. This will ensure that data can be used as and when required.

The memory where the data is stored on a long-term basis is called secondary memory. The information stored is not lost even when the computer is shut down.

FACT FILE

ROM is the memory created by the computer manufacturer. These days, along with ROM, users can program or create a part of their ROM called as Programmable ROM (PROM). However, once recorded PROM cannot be changed.

Erasable PROM is a type of memory where the information can be erased or changed.

It is also known as the **external memory**. It is stored at places other than the primary memory of a computer. For example, floppy disk, compact disc, hard disk, flash drive, Blu-ray disc, multimedia card, etc.

Floppy disk

Floppy disk is a circular magnetic disc enclosed in a square or a rectangular shaped plastic body. The data can be read and written with the help of a floppy disk drive. Data can also be transferred from one computer to the other using a floppy disk. These are available in two standard sizes.

5.25 inch: It was the first available floppy disk. It can store data upto 1.2 MB. Its body is made up of a material which makes it bend or fold easily. Thus, a lot of care is needed to handle it.

3.5 inch: It is much smaller in size. It can store data upto 1.44 MB. It is made up of a hard body so it does not bend. Thus, it is less prone to data damage.

5.25 inch floppy disk

3.5 inch floppy disk

Advantages of a floppy disk

1. It is less expensive.
2. It is highly portable.

Disadvantages of a floppy disk

1. The stored data gets easily damaged due to rough handling, temperature variation, exposure to dust and light.
2. It has a limited storage capacity.

FACT FILE

The floppy disk symbol is used to save file in several software. For example, MS Word and Paint.

Hard disk

A hard disk is similar to a floppy disk but it can store a large amount of data and provides relatively quicker access. The data is stored on an electromagnetically charged surface or set of surfaces. Hard disk is generally fitted inside the system unit. Nowadays, computers are fitted with a hard disk that has storage capacity in terms of gigabytes (GB) and terabytes (TB).

A hard disk is made up of a collection of discs called **platters**. These are stacked on a cylindrical rod. Each of which, like phonograph records, has data recorded electromagnetically in concentric circles or **tracks** on the disk. Tracks are further divided into **sectors**.

A 'head' reads or writes the information on the tracks with the help of the hard disk drive (HDD).

A **portable hard disk** (also known as a **portable hard drive**) is very much in use these days. It is a mass storage device designed to be easily transported and externally connected to a computer. These days, portable HDDs are available that can store up to 2 TB (2 Terabytes = 2048 GB) of data.

Structure of a hard drive

Advantages of a hard disk

1. It stores a large amount of data.
2. It is highly reliable as it is less prone to data damage.

Disadvantages of a hard disk

1. It is quite expensive.

Compact Disc

Compact Disc (CD) is a small, portable, round medium disc used for recording, storing, and playing audio, video, text, and other information in the digital form. It was originally developed to store sound recordings. Later, it also allowed the preservation of other types of data.


Compact disc

A standard CD has a diameter of 120 mm. It stores up to 80 minutes of uncompressed audio (700 Mib/737 MB of data). A mini CD has a diameter ranging from 60 to 80 mm. These store up to 24 minutes of audio.