1 Know Your Computer

LEARNING OBJECTIVES

You will learn about:

1. Input–Process–Output data flow diagram
2. network and Internet concepts

Introduction

Computer is an electronic device capable of solving problems by accepting data, performing operations on the data, and giving the result. Before going into the details, let us revise some important terms learnt in the previous classes.

Input

Input is the raw data given to the computer using input devices like keyboard, mouse, scanner, etc.

Just as you put fruits in a juicer, similarly, you input the raw data onto a computer (Fig. 1.1).

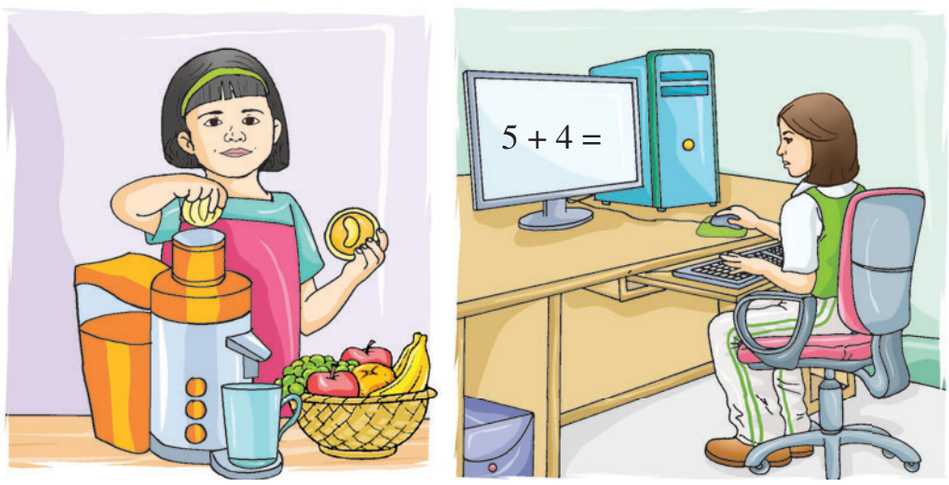


Fig. 1.1 *Input process*

Process

The raw data is manipulated to generate information by performing certain operations using the computer's processing device, that is, Central Processing Unit. It is similar to the processing of fruits in the juicer (Fig. 1.2).

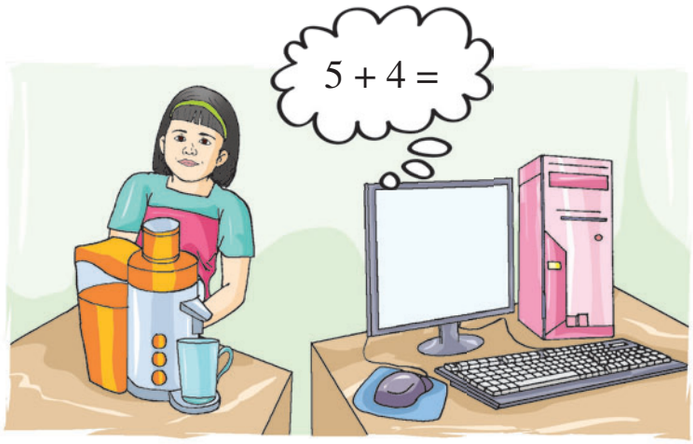


Fig. 1.2 *Processing of inputs*

Fig. 1.3 *Output process*

Output

The information generated is known as output. It is given to the outside world with the help of output devices like printer, monitor, etc. It is similar to the juice served in glasses, after processing (Fig. 1.3).

Input–Process–Output Cycle (IPO Cycle)

The three terms, that is, input, process and output are interrelated. The information flows from the input device to the processing device and then to the output device. Sometimes the result generated acts as an input for the next stage of data flow. Thus, this whole flow of information follows a cycle which is known as Input–Process–Output Cycle.

The information flow aims to present the information in a user-friendly way (Fig. 1.4).

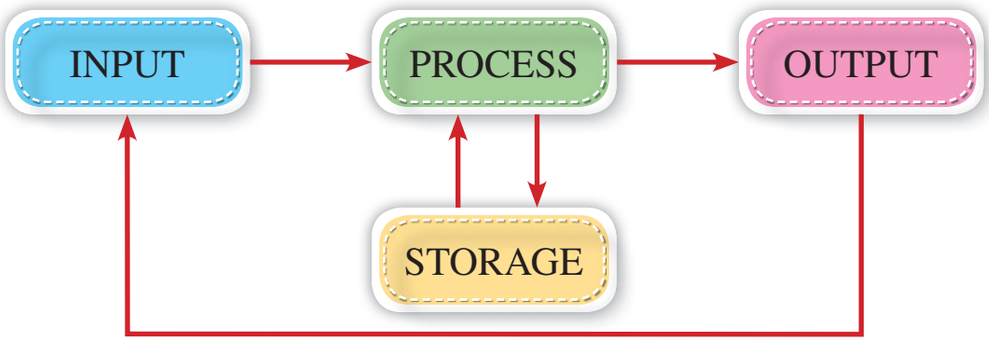


Fig. 1.4 *Input–Process–Output Cycle*

Information often needs to be kept safe for later use. This information may be stored in storage devices like floppy disk, compact disc, hard disk, flash drive, memory cards, etc. (Fig. 1.5).

Let us also study the IPO cycle in the form of the following examples.

Fig. 1.5 *Storage device*

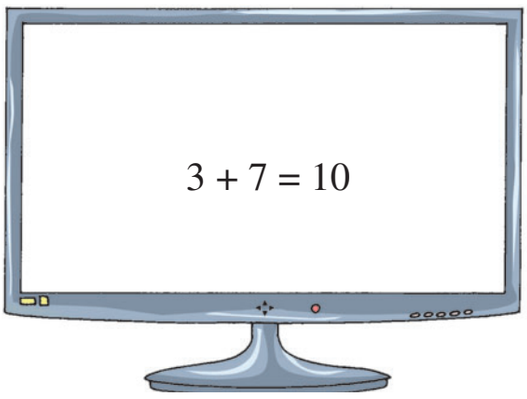


Fig. 1.6 *Adding two numbers*

Adding two numbers

1. *Input:* Two numbers to be added, are given to the computer using an input device.
2. *Process:* Addition operation is performed on these two numbers.
3. *Output:* Result is displayed on the screen (Fig. 1.6).

Generating a report card

1. *Input:* The marks of all subjects entered in the computer.
2. *Process:* Percentage or grades calculated and report card generated in a specific format.
3. *Output:* The generated report card displayed on the monitor taken out as a printout (Fig. 1.7).

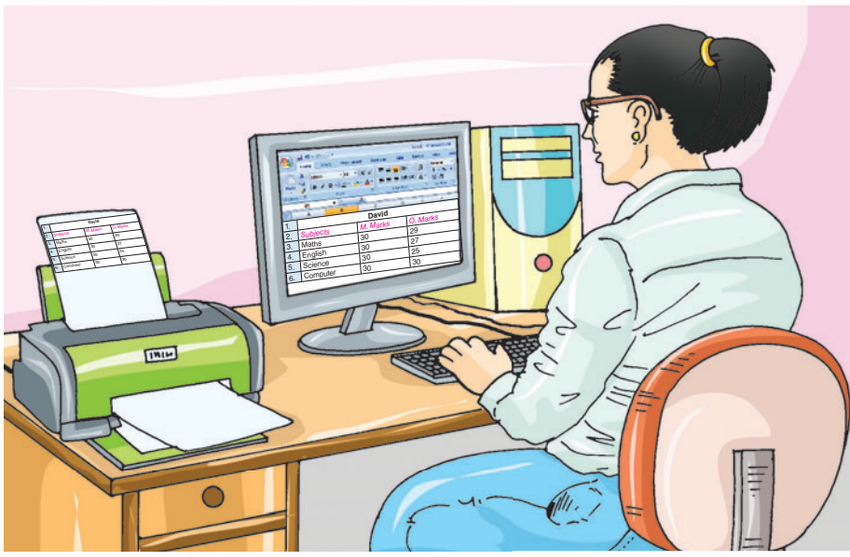


Fig. 1.7 *Generating a report card*

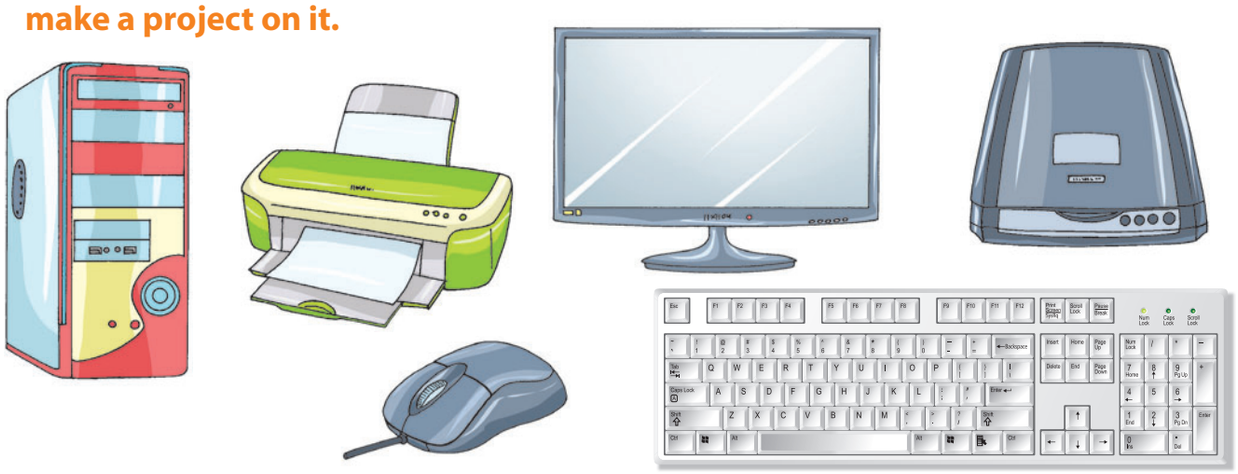
Playing games

1. *Input*: The player's information given to the computer along with some keys pressed to run the car.
2. *Process*: The speed and the direction of the player's car is taken care of as per the keys pressed.
3. *Output*: The effect of the keys pressed is seen in the form of animated pictures and sound on the screen (Fig. 1.8).

Fig. 1.8 *A child playing a computer game*

ACTIVITY

A. Identify the input and output devices given below. Collect their pictures and make a project on it.



B. Suggest at least three more examples that can be compared with the IPO cycle.

Concept of Networking

Definition of a computer network

The word 'network' may be defined as a collection of computers connected together for the purpose of sharing information and resources (Fig. 1.9). These interconnected computers can be present within a local area or may cross different cities or countries.

Fig. 1.9 *Networking concept*

Computer networking is a core part of the whole information technology field. Computers can never communicate with each other locally and remotely in the absence of computer networking. Just imagine a bank or a corporate office without computer networking (Fig. 1.10)! How difficult it would be for the employees to communicate and share the data.

In today's world, networking is also used in bank transactions through ATMs, the Internet and online ticketing and reservation, online shopping, etc.

Fig. 1.10 *Computer networking*

Networking is a necessity

The need of networking arises due to the following reasons.

1. *Limited resources:* Instead of connecting a printer to all the computers separately, you can connect it to the main network. In this way, every computer can share the printer on a priority basis.
2. *Desire to share information:* Information is centralised. Thus, it is made available to all the computers connected to a network.
3. *Cost reduction:* It reduces cost as an input device like a scanner and an output device like a printer can be easily shared.

Parts of a computer network

The different parts of a computer network are discussed here (Fig. 1.11).

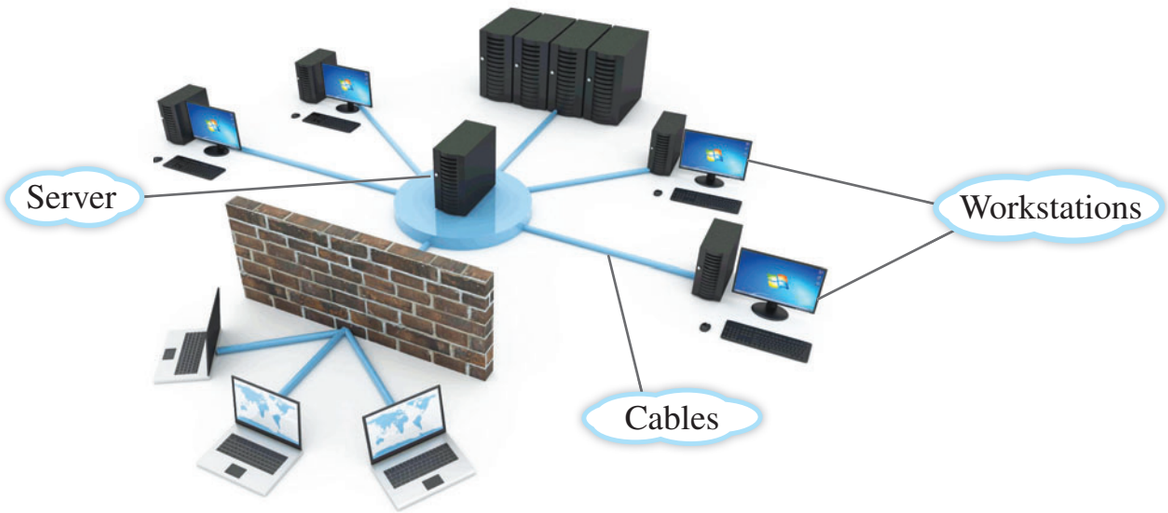


Fig. 1.11 *Parts of a computer network*

1. *Workstations:* The individual computers connected to a network that share data and information are called workstations or terminals. They can be compared to clerks working together in a group, in a department, to do a specific job.
2. *Server:* The main computer in the networking environment that controls the functioning of the entire network is called the server. It can be compared to a manager of a company who manages all the work and coordinates well with the various clerks.

3. *Communication channels*: These are used to connect the computers for the purpose of sharing information. These communication channels can be either cables, fibre optics, radio waves, or satellites (Fig. 1.12).

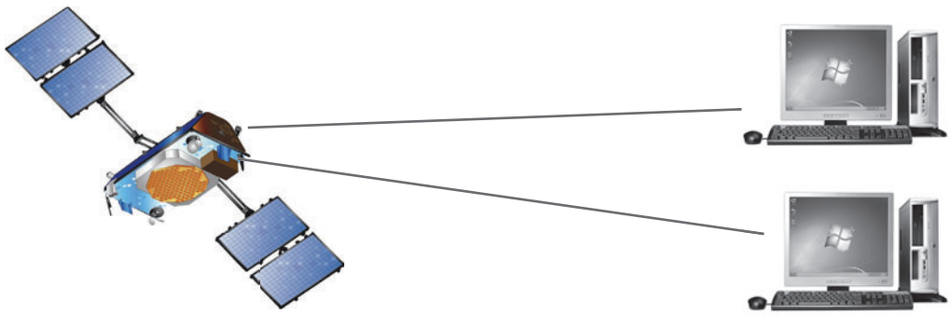


Fig. 1.12 *Communication through satellite*

4. *Modem*: It stands for **Modulator Demodulator**. A modem is an electronic device which allows one computer to send information to another through standard telephone wires and therefore cover long distances. It is required because, computers are digital devices and the telephone system is analogue. The modem converts data from digital to analogue and vice versa for effective transmission. These days, three types of modem connections are available viz. cable, telephone and wireless. They can be fitted inside the computer (**internal modem**) or placed outside the computer (**external modem**) (Fig. 1.13).

a. *Internal modem*

b. *External modem*

Fig. 1.13 *Types of modem*

FACT FILE

Speed of a modem is calculated in bits per second (bps).

5. *Router:* It is an electronic device that connects together two or more networks and directs the data between them (Fig. 1.14).

Fig. 1.14 *A router*

6. *Bluetooth*: It is a system for connecting electronic equipments such as mobile phones and computers to each other and to the Internet using radio signals. To use this technology a Bluetooth device is used. For example, these days you get Bluetooth mobile phone headsets (Fig. 1.15).

a. *A Bluetooth logo*

b. *A Bluetooth mobile phone headset*

Fig. 1.15 *Bluetooth*

Types of Network

Personal Area Network

When the computers and devices that belong to the same user are interconnected over a short range, it forms a Personal Area Network or PAN (Fig. 1.16).

The communication channels in this case are mainly Bluetooth and Wi-Fi devices.

Fig. 1.16 *Personal Area Network*

Local Area Network (LAN)

When the computers are interconnected in the same office building, school or home for sharing information, then it forms Local Area Network (LAN).

LAN connects computers over a relatively short distance. It generally uses cables as a communication channel (Fig. 1.17).

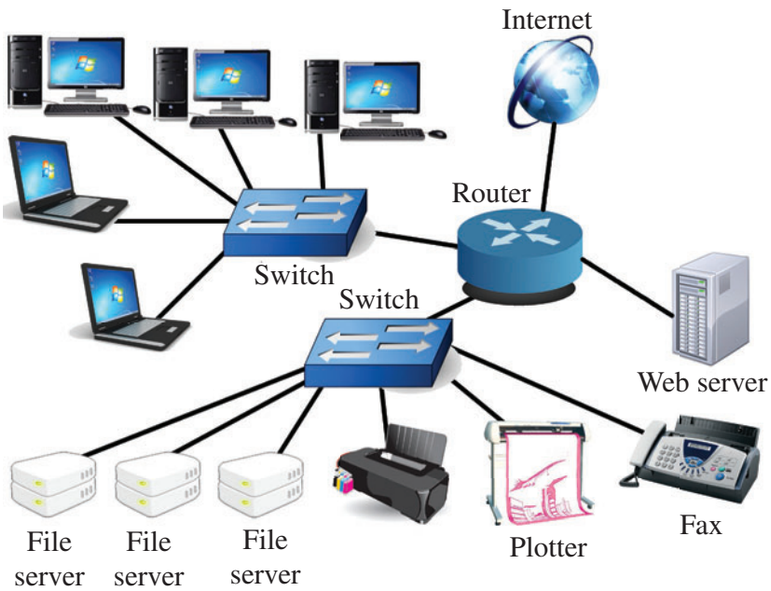


Fig. 1.17 *Local Area Network*

Metropolitan Area Network (MAN)

When computers are interconnected to extend over an entire city, then it forms Metropolitan Area Network or MAN (Fig. 1.18). For example, all the branches of a company are interconnected using MAN within the same city. The cable operator supplies cable television network using MAN.

The communication channels in this case are either cables or satellites.

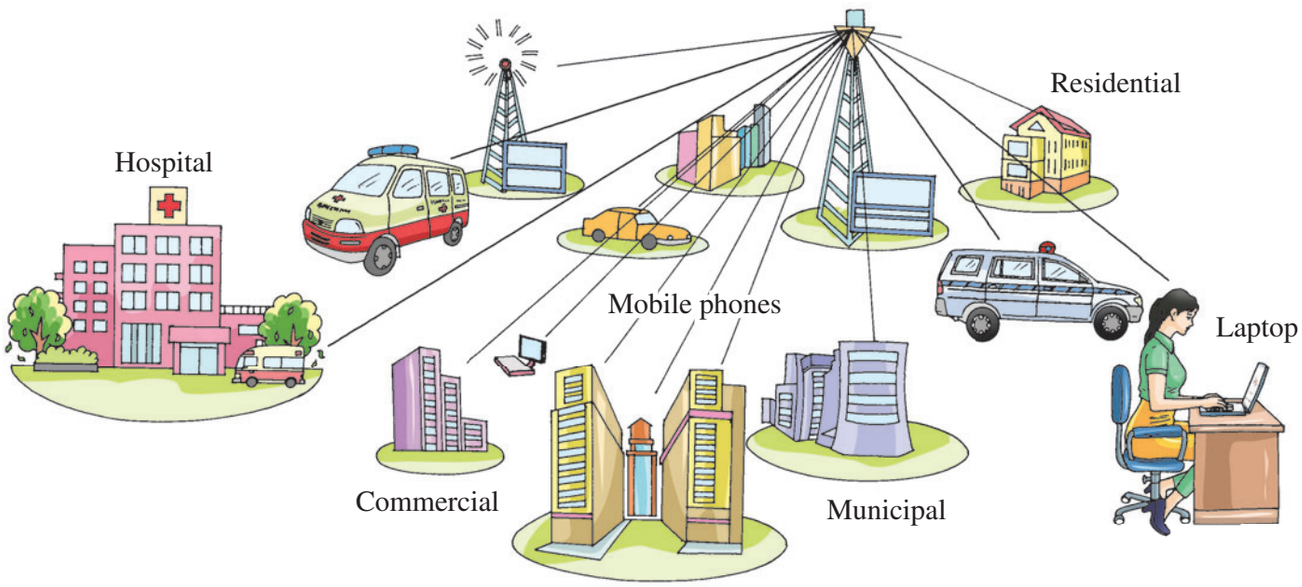


Fig. 1.18 *Metropolitan Area Network*

Wide Area Network (WAN)

When the computers are interconnected for transmitting information over a large geographical area that may comprise a country, a continent or even the whole world, it forms a Wide Area Network or WAN (Fig. 1.19). The Internet is the best example of WAN.

The communication channels used are mostly satellites.

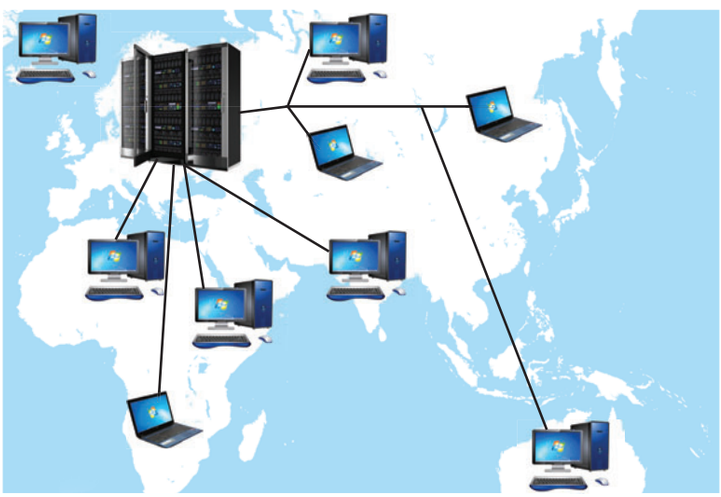


Fig. 1.19 *Wide Area Network*

ACTIVITY

A. Try to find out which category of network is used in your lab.

B. Take the help of your teacher and prepare a PowerPoint presentation on types of computer network.

GLOSSARY

Computer network: It is a network of computers, connected together for sharing information and resources.

Input: It is the raw data given to a computer.

Internet: It stands for Interconnected Network.

IPO cycle: It stands for the Input–Process–Output cycle.

LAN: It stands for Local Area Network.

MAN: It stands for Metropolitan Area Network.

Modem: It is a modulator and a de-modulator.

Output: It is the processed data generated and given to the outside world.

Process: It is the process of manipulating raw data using CPU.

Server: It is the main computer that controls the functioning of the entire network.

WAN: It stands for Wide Area Network.

Workstation: It refers to the individual computers in a computer network.

NOW YOU KNOW

1. Computer is an electronic device capable of solving a problem by accepting data, performing operations on the data and giving the result.
2. An input is given to the computer using input devices like keyboard, mouse, scanner, etc.
3. Central Processing Unit is the computer's processing device.
4. An output is given to the outside world using output devices like printer, monitor, plotter, etc.
5. The information flows from an input device to the processing device and then to an output device. This flow of information follows a cycle which is known as Input–Process–Output Cycle.