Computer

World

Written by :

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New Edition

Written by :

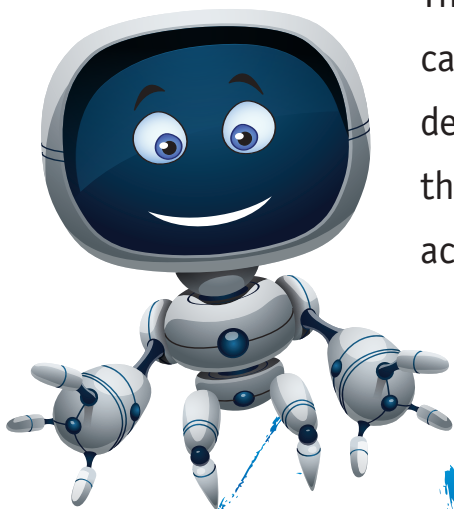Anuj Gupta

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Preface

Computer education is an essential part of educational curriculum today. Computer have become an important source of information and are being used for studying other subjects as well.

The present series of books 'Computer World' starts from class 1 to 8. The books describe this electronic device in detail, step by step. The young learners will find it easy to study and understand these books. The books have been made attractive by the introduction of coloured illustrations and diagrams related to a computer, and also to make it easy for the child to understand the subject.

The concept of the computer system has been selected very carefully. To test the child's skill after every few chapters, well designed exercises have been provided. Suggestions to improve the series in the interest of the children will be gratefully accepted and acknowledged. Feel free to send your suggestions.
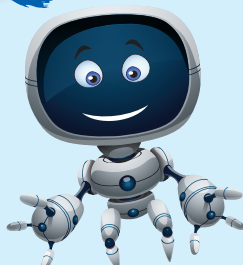
—Author

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1 Computer Fundamentals

INTRODUCTION

Today, there is no one who is not familiar with the computer, so it is no need to give its introduction. However, you must know the definition of the computer.

In simple words, **Computer is a Machine**. A machine is that device which has mechanical, electrical or electronic parts and performs work to help the human beings.

Computer is a machine that helps in doing the mental work. For example : If you have a computer and want to make a mark sheet, you need not have to do all the processing by using your mind repeatedly for all the students, instead you can just set the logic in the computer program which will automatically module the task.

WHAT IS A COMPUTER ?

The most obvious question related to understanding computers and their impact on our lives is "What is a computer ?" Ans–'A **computer** is an electronic device, which operates under the control of instructions stored in its own memory unit'. It can accept data (input), process data arithmetically and logically, produce output from the processing and can store the results for future use.

WHAT DOES A COMPUTER DO ?

Whether small or large, computers can perform four general operations. These operations which comprise the information processing cycle are–input, process, output and storage. Collectively, these operations describe the procedures that a computer performs to process data into information and store it for future use.

All computer processing requires data. **Data** refers to the raw facts, including numbers and words, given to a computer during the input operation. In the processing phase, the computer manipulates the data to create information.

Information refers to a data that has been processed into a meaningful and useful form. The production of information by processing data on a computer is called **information processing** or sometimes **data processing** (DP). During the output operation, the information that has been created is put into some kind of form, such as printed report, that people can use.

The people who either use the computer directly or use the information it provides are called 'computer users', 'end users', or sometimes just simply 'users'. A computer user are demonstrates how the four operations of the information processing cycle can occur on a personal computer.

1. The computer user inputs data by pressing the keys on the keyboard.

2. The data is then processed by the unit called the processor.

3. The output, or results, from the processing are displayed on the screen or printed on the printer, providing information to the user.

4. Finally, the output may be stored on a CD for future reference.

WHY IS A COMPUTER SO POWERFUL ?

The input, process, output and storage operations that a computer performs may seem very basic and simple. However, a computer's power derives from its capability to perform these operations very quickly, accurately and reliably. In a computer, operations occur through the use of electronic circuits contained on small chips. When data flows along these circuits it travels at close to the speed of light. This allows processing to be accomplished in billionths of a second. The electronic circuits in modern computers are very reliable and seldom fail. Storage capability is another reason why computers are so powerful. They can store enormous amounts of data and keep that data readily available for processing.

This capability combined with the factors of speed, accuracy and relability are why a computer is considered to be such a powerful tool for information processing.
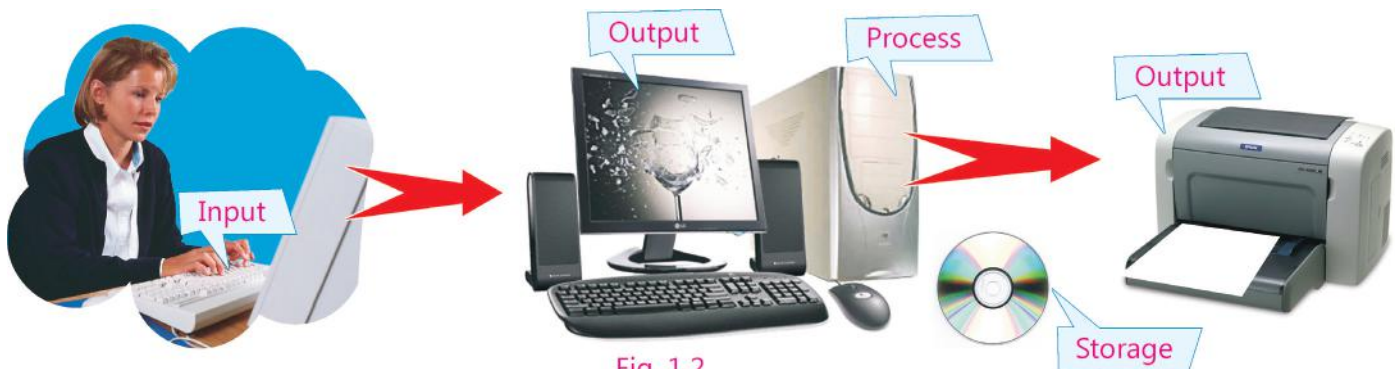
Fig. 1.2

HOW DOES A COMPUTER KNOW WHAT TO DO ?

For a computer to perform the operation in the information processing cycle, it must be given a detailed set of instructions that tell it exactly what to do. These instructions are called computer program or software.

Before the information processing cycle for a specific job begins, the computer program corresponding to that job is stored in the computer. Once the program is stored, the computer can begin to process data by executing the program's first instruction. The computer executes one program instruction after another until the job is complete.

THE INFORMATION PROCESSING CYCLE

As you all know the information processing cycle consists of four operations. They are input, process, output and storage.

The first three of these operations, 'input', 'process', and 'output', describe the procedures that a computer performs to process data into information. The fourth operation, 'storage', describes a computer's electronic storage capability. As you learn more about computers, you will see that these four operations apply to both the computer equipment and the computer software. The equipment, or devices of a computer are classified according to the operations that they perform. Computer software is made up of instructions that describe how the operations are to be performed.

WHAT ARE THE COMPONENTS OF A COMPUTER ?

A computer is composed of input devices through which data is entered into the computer; the processor that processes data stored in main memory; output devices on which the results of the processing are made available; and auxiliary storage units that store data for future processing. Data is processed by specific equipment that is often called computer hardware. This equipment consists of : input devices, a processor unit (CPU), output devices and auxiliary storage units.
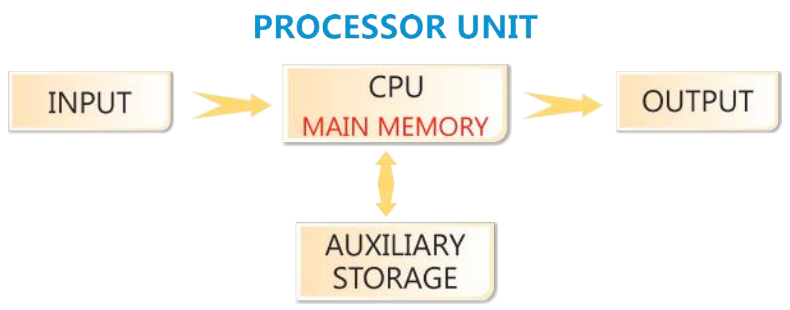
Input Devices

Input devices are used to enter data into a computer. A common input device is the keyboard which is along with other components of computer. As the data is entered or keyed, it is stored in the computer and displayed on a screen.

Processor Unit

The processor unit of a computer, which contains the electronic circuits that actually cause the processing of data to occur. The processor unit is divided into

two parts, the central processing unit and main memory. The central processing unit (CPU) contains a control unit that executes the program instructions and an arithmetic/logic unit (ALU) that performs mathematical and logic operations. Arithmetic operations include numeric calculations such as addition, subtraction, multiplication and division. Comparisons of data to see if one value is greater than, equal to, or less than another are called logical operations.

Output Devices

Output from a computer can be presented in many forms. The two most commonly used output devices are the printer and the computer monitor. Other frequently used name for the monitor is CRT, which stands for cathode ray tube.

Auxiliary Storage Units

Auxiliary storage units store instructions and data when they are not being used by the processor unit. A common auxiliary storage device on personal computer is CD-drive or a diskette drive which stores data as magnetic spots on a small plastic disk or fibre disk called diskette. Another important auxiliary storage device is called a hard disk drive. It contain non-removable metal disks and provide larger storage capacities than diskettes or CD.

Categories of Computers

Computers are generally classified according to their size, speed, processing capabilities and price. However, rapid changes in technology make firm definitions of these categories difficult. This year's speed, performance, and price classification of a mainframe might fit-next year's classification of a minicomputer. Even though they are not firmly defined, the categories are frequently used and should be generally understood.

1. **Microcomputers :** Microcomputers also called personal computers or micros, are the small desktop–sized system that have become so widely used in recent years. These machines are generally priced under Rs 40,000. This category also includes hand held notebook, laptop, portable and super microcomputers.

2. **Minicomputers :** Minicomputers are more powerful than micro computers and can support a number of users performing different tasks. Originally developed to perform specific tasks such as engineering calculations, their use grew rapidly as their performance and capabilities increased. These systems can cost from approximately Rs 60,000 up to several hundred thousand rupees. The most powerful minis are called superminicomputers.
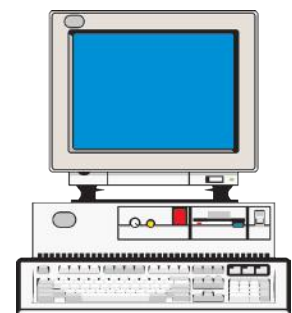
3. **Mainframe Computers :** Mainframe computers are large systems than can handle hundreds of users, store large amounts of data and process transactions at a very high rate. Mainframes usually requires a specialized environment including separate air conditioning, cooling and electrical power. Raised flooring is often built to accommodate the many cables connecting the system components underneath. The price range for mainframes is from several hundred thousand rupees to several lakh rupees.

4. **Supercomputers :** Supercomputers are the most powerful category of computers and, accordingly, the most expensive. The capability of these system to process hundreds of millions of instructions per second is used for applications such as weather forecasting, engineering design and testing, space exploration and other jobs requiring long, complex calculations. These machines cost several lakh rupees.

Points to Remember

- A computer is an electronic device which operates under the control of instructions stored in its own memory unit. It can accept data (input), process data arithmetically and logically, produce output from the processing, and store the results for future use.

- A computer can perform input, process, output and storage operations, collectively called the information processing cycle.

- Data refers to the raw facts, including numbers and words that are processed on a computer.

- Information is a data that has been processed into a meaningful and useful form.

EXERCISE

A. Tick (✓) the correct option :

1. This device are used to enter data into a computer.

    (a) Input ☐   (b) Processor ☐   (c) Output ☐

2. It is the most powerful category of computer.

    (a) Microcomputers ☐   (b) Minicomputers ☐   (c) Supercomputers ☐

3. This is also called personal computers.

    (a) Minicomputers ☐   (b) Supercomputers ☐   (c) Microcomputer ☐

4. A common auxiliary storage device is

    (a) CD- drive ☐   (b) USB ☐   (c) Hard disk drive ☐

5. It refers to the raw fact.

    (a) Data ☐   (b) Information ☐   (c) Output ☐

B. Fill in the blanks :

1. _____ is a calculating machine.
2. _____ is a fact or figure.
3. _____ devices are used to enter data into a computer.
4. The _____ unit contains the electronic circuit that cause processing to take place.
5. _____ devices are used to print or display data and information.

C. Write (T) for true and (F) for false statements :

1. A computer works on the principle of input-process-output-storage. ☐
2. A computer executes all the program instructions simultaneously. ☐
3. CD-drive is a common auxiliary storage device on personal computer. ☐
4. Mainframe are the most powerful category of computers. ☐

D. Answer the following questions :

1. Define computer.
2. Distinguish between data and information.
3. What is the information processing cycle ?
4. Identify some of the difference among microcomputer, minicomputer, mainframe computer and supercomputer.
5. What are the basic operations in computer functioning ?
6. Name some common input devices.

ACTIVITY

1. Prepare a report for your class describing the use of computers at your school. You may focus on a single department or prepare a general report about computer use throughout the school.
2. Prepare a brief report on an individual who made a contribution to the history of computer, with the help of your guardian or teacher.
3. Write the name of some places where the following types of computers are used :

    Micro   _____ _____ _____ _____

    Mini   _____ _____ _____ _____

    Mainframe _____ _____ _____ _____

    Super   _____ _____ _____ _____