

More About Computers

Introduction

In the previous class, you have learnt about the evolution of computers i.e. how various changes were made and computers were improved from one generation to another.

Today, the development of computers is at its peak and computers are used in a large variety of areas of work. We saw the classification of computers as per their generation. However, now we will list the classification of computer as per their usage. On the basis of the usage, computers are classified into five groups.

This chapter includes

- ▶ Types of computers
 - Microcomputers
 - Minicomputers
 - Mainframe Computers
 - Supercomputers
- ▶ Computer language
 - Low level language
 - High level language
- ▶ Computer capabilities
- ▶ Limitations of computers

Types of computers

Computers can be generally classified by size and power and can be classified under the following categories:

1. Microcomputers
2. Minicomputers
3. Mainframe Computers
4. Supercomputers

Microcomputers

The least expensive device that we normally call a “computer” is microcomputer. A microcomputer is a computer system which is small in size. It includes hardware, operating system and application software. You can divide the large number of microcomputers into following categories:

Home computers: A home computer is a microcomputer that is designed primarily for use in the home.

Laptop computers: A laptop microcomputer is designed to use while travelling. The most important characteristics of these computers are their compactness i.e. their size and light weight.

Workstation: A powerful, single-user computer. A workstation has a powerful microprocessor and, in general, a higher-quality monitor.

Personal Computer: Personal computer or PC is a small, single-user computer based on a less powerful microprocessor as compared to Workstation. It can be defined as a small, relatively inexpensive computer designed for an individual user.

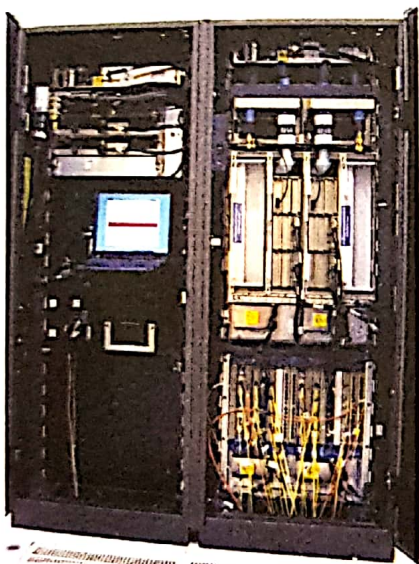
Types of PCs are: Desktop, Laptop, Notebook, Subnotebook, Palmtop, PDA etc.

Minicomputers

A multi-user computer which is capable of supporting up to hundreds of users simultaneously. They are bigger in size than microcomputers. They have a higher processing speed and can be used by several users at a time.



Mainframe Computers



Mainframe computers are used in large organizations where a huge amount of data needs to be handled.

These are big, powerful and expensive systems. These computers are useful in areas like banks, airlines and government sectors. Examples of Mainframe computers are IBM Z series, PDP-10

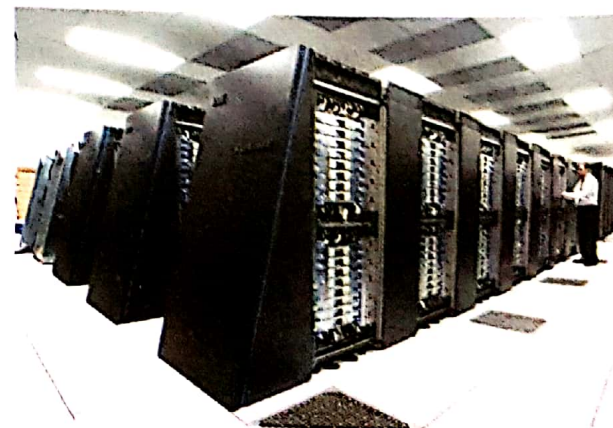
The advantages of mainframe computers are:

- A wide variety of memory size.
- The availability of large sophisticated operating system.
- The ability to handle large amount of computer applications such as railway reservations.

Supercomputers

An extremely fast computer that can perform thousands of instructions per second.

Supercomputers are very expensive and are employed for specialised applications that require immense amount of mathematical calculations. For example: weather forecasting, scientific simulations, nuclear energy research and analysis of geological data.



Computer language

Human needs language to communicate to each other, similarly computers also need a language to communicate, take the orders and perform operations. The language that is required by a computer is called programming language. These languages are used to instruct the computers. There are two kinds of computer languages: Low-level and High-level language.

Low level language

Low-level language is a programming language that deals with computer's hardware components. They are designed to operate and handle the entire hardware.

Programs and applications written in low-level language are directly executable on the computing hardware without any interpretation or translation.

These languages are often known as computer's native language.

High level language

High-level languages are considered to be more closer to human beings. These are easily read and understood as compared to low level languages. The first high-level programming languages were designed in the 1950s. Examples of high level language are Ada, Algol, BASIC, COBOL, C, C++, FORTRAN, LISP, Pascal and Prolog.

Difference between High level language and Low level language

High Level Language (HLL)	Low Level Language (LLL)
High Level Languages are easy to learn.	These languages are difficult to learn.
These languages are familiar to human languages.	Low level languages are not familiar to human languages.
Programs in high level languages are easy to modify.	Programs written in these languages are difficult to modify.
Knowledge of hardware is not required to write programs.	Deep knowledge of hardware is required to write programs.
Such languages are normally used to write application programs.	Such languages are normally used to write hardware programs.

Computer Capabilities

Speed

Computers are much faster as compared to human beings. Modern computer can execute millions of instructions in a minute that may take days if performed manually.

Accuracy

Computer can perform all the calculations and comparisons accurately, provided the hardware does not malfunction.

High Storage capacity

Computers can store a large amount of information within a very small space.

Reliability

Computers are more reliable than human beings. They never feel tired even if they have to work for very long hours.

Versatility

A computer is a very versatile machine. This machine can be used to solve the problems related to various fields. At one instant, a computer may solve a complex scientific problem, the very next moment it may play game of chess and then be busy in taking up a pay-roll problem.

Limitations of Computers

Lack of Decision Making Power: Computers cannot decide on their own.

IQ Zero: Computers have zero IQ. They need to be instructed on each and every step.

Beyond the chapter

Seymour Roger Cray was an American electrical engineer and supercomputer architect who designed a series of computers that were the fastest in the world for decades and founded Cray Research which would build many of these machines. He is known as "The Father of Supercomputing."

The first supercomputer was invented by NASA in 1960s to enable the Apollo missions to the moon.



Terms.....

Programming: It is a process of writing specific instructions in a computer language.

Program: Set of instructions which tells the computer what to do.

Versatility: Having a variety of skills.

Let's Summarise

- A microcomputer is a computer system which is small in size. It includes hardware, operating system and application software.
- Minicomputers are bigger in size than microcomputers with a higher processing speed.
- The mainframe computers are capable of supporting thousands of users at a time.
- Supercomputers are used for specialized applications that require a great amount of mathematical calculations.
- Low level language is a programming language that deals with the computer hardware and high level languages are considered to be more closer to human beings.
- Computer capabilities: Speed, Accuracy, high storage capacity, reliability and versatility.

Exercise

I Fill in the blanks:

four components Mainframe Computers Microcomputer

1. There are types of computer based on their sizes.
2. is a computer system in small size.
3. Hardware refers to the of the computer system.
4. are capable of supporting hundreds of users at a time.

II Write T for true and F for false for the following statements.

1. Low level language deals with the computer hardware.
2. Computer is a versatile machine.

3. Computers have zero IQ.
4. Supercomputers are used in banks.

III Lab Activity

Make a presentation on "Microcomputers".

IV Project

Prepare a chart describing any one type of computer along with the pictures.

V Write one word for the following:

1. Which language is machine independent?
2. Name some high level languages.
3. Which computers can do very large calculations?
4. What is the full form of HLL?

VI Short answer questions

1. Write a short note on microcomputer.
2. What is supercomputer?
3. What are the limitations of a computer?
4. Write a short note on HLL and LLL.

VII Long answer questions

1. Distinguish between high level languages and low level languages.
2. Describe the capabilities of computers.

VIII Multiple Choice Questions (MCQs)

1. The smallest and least expensive device that we normally call a computer is:

a. Supercomputer <input type="radio"/>	b. Mainframe Computer <input type="radio"/>
c. Microcomputer <input type="radio"/>	d. Minicomputer <input type="radio"/>
2. An extremely fast computer that can perform thousands of instructions per second:

a. Supercomputer <input type="radio"/>	b. Mainframe Computer <input type="radio"/>
c. Microcomputer <input type="radio"/>	d. Minicomputer <input type="radio"/>
3. High level languages are:

a. Easy to learn <input type="radio"/>	b. To write hardware languages <input type="radio"/>
c. Difficult to modify <input type="radio"/>	d. Far from human language <input type="radio"/>
4. Which of the following is not a high level language?

a. BASIC <input type="radio"/>	b. COBOL <input type="radio"/>
c. C++ <input type="radio"/>	d. Assembly language <input type="radio"/>