



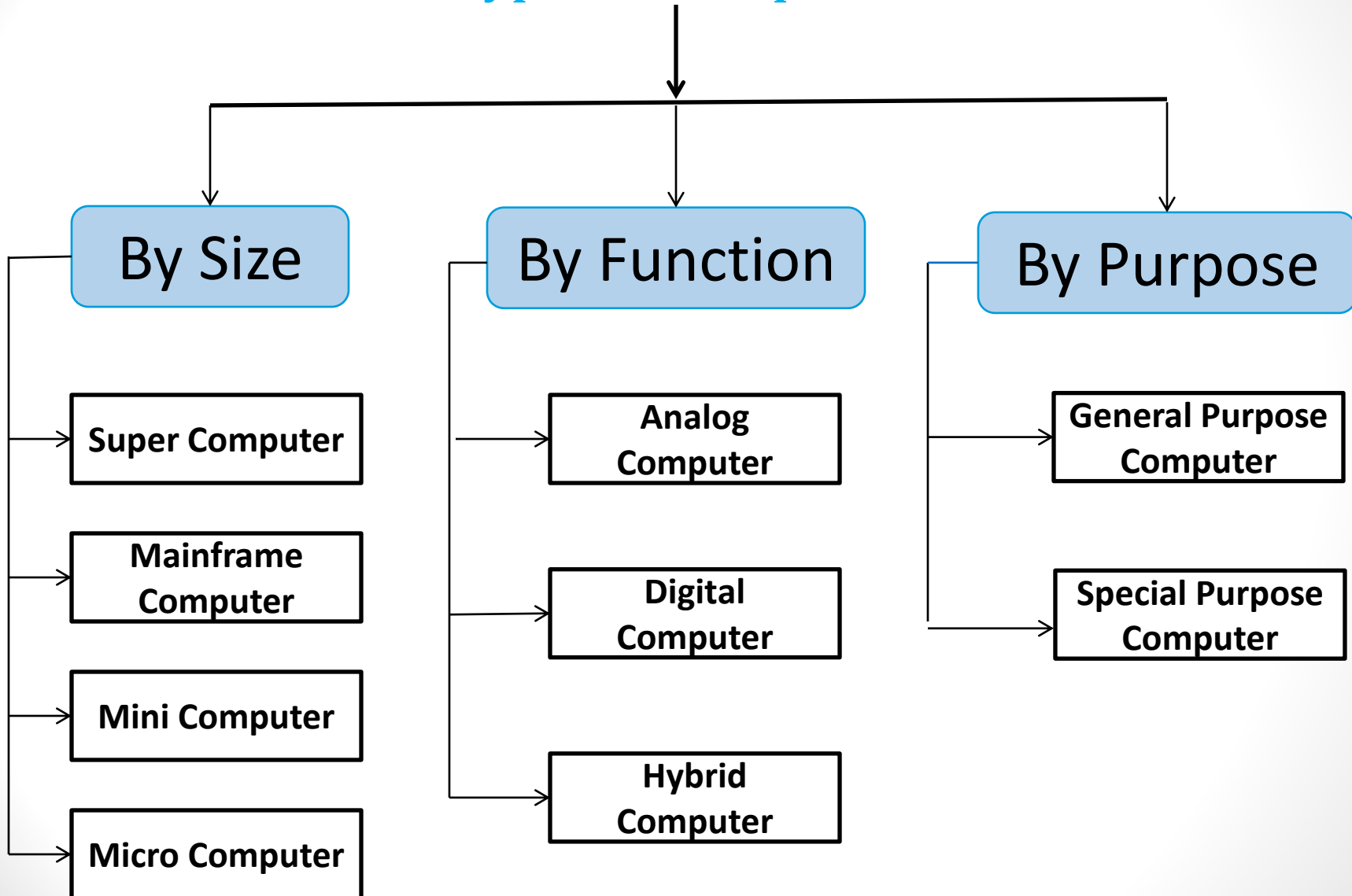
LECTURE - 03

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Outline

- Types of Computer

Types Of Computer



Types of Computers – Based on Size

1. Super Computer
2. Mainframe Computer
3. Mini Computer or Mini-frame Computer
4. Micro Computers or personal Computers

Super Computer

- Supercomputers are the biggest and fastest computers. They are designed to process huge amount of data. A supercomputer can process trillions of instructions in a second. It has thousands of interconnected processors.
- Super Computers are particularly used in scientific and Engineering applications such as Weather forecasting, Quantum Mechanics, Climate research, scientific simulations and nuclear energy research etc.

Characteristics or applications of supercomputers:

- It has the ability to decrypt your password to enhance protection for security reasons.
- It produces excellent results in animations.
- It is used for virtual testing of nuclear weapons and critical medical tests.
- It can study and understand climate patterns and forecast weather conditions.
- It has played a vital role in managing the online currency world such as stock market and bitcoin.
- It helps in the diagnosis of various critical diseases and in producing accurate results in brain injuries, strokes, etc.
- It helps in scientific research areas by accurately analysing data obtained from exploring the solar system, satellites, and movement of Earth.

Mainframe Computer

- Mainframe computers are designed to support hundreds or thousands of users simultaneously. They can support multiple programs at the same time. It means they can execute different processes simultaneously. These features of mainframe computers make them ideal for big organizations like banking and telecom sectors, which need to manage and process high volume of data.

Characteristics of Mainframe Computer

- It can process huge amount of data, e.g. millions of transactions in a second in the banking sector.
- It has a very long life. It can run smoothly for up to 50 years after proper installation.
- It gives excellent performance with large scale memory management.
- It has the ability to share or distribute its workload among other processors and input/output terminals.
- There are fewer chances of error or bugs during processing in mainframe computers. If any error occurs it can fix it quickly without affecting the performance.
- It has the ability to protect the stored data and other ongoing exchange of information and data.

Applications of Mainframe Computer

- **In health care**, it enabled hospitals to maintain a record of their millions of patients in order to contact them for treatment or related to their appointment, medicine updates or disease updates.
- **In the field of defence**, it allows the defence departments to share a large amount of sensitive information with other branches of defence.
- **In the field of education**, it helps big universities to store, manage and retrieve data related to their courses, admissions, students, teachers, employees and affiliated schools and colleges.
- **In the retail sector**, the retail companies that have a huge customer base and branches use mainframe computers to handle and execute information related to their inventory management, customer management, and huge transactions in a short duration.

Mini or Mini-frame Computer

- It is a midsize multiprocessing computer. It consists of two or more processors and can support 4 to 200 users at one time. Mini-frame computers are used in institutes and departments for tasks such as billing, accounting and inventory management. A minicomputer lies between the mainframe and microcomputer as it is smaller than mainframe but larger than a microcomputer.

Applications Mini or mini-frame Computer

A minicomputer is mainly used to perform three primary functions, which are as follows:

- **Process control:** It was used for process control in manufacturing. It mainly performs two primary functions that are collecting data and feedback. If any abnormality occurs in the process, it is detected by the minicomputer and necessary adjustments are made accordingly.
- **Data management:** It is an excellent device for small organizations to collect, store and share data. Local hospitals and hotels can use it to maintain the records of their patients and customers respectively.

Applications Mini or Mini-frame Computer

- **Communications Portal:** It can also play the role of a communication device in larger systems by serving as a portal between a human operator and a central processor or computer.

Characteristics of Mini or Mini-frame Computer

- It is light weight that makes it easy to carry and fit anywhere.
- It is less expensive than mainframe computers.
- It is very fast compared to its size.
- It remains charged for a long time.
- It does not require a controlled operational environment.

Micro or Personal Computers

- Microcomputer is also known as a personal computer. It is a general-purpose computer that is designed for individual use. It has a microprocessor as a central processing unit, memory, storage area, input unit and output unit. Laptops and desktop computers are examples of microcomputers. They are suitable for personal work that may be making an assignment, watching a movie, or at office for office work.

Characteristics of a Microcomputer:

- It is the smallest in size among all types of computers.
- A limited number of software can be used.
- It is designed for personal work and applications. Only one user can work at a time.
- It is less expensive and easy to use.
- It does not require the user to have special skills or training to use it.
- Generally, comes with single semiconductor chip.
- It is capable of multitasking such as printing, scanning, browsing, watching videos, etc.

Types Of Computer – Based On Types

- The **three** types of computers along with their functions are given below:
 1. Analogue Computer
 2. Digital Computer
 3. Hybrid Computer

Analogue computer

- Analogue computers are designed to process analogue data. Analogue data is continuous data that changes continuously and cannot have discrete values. We can say that analogue computers are used where we don't need exact values always such as speed, temperature, pressure and current.
- Analogue computers directly accept the data from the measuring device without first converting it into numbers and codes. They measure the continuous changes in physical quantity and generally render output as a reading on a dial or scale.
- **Example:** Speedometer, Analogue Clock, and mercury thermometer are examples of analogue computers.

Advantages of using Analogue computers

- It allows real-time operations and computation at the same time and continuous representation of all data within the range of the analogue machine.
- In some applications, it allows performing calculations without taking the help of transducers for converting the inputs or outputs to digital electronic form and vice versa.
- The programmer can scale the problem for the dynamic range of the analogue computer. It provides insight into the problem and helps understand the errors and their effects.

Digital Computer

- ✓ Digital computer is designed to perform calculations and logical operations at high speed. It accepts the raw data as input in the form of digits or binary numbers (0 and 1) and processes it with programs stored in its memory to produce the output.
- ✓ All modern computers like laptops, desktops including smartphones that we use at home or office are digital computers.

Advantages of Digital Computers

- ✓ It allows you to store a large amount of information and to retrieve it easily whenever you need it.
- ✓ You can easily add new features to digital systems more easily.
- ✓ Different applications can be used in digital systems just by changing the program without making any changes in hardware
- ✓ The cost of hardware is less due to the advancement in the IC technology.
- ✓ It offers high speed as the data is processed digitally.
- ✓ It is highly reliable as it uses error correction codes.
- ✓ Reproducibility of results is higher as the output is not affected by noise, temperature, humidity, and other properties of its components.

Hybrid Computer

- Hybrid computer has features of both analogue and digital computer. It is fast like an analogue computer and has memory and accuracy like digital computers. It can process both continuous and discrete data. It accepts analogue signals and convert them into digital form before processing. So, it is widely used in specialized applications where both analogue and digital data is processed.
- For example, a processor is used in petrol pumps that converts the measurements of fuel flow into quantity and price. Similarly, they are used in airplanes, hospitals, and scientific applications.

Advantages of using Hybrid Computer

- Its computing speed is very high due to the all-parallel configuration of the analogue subsystem.
- It produces precise and quick results that are more accurate and useful.
- It has the ability to solve and manage big equation in real-time.
- It helps in the on-line data processing.

Types of Computers – Based on Purpose

- On the basis of purpose, there are just two variety of computers. Those two varieties have been discussed in detail below:
 - General Purpose
 - Special Purpose
- **General Purpose:** Based on General Purpose, there are these following functions which a device is expected to perform:
 - Basic Input/Output functions
 - Calculations
 - Data Saving on a smaller scale
 - General performing activities

Types of Computers – Based on Purpose(cont.)

- These may include basic calculators, laptops, desktop computers, mobile phones, etc., which can help people with their basic necessary functions are included in the General Purpose computer type.
- **Special Purpose:** When a computer is designed specifically to perform a certain function, such type of computers is known as Special Purpose computer. These types may include:
 - Thermometers to test temperature
 - Generators to manage electricity
 - Devices used for analysing Climate Change
 - Large computers for IT Companies
 - Machines used at Manufacturing Units and the list goes on and on

Types of Computers – Based on Purpose(cont.)

- The special-purpose computers are important for various Organizations and their applications are made in a way that makes the work easy and efficient.

Any Questions?