# Classification of Computers:

A computer can be classified based on its size, capacity, and purpose.

The following diagram illustrates different types of computers as per their size, capacity, and purpose.

# Classification of Computer

## Based on Size

Micro Computer

Mini Computer

Mainframe Computer

Super Computer

## Based on Capacity

Analog Computer

Digital Computer

Hybrid Computer

## Based on Purpose

Special Purpose

General Purpose

# Computer's classification based on Size

❖ **Micro Computer**

❖ **Mini Computer**

❖ **Mainframe Computer**

❖ **Super Computer**

**Micro Computers:**

❖Microcomputers, also known as personal computers (PCs), are a type of computer designed for individual use.

❖They are distinguished by their compact dimensions, small size, processing power, compatibility, internet connectivity, portability, low price, and versatility.

**Example:**

Some of the popular microcomputers are laptops and desktops, standard PCs, mobile phones, and notebooks.

**Uses of Microcomputers:**

Microcomputers are most widely used in education and learning, entertainment and media, innovation and creativity, research and science, healthcare and medicine, home automation, remote work, and e-commerce and online shopping.

**Mini Computers:**

❖ A minicomputer is a type of computer that is smaller in size than large computers.

❖ It possesses all the capabilities of a large computer.

❖ Hence, it is a midsize multi-processing system capable of supporting up to 250 users simultaneously.

**Example:**

Some of the popular minicomputers are the PDP-11, IBM's AS/400e, Honeywell 200, and TI-990.

## Uses of Minicomputers:

Minicomputers are most widely used in scientific computations, engineering, business transaction processing, file handling, and database management.

## Mainframe computer

The mainframe is very large and is an expensive computer capable of supporting hundreds or even thousands of users simultaneously.

The mainframe executes many programmes concurrently and supports simultaneous execution of programmes.

**Example:**

Some of the popular mainframe computers are IBM zSeries mainframes (BM z14 and IBM z15), Unisys ClearPath, Fujitsu GS21 Series, and Hitachi VOS3.

**Uses of the Mainframe:**

Mainframe computers are most widely used in finance, government, healthcare, and more.

## Supercomputer

A supercomputer is a special type of computer that is more powerful and capable of high-performance computing.

It is specifically designed to compute complex and intensive tasks that regular computers cannot do efficiently.

**Example:**

Some of the popular supercomputers are Fugaku, Google Sycamore, Baidu's quantum supercomputer, and Sierra.

## Uses of the Supercomputer:

Supercomputers are most widely used in scientific research, data analysis, weather forecasting, scientific simulations, graphics, fluid dynamic calculations, nuclear energy research, electronic design, and the analysis of geological data.

# Computer's classification based on Capacity

❖**Analog Computer**

❖**Digital computer**

❖**Hybrid computer**

# Analog Computer

A computer that uses physical means like mechanical or hydraulic components to do the computation rather than electronic circuits is called an analogue computer.

These computers work with continuous data and can manage physical quantities efficiently.

They are particularly good at solving differential equations and simulating dynamic systems.

## Digital Computer

A digital computer is a type of computer that represents and processes data using discrete, distinct values.

In digital computers, data is processed using binary numbers 0 and 1.

These computers are designed to perform arithmetic calculations and complex data processing and manipulation.
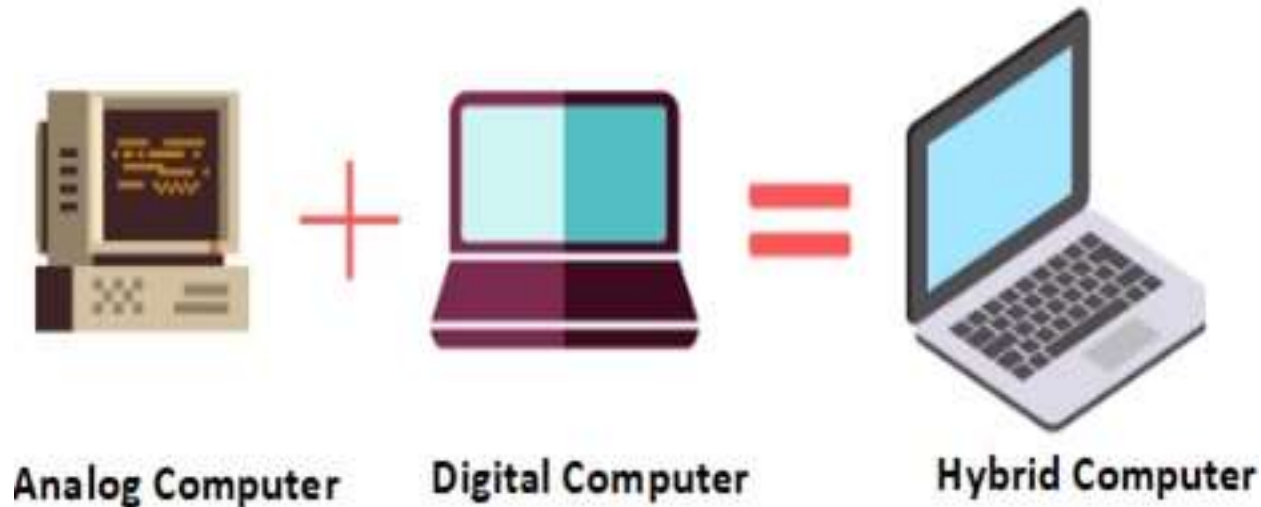
The main components of a digital computer are input, processing, and output.

# Hybrid Computer

A hybrid computer is a type of computer system that integrates the features and capabilities of both analogue and digital computers.

This integration allows the hybrid computer to perform various tasks efficiently by leveraging the strengths of both digital and analogue technologies.



Analog Computer     Digital Computer     Hybrid Computer

The main components of a hybrid computer are the analogue and digital components –

**Analog Component** – Analogue components in a hybrid computer can process real-world data like voltage, current, temperature, pressure, etc. using analogue circuits and components.

**Digital Component** – Digital computers work with discrete data and are based on binary numbers (0s and 1s).

Digital components in a hybrid computer provide the computational power to perform complex calculations and control the overall operation of the system.

# Computer's classification based on Purpose

❖**Special Purpose**

❖**General Purpose**

## Special Purpose Computer

A computer that is designed and optimised for a specific task or set of tasks is called a special purpose computer (SPC).

SPCs are designed to excel at a single or limited set of functions, frequently with a high degree of efficiency, speed, and accuracy.

Some of the following popular SPCs are:

**Embedded Systems** – These systems are integrated with devices to control specific functions. For example, a car's engine control unit and microwave ovens

**Digital Signal Processors** – These are commonly used in applications like audio processing, image compression, and telecommunications.

**Automated Teller Machines** – ATMs are special-purpose computers designed specifically for banking transactions and interactions with customers.

**Medical Equipment** – Machines like MRI and CT scanners are specialised computers used for capturing and processing medical images.

**Spacecraft Computers** – Computers used in spacecraft have to operate in extreme conditions and are optimised for the demands of space missions.

# General Purpose Computer

A computer that is designed to perform a wide range of tasks and functions is called A General Purpose Computer (GPC).

A GPC is versatile and can be used for various purposes by running different software and applications.

Some of the following popular GPCs are as –

**Turing Completeness** – A GPC can simulate any algorithm or computation that can be explored algorithmically.

**Programmability** – GPCs can run different applications.

**General-Purpose Operating System** – GPCs like Windows, macOS, or Linux that provide an interactive user interface and manage hardware resources, enabling the execution of various application programmes.

**Input and Output Capabilities** – GPCs have input and output devices (keyboard, mouse, monitor, etc.) that permit users to interact with the system and receive feedback.