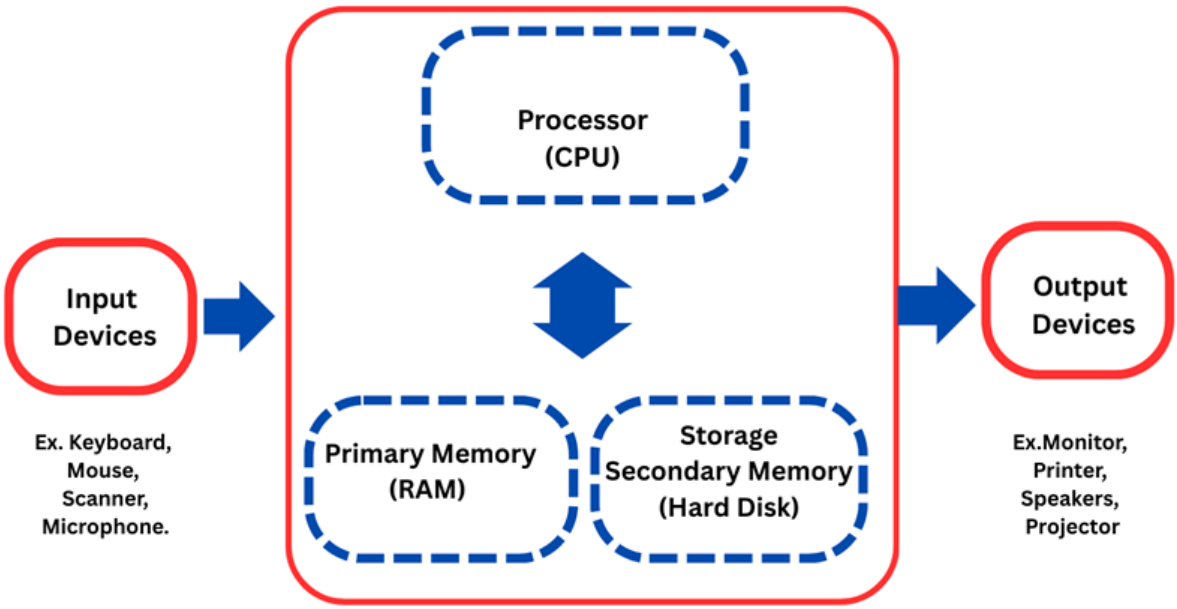
What is a Computer?

A computer is an electronic device that accepts data (input), processes it (using instructions-software), and produces information (output). It can also store data.

It has two main parts:

1. **Hardware** → **T**he physical parts (that you can touch).
2. **Software** → Set of instructions (that makes the hardware work).



Hardware Components

These are the physical parts of a computer system.

Main Hardware Components:

1. **Input Devices –** Used to give data to the computer.
   Examples: Keyboard, Mouse, Scanner, Microphone.

2. **Output Devices –** Show the result of processing.
   Examples: Monitor, Printer, Speakers, Projector.

3. **Central Processing Unit (CPU) –** The brain of the computer.
   ALU (Arithmetic Logic Unit) → Performs calculations and logical operations.
   CU (Control Unit) → Controls the flow of data.
   Registers → Small storage locations inside CPU.

4. **Memory / Storage**
   Primary Memory (RAM, ROM) → Fast, temporary storage.
   Secondary Storage (Hard Disk, SSD, Pen Drive, CD/DVD) → Permanent storage.

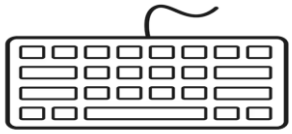
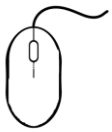
5. **Motherboard –** Main circuit board that connects all components.

6. **Power Supply Unit (SMPS) –** Converts electricity to power the computer.

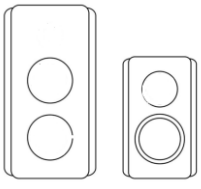
7. **Networking Devices (optional) –** Wi-Fi card, LAN card.

Output & Input Devices

Input Devices: Input **Devices** are the devices through which instructions or data can be given to computers. **(Ex.** Keyboard, Mouse, Scanner**).**

		
Keyboard	**Mouse**	**Scanner**

Output Devices: Output Devices are those devices through which results of given data can be displayed **(Ex.:** Monitor, Printer, Speakers**).**

		
Monitor	**Scanner**	**Speaker**

Software Components

Software is a set of instructions (code) that tells (instructs) the computer to perform task.

Types of Software:

1. **System Software – Manages hardware and provides a platform for other software.**
   Operating System (OS) → Windows, Linux, macOS, Android.
   Utility Programs → Antivirus, File Compression tools.

2. **Application Software – Programs for specific tasks.**
   MS Word, Excel, Web Browsers, Games, Media Players.

3. **Programming Software – Used to create other software.**
   Compilers, IDEs, Editors, Debuggers.

Benefits of Computer

1. **Speed –** Performs millions of operations per second.

2. **Accuracy –** Gives correct results if instructions are correct.

3. **Automation –** Reduces manual effort.

4. **Storage –** Can store large amounts of data.

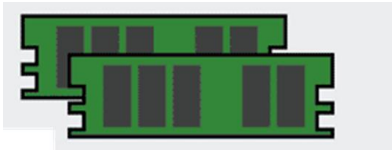
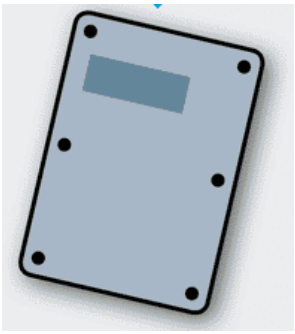
5. **Communication –** Connects people worldwide via the Internet.

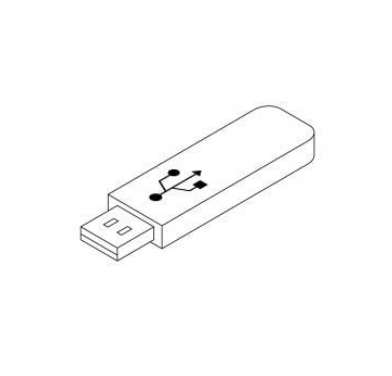
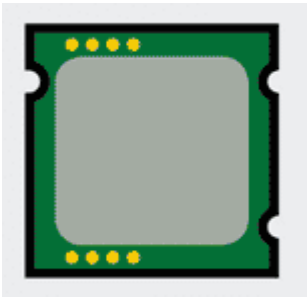
6. **Multitasking –** Can handle many tasks at the same time.

7. **Entertainment –** Movies, music, games, and creativity tools.

Computer Memory

1. **Primary Memory**
   - **RAM** (Random Access Memory) – Temporary, fast, volatile.
   - **ROM** (Read Only Memory) – Permanent, stores boot instructions.
2. **Secondary Memory**
   - Hard disk, SSD, CD/DVD, Pen drives – Permanent storage.
3. **Cache Memory** – High-speed memory between CPU and RAM.

RAM	ROM	Hard Drive
		

Pen Drive	CD	CPU
		

Storage Devices & Importance

1. Hard Disk Drive (HDD) – Large storage capacity.
2. Solid State Drive (SSD) – Faster than HDD.
3. Optical Discs (CD/DVD/Blu-ray) – Portable, less common today.
4. Pen Drive / USB – Small, portable, reusable.
5. Cloud Storage – Online storage (Google Drive, OneDrive).

Importance: Stores data, programs, backups, and multimedia for long-term use.

Different Types of Printers

- **Impact Printers**
  Dot Matrix Printer – Prints by striking pins.

- **Non-Impact Printers**
  Inkjet Printer – High-quality, uses liquid ink.
  Laser Printer – Fast, high-quality, uses toner.
  Thermal Printer – Used for receipts, heat-sensitive paper.

Introduction to Artificial Intelligence (AI)

- Artificial Intelligence (AI) means giving machines the ability to think and act like humans.

- AI can learn, solve problems, and make decisions.

- Examples Of AI Use:
  Google Assistant, Siri, Alexa (voice assistants).
  Self-driving cars.
  Face recognition on mobile phones.

AI is the future of computers, making machines smarter.

Types of Computer Languages

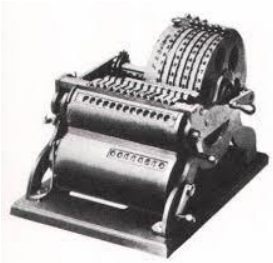
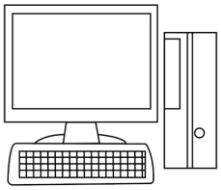
1. **Machine language:** uses binary (0s and 1s).

2. **Assembly language:** uses symbols and mnemonics.

3. **High-level languages:** like C, Java, Python are easy for humans to understand.

4. **Fourth Generation Languages (4GLs) and scripting languages:** (SQL, JavaScript) simplify complex tasks.

History of Computers

			
Abacus	Mechanical Calculator	Analytical Engine	Modern Computer

Computers developed in generations:

Abacus (early calculator) – 3000 BC.

The **Abacus** is considered the first calculating device, invented in ancient times.It used beads on rods to perform simple arithmetic operations like addition and subtraction.

Mechanical Calculators – 1600s (Pascal, Leibniz).

Inventors like **Blaise Pascal** (Pascaline) and **Gottfried Leibniz** built mechanical calculators.These machines could perform addition, subtraction, multiplication, and division using gears and wheels.

Analytical Engine – **Charles Babbage –** "Father of Computer," designed the Analytical Engine in 1837 , known as the **"Father of the Computer".** It was the first concept of a programmable machine, with input, memory, processing, and output units.

Modern Computers – Modern computers began in the **1940s** with the invention of **vacuum tube–based machines** like ENIAC.Since then, computers have evolved in **five generations**, using transistors, ICs, microprocessors, and AI.

<u>Generations of Computers</u>

First Generation (1940–1956) : Used **vacuum tubes were** huge, costly, and generated heat. **Examples :** ENIAC, UNIVAC.

Second Generation (1956–1963) : Used **transistors**, which made computers smaller and more reliable. **Examples :** IBM 1401.

Third Generation (1964–1971) : Used **Integrated Circuits (ICs)**, making computers faster and cheaper. **Examples :** IBM 360 series.

Fourth Generation (1971–Present) : Used **microprocessors**, leading to personal computers and laptops. **Examples :** Apple, IBM PC.

Fifth Generation (Present & Future) : Focuses on **Artificial Intelligence, robotics, quantum computing, and machine learning**. These computers can learn, decide, and solve problems like humans.

Introduction to Windows

1. Operating System and its Functions

- An Operating System (OS) is a special program that runs the computer.
- It controls both hardware and software.
- **Examples:** Windows, Linux, macOS, Android.

Functions of an Operating System:

1.Starts the computer (booting).
2.Provides a user interface (desktop, icons, menus).
3.Manages files and folders.
4.Controls input and output devices.
5.Runs application software (MS Word, Paint, etc.).
6.Provides security (user accounts, passwords).

2. Exploring the Desktop

- **The desktop is the main screen that appears after starting Windows.**
- **Parts of Desktop:**
  Icons → Small pictures representing programs/files (e.g., Recycle Bin, My Computer).
  Taskbar → Bar at the bottom of the screen, shows open programs and the Start button.
  Start Menu → Used to open programs, shut down, search.
  Wallpaper → Background picture on the desktop.

3. Exploring My Computer (This PC)

- **My Computer / This PC helps us explore and manage files/folders.**
- **Shows drives like C: (hard disk), D: (DVD/CD), and USB drives.**
- **Helps to:**
  Open, copy, delete, or move files.
  Check available storage.

Access control panel and settings.

4. Exploring Windows

- **Window → A rectangular area on the screen where a program or file opens.**
- **Common parts of a Window:**
    - **Title Bar – Shows program/file name.**
    - **Menu Bar – Provides options like File, Edit, View.**
    - **Scroll Bar – Helps move up, down, left, right.**
    - **Minimize, Maximize, Close buttons – To adjust or exit windows.**

Windows allows multitasking → running many programs at the same time.

5. Applications of Windows

- **Windows makes computers easy to use.**
- **Some applications:**
    MS Paint – Drawing and coloring.
    Notepad – Writing small notes or text.
    MS Word – Preparing documents.
    Calculator – Doing calculations.
    Games & Entertainment – Playing games, music, videos.
    File Management – Storing and organizing data.