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((Computer Science))

Stage (1)

LEC- ((1))

Introduction to Computers

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Introduction to Computers

Hardware, Software, Data & Information, and ICT Basics

Learning Objectives

- Define a computer and explain the difference between hardware and software.
- Describe the basic components of a computer system and how they work together.
- Differentiate between data and information with real examples.
- Explain what ICT (Information and Communication Technology) means and where it is used.
- Identify common input/output devices and peripherals and how they connect to the CPU.



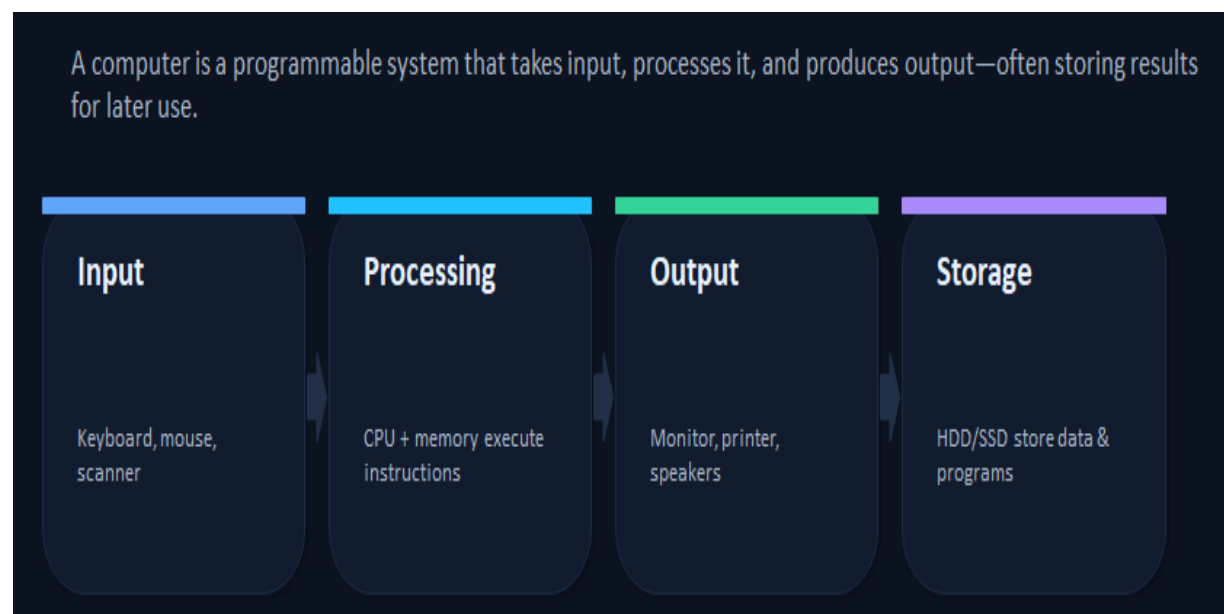
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Key Terms

Term	Meaning (short)
Computer	Electronic device that processes data to produce information.
Hardware	Physical components you can touch (CPU, memory, devices).
Software	Programs/instructions that tell hardware what to do.
Data	Raw facts (numbers, text, images) before processing.
Information	Processed/organized data that has meaning.
ICT	Technologies for creating, storing, and communicating information.
Peripheral	External device connected to the computer (keyboard, printer, etc.).

A computer is a programmable system that takes input, processes it, and produces output—often storing results for later use.





1. Concept of a Computer

A computer is an electronic system that accepts input (data), processes it using instructions (software), stores it, and produces output (information). Most computers follow the Input → Process → Output → Storage (IPOS) model.

The IPOS Model

Input: Data enters through input devices (keyboard, mouse, scanner, sensors).

Process: The CPU executes instructions and performs calculations/logic.

Output: Results are shown via output devices (monitor, printer, speakers).

Storage: Data/information is saved for later use (HDD/SSD, cloud storage).

Mini-Example

Typing your name (input) → CPU processes characters (process) → shown on the screen (output) → saved in a file (storage).

2. Hardware vs. Software

A computer system combines ****hardware**** (physical parts) and ****software**** (programs). They depend on each other.

Hardware (examples)

CPU, motherboard, RAM, storage (SSD/HDD)

Monitor, keyboard, mouse

Network card/Wi-Fi adapter, printer, scanner

Software (examples)

System software: Operating system (Windows, Linux, macOS), device drivers

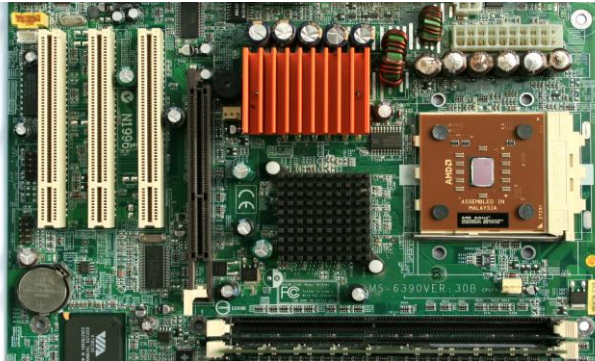
Application software: Word processors, browsers, media players, AI tools



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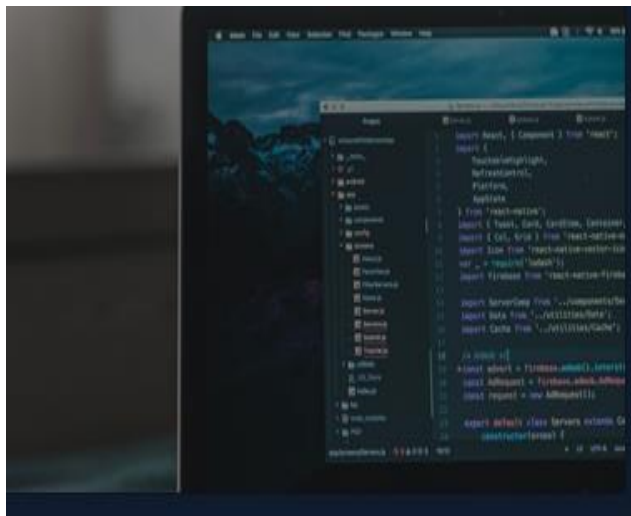


Hardware



- CPU, memory, motherboard
- Storage (HDD/SSD)
- Input/Output devices & cables

Software



- System software (OS, drivers)
- Application software (Word, browser, games)
- Utilities (backup, antivirus)



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3. Computing, Data, and Information

Computing refers to using computers to perform tasks such as calculation, storage, communication, and automation. At the heart of computing are **data** (raw inputs) and **information** (meaningful results).

Data vs. Information (quick comparison)

Item	Data	Information
Definition	Raw facts and measurements.	Processed and organized data with meaning.
Example	"37, 39, 41"	"Average temperature is 39°C"
Use	Input to processing.	Output used for decisions.



4. Applications of ICT

ICT (Information and Communication Technology) includes tools and networks that support information creation, storage, processing, and communication—such as computers, the Internet, mobile devices, and software platforms.

Common ICT application areas

Education (e-learning, hybrid learning platforms)

Healthcare (electronic records, telemedicine)

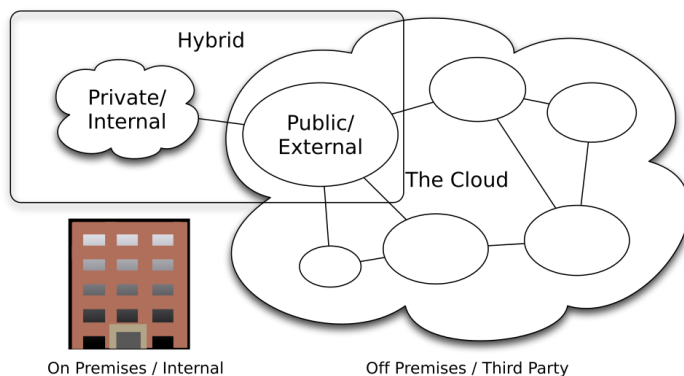
Business (e-commerce, ERP systems, digital marketing)

Government (e-services, digital identity)

Science and engineering (simulation, data analysis, AI/ML)



Cloud computing is one major ICT model.



Cloud Computing Types



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Where ICT is used:

- Education (online learning)
- Healthcare (telemedicine)
- Business (e-commerce, ERP, collaboration)
- Government services (digital identity, e-forms)
- Entertainment (streaming, social media)



5. Connecting Input/Output Devices and Peripherals to the CPU

Devices connect to the computer through ports and interfaces. Some are ****wired**** (USB, HDMI) and others are ****wireless**** (Bluetooth, Wi-Fi). The operating system uses ****device drivers**** to communicate with peripherals.

Keyboard



Mouse



Scanner



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Common ports & interfaces

USB (keyboard, mouse, storage, camera)

HDMI/DisplayPort (monitor/projector)

Audio jack / USB audio (headset, speakers)

Ethernet / Wi-Fi (network connection)

Bluetooth (wireless mouse/keyboard, headphones)