Operating System

DR. GHADA FATHY

Course Information

Lecturers:

– Dr. Ghada Fathy

Credit hours (2)

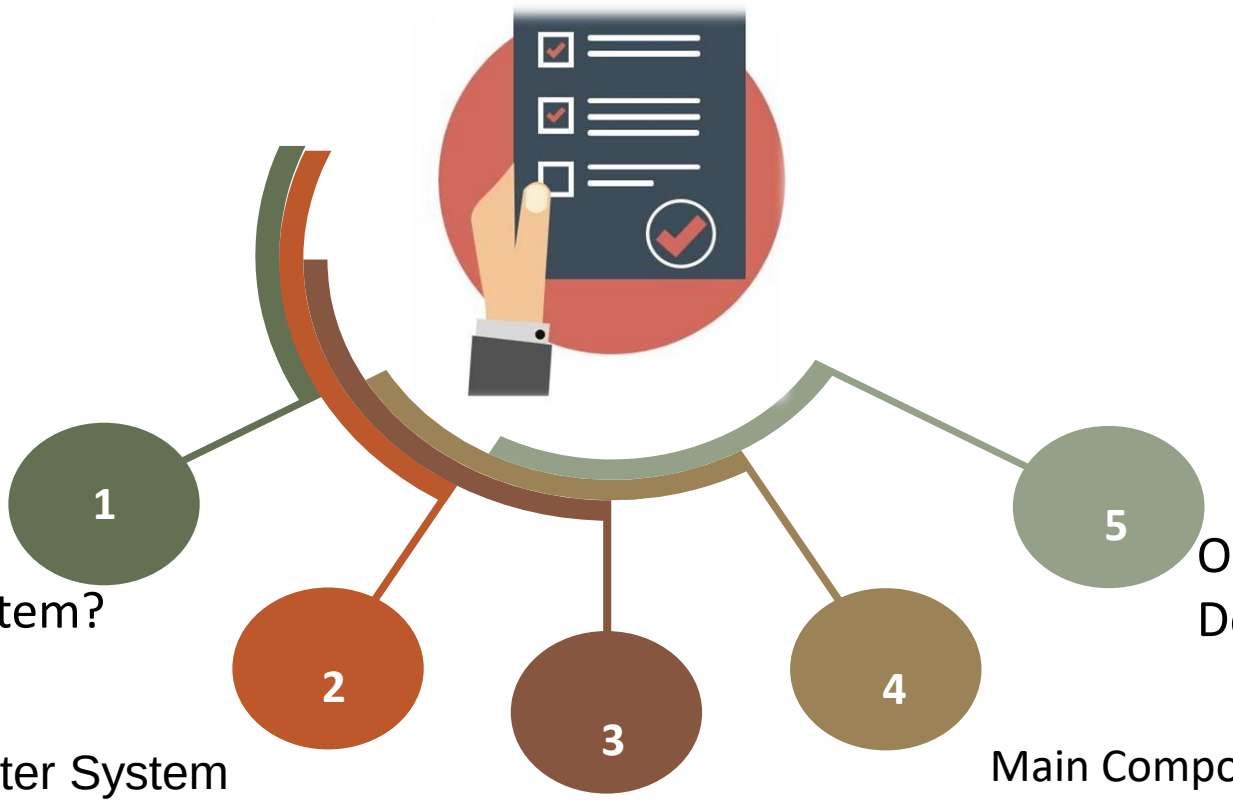
Requirements & Grading (Total 100 marks)

- Class work and attendance (30 marks)
- Midterm exam (20 marks)
- Final Exam during finals week (50 marks)

- Book Reference

  - Operating System Concepts (9th Edition)

Outlines



What is an Operating System?

Computer System Structure

What should the operating system prioritize

Main Components of a Computer System

Operating System Definition

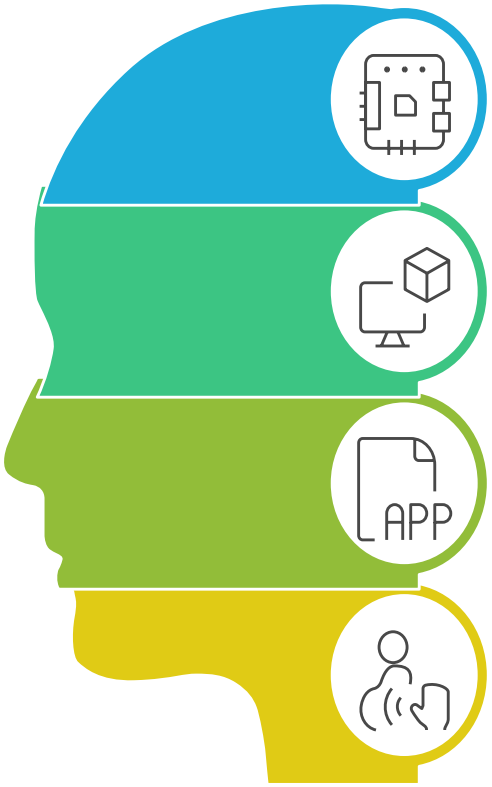
What is an Operating System?

A program that acts as an intermediary between a user of a computer and the computer hardware.

Operating system goals:

- Execute user programs and make solving user problems easier
- Make the computer system convenient to use
- Use the computer hardware in an efficient manner

Computer System Structure



Hardware

Provides basic computing resources
CPU, memory, I/O devices

Operating System

Controls and coordinates use of
hardware among various applications and users

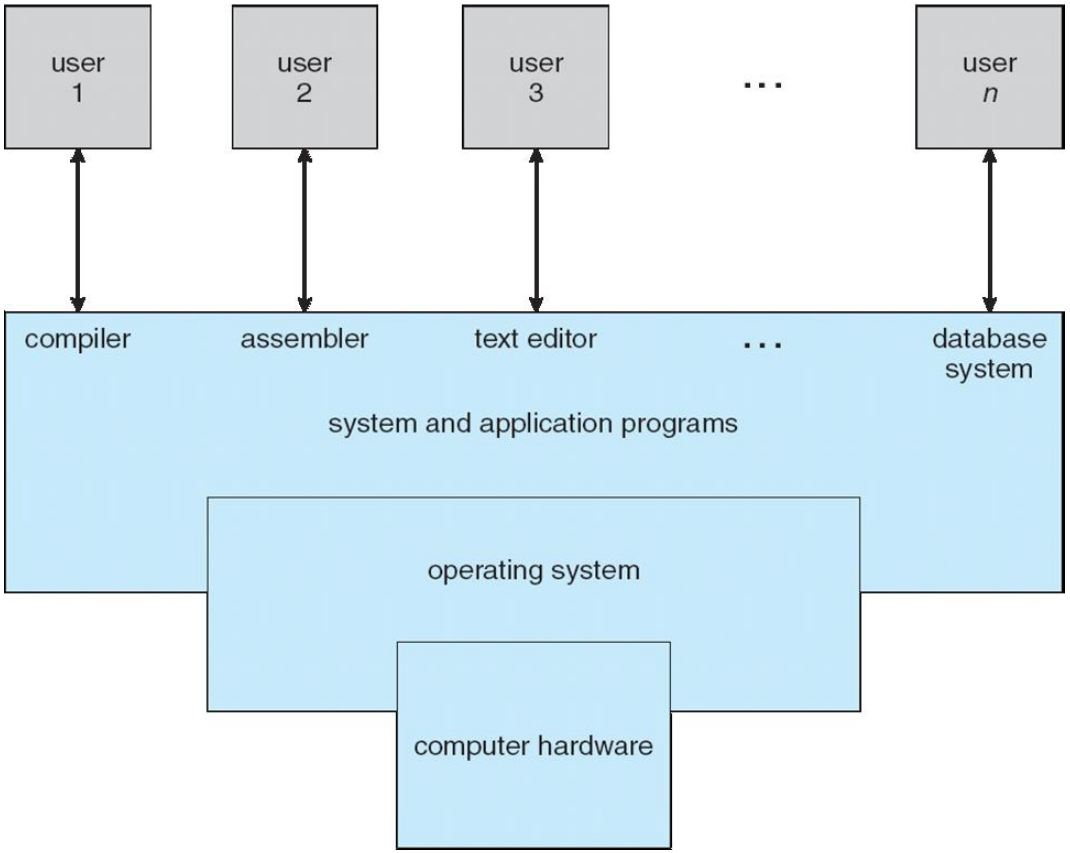
Application Programs

Defines how system resources are used to
solve the computing problems of the users

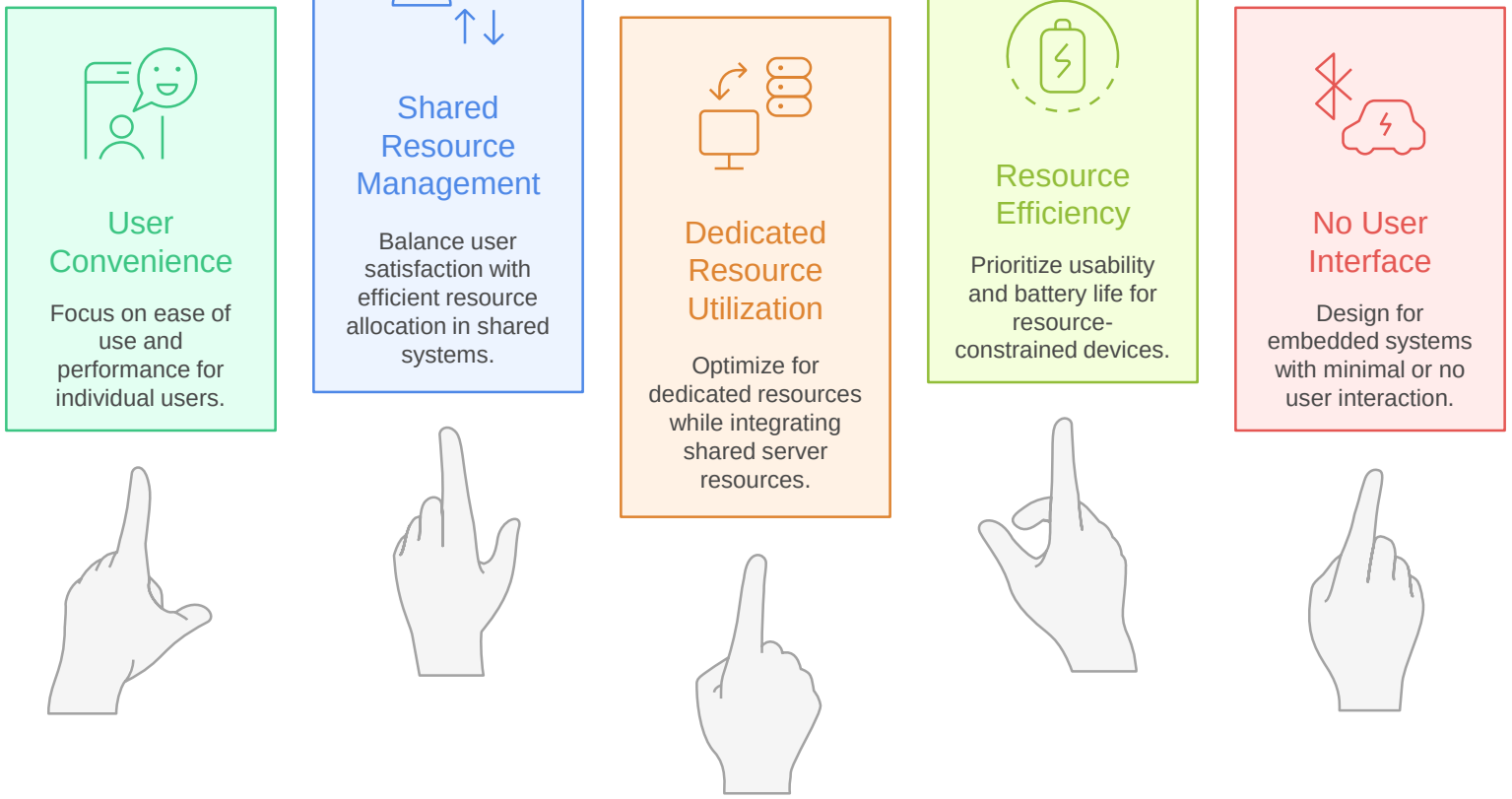
Users

People, machines, or other computers
interacting with the system

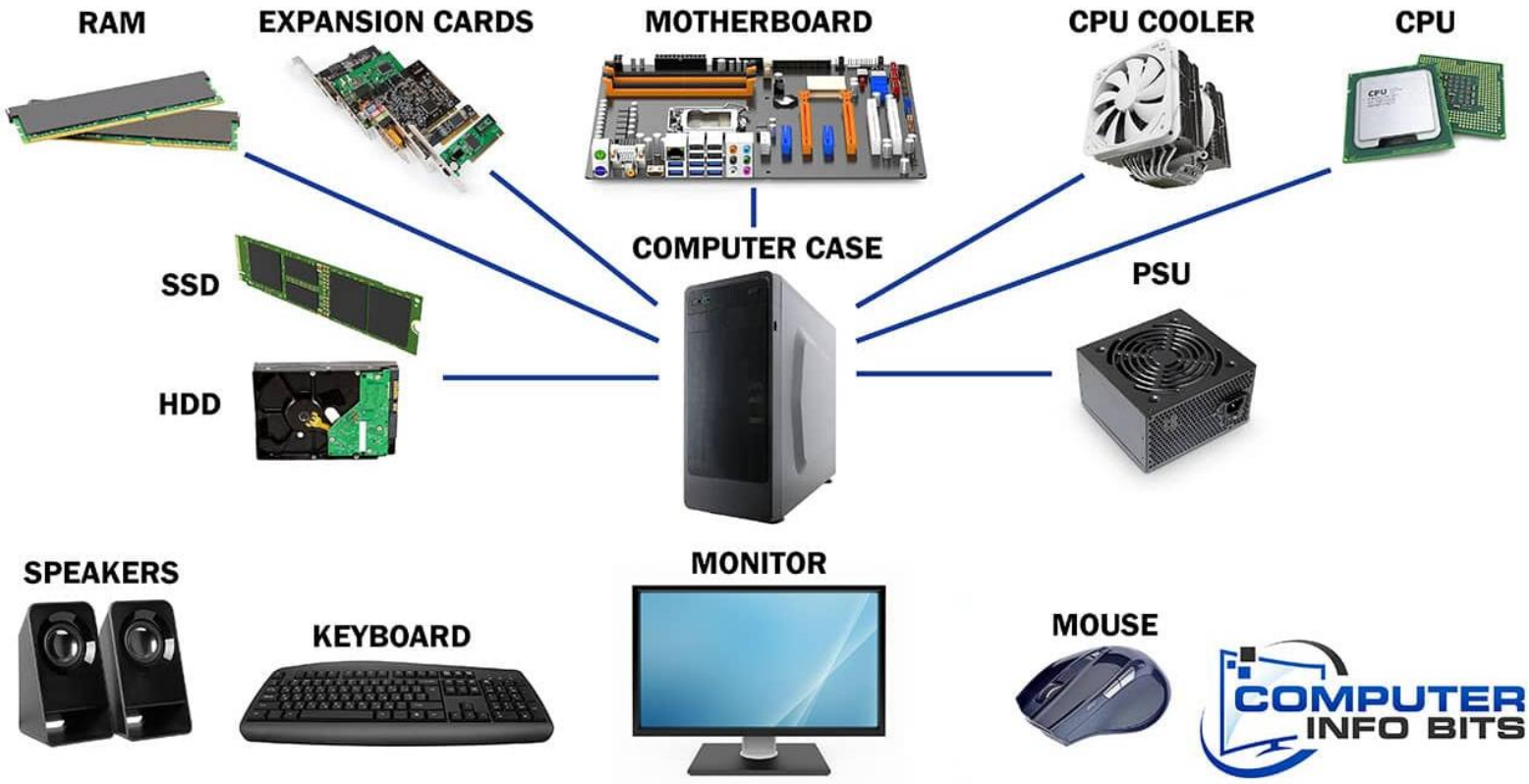
Four Components of a Computer System



What should the operating system prioritize?



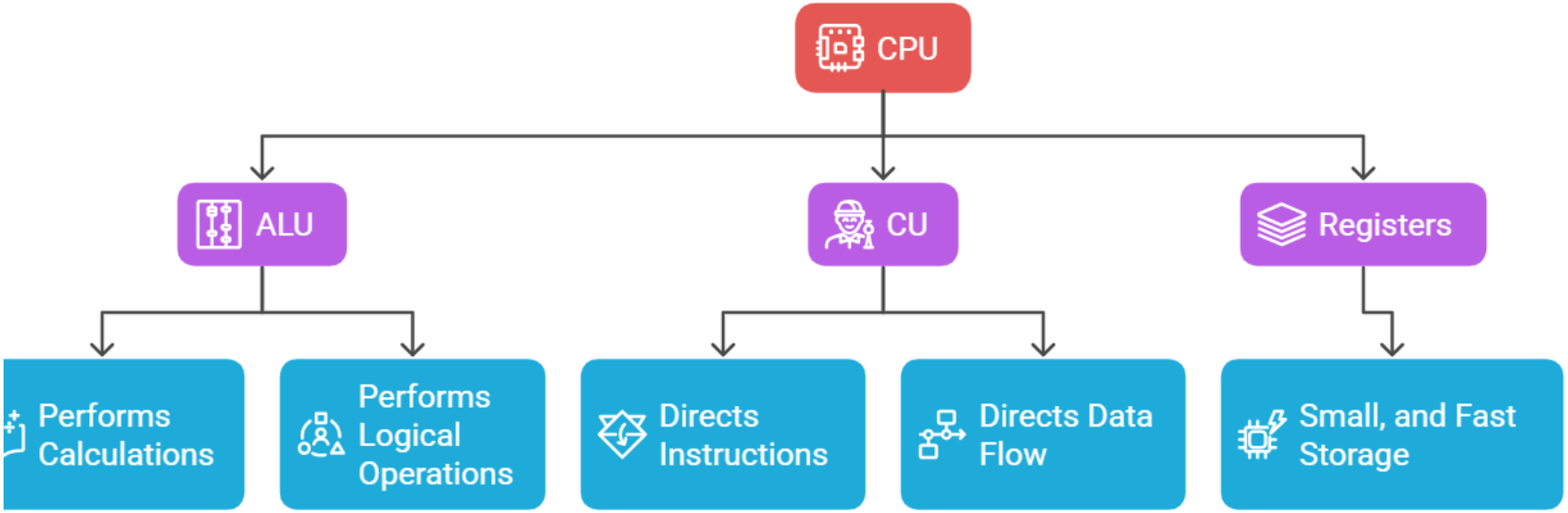
Main Components of a Computer System



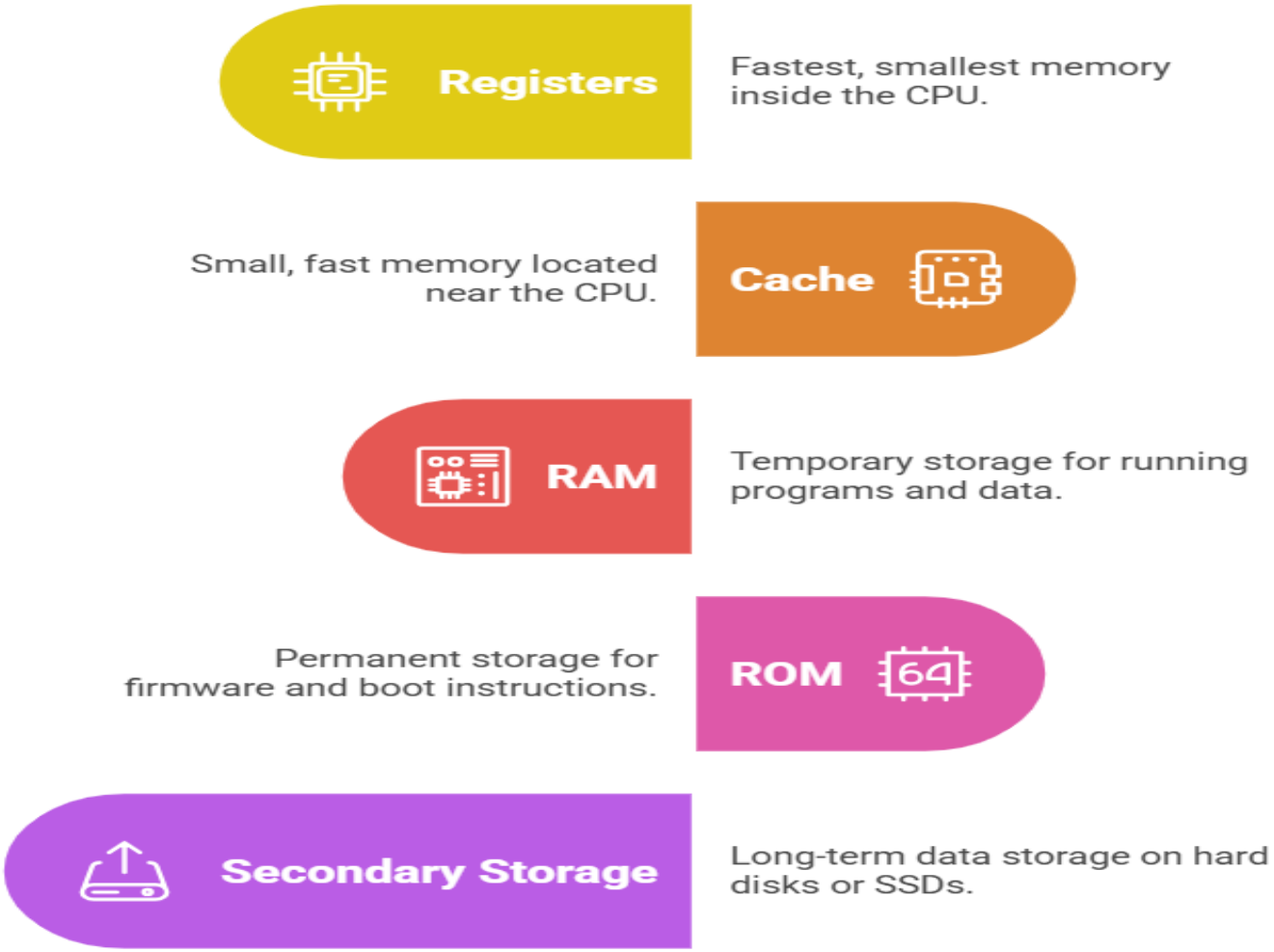
Central Processing Unit (CPU)

Brain of the computer.

Works with the **system clock** to execute instructions.



Memory (Storage Hierarchy)



Input/output (I/O) Devices

Input Devices

Devices that feed data into the system
ex: keyboard, mouse, Scanner

Output Devices

Devices that display or produce data from the system
ex: Monitor, Printer

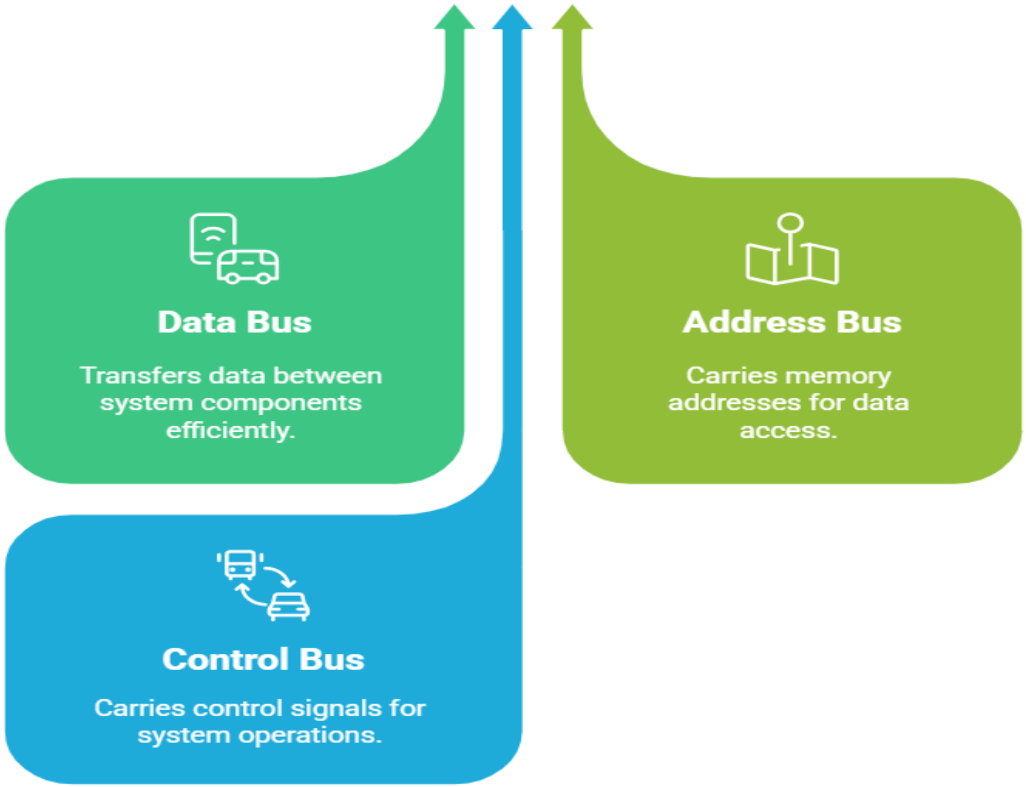
I/O Controllers

Components that manage the flow of data between devices

System Bus (Communication Pathways)

Connects CPU, memory, and I/O.

- Types of buses:



Network Interfaces

Controlled by **network controllers**

LAN Cards

Enable wired communication

Wi-Fi Cards

Enable wireless communication

Operating System Definition

OS is a **resource allocator**

- Manages all resources
- Decides between conflicting requests for efficient and fair resource use

OS is a **control program**

- Controls execution of programs to prevent errors and improper use of the computer