Al-Mustaqbal University

College of Engineering and Technology

Department of Medical Instrumentation Techniques Engineering

Class: First Class

Subject: Principle of Computer

Lecturer: Dr. Myasar Mundher Adnan

Lecture Address: Basic Concept of computer

2024 - 2025

Chapter One: Basic Concepts of Information Technology

- Introduction to Computers
- Computer Components (Hardware and Software)
- Applications of Computers in Society
- Introduction to Computer Networks
- Software Development and Benefits of Using Electronic Documents
- Computer Viruses

Introduction to Computers

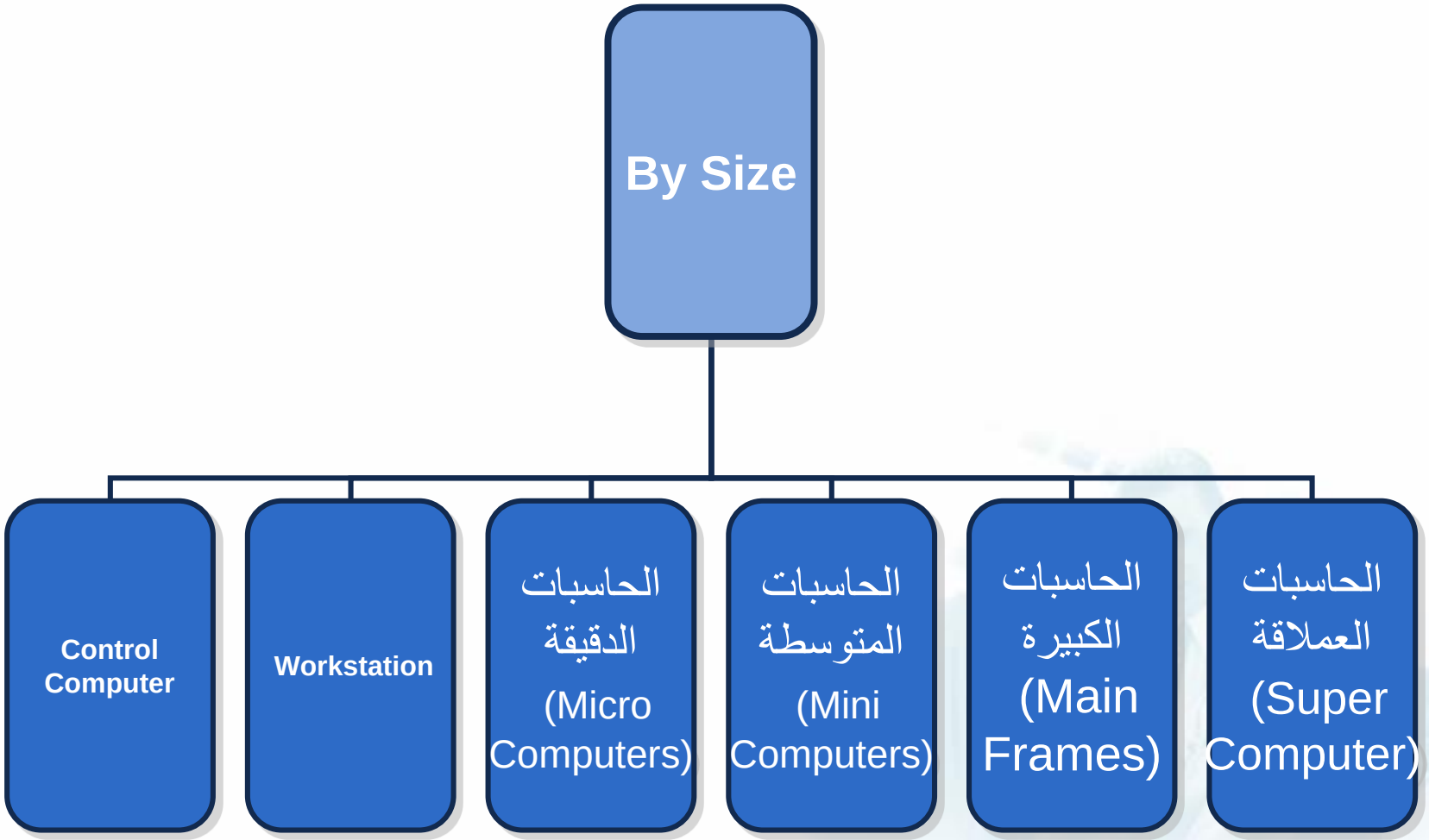
Definition of a Computer

- **Definition of a Computer:** It is an electronic device capable of storing data, processing it to extract information, and retrieving it again whenever requested.
- **Information and Data:** The inputs to the device are called data, which the computer processes or stores, while the outputs are referred to as information or results.

Features of Computers:

- **Speed:** Performs calculations and processes data quickly.
- **Accuracy:** The error rate is so minimal that it can be disregarded.
- **Storage Capability:** Stores vast amounts of information on internal (internal storage) or external disks (external storage).
- **Cost Efficiency:** Economical in terms of both cost and time.
- **Network Communication:** Provides fast networking services, saving time, effort, and costs, such as through global network services (web, Internet).

Types of computers (according to size):



Types of computers (according to size):

الحاسبات العملاقة (Super Computer):

- These are extremely fast machines capable of running dozens of programs simultaneously.
- They can store billions of characters in memory, utilizing the latest technological advancements for this purpose.
- Supercomputers can be connected to hundreds of peripheral devices.
- The cost of such devices can reach millions of dollars.
- They are exclusively used in fields like governmental scientific research, universities, and industrial application centers .

Types of computers (according to size):

الحاسبات الكبيرة (Main Frames):

- **Mainframe Computers:**
- They are characterized by their extremely high speed.
- They have the ability to serve hundreds of users simultaneously.
- They possess a large storage capacity.
- These computers are often connected to terminals and are commonly used in large companies and universities.

Types of computers (according to size):

الحاسبات المتوسطة (Mini Computers):

- They are smaller in size, have less storage capacity, and operate at lower speeds compared to mainframe computers.
- Suitable for small to medium-sized businesses, industrial control operations, and information communications.
- They typically require no more than eight individuals to operate.
- They are less expensive than mainframe computers .

Types of computers (according to size):

الحاسبات الدقيقة (Micro Computers):

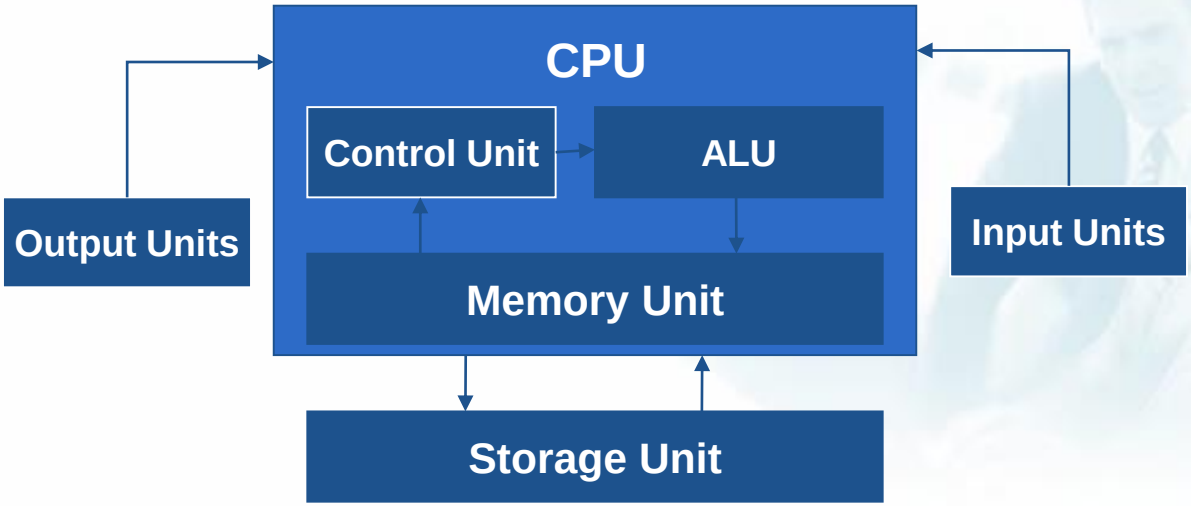
1. The smallest type in size, with limited storage capacity.
2. Also known as personal or home computers (Personal Computers).
3. They perform non-complex, general-purpose tasks.
4. Considered the cheapest type of computers and can only be used by one person at a time.

The components of a computer

مكونات الحاسب

Hardware المكونات المادية

1. (Processing Unit).
2. (Memory Unit).
3. (Input Units).
4. (Output Units).
5. (Storage Unit).



وحدة المعالجة المركزية (Processing Unit)

Control Unit

Arithmetic and Logic Unit
“ALU”

The unit of CPU speed is megahertz (MHz).

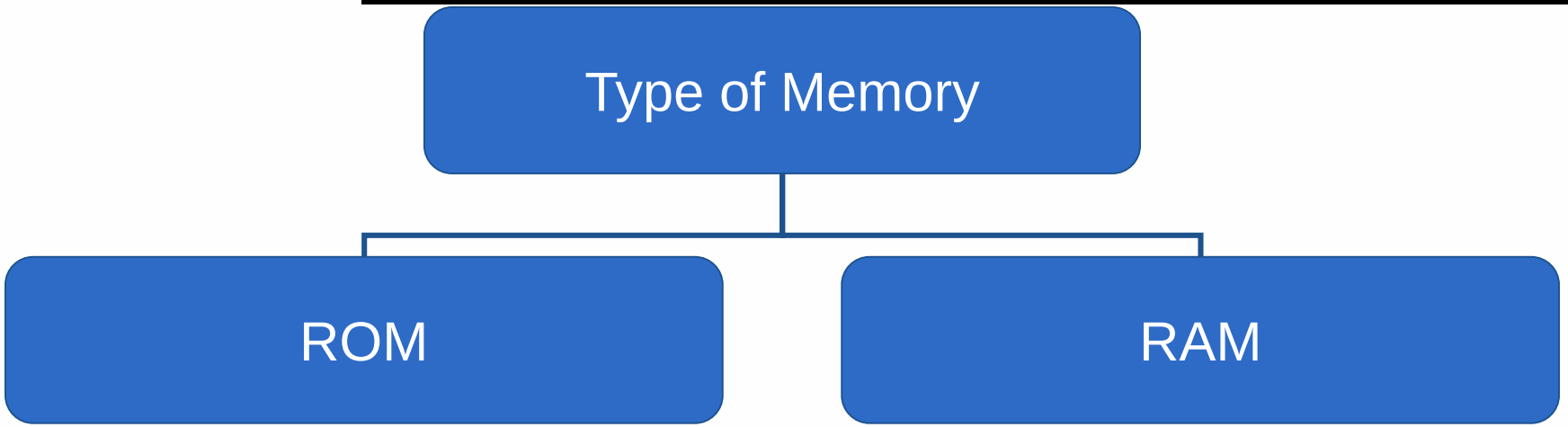
Central Processing Unit (CPU)

Central Processing Unit (CPU)

The Central Processing Unit (CPU) is similar to the human brain in its work, and it controls all arithmetic and logical operations, and is divided into:

- **Control Unit:** This is the part that controls all parts of the computer, and through it instructions are sent from one part to another.
- **Arithmetic and Logic Unit:** This is the part that performs all arithmetic and logical operations in the computer.

(Memory Unit) وحدة الذاكرة



- **Read-Only Memory (ROM)**
- **It does not lose its contents when the device is powered off.**
- **It stores essential data needed for the device to start up, such as information about connected input and output devices and operating system files.**
- **Its data can only be modified by specialized programmers.**

- **Random Access Memory (RAM)**
- **It loses its contents once the device is powered off.**
- **It is used to temporarily store data while working on the device and files that are changeable or can be written to.**
- **It is a user-accessible memory, allowing the user to interact with and modify its data.**

Input Units

Bar code reader

Keyboard

Scanner

Mouse

Keyboard

Output Units

Printer

Speakers

Monitor

In addition to plotters for creating large prints, such as architectural designs.

Units used for input and output:

Touch Screen

Infrared (IR) Devices and Bluetooth Devices:

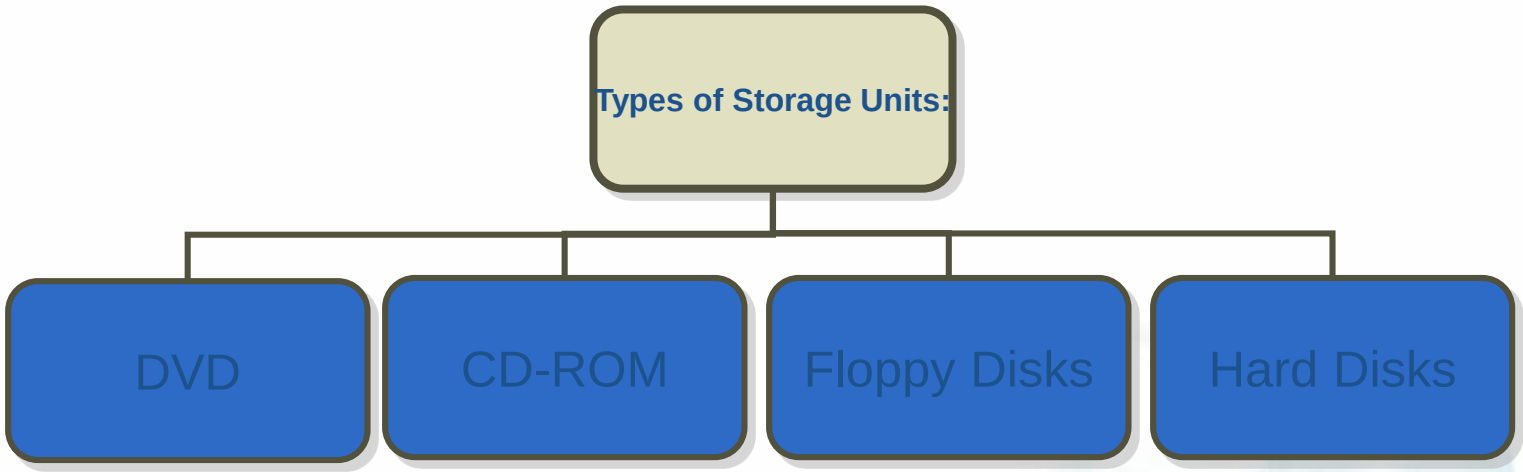
Storage Unit

External Storage Units
(Floppy Disk, Flash Memory, External Hard Drive)

Internal Storage Units
(Hard Disks الأقراص الصلبة)

Storage Unit

They are used to store data, which can be retrieved upon the user's request. These units do not lose their contents when the device is powered off.



Note: The term "optical discs" refers to both digital discs and compact discs (CDs) because they use laser technology for data storage.

Storage Unit

External Units

- External Hard Disk
- Flash memory
- Memory cards
- Zip Disk