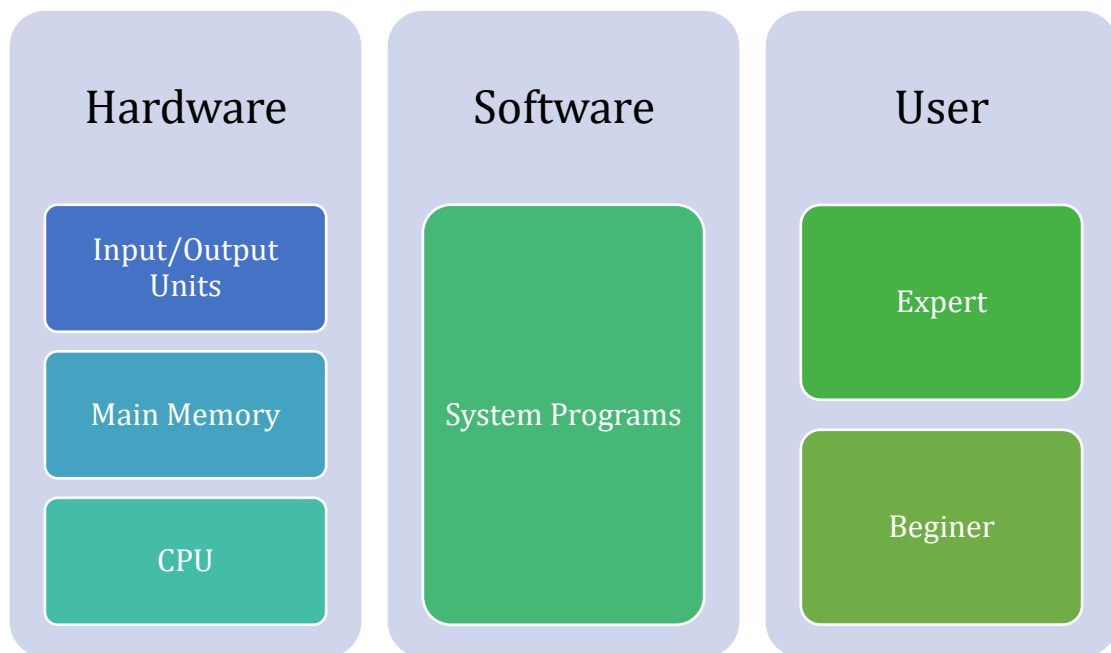


Lecture 1: Computer Fundamentals

📖 **Computer:** the Computer is electronic device consists of separate parts connected and directed using special orders to process the data.

📖 **The Computer system consist of:**

1. **Hardware:** The electronic and mechanical parts that's enable the computer to work.
2. **Software:** The series of instructions that tells the computer how to work.
3. **Users:** The peoples that use the computer.



📖 **The computer basic operations are:**

1. Receive the input data as pictures, texts, etc.
2. Processing the data to information as in mathematical operations, comparison etc.
3. Show output information (getting results).

📁 Computers types:

1. Supercomputer:

A *supercomputer* is considered to be the fastest type of computer available. It is very expensive due to the amount of information that needs to be processed on a daily basis. Supercomputers generally have specialized software programs installed and are typically used for scientific and engineering tasks such as forecasting weather, nuclear energy research, resource exploration, or animation.



2. Mainframe computer:

Mainframe computers are large enough to fill an entire room. They can simultaneously handle hundreds of different programs and users without sacrificing performance. They process large volumes of data at an incredible speed. Mainframes are commonly found in government agencies or large organizations, e.g., telephone companies, credit card companies, airlines, or universities. Often, users include members of the public who need access to this information. For instance, you access a mainframe computer whenever you use your bankcard at an automated teller machine (ATM).



3. Minicomputer:

Minicomputers can fill part of a room. Typically, they process data at a slower rate and in smaller volumes than the mainframe computers. Several people can use a minicomputer simultaneously; but as the number of users increases, each user would notice a reduction in speed. Minicomputers are commonly found in medium-sized manufacturing companies and legal or accounting firms. The point-of-sale terminals (cash registers) in a department store or the scanners in a grocery store would link to a minicomputer.



4. Microcomputer:

Microcomputers sit on, beside or under a desk. They process data quickly and are designed for one user. The cost is relatively low, depending on the type, model and features. These computers are found in small businesses, schools and homes.



5. Workstation:

A *workstation* is essentially any computer. It generally has been considered a computer that requires a lot of power for processing files, such as desktop publishing, graphics design, video editing and programming. Because of the high amount of resources needed, these workstations may not have a disk drive and could be connected to a centralized system that has enough space and power to handle the software and storage requirements. Workstations can either be connected to a network where multiple users share the same software or data files, or used by one person only.



📁 Elements of a Personal Computer:

The following picture shows an example of a *personal computer system (PC)*. The system unit or box, monitor, keyboard, and mouse are part of the system hardware. There are four major hardware component parts on a system unit: the Central Processing Unit (CPU), Random Access Memory (RAM), Input/Output (I/O) Devices, and Storage Devices.

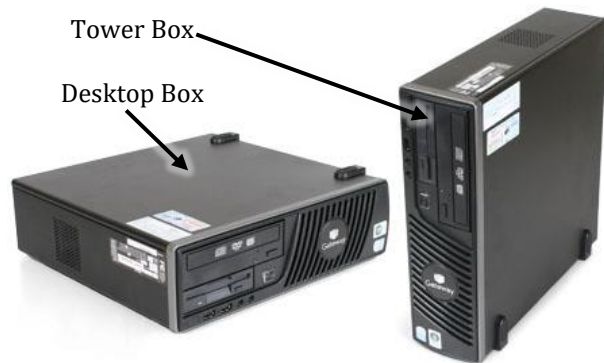


📁 Looking at the System Unit:

The *System Unit or Box* is often the most important and expensive part of the computer system. It comes as either a Desktop box or a Tower box. They both provide the same functionality.

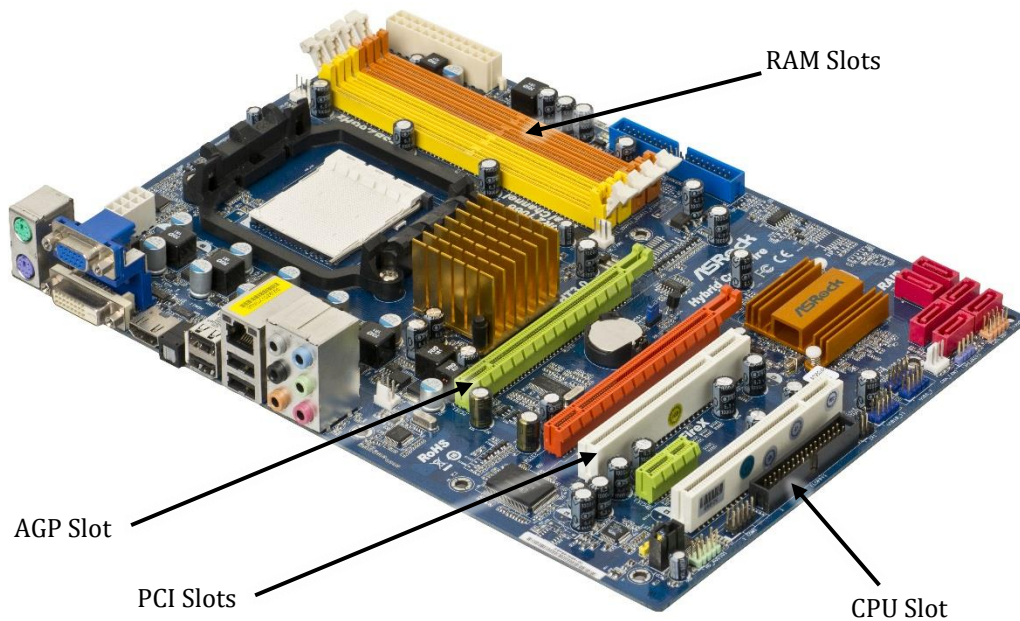
Inside the box, there are many separate devices that perform specialized functions for the computer. If one of these devices

fails, it is usually a matter of replacing the defective part. The power supply, which provides electricity to the devices, is also located inside the box. Descriptions of these components follow.



1. Motherboard:

The largest electronic circuit board in the computer is called the motherboard. It is the foundation of the computer and consists of the CPU, RAM, and ROM BIOS.



PCI Slots: Peripheral Component Interconnect; these slots allow you to add new components or cards in the computer, such as a modem or sound card.

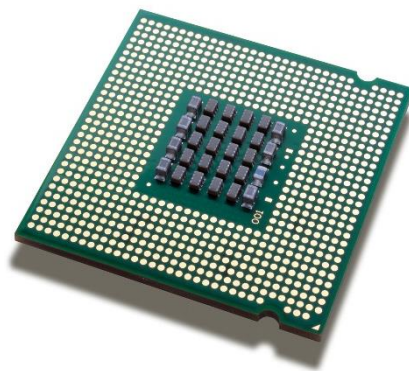
AGP Slot: Accelerated Graphics Port; this slot is meant for a card that can handle 3-D graphics.

CPU Slot: Central Processing Unit; this slot will contain the microprocessor chip.

RAM Slots: Random Access Memory; these slots are designed for these types of memory chips (covered later in this module).

2. The Microprocessor Chip:

The *microprocessor chip* is the “brain” of the computer and is located on the motherboard. This can also be referred to as the CPU or Central Processing Unit. It is the component that receives and executes instructions from the software programs and the user. Each model or type of CPU processes information and instructions at a different speed measured in Megahertz (MHz) or Gigahertz (GHz).



3. The Power Supply:

Every system box has a power supply that converts the AC (alternating current) coming from a wall outlet to the DC (direct current) format needed by a computer.



4. Hard Disk Drives:

Computers use hard disk drives (hard drive) as their primary storage for both data and programs. Many software programs must be installed onto a hard disk before you can actually use them.



5. CD Drives:

The CD-ROM (Compact Disk Read Only Memory) or CD drive is another form of data storage.



6. Memory:

Its either small chips fixed in slots in mother board or built in within the mother board.

Read Only Memory (ROM) BIOS: *The Read Only Memory - Basic Input/Output System (ROM BIOS)* is a group of integrated circuits responsible for starting the computer, checking the RAM and loading the operating system. This occurs only when the computer is first turned on or each time you have to restart (reboot) the computer.

Random Access Memory (RAM): *Random Access Memory (RAM)* is a kind of electronic pool of memory where the computer can hold programs and data. It is located on the motherboard with the CPU. The computer uses RAM to temporarily hold the current software program and the current data created by the user, this may also be referred to as system RAM. RAM is volatile — it only works when the computer is turned on and the information “vanishes” when the computer is turned off.