Tikrit University

College of Computer Sciences & Mathematics

Computer Science Department

First Stage
Lecture -3

Computer Organization

Lecturer

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Computer System Components

- ***Computer Components :*** *All the different pieces of electrical hardware that join together to make up the complete computer system.*
- ***Computer system*** *has two main components which when both combined makes the computer system . These are :*
  - Hardware .
  - Software .

Computer System Components

- ***Hardware*** *is the physical parts of the computer system, these parts can you touch and see. A motherboard, CPU, keyboard and a monitor are all items of hardware. Hardware is useless without software to run on it.*

- ***Software*** *is a collection of instructions that can be run on the computer. These instructions tell the computer hardware what to do. Software is useless unless there is hardware to run it on.*

Computer System Components

Software

System

Aplication

Hardware

Computer System Components

- **Computer system** is the combination of hardware and software. A typical of computer system has memory and a set of states that define the relationship between the system's inputs and outputs.

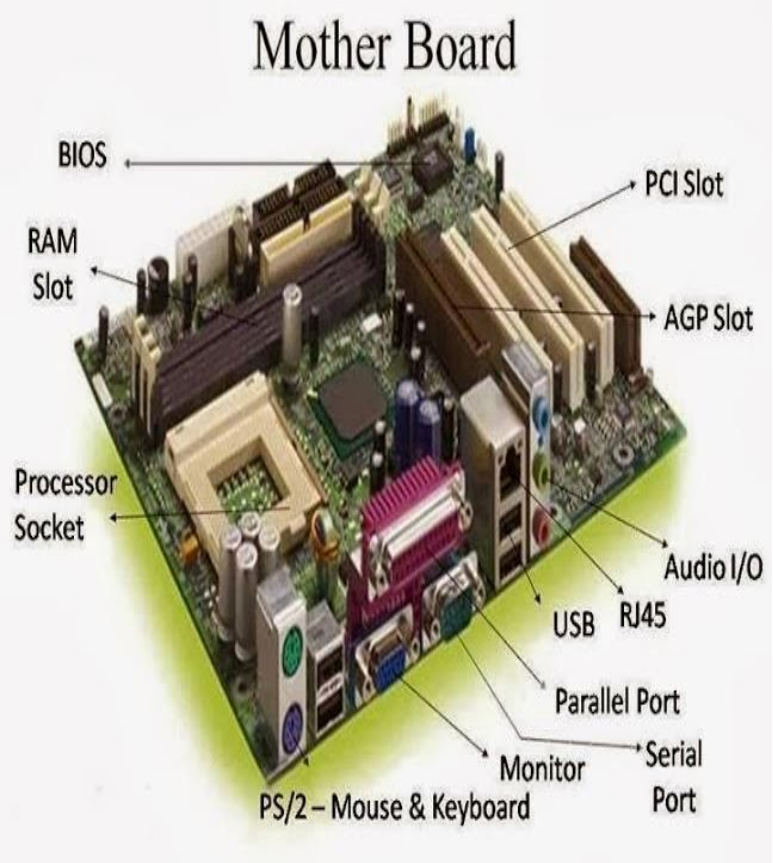
Internal Hardware Computer Components

- ***Internal computer components are designed to fit INSIDE the computer system and they all carry out important roles. We will discuss the following:***

- *Motherboard*
- *Processor (Central Processing Unit / CPU)*
- *Internal Memory (RAM and ROM)*
- *Video Card (graphics card)*
- *Sound Card*
- *Secondary Storage (Internal Hard Disk Drive)*

1 Motherboard

- *The motherboard is central to any computer system.*
- *Also known as the system board, the backplane, or the main board.*
- *All components plug into the motherboard either directly (straight into the circuit board) or indirectly (via USB ports).*
- *Once connected to the motherboard, the components can work together to form the computer system.*



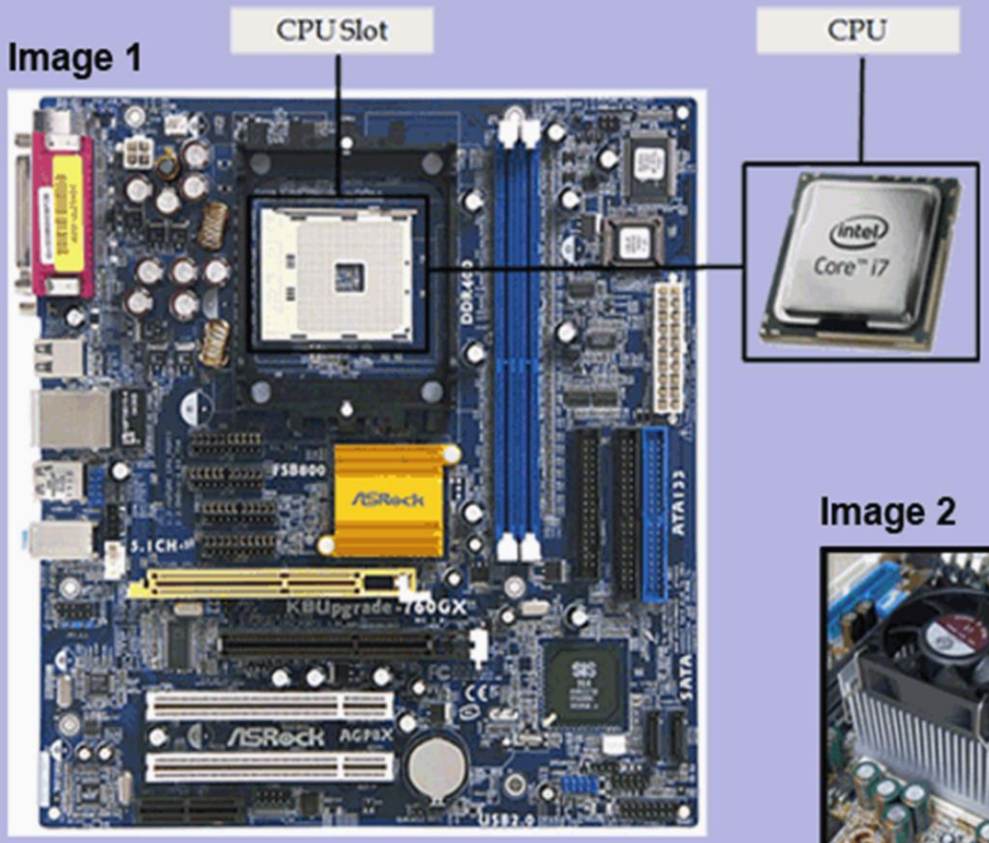
2 Processor (Central Processing Unit / CPU)

- *The Central Processing Unit (CPU) is the brain of the computer.*
- *The CPU 'controls' what the computer does and is responsible for performing calculations and data processing. It also handles the movement of data to and from system memory.*
- *CPU itself has following three components.*

  - ***Control Unit.***
  - ***ALU(Arithmetic Logic Unit).***
  - ***Registers***

CPU Location

Image 1



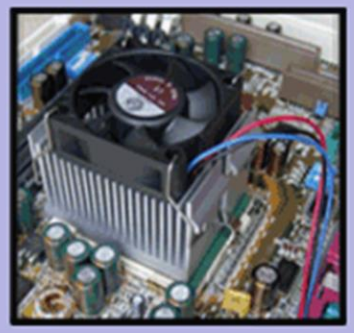
CPU

Image 1 shows where the CPU is installed on a motherboard.

The CPU has a bunch of pins which fit into the CPU Slot on the motherboard.

Image 2 shows a cooling fan which is installed directly above the CPU to pull heat away.

Image 2



2 Processor Components

- ***CU (Control Unit) :*** *It reads and interprets instructions from memory and transforms them into a series of signals to activate other parts of the computer.*
- ***ALU (Arithmetic Logic Unit) :*** *performs simple arithmetic and logical operations .*
- ***Registers :*** are devices capable of storing information, receiving data from other areas within the computer and transferring information as directed by the control unit, it is used for temporary storage of data or instruction and the most important register are :
  - **Program counter (PC):** it contains the address of the next instruction to be executed.
  - **Instruction register (IR):** it contains the instruction being executed.
  - **Address register (AR) :** holds the address of memory location

CPU functions and components Diagram