Introduction to Information Technology

CSC109

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Chapter 2
Computer System Hardware

- ✓ Central Processing Unit (CPU)
  - ✓ ALU
  - ✓ Registers
  - ✓ Control Unit (CU)
- ✓ Memory Unit
  - ✓ Cache Memory
  - ✓ Primary Memory
  - ✓ Secondary Memory
- ✓ Instructions (Format, set Cycle, Decoding, executing& storing)
- ✓ Microprocessor
- ✓ Interconnecting units
- ✓ Computer Performance
- ✓ Inside cabinet

2.1 Introduction

Computer Hardware: 3 Key points

1. Computer Architecture; spec of Components; eg:-

2. Computer Organization; focus on the organizational structure

3. Computer Design; focuses on the hardware to be used and the interconnection of parts

three main components of computer are?

(1) Input/Output (I/O) Unit,

(2) Central Processing Unit (CPU),

(3) Memory Unit.

User interacts with the computer via?

2.2 CENTRAL PROCESSING UNIT (CPU)

CPU

Also Called?

Consist of ?

Registers?

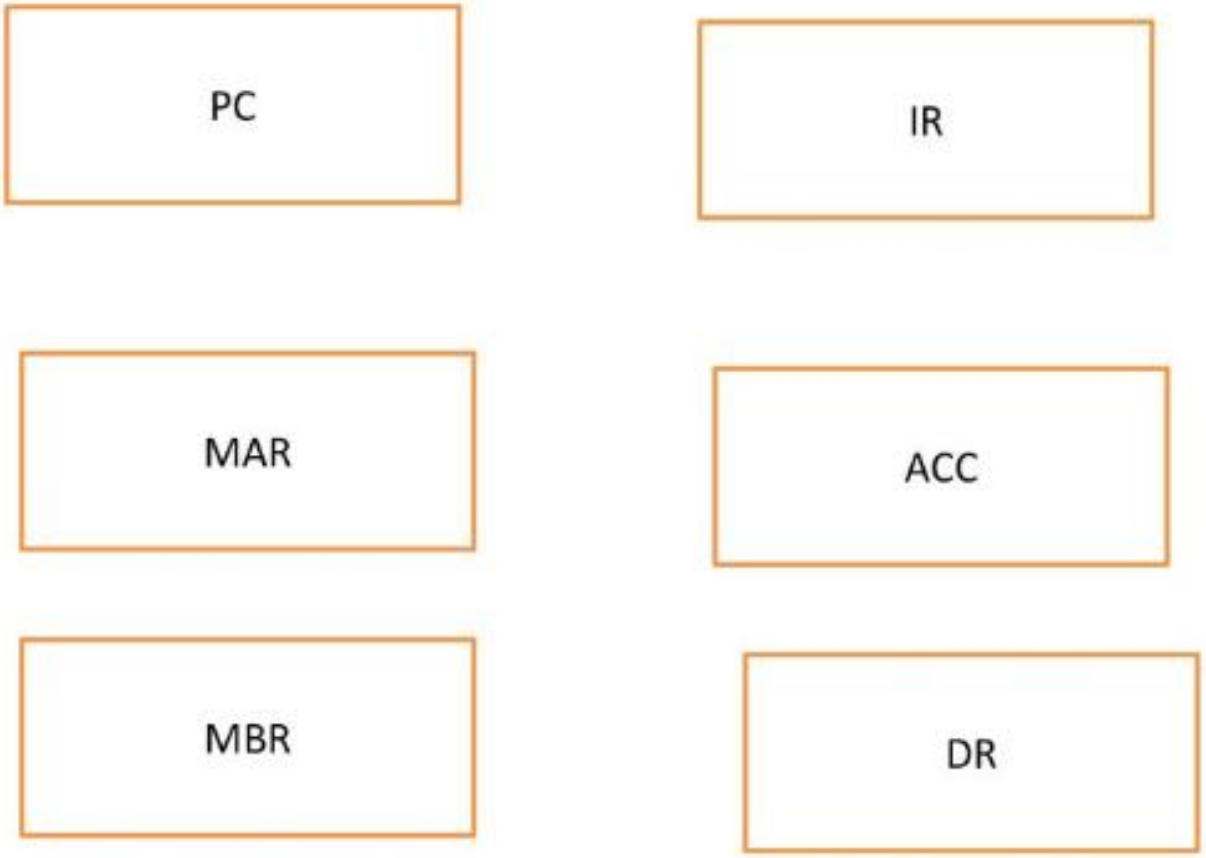
Arithmetic Logic unit?

Control Unit?

2.2.1 Arithmetic Logic Unit

- Consist of 2 Unit
  - Arithmetic Unit
  - Logic Unit
- Arithmetic Unit
  - Performs Arithmetic Operation on data
  - Ex: Addition, Subtraction, Mul
- Logical Unit
  - Performs Logical operations on data
  - Ex: Comparison of number, Letters and special characters
- ALU Uses Register to hold data that is being processes

2.2.2 Registers



2.2.2 Registers Cont…

Accumulator **(ACC):** Stores Result of Arithmetic and Logic Operations

Instruction Register **(IR)**: Contains current instruction most recently executed

Program Counter **(PC)**: Contains the address of the next instruction to be processed

Memory Address Register **(MAR)**: Address of next location in the memory to be accessed

Memory Buffer Register **(MBR)**: Temporary stores data from memory or data to be sent to memory

Data Register **(DR)**: Stores the operands and other data

2.2.2 Register Cont...

Speed and power of CPU is determined by?

- Number of Registers
- Size of each Register

number of registers?

- Not Defined; Can vary
- Depend on the type and complexity of the processor.

size of register?

- Word Size
- Bigger the size more quickly it can process
- May be in 8, 16, 32,64 bits

2.2.3 Control Unit

- It is a storage buffer that stores the data that is used more often, temporarily and make them available to CPU at fast rate
- Very high speed memory placed between RAM and CPU
- Increases the speed of processing
- CU uses the instructions in the Instruction Register (IR) to decide which circuit needs to be activated,
- instructs the ALU to perform the arithmetic or logic operations
- During Processing, CPU first checks cache for data, if not then CPU looks in the RAM for data
- No System bus for accessing the cache.

2.3 Memory Unit

- **Consist of**

Cache Memory

Primary Memory (RAM & ROM)

Secondary Memory

- **Primary Memory (RAM & ROM)**

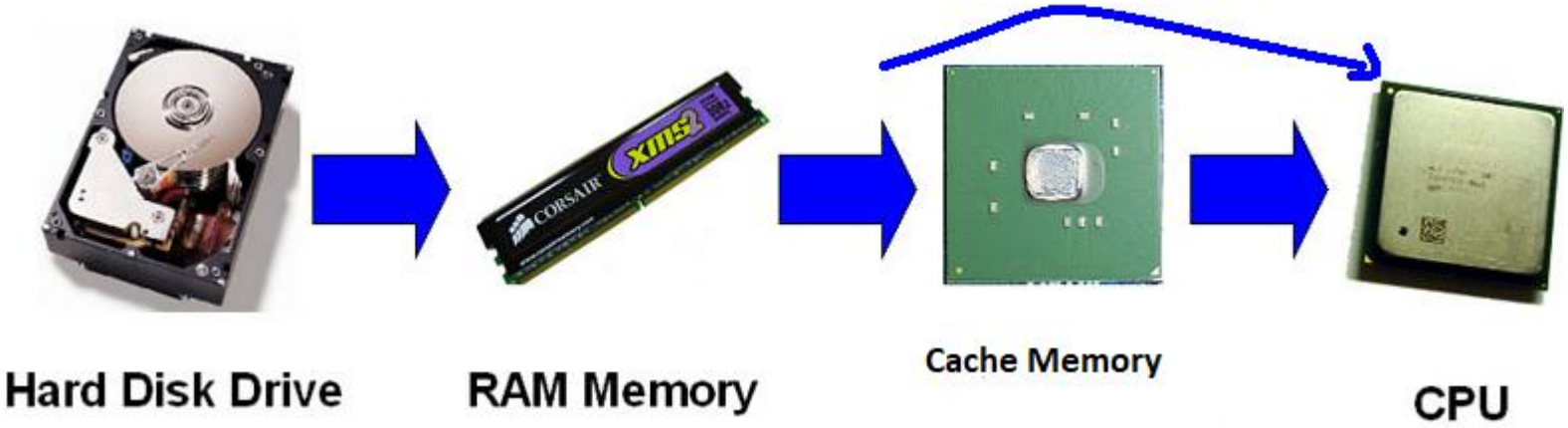
Primary memory or main memory of the computer is used to store the data and instructions during execution of the instructions

- **Cache Memory**

Cache memory is a very high speed memory placed in between RAM and CPU. Cache memory increases the speed of processing

- **Secondary Memory**

Secondary memory is non-volatile and is used for permanent storage of data and programs.


CORSAIR
XMS2
Hard Disk Drive
RAM Memory
Cache Memory
CPU