DFITT:**Computer Architecture**

Lecture One

Reviews

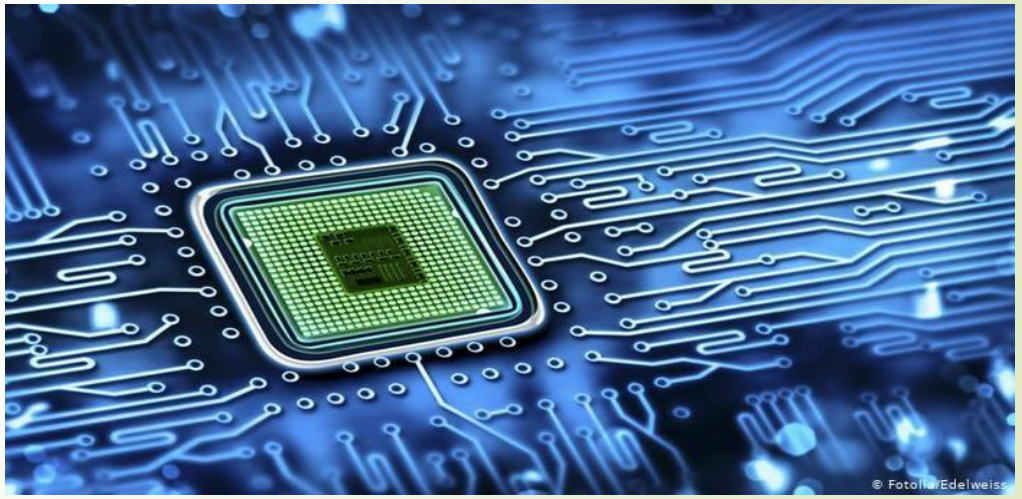
- Introduction
- Architecture of a computer system
- Performance in a computer system
- Perspective and evolution of technology

Introduction

- What is Architecture

Computer Architecture

- Computer architecture defines the design and functionality of a computer system.



Categories in computer architecture

- There are three main categories in computer architecture

i. System design: The system design considered to be the actual computer system

ii. Instruction set architecture: It includes the CPU capabilities and functions, which includes the CPU's data formats, programming language and processor register types and instructions, which are used by the computer

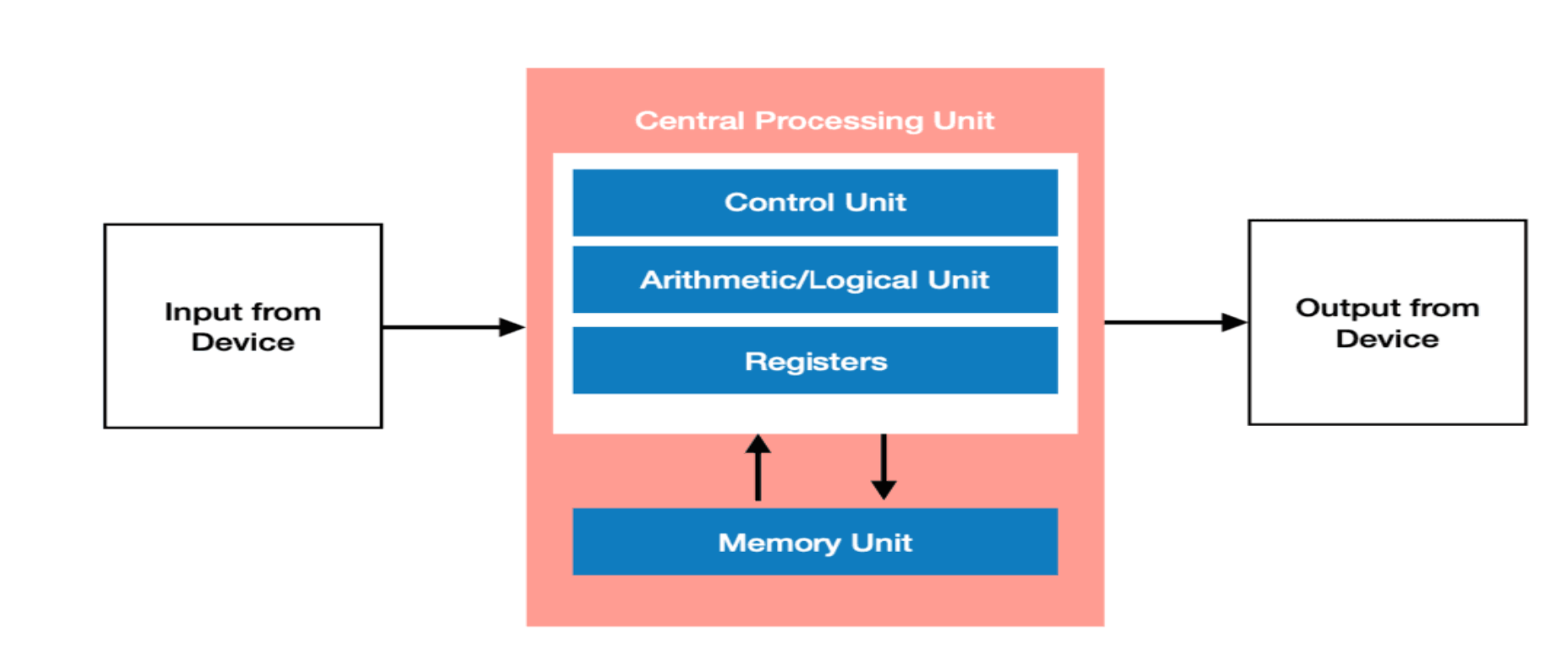
Categories in computer architecture

- Microarchitecture: The microarchitecture in a system will define the storage element/data paths and how they will be implemented into the instruction set architecture, the microarchitecture also is responsible for data processing

von Neumann architecture

- Named after John von Neumann, this is the most fundamental computer architecture.
- It consists of a single memory unit for both data and instructions.
- Instructions and data are fetched from memory into the CPU for processing.
- Most general-purpose computers, including personal computers, are based on this architecture

von Neumann architecture ..



Characteristics of von Neumann Architecture

- **Central Processing Unit (CPU)**
  - ✓ Control Unit
  - ✓ Arithmetic and Logical Unit (ALU)
  - ✓ Memory Unit

- **Registers**
  - ✓ Program Counter (PC)
  - ✓ Accumulator (AC)
  - ✓ Memory Address Register (MAR)
  - ✓ Memory Data Register (MDR)
  - ✓ Current Instruction Register (CIR)

Characteristics of von Neumann Architecture

- **Buses**
  - ✓ Data bus
  - ✓ Address bus
  - ✓ Control bus
- **Input/Outputs**

The End

Assignment

Q.1. Explain the key components of the Von Neumann architecture

Q.2 How does Harvard architecture differ from Von Neumann architecture in terms of memory organization?

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