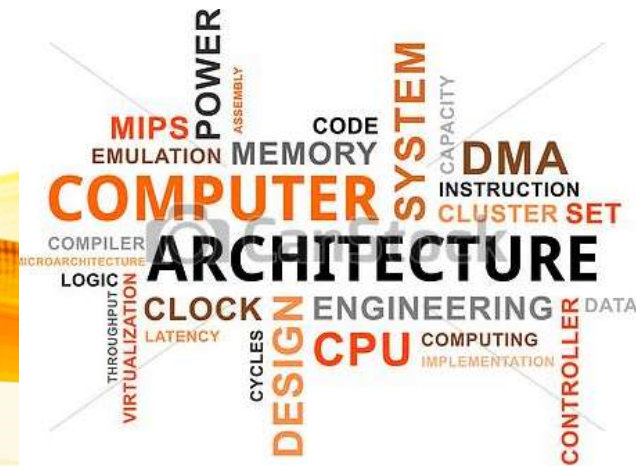# UNIT I
BASIC STRUCTURE OF COMPUTERS

Functional units – Basic operational concepts – Bus Structures – Performance – Memory locations and addresses – Memory operations – Instruction and Instruction sequencing –– Addressing modes – Assembly language – Case study : RISC and CISC Architecture.

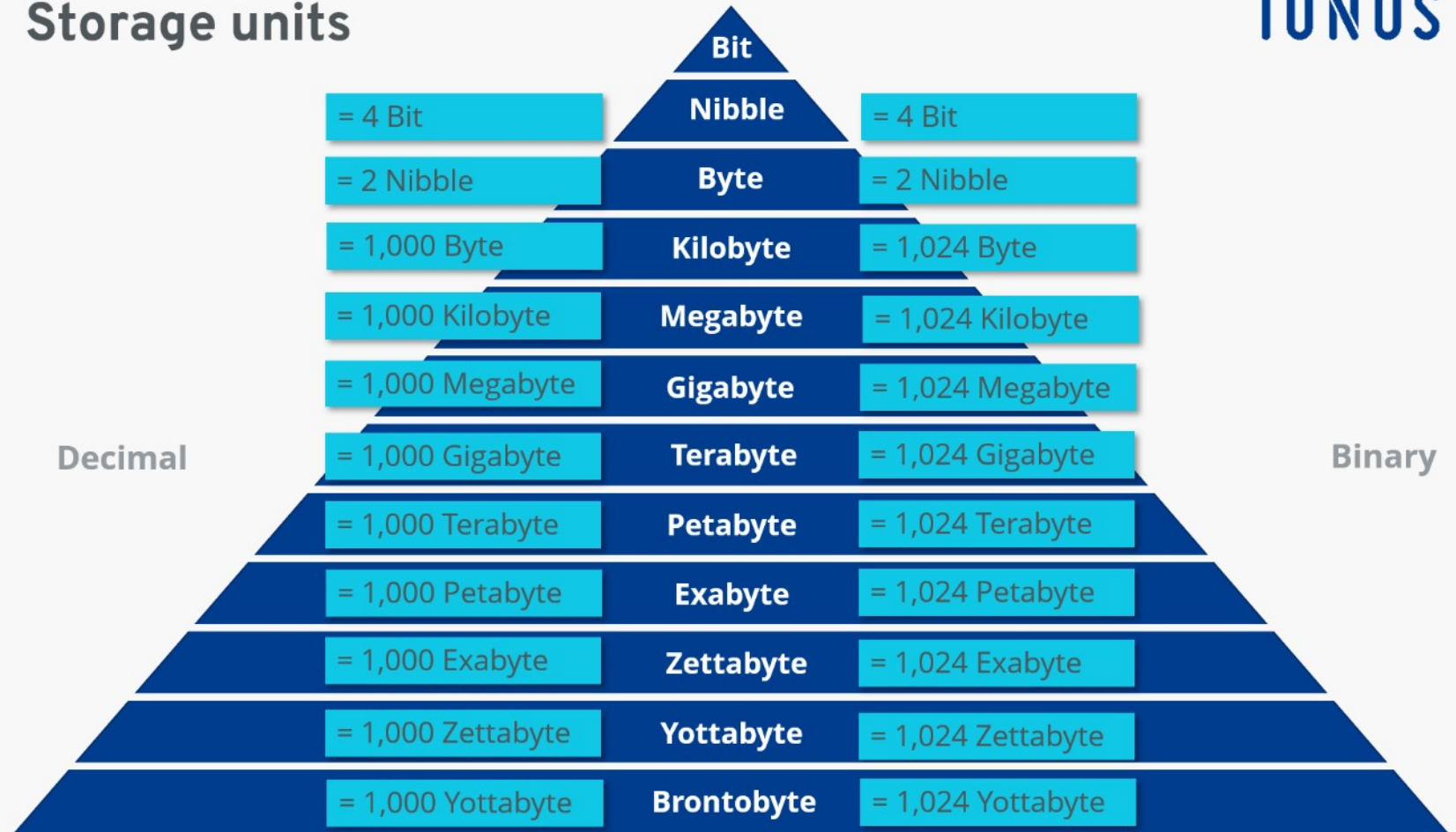# Recall the prior Knowledge

Computer ?

Storage units

IONOS

Decimal		Binary
	Bit	
= 4 Bit	**Nibble**	= 4 Bit
= 2 Nibble	**Byte**	= 2 Nibble
= 1,000 Byte	**Kilobyte**	= 1,024 Byte
= 1,000 Kilobyte	**Megabyte**	= 1,024 Kilobyte
= 1,000 Megabyte	**Gigabyte**	= 1,024 Megabyte
= 1,000 Gigabyte	**Terabyte**	= 1,024 Gigabyte
= 1,000 Terabyte	**Petabyte**	= 1,024 Terabyte
= 1,000 Petabyte	**Exabyte**	= 1,024 Petabyte
= 1,000 Exabyte	**Zettabyte**	= 1,024 Exabyte
= 1,000 Zettabyte	**Yottabyte**	= 1,024 Zettabyte
= 1,000 Yottabyte	**Brontobyte**	= 1,024 Yottabyte

Why to study computer Architecture?

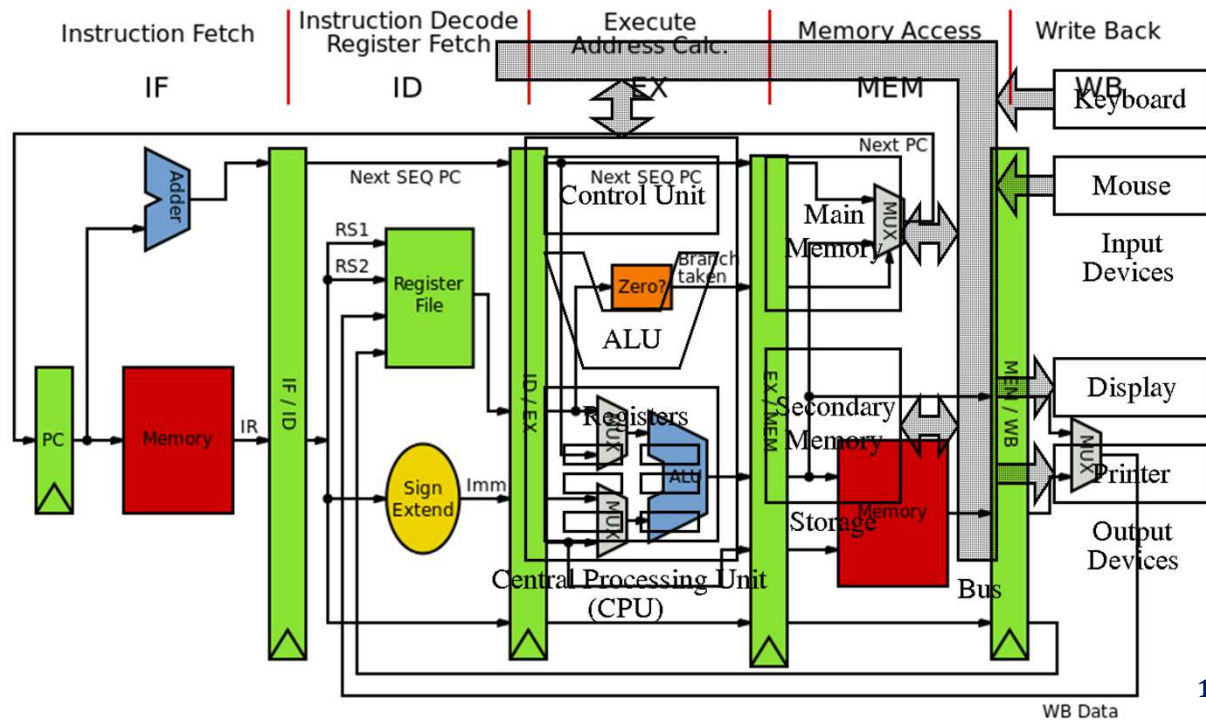Structure an internal component of a computer

Program to realize the logics

Runs more efficiently on a real time machine

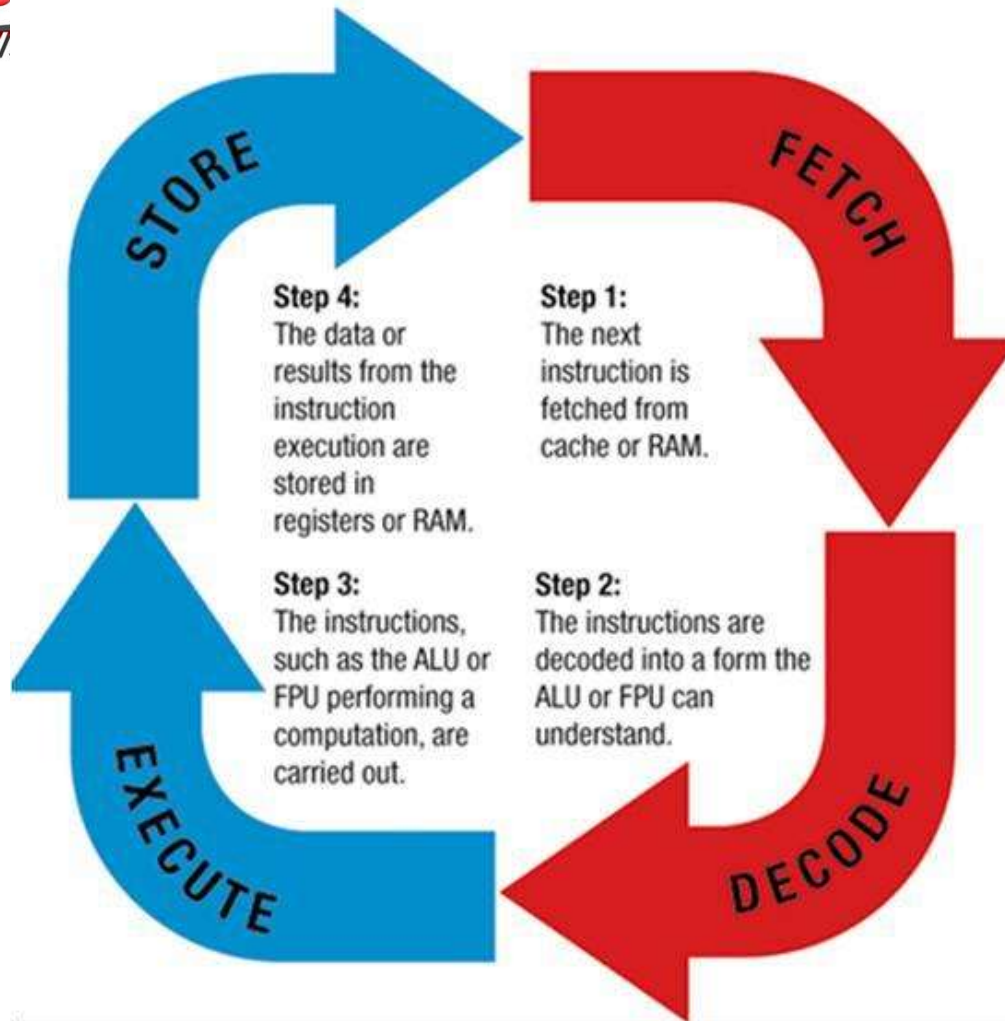# Introduction

Computer

Architecture

Definition

- Concerned with the structure and behavior of the various functional modules computer and how they interact to provide the processing needs of the user.

- Refers to the operational units and their interconnections

- Computer is a fast electronic calculating machine which accepts digital input, processes it according to the internally stored instructions (Programs) and produces the result on the output device.

...ersion

High-level language program (in C)

STORE

FETCH

Step 4:
The data or results from the instruction execution are stored in registers or RAM.

Step 1:
The next instruction is fetched from cache or RAM.

Step 3:
The instructions, such as the ALU or FPU performing a computation, are carried out.

Step 2:
The instructions are decoded into a form the ALU or FPU can understand.

EXECUTE

DECODE
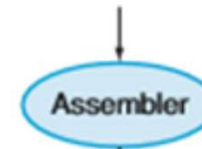
```
            ↓
swap:
        multi    $2, $5,4
        add      $2, $4,$2
        lw       $15, 0($2)
        lw       $16, 4($2)
        sw       $16, 0($2)
        sw       $15, 4($2)
        jr       $31
            ↓
       (Assembler)
            ↓
```
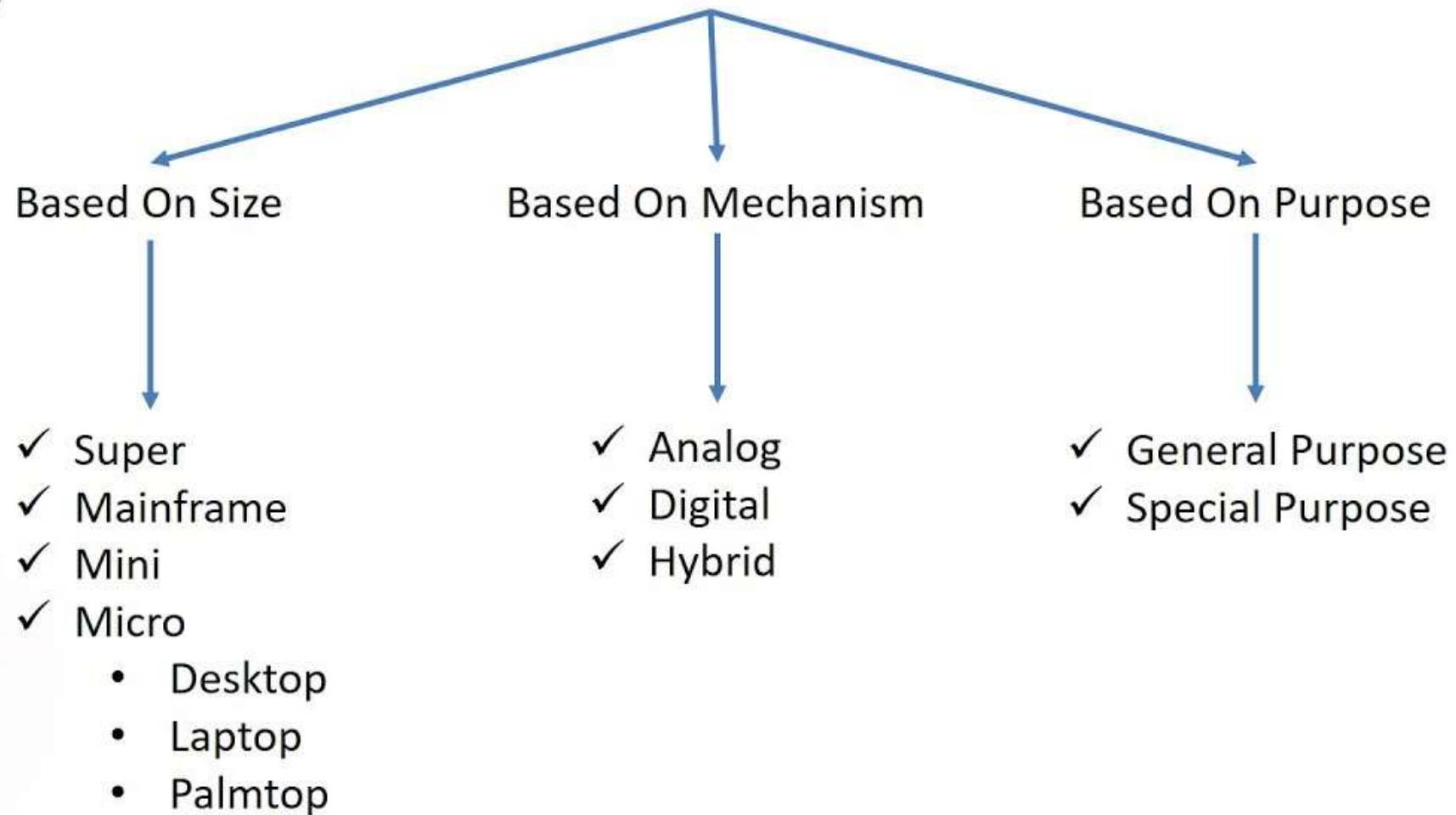
```
00000010100010000000000100011000
00000010000010000100000100001
00110111100010000000000000000
00111000010010000000000000100
10111000010010000000000000000
10110111100010000000000000100
00000011111000000000000000001000
```

Types of Computer

Based On Size

- ✓ Super
- ✓ Mainframe
- ✓ Mini
- ✓ Micro
  - • Desktop
  - • Laptop
  - • Palmtop

Based On Mechanism

- ✓ Analog
- ✓ Digital
- ✓ Hybrid

Based On Purpose

- ✓ General Purpose
- ✓ Special Purpose

Computer Types

Mainframe
Computer

Super
Computer

Workstation
Computer

Personal Computer (PC)

It is a low cap

Apple Macin

It is a sort of   y.

Laptop comp

It is a handy

Tablet and S

Modern technology has advanced further. It has helped develop computers that are pocket-friendly.

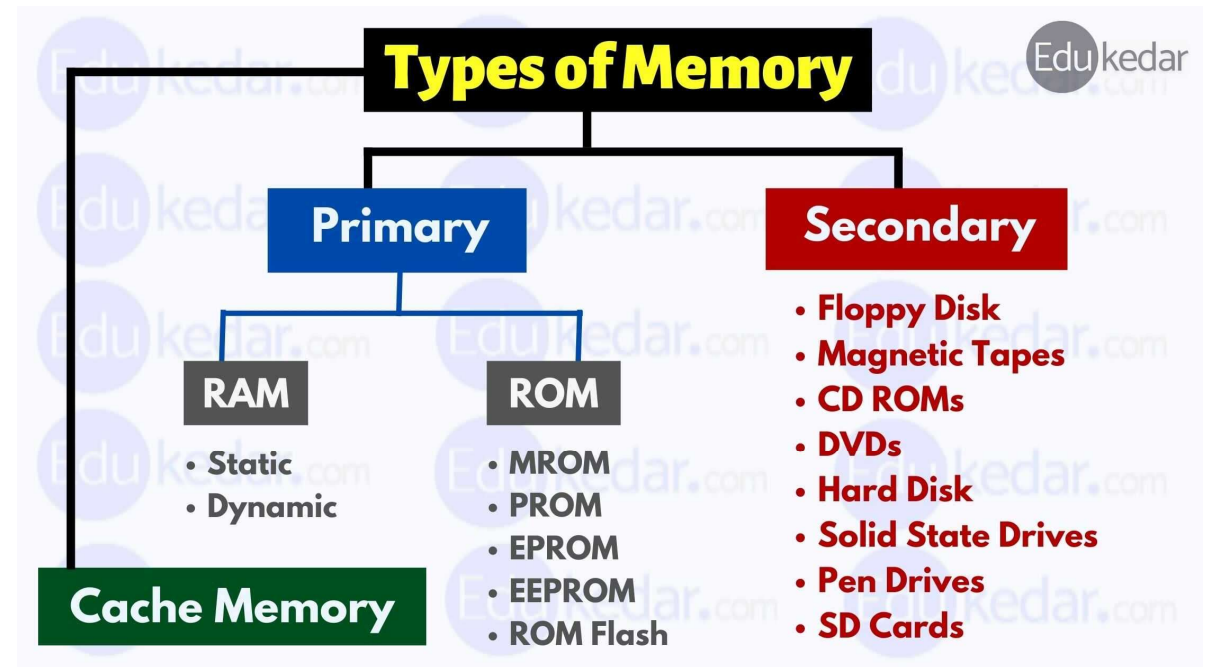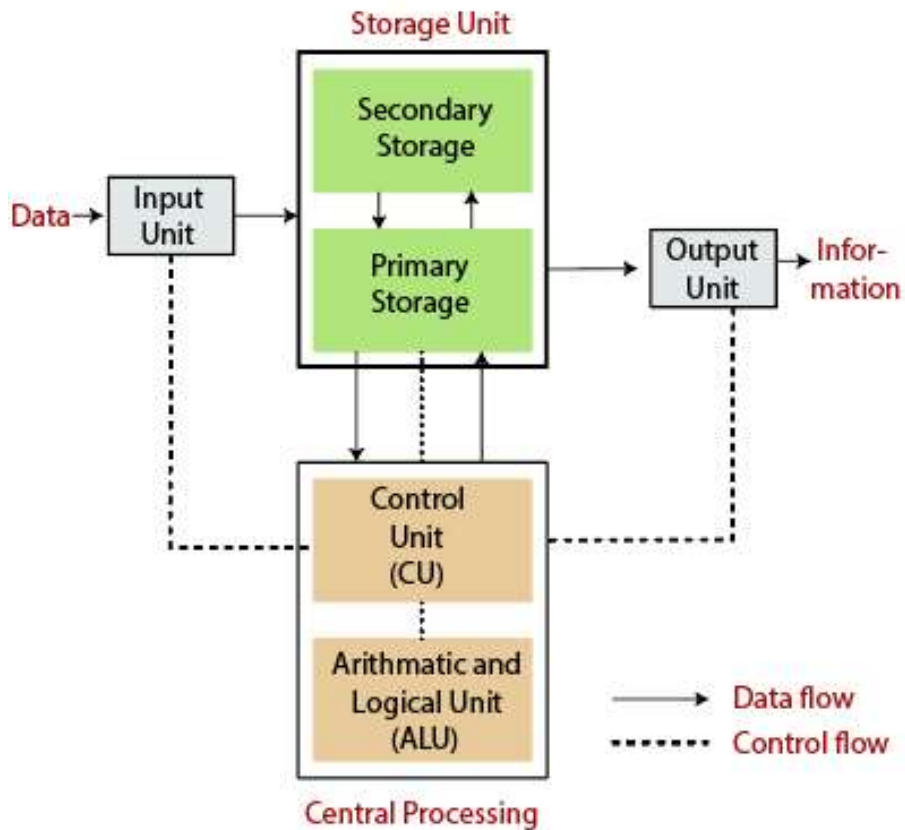# Generation of Computers

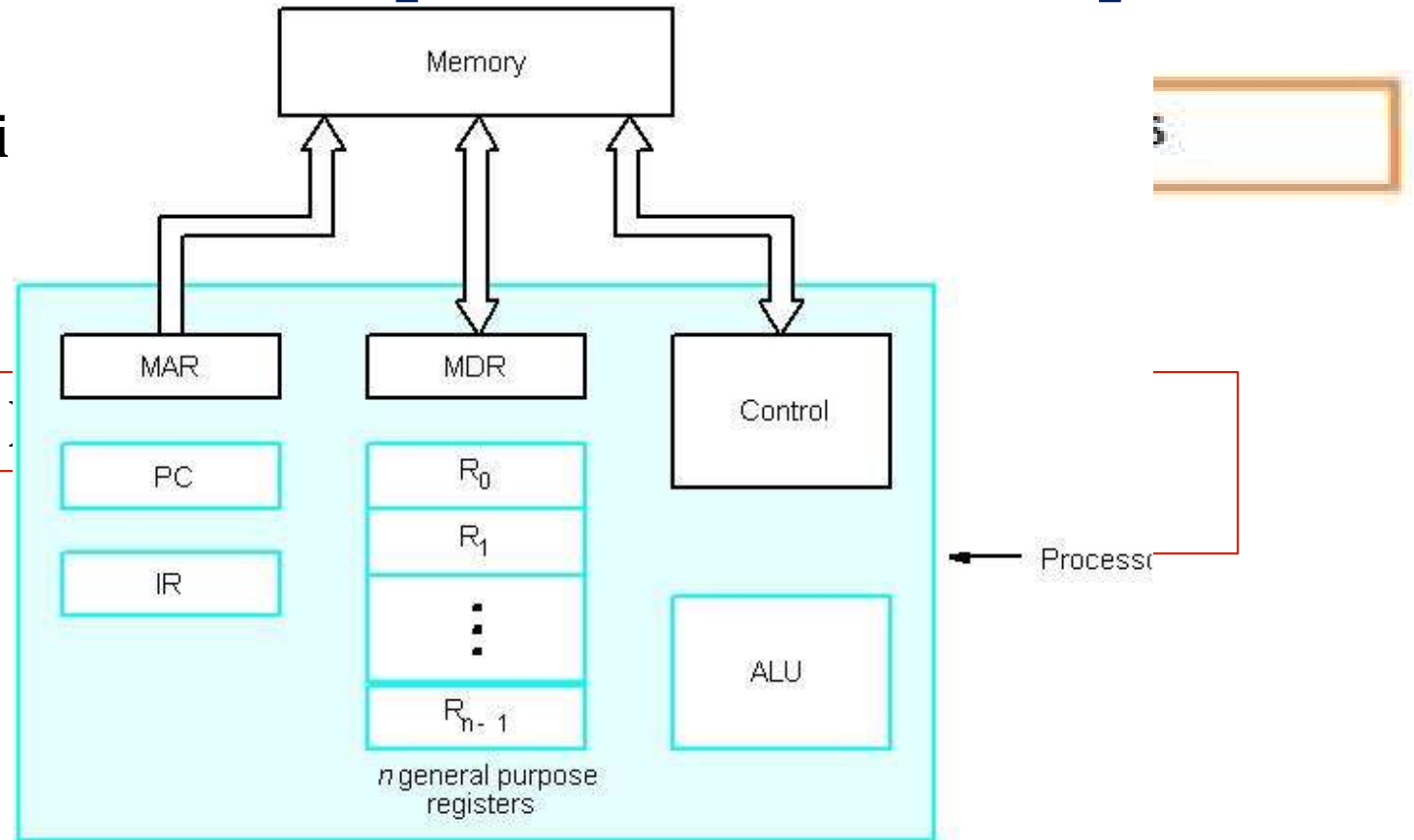| Generations of computers	Generations timeline	Evolving hardware
First generation	1940s-1950s	Vacuum tube based
Second generation	1950s-1960s	Transistor based
Third generation	1960s-1970s	Integrated circuit based
Fourth generation	1970s-present	Microprocessor based
Fifth generation	The present and the future	Artificial intelligence based

Functional Unit

Block diagram of Computer

Types of Memory

Edu kedar

Primary

Secondary

RAM
- Static
- Dynamic

ROM
- MROM
- PROM
- EPROM
- EEPROM
- ROM Flash

- Floppy Disk
- Magnetic Tapes
- CD ROMs
- DVDs
- Hard Disk
- Solid State Drives
- Pen Drives
- SD Cards

Cache Memory

Basic Operational Concepts

- Instruction consi

- Example

ADD   LOCA,

Thank You