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الاستعجال والاعتماد عليه فقط سوف يجعلك تخسر كميه معلومات
وخبرات كثيره
يجب عليك مشاهدة فيديو الدرس كاملا
لاتنسى عمل لايك ومشاركة القناة لتعم الفائدة للجميع
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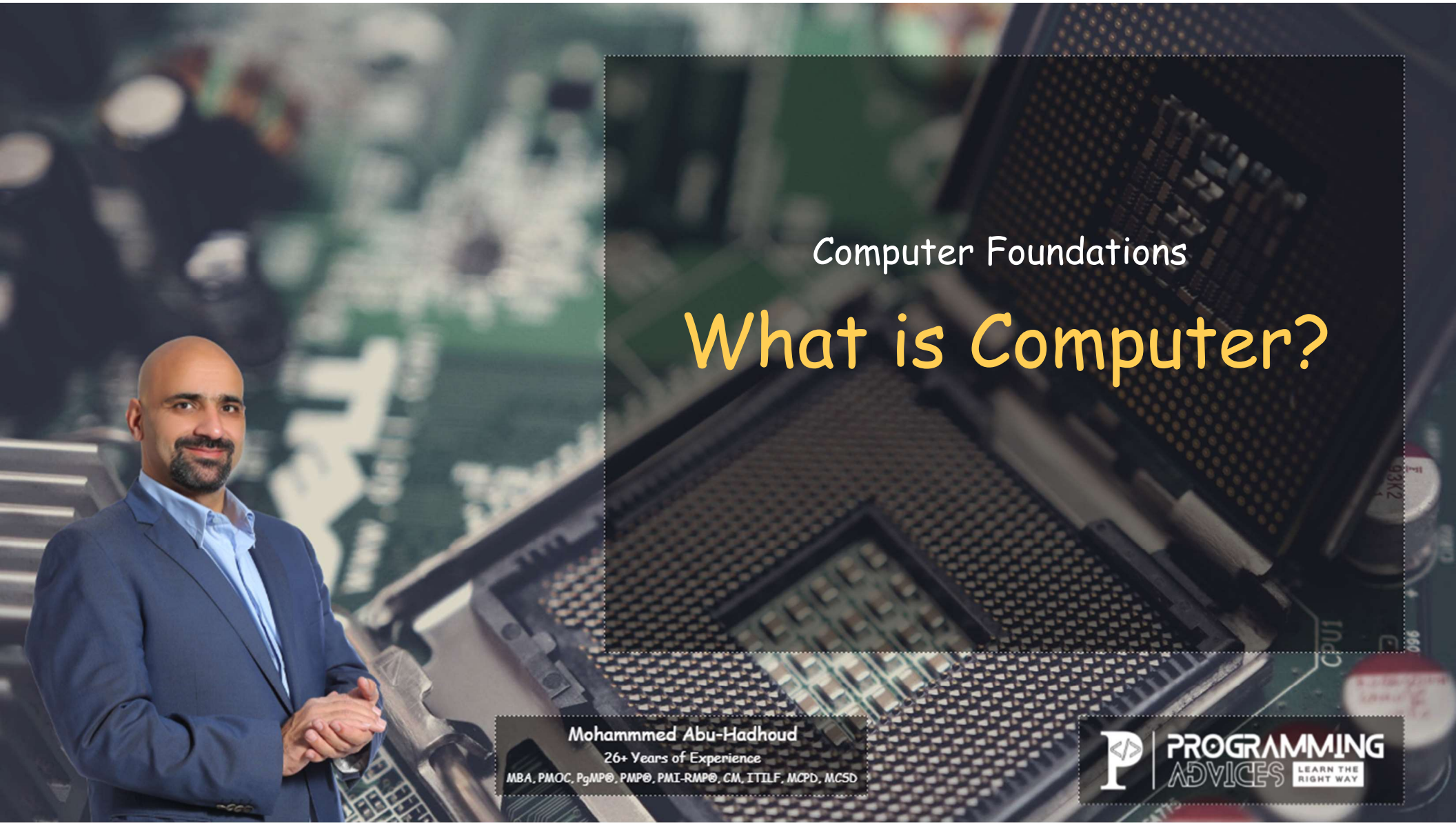
Computer Foundations
What is Computer?
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Before we know what is computer?

Let us remember...



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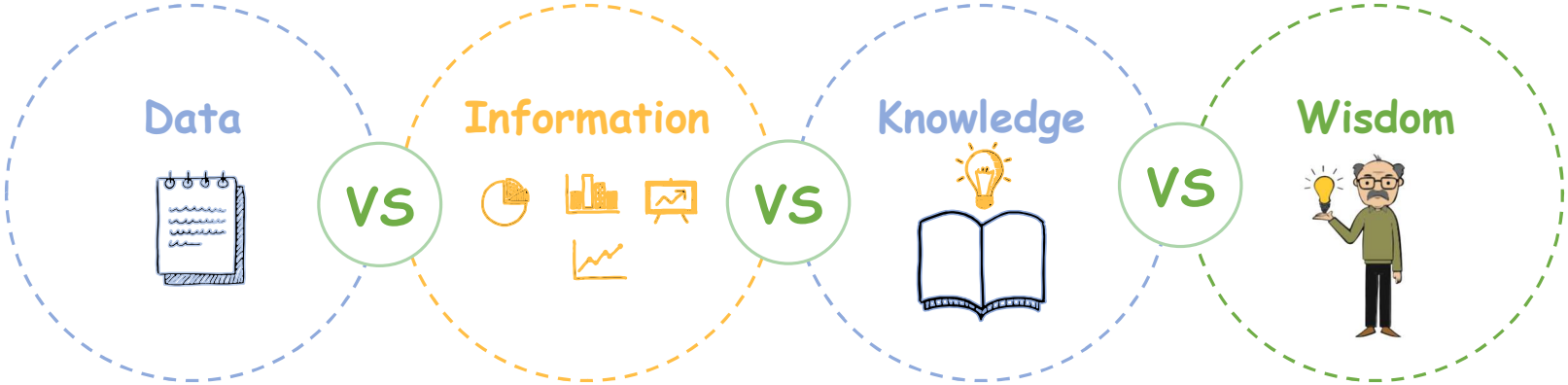
# What is the difference between…



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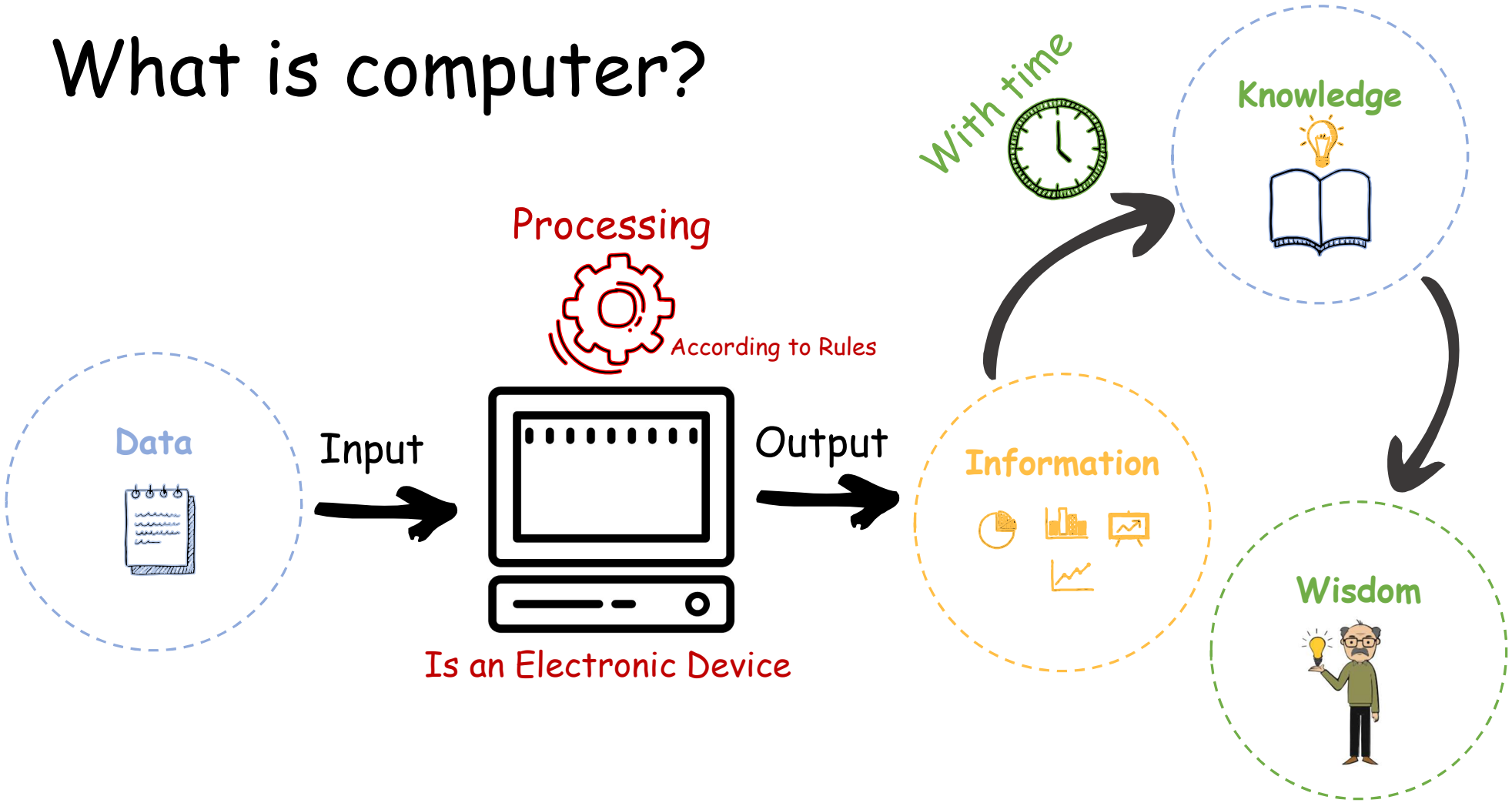
# What is computer?



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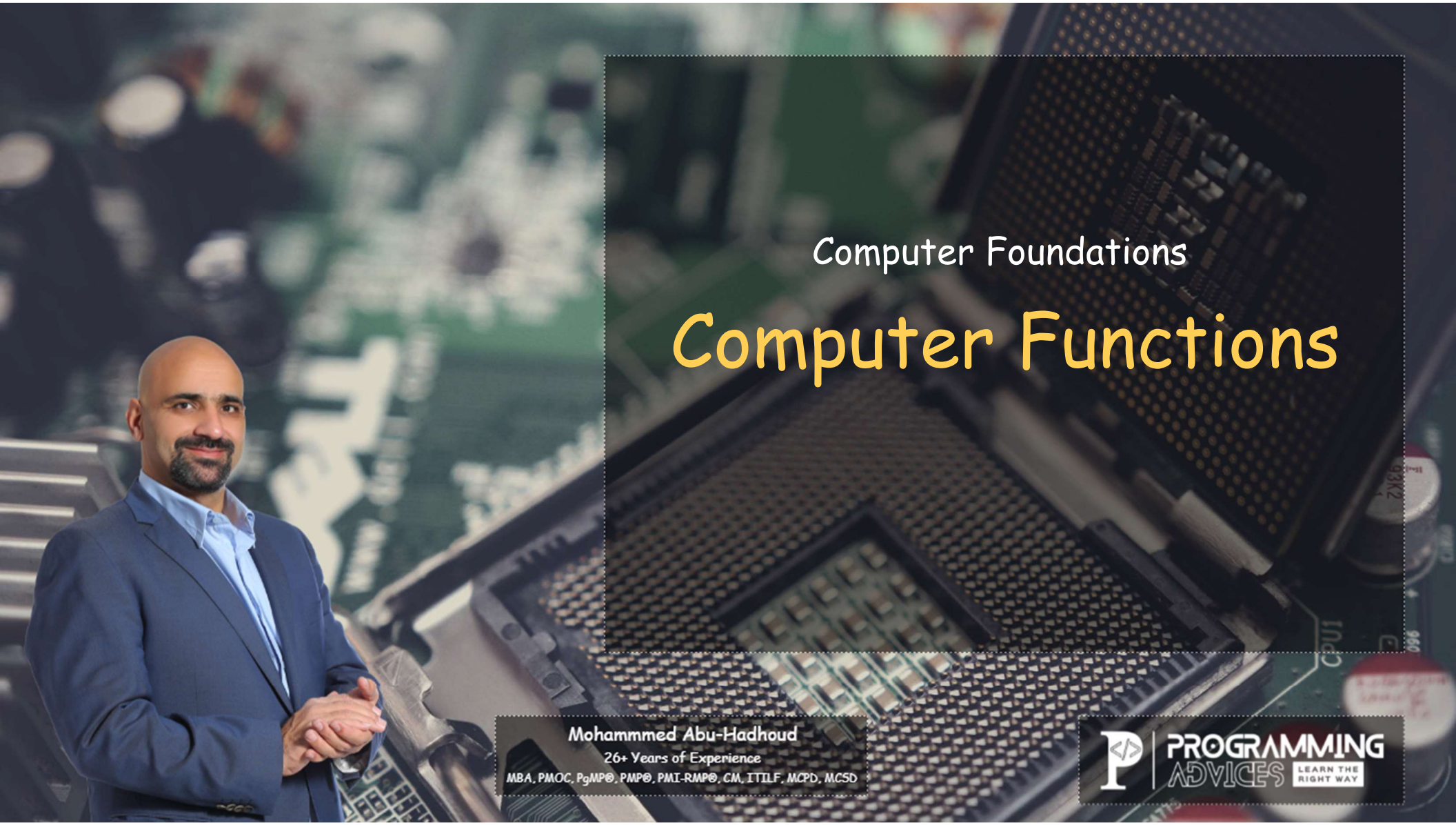
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# Functionalities of Computer

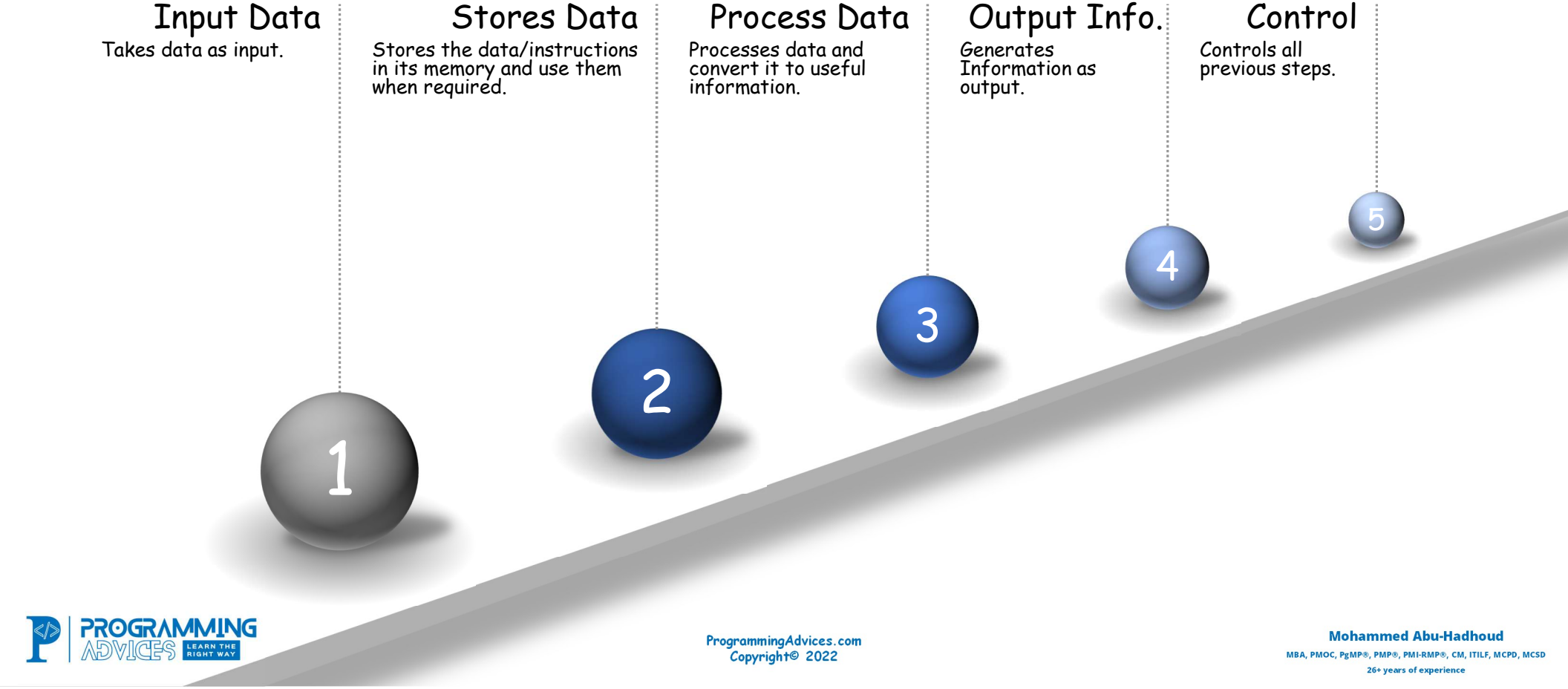
## Input Data
Takes data as input.

## Stores Data
Stores the data/instructions in its memory and use them when required.

## Process Data
Processes data and convert it to useful information.

## Output Info.
Generates Information as output.

## Control
Controls all previous steps.

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# Computer is:

- Electronic Device.
- Operating under the control of instructions.
- Accepts Data (Input).
- Processes Data according to certain rules.
- Produces Information (Output).
- Stores information for future use.


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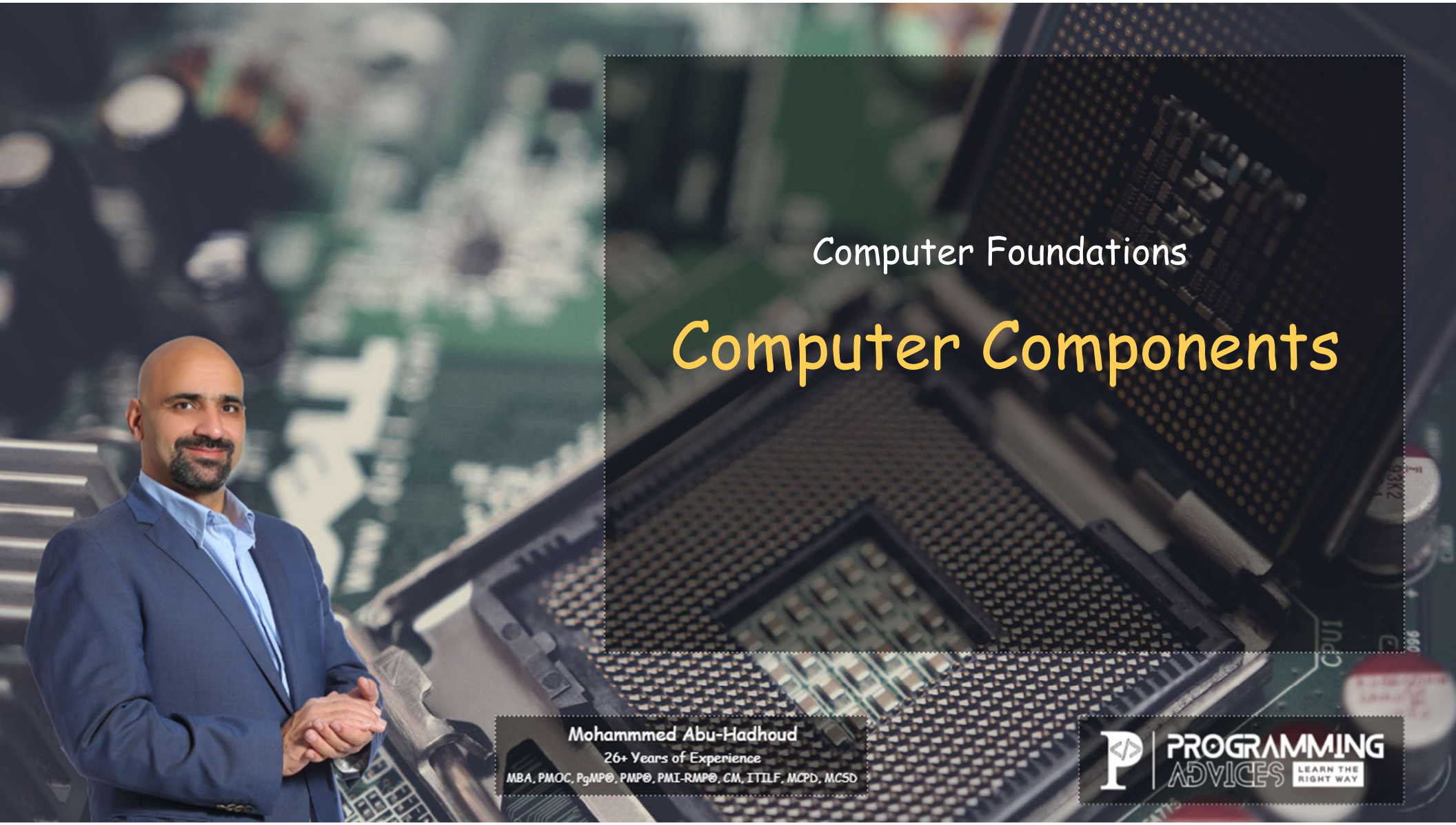
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# Computer Components

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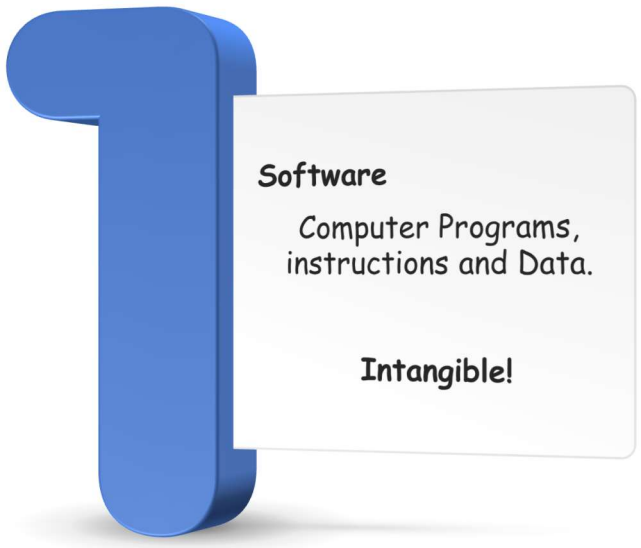
# Software




**System Software:** Operating Systems
Windows, Mac OS, Unix, DOS, Linux, Android, …etc

**Application Software:**
Ms Office, Photoshop, Browsers, …etc



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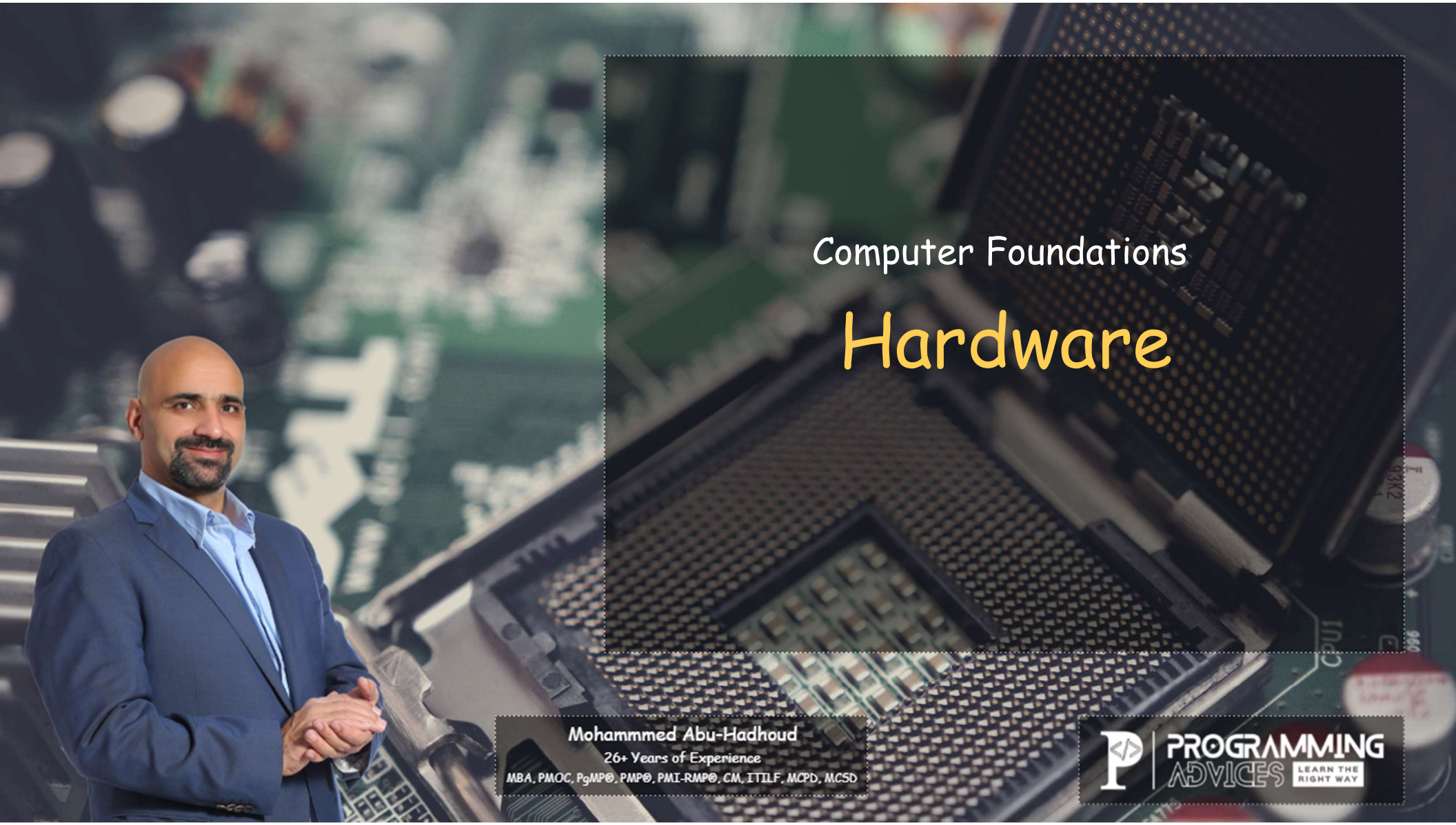
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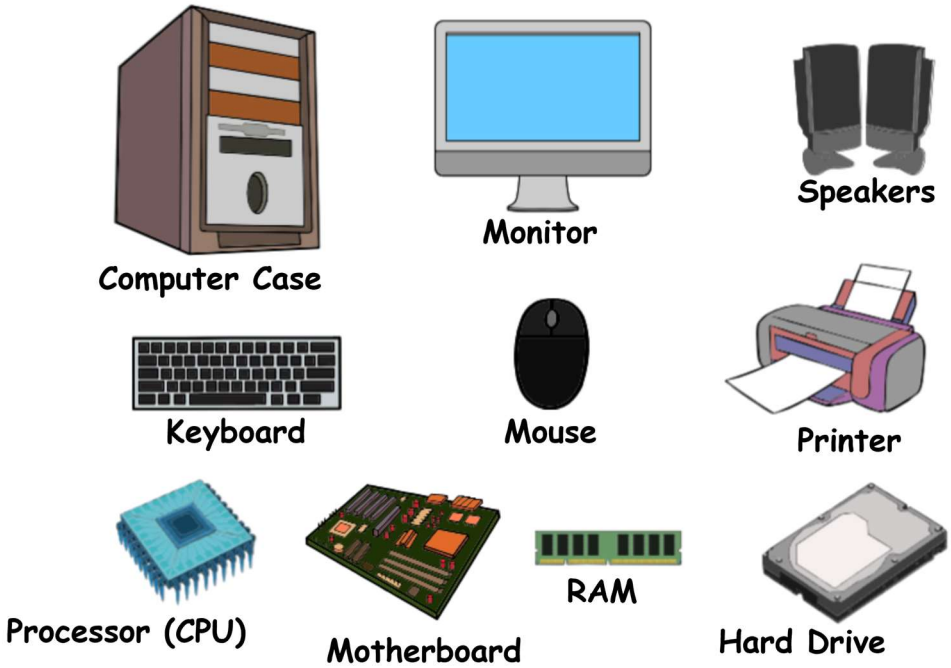
# Hardware



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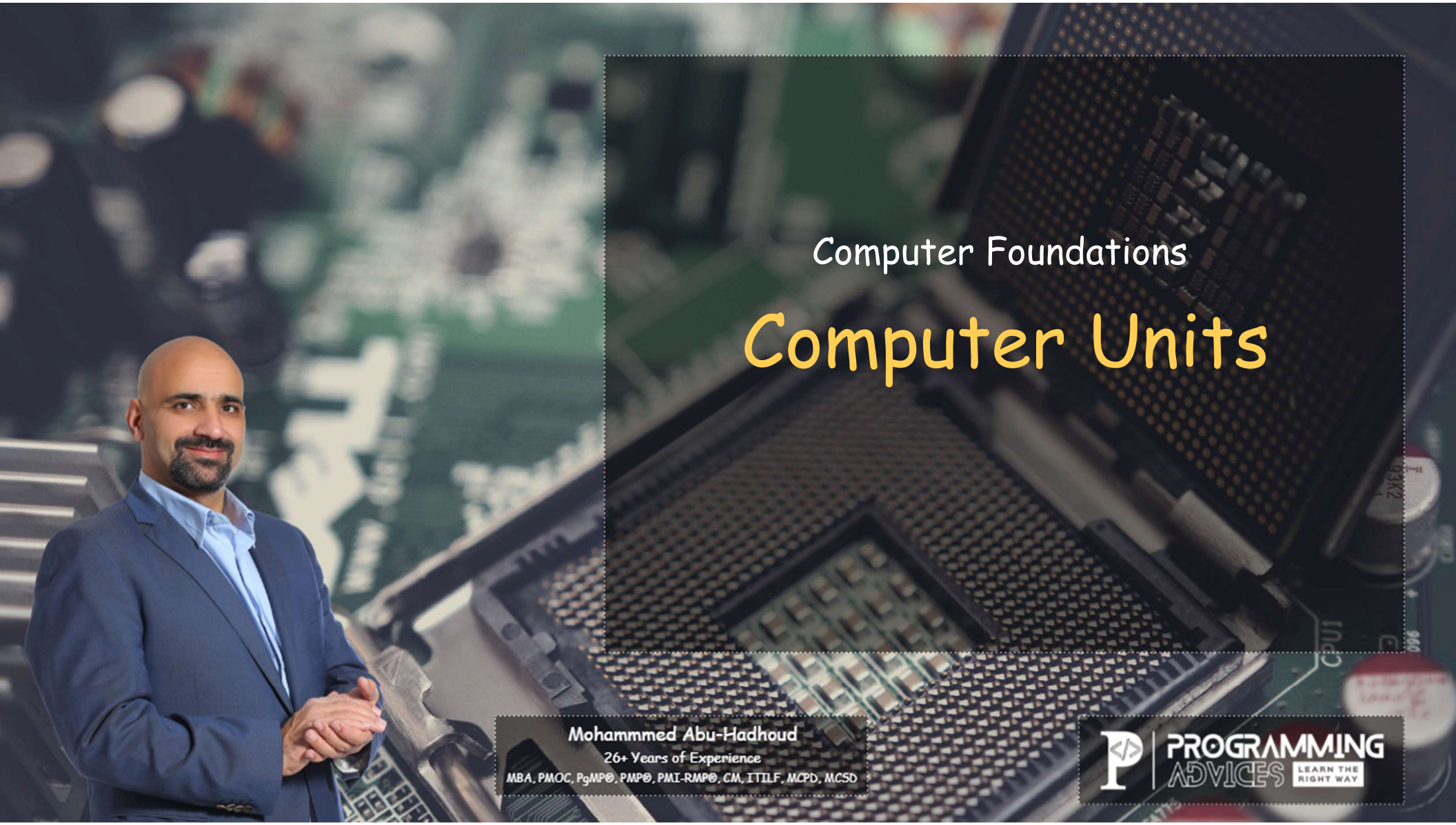
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Computer Units
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# Computer Units

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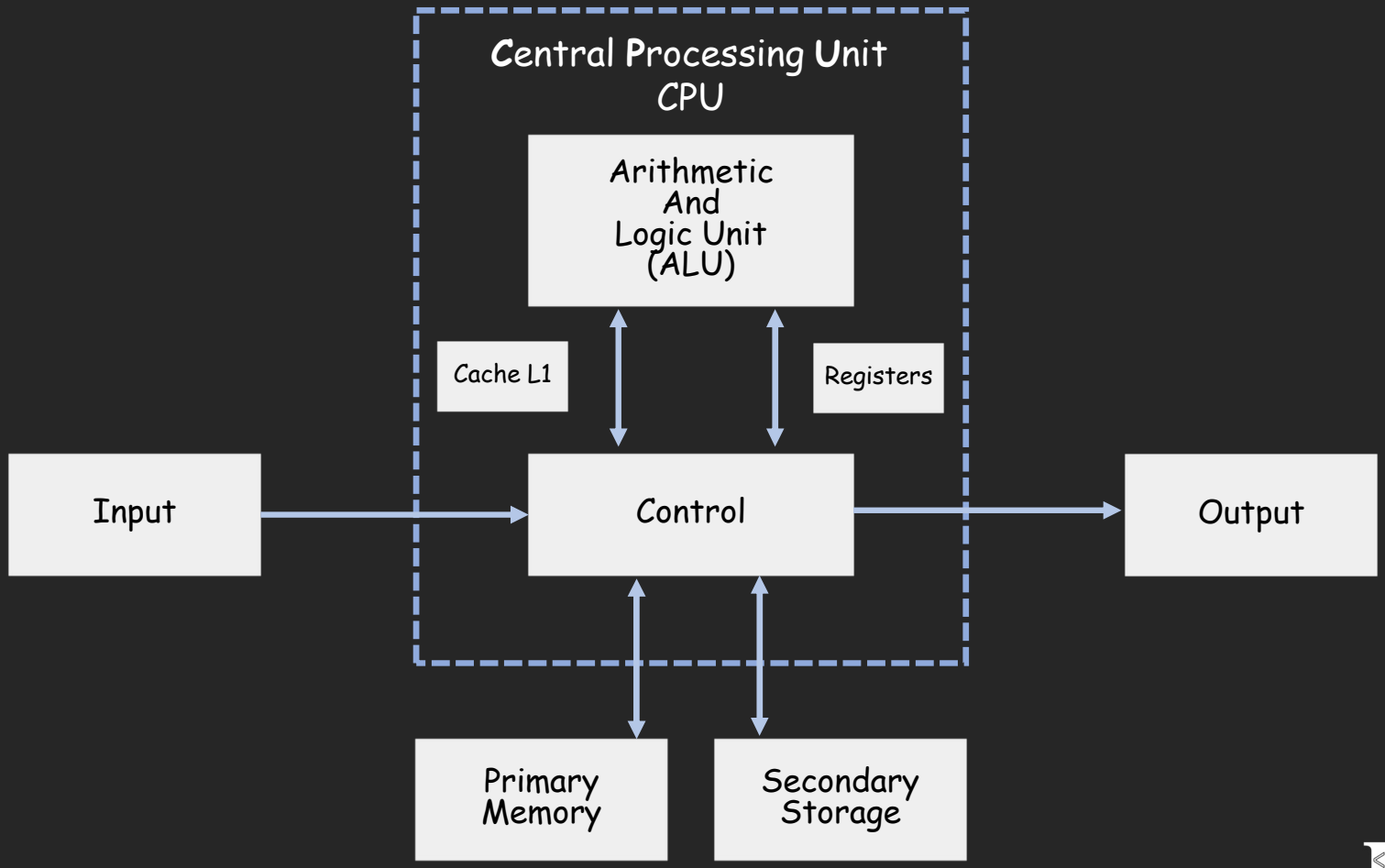
# Computer Units

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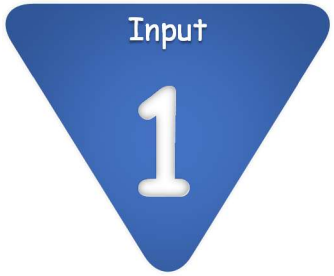
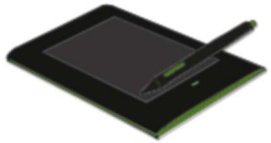
# Computer Units - Input




Any device that provides data or signal to computer.

Keyboard

Mouse

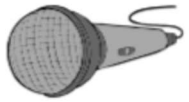


Touch Screen & Pens

Joystick

Camera

Remote



Mic

Scanner



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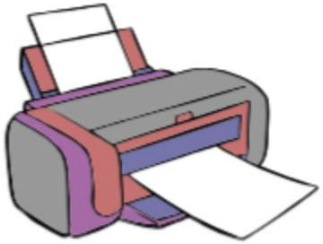
# Computer Units - Output

**Any device used to communicate results.**



**Printer**

**Monitor**

**Speaker**



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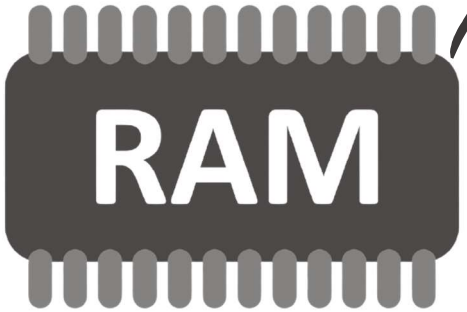
# Computer Units – Primary Memeory

RAM & ROM

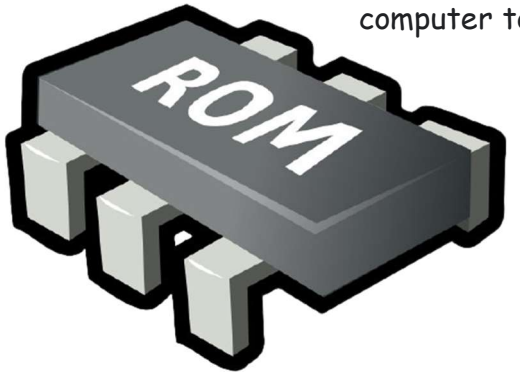



Temporary

Random Access Memory

Permanent

Example: It stores the instructions for the computer to start up.




Read Only Memory



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# Computer Units – Secondary Storage

Stores data parentally

Hard Drive

CD

Memory Card

Flash Memory



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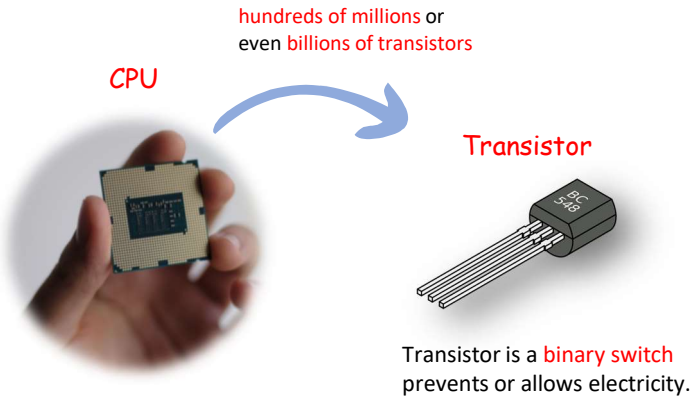
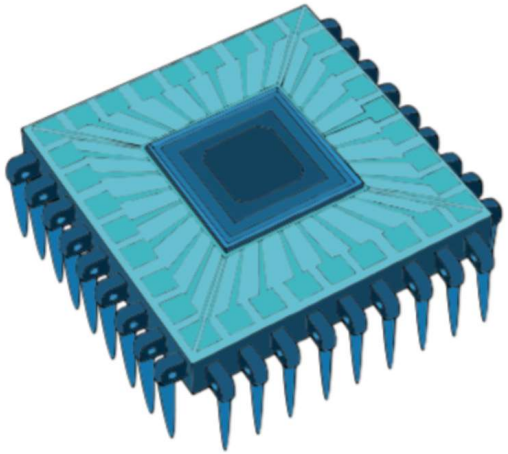
# Computer Units - CPU

It is responsible for all functions and processes.




Known as microprocessor or processor



- ALU (Arithmetic Logic Unit)
- Control Unit
- Cache & Registers

Central Process Unit (CPU)



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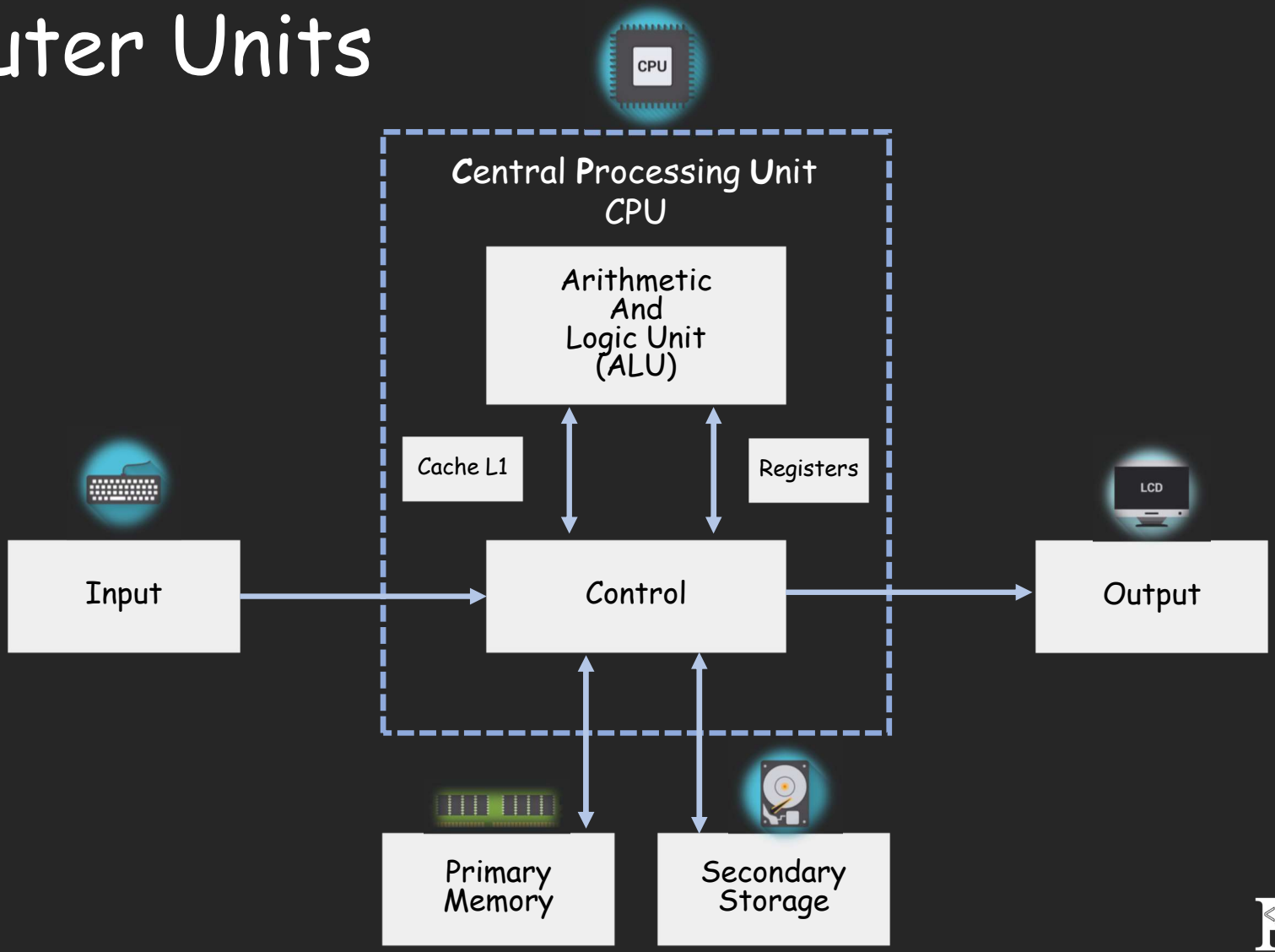
# Computer Units

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# Arithmetic and logical Unit - ALU:

- Executes Arithmetic and logical operations.
  - Arithmetic calculations (Addition, Subtraction, Multiplication, Division).
  - Logical Operations ( Compare numbers, letters, characters).


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# Control Unit - CU:

- Controls and coordinates computer components.
  - Reads data from memory
  - Sends data to ALU or register
  - Instructs hardware to perform the requested operation


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# Cache & Registers:

- **Cache** is a Highigh-Speed memory inside the CPU chip.
- **Registers** are Highigher-Speed memory inside the CPU chip.

These are memory locations that can be directly accessible by processor.


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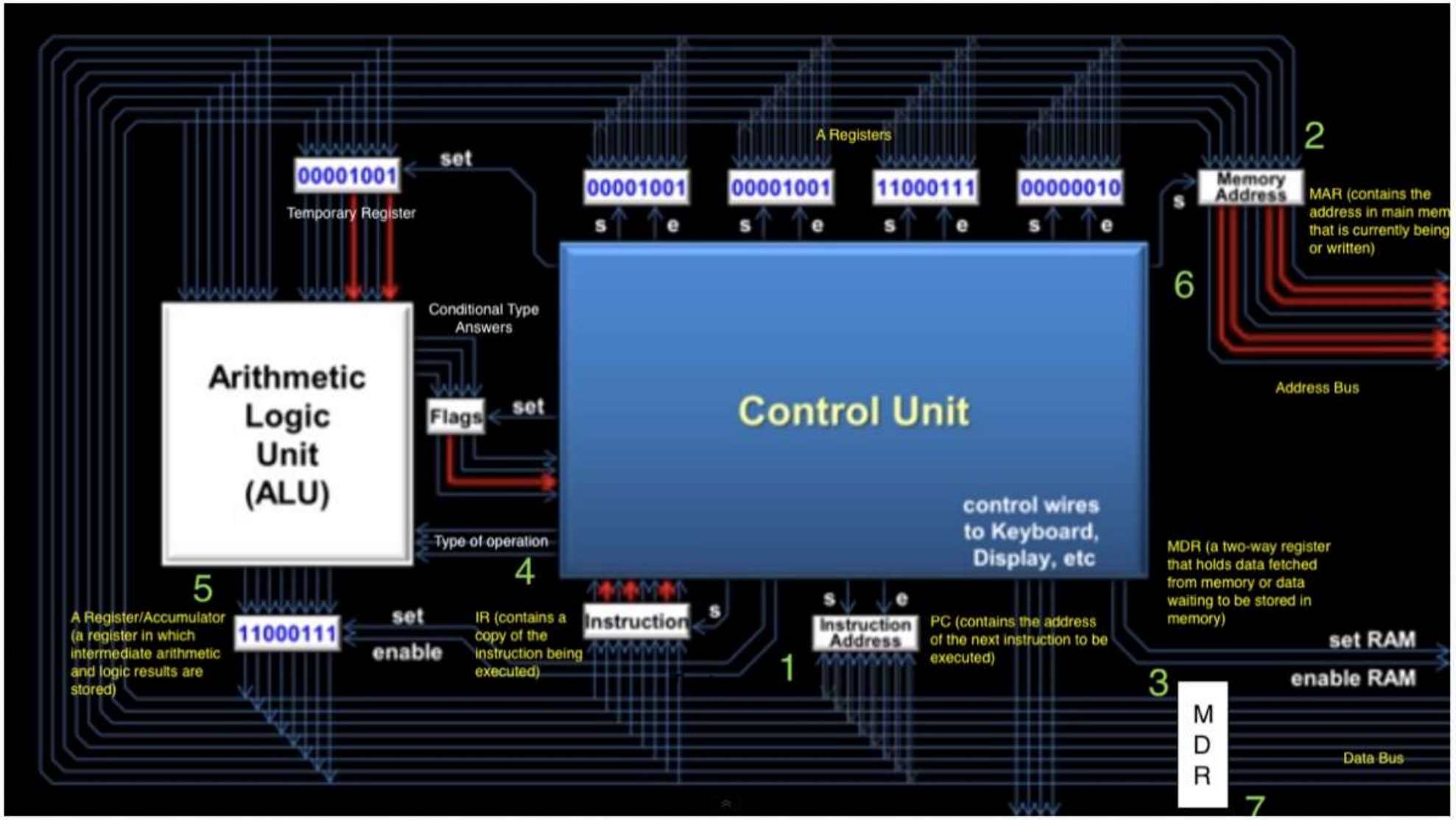


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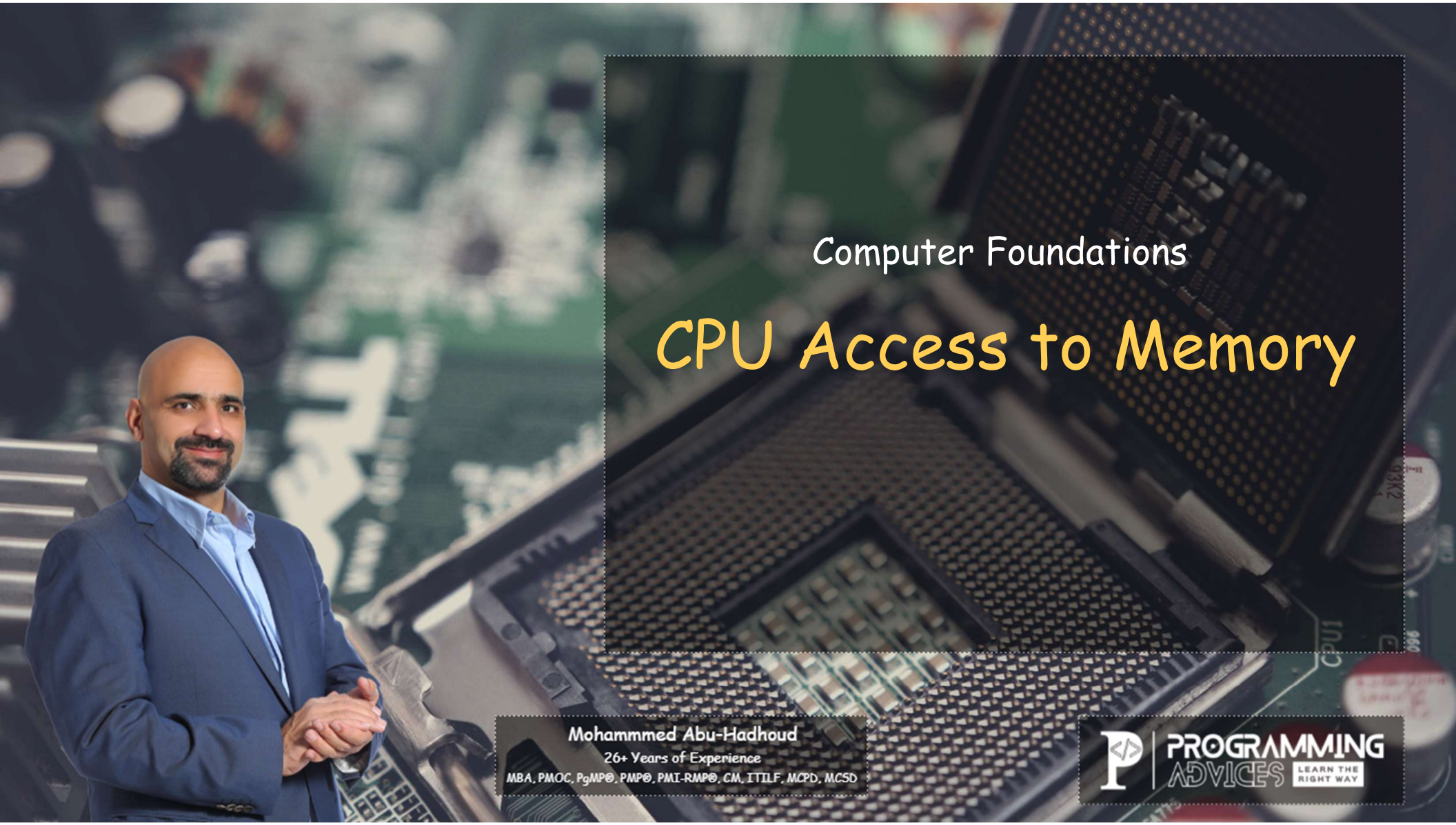
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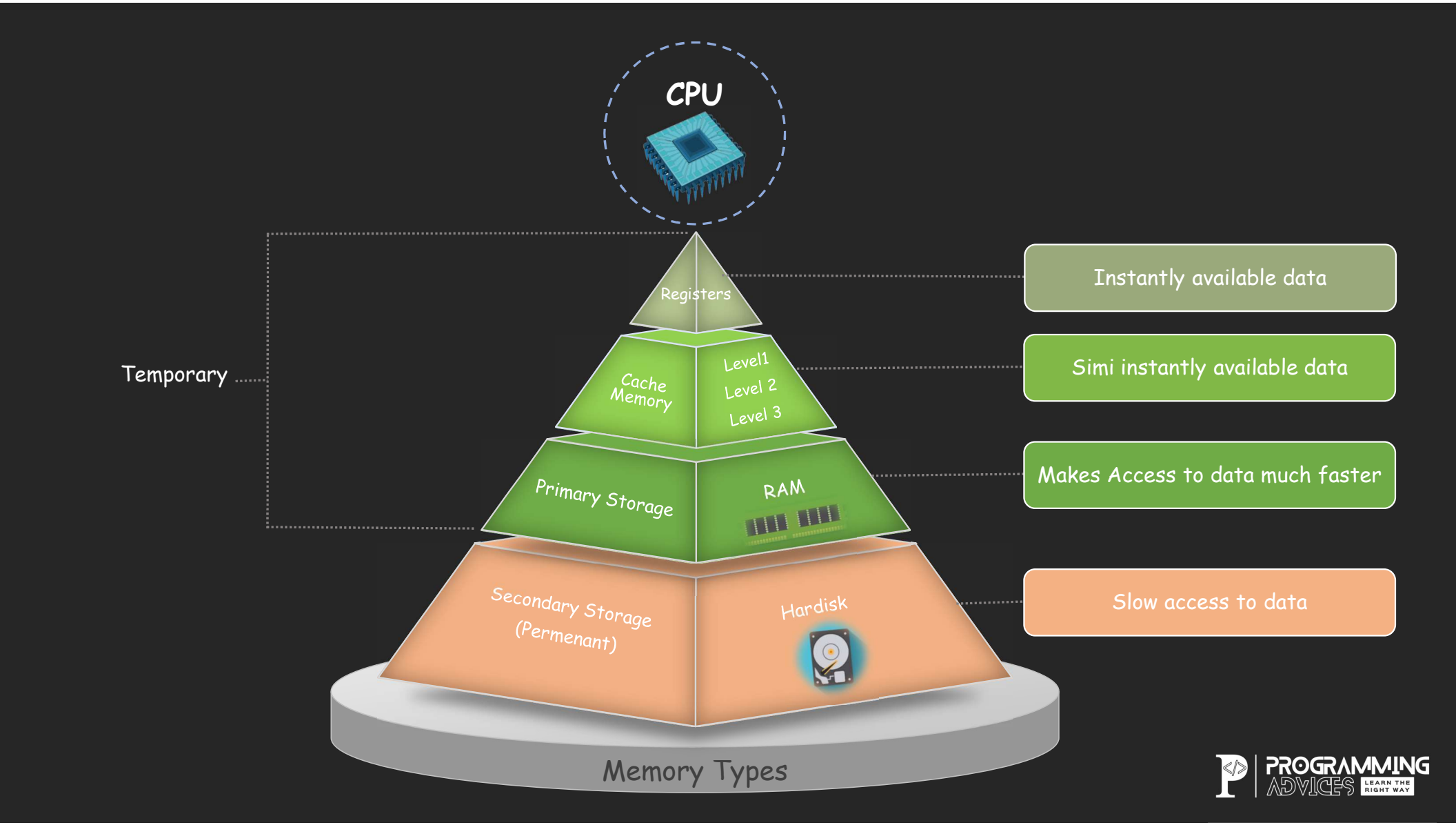
CPU
Registers
Cache Memory
Level1
Level 2
Level 3
Primary Storage
RAM
Secondary Storage (Permenant)
Hardisk
Memory Types
Temporary
Instantly available data
Simi instantly available data
Makes Access to data much faster
Slow access to data
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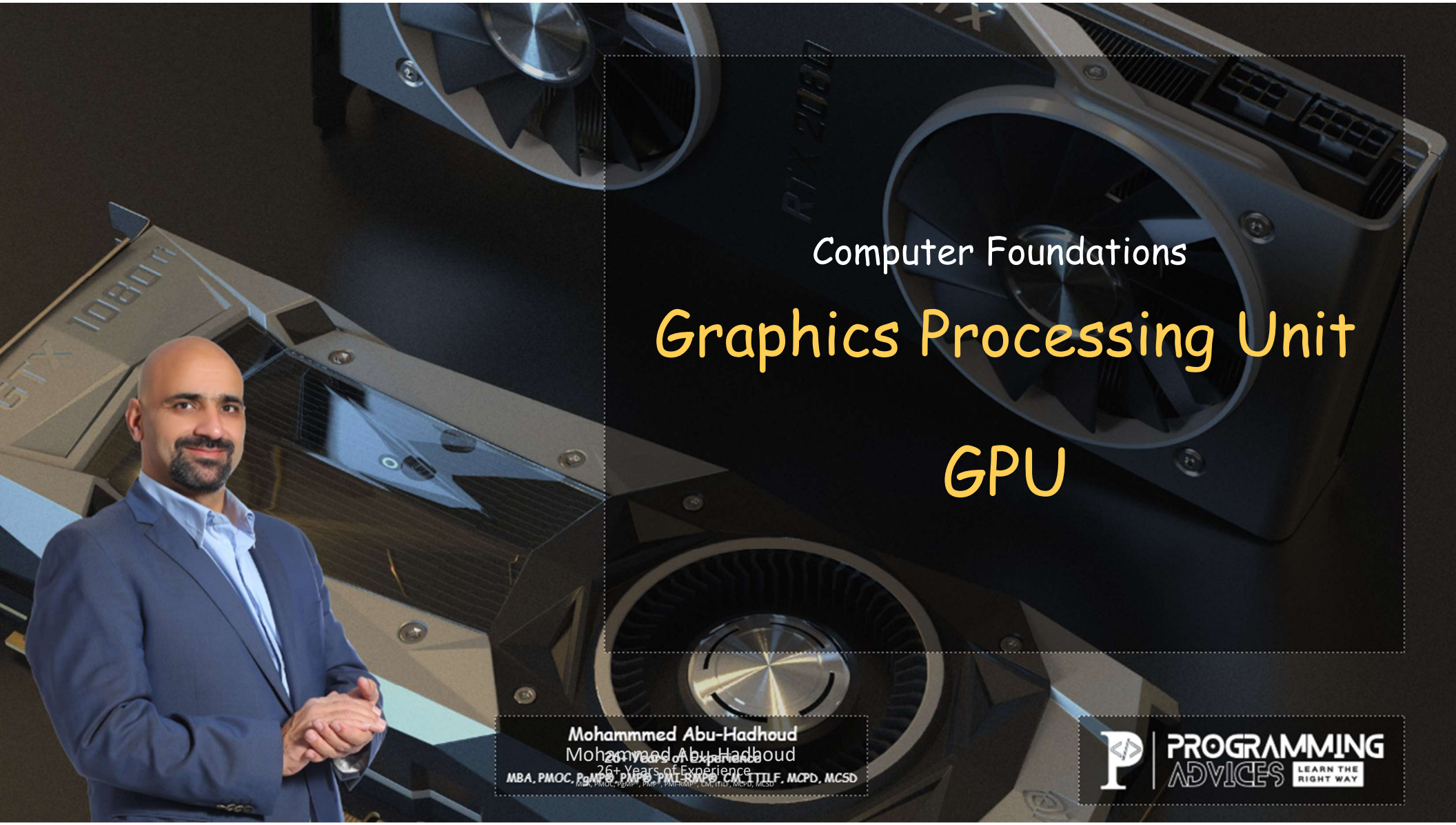
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GPU
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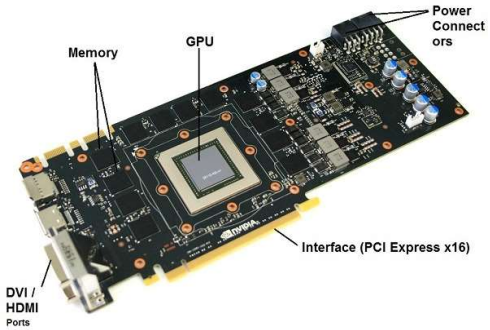
# What is GPU?

- GPU stands for graphics processing unit.
- You'll also see GPUs commonly referred to as graphics cards or video cards!
- But it is not graphic card, it's only one part of it.





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# GPU vs CPU

- CPU is designed to handle tasks quickly but are limited in the concurrency of tasks that can be running.

- A GPU is designed to quickly render high-resolution images and video concurrently.


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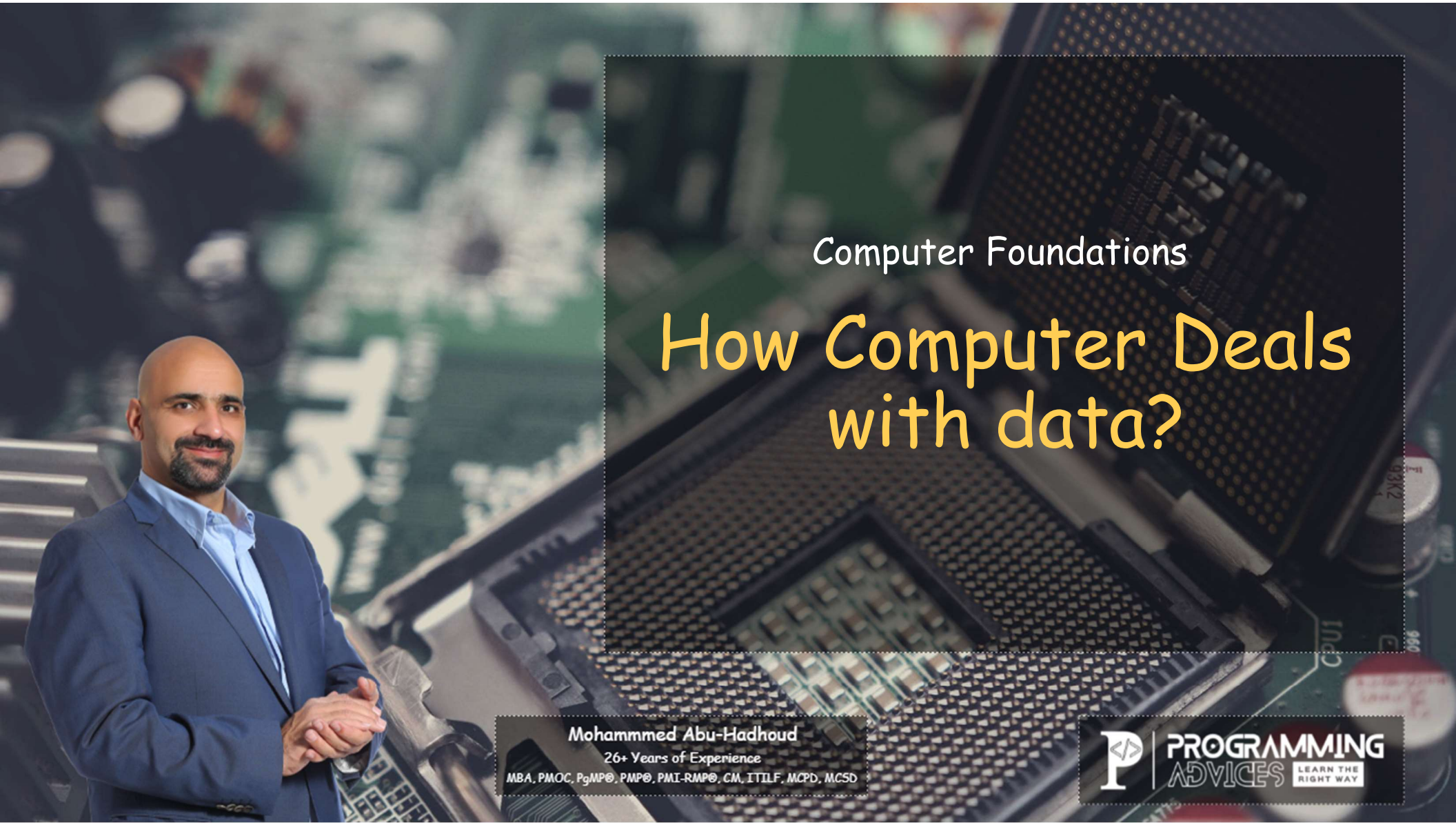
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How Computer Deals with data?
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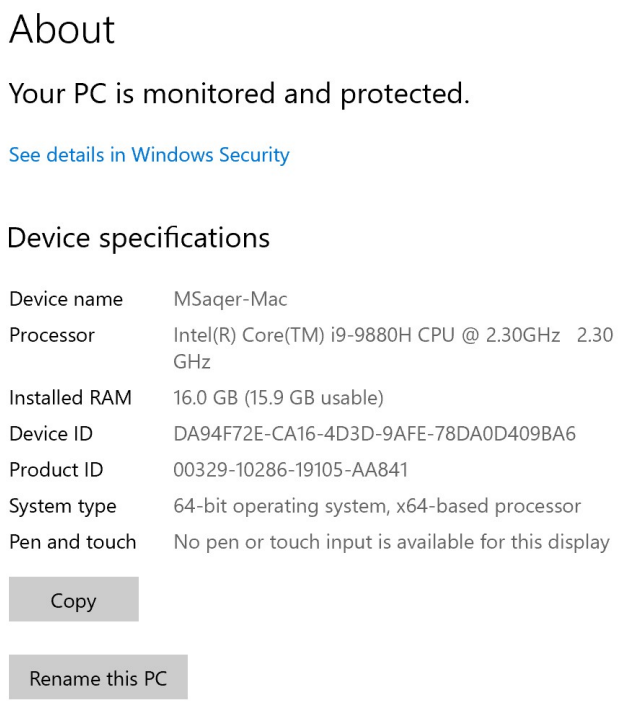
What is 32 vs 64

32-bit number has **2^32** possible addresses, or **4,294,967,296**. On other side, a 64-bit number's capacity is **2^64**, or **18,446,744,073,709,551,616**. Comparing ~4 billion bytes (about 4 gigabytes) to ~18 quintillion bytes (about 18 billion gigabytes or 16 exabytes) showcases the vast difference.

*x64* or *x86-64 and* 32-bit hardware and software are often referred to as *x86* or *x86-32*.

•64-bit computer architecture provides higher performance than 32-bit architecture by handling twice as many bits of information in the same clock cycle.
•A computer with a 32-bit processor can only run a 32-bit operating system and 32-bit software. But a computer with 64-bit processor can run both 64-bit and 32-bit operating systems and software.
**Note:** if you have installed 32-bit operating system on a 64-bit computer, then it can run 32-bit software only.

**32bit** operating systems can allocate only 4GB of memory (2^32 = 4294967296), whereas **64bit** ones can allocate a lot more (2^64 = 18446744073709551616). So if you have under 4 GB of RAM in your computer, you don't need a 64-bit CPU, bu if you have 4 GB or more, Then you must have 64 Bit CPU and operating system.





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CPUs are built by placing billions of microscopic transistors onto a single computer chip.

a transistor is a binary switch and the fundamental building block of computer circuitry. Like a light switch on the wall, the transistor either prevents or allows current to flow through. A single modern CPU can have hundreds of millions or even billions of transistors.


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