Coding Fundamentals ASPIRE

(8/11 - 12/12)

Helix Charter High School
Isabelle Viraldo

Week 11

Welcome!

- Mondays: Discussion + Activity
- Fridays: Review + Programming Exercise

What do you want to learn?

What do you care about?

What do you want to accomplish?

feedback!

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Topics I hope to cover:

- GitHub (How to use and let's set one up!)
- AI (Machine Learning vs Generative AI vs Image Detection, let's break it down (and make one of our own))
- How to code! (Some practical skills, and also best practices)
- Binary (What is it? Why is it important? Who cares?)
- Robotics (What do you need to get a robot working?)
- How does your computer work? (What do computers do when you're not looking?
- What do you want to learn?

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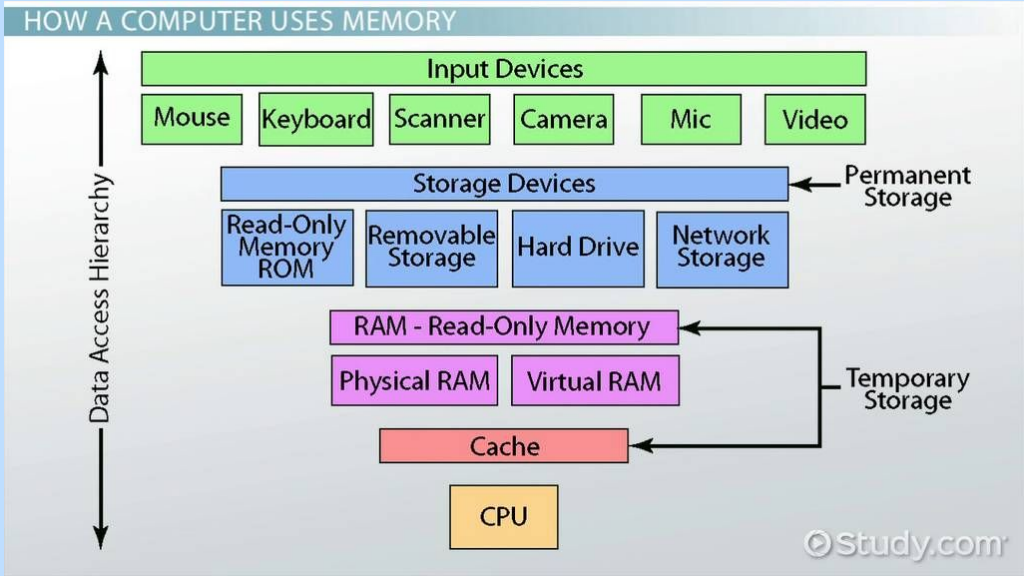
How does a computer work?

4 main parts:

- CPU (Central Processing Unit)
- Memory (cache or RAM)
- Storage (Disks or SSD)
- I/O (Input/Output)



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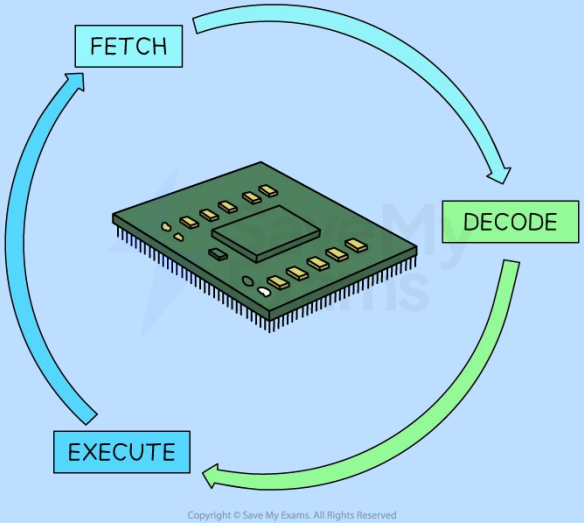
CPU

Fetch
- get next instruction from memory (using program counter)

Decode
- figure out what the instruction means

Execute
- do it (math/logic/move data), then update program counter

Billions of times per second



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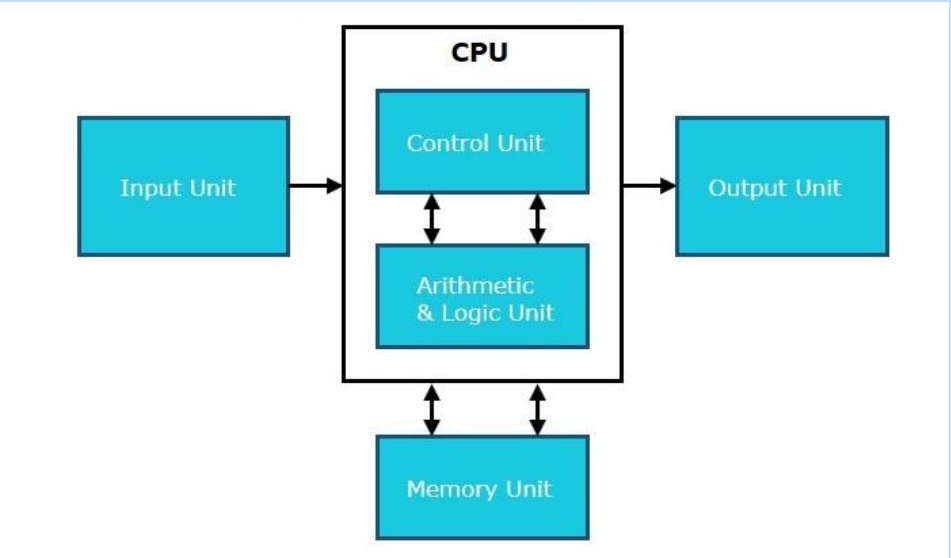
CPUs Parts:

ALU (Arithmetic Logic Unit):
- This does actions like add, compare, and/or/xor

Registers
- Where the bits are stored

Control Unit
- Runs the cycle, updates program counter

Clock
- Controls timing of everything



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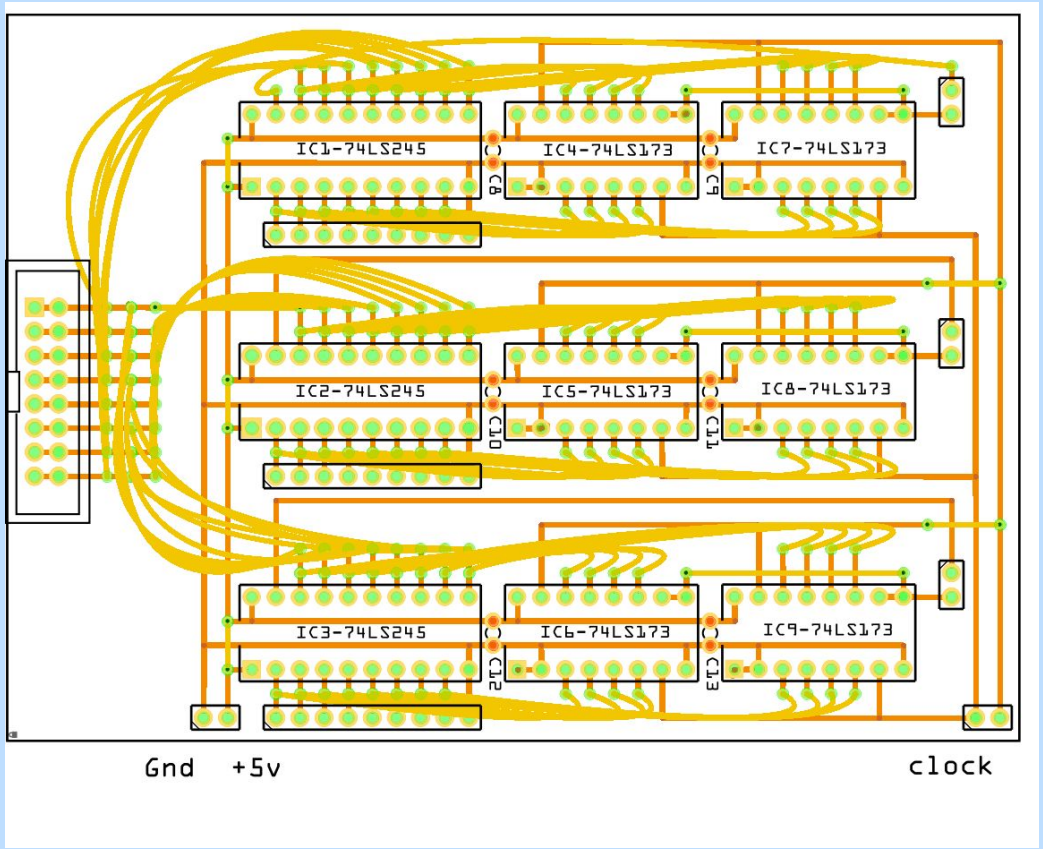
x = 0 + 5
y = x + 3
z = y - 4

addi $s0, $zero, 5
addi $s1, $s0, 3
addi $s2, $s1, -4

001000 10000 00000 0000000000000101

001000 10001 10000 0000000000000011

001000 10010 10001 1111111111111100



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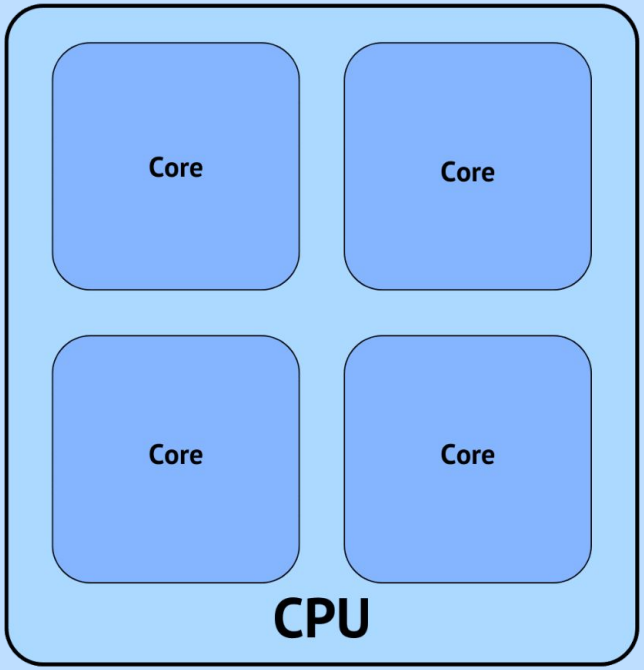
Cores
- Why multiple CPUs = more faster

Not all work splits evenly across cores

“8-core processor” = 8 cores in the CPU



“CPU” referring to the entire processor

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Coding activity! Get out your Chromebooks!

Everyone look up:

python online compiler

Or

Go to: https://tinyurl.com/yc4w9mdh

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