AIM: How do computers run/execute instructions?

Students will be able to (SWBAT) analyze commands and rules of a programming language and execute a set of instructions to complete a task

DO NOW: World's Slowest Computer Level 1

AIM: How do computers run/execute instructions?

ACTIVITY: The World's Slowest Computer

- Directly corresponds to real computers
- Runs/Executes at human speed so we can track it
- Everything you do is real computation, not a simulation

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Vocabulary:

- **Program** - A set of instructions that perform a specific task
- **Initialization** - Preparing the computer to execute a program
- **Execution** - Carrying out instructions in a program
- **Programming Language** - Commands and grammar for programs
- **Memory Cells** - Aka. “registers”, each storing an integer
- **Monitor** - A 10x10 grid of pixels: White/Yellow= blank; Green = filled
- **Hertz** - Number of instructions executed per second

AIM: How do computers run/execute instructions?

Roles: One partner is the Compiler. Second partner is the CPU/Memory. Third partner is the graphics card and monitor and will share their screen.

- **Compiler**: Reads instructions from program booklet
- ***Error Checker**: Checks each instruction is executed correctly and monitor is correct
- **Graphics Card**: Instead of flipping sponges, write “x” or another symbol. Yellow = blank; Green = [filled in]
- **CPU and Memory (Reader/Writer)**: Reads/Writes and Calculates values to the registers / memory

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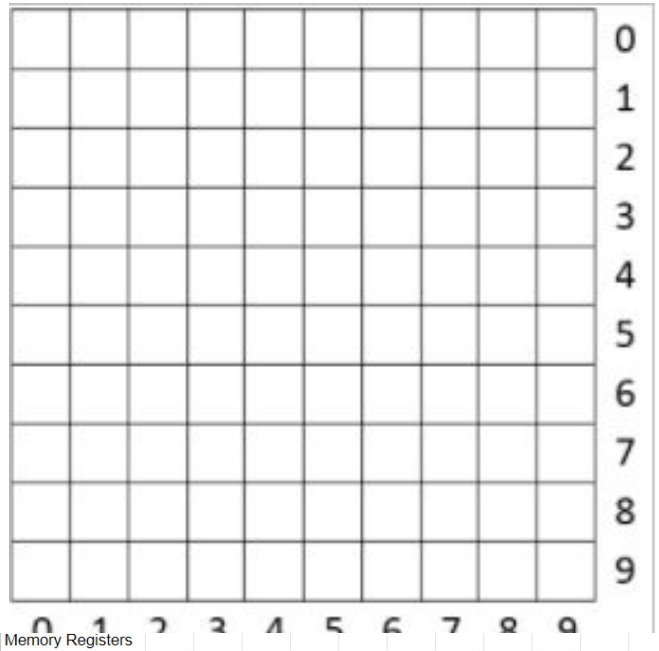
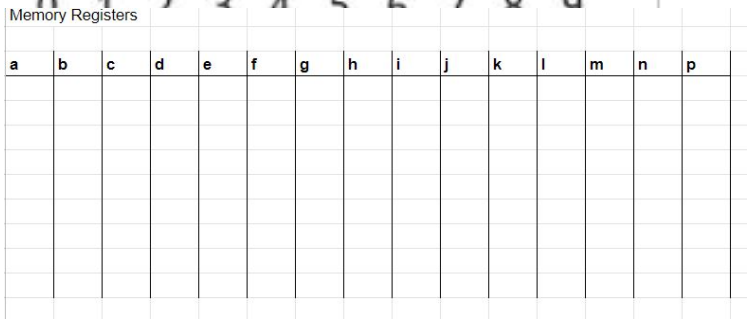
Instructions I: The World's Slowest Computer





1) Work with two other partners
   - One is Compiler and *error checker
   - Second partner is CPU/Memory
   - Third partner is the Graphics Card
2) Initialize the monitor
   - Draw a 10x10 grid. (Open sheet)
   - Number rows and columns from 0 thru 9. (zero based indexing!)

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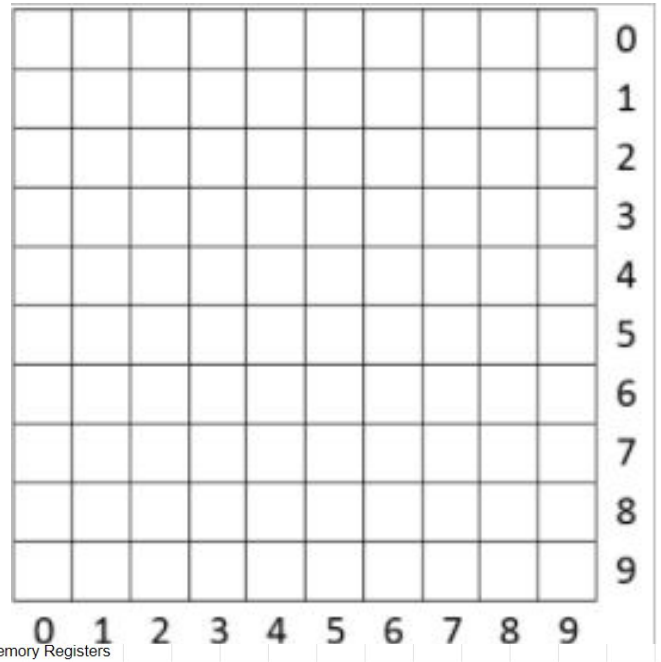
Instructions II: The World's Slowest Computer



Memory Registers

a	b	c	d	e	f	g	h	i	j	k	l	m	n	p

3) Initialize the computer memory

- Label your memory registers a thru p

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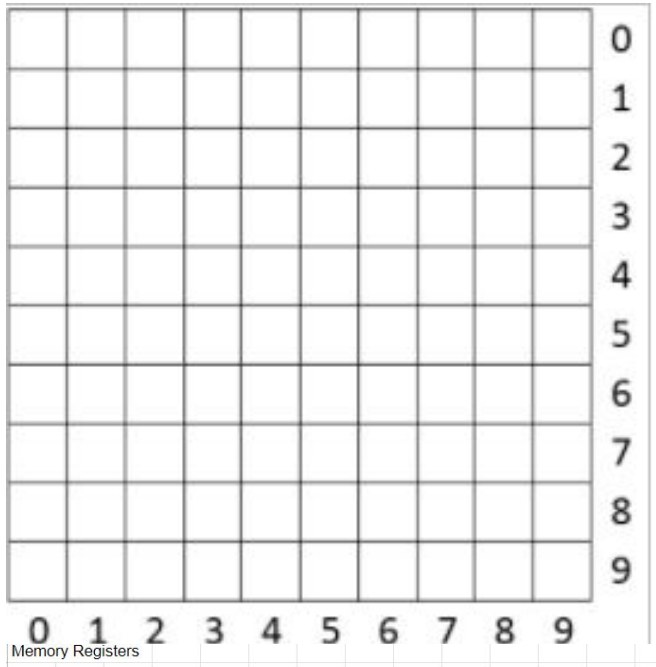
Instructions III: The World's Slowest Computer



Memory Registers

a	b	c	d	e	f	g	h	i	j	k	l	m	n	p

- Partner 1 - Compiler:
  - Read each instruction carefully
- Partner 2:
  - executes instruction
  - Reads/Writes in memory as needed
- Share your screen and Plot graphics when directed

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Get Started! What's the output?

AIM: How do computers run/execute instructions?

Q: What is the World's Slowest Computer?