Computing

Lesson 3: The FDE cycle

Computer systems

Mac Bowley

Materials from the Teach Computing Curriculum created by the National Centre for Computing Education

Task 1 - Task name

Which component of the CPU is described in each line of this table?

Carries data around the CPU	
Regulates the cycles per second	
Instructs the other components	
Carries out mathematical operations	
Fast access memory locations in the CPU	

Fetch-decode-execute jumble

Fetch | **Decode** | **Execute**

1	
2	
3	
4	
5	
6	
7	
8	
9	The cycle repeats

The CPU executes the instruction

Instructions are loaded into RAM from secondary memory

The instruction is transferred via the data bus to the CPU

The result may be stored back into RAM

The CPU may fetch data held in memory if referenced in the instruction

The instructions are stored in RAM in numbered memory locations

The CPU sends a signal requesting an instruction from a specific location in RAM

The CPU decodes the instruction

The FDE cycle in action

Instruction

- Open oaknat.uk/comp-101comp-lmc
- Change the program using the dropdown menu in the bottom left hand corner, you want “Adding 2 inputs” (Hint on next slide)
- Run the program using the “Run Program” button. Watch the log as it runs

Question 1

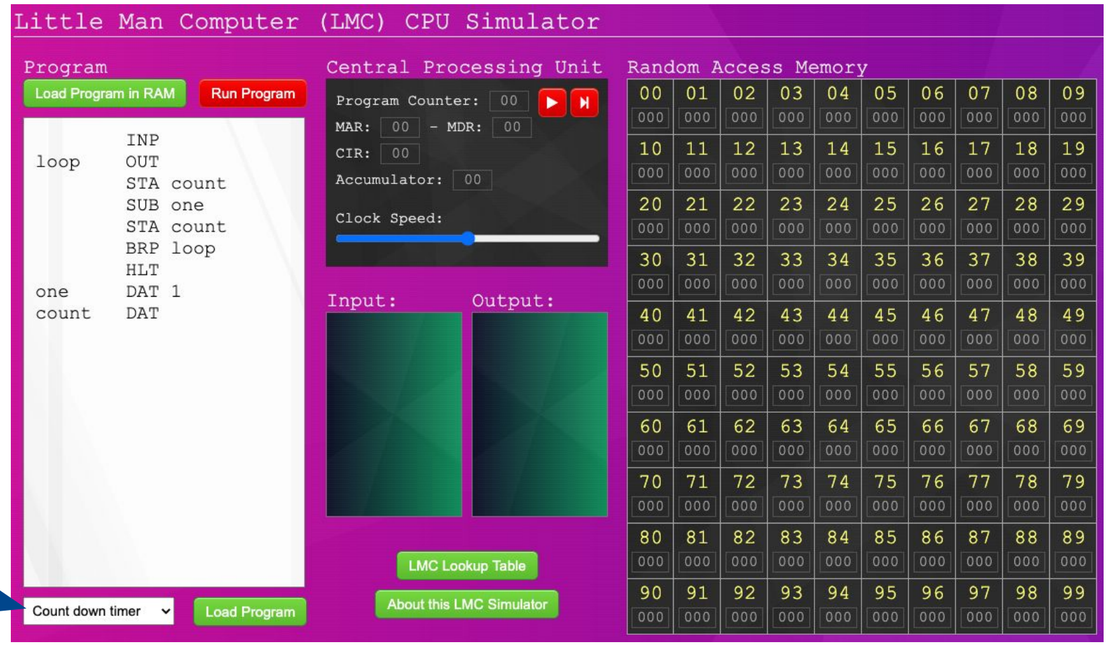
What does **num1** represent on lines 2 & 4?

Question 2

What is the instruction number for **INP?**

The FDE cycle in action - Part 1

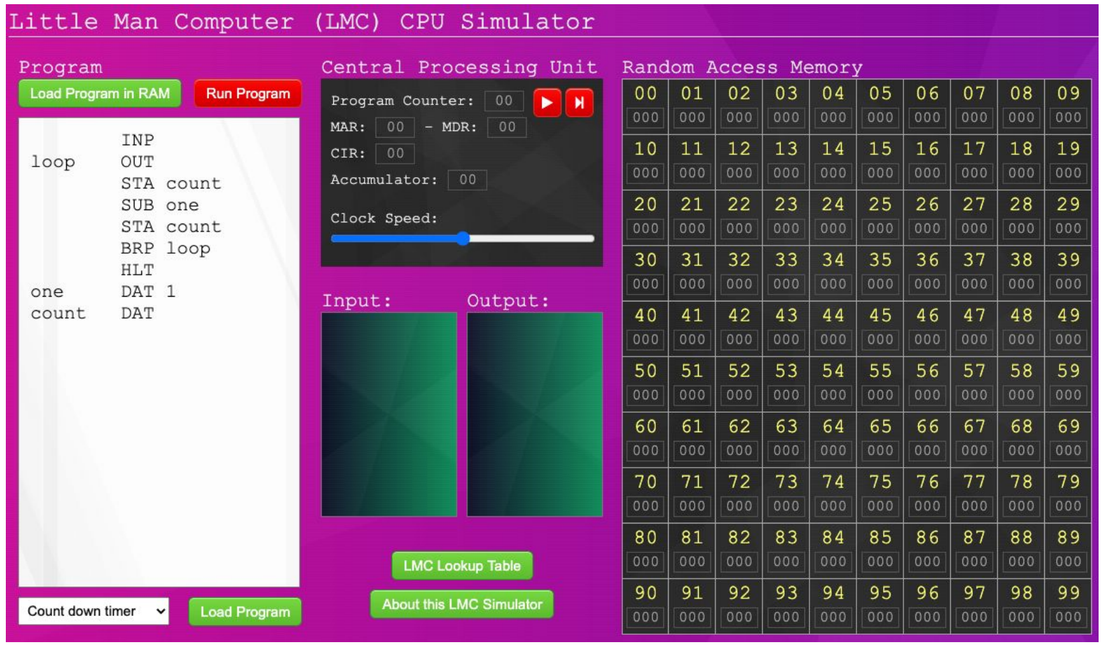
Change the program using the **dropdown menu** in the bottom left hand corner, you want “**Adding 2 inputs**”



Credit: Philippe Kerampran, 101computing

The FDE cycle in action - Part 2

Use the tables on the next 2 pages to note down what each component is doing during the cycle.



Credit: Philippe Kerampran, 101computing

The FDE cycle in action

Component	Fetch	Decode	Execute
Control Unit			
ALU			
Buses			
Accumulator			

The FDE cycle in action

Component	Fetch	Decode	Execute
Memory address register			
Memory data register			
Current instruction register			
Program counter