

No E-Mail submissions will be accepted.  
Submission formats and file naming:

File name : firstName\_lastName\_lab\_6

File format: pdf or MS Word format

e.g. Donald\_Trump\_lab\_6.pdf

Reading materials

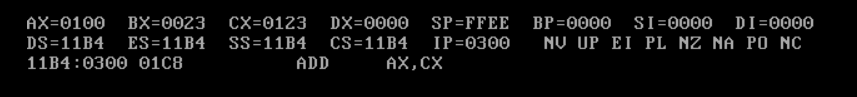
Use the following links and write a one page summary about the movies.

# How Does a Quantum Computer Work?

<https://www.youtube.com/watch?v=g_IaVepNDT4&ab_channel=Veritasium>



**1)** The state of 8088 CPU at certain time is given by the following figure. Using this figure obtain next instruction, machine code, and the value of AX, CX, and BX before and after CPU execution.



Before

AX = ?, BX = ?, CX = ?

Next instruction = ?

Machine code = ?

The memory address of the next instruction = ?

After

AX = ?, BX = ?, CX = ?

**2)** A program consists of 8 floating point instructions and 12 integer instructions. Floating point instructions take 5 cycles and integer instructions take 2 cycles each. Assuming that the processor has a clock rate of 200.0 MHz:

1. Obtain the total cycles.
2. Obtain the total instructions.
3. Obtain the average cycles per instruction.
4. Using the total cycles Obtain the execution time.
5. Using the average cycles per instruction obtain the execution time.
6. Compare the results obtained in parts d and e.

**3)** A program consists of 50,000 instructions as follows:

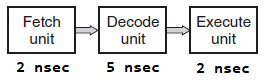
|  |  |  |
| --- | --- | --- |
| **Instruction Type** | **Instruction Count(IC)** | **Cycle per Instruction(CPI)** |
| Floating point | 30,000 | 5 |
| Integer | 16,000 | 2 |
| Data transfer | 4,000 | 6 |

* Complete the following table:

|  |  |  |  |
| --- | --- | --- | --- |
| **Processor** | **Clock Rate**  **(MHz)** | **Cycle Time(CT)**  **(nanosecond)** | **Execution Time**  **(microsecond)** |
| P1 |  | 5 |  |
| P2 | 300 |  |  |
| P3 | 500 |  |  |

* Obtain the average cycles per instruction.

**4)**A computer has a pipeline with 3 stages:



Non-pipelined processor:

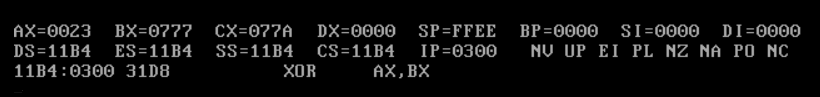
1. How many instructions per second can this machine execute?
2. What is the latency of an instruction?

Pipelined processor:

1. How many instructions per second can this machine execute?
2. What is the latency of an instruction?

**5)**The state of 8088 CPU at certain time is given by the following figures. Using this figures obtain next instruction, machine code, and the value of AX, CX, and BX before and after CPU execution.Do they have same machine codes(figures 1 and 2)?

**Fig 1**



Before

AX = ?, BX = ?, CX = ?

Next instruction = ?

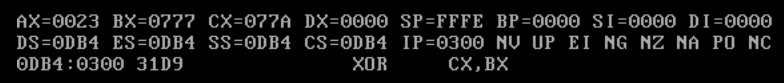
Machine code = ?

The location of next instruction = ?

After

AX = ?, BX = ?, CX = ?

**Fig 2**



Before

AX = ?, BX = ?, CX = ?

Next instruction = ?

Machine code = ?

The location of next instruction = ?

After

AX = ?, BX = ?, CX = ?