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Lab 3c

1. Suppose a program contains 500 million instructions to execute on a processor running on 2.2 GHz**.** Half of the instructions take 3 clock cycles to execute, where the rest of the instructions take 10 clock cycle**.** What is the execution time of the program?

500 million instructions = 500,000,000 / 2 = 250,000,000 instructions

**First half of instructions:**

250,000,000 instructions take 3 clock cycles

The total clock cycle for half of the instructions taking 3 clock cycles = 250 million ∗ 3 clock cycles = 3 ∗ 106 cycles

Processor frequency given to us is 2.2 GHz

Processor produces 2.2 ∗ 109 cycles in 1 second

2.2 ∗ 109 cycles take 1 second

3 ∗ 106 cycles take second ≈ 0.0014 seconds

**Second half of instructions:**

250,000,000 instructions take 10 clock cycles

The total clock cycle for second half of the instructions taking 10 clock cycles = 250 million ∗ 10 clock cycles = 10 \* 106 cycles

Processor frequency given to us is 2.2 GHz

Processor produces 2.2 ∗ 109 cycles in 1 second

2.2 ∗ 109 cycles take 1 second

10 ∗ 106 cycles take second ≈ 0.0045 seconds

The total execution time of the program is about 0.0014 + 0.0045 = 0.006 seconds

1. A processor is 20 Million Instructions per second**.** If you run a program on that processor and the program takes 30 seconds to finish**.** How many instructions are there in this program?

20 MIPS ∗ 1 million = 20 million

20 million ∗ 30 seconds = 600 million instructions

**There are 600 million instructions in this program**