CSC 808 Adv. Computer Architecture

Lesson One: Student Task: Understanding Clock Speed and CPI

Task Instructions:

A computer processor has the following specifications:

- **Clock Speed:** 2.5 GHz
- **Instruction Count:** 10 million instructions
- **Cycles Per Instruction (CPI):** 1.8

Questions:

1. Calculate the total number of clock cycles needed to execute the program.
2. Determine the total execution time (in seconds) of the program.
3. Explain in your own words how CPI and Clock Speed together affect the performance of a processor.
4. If the CPI improves to 1.2, how much faster will the program execute? Show your calculations.
5. Suppose another processor has a 3.0 GHz clock speed but a CPI of 2.5 for the same program. Which processor is faster? Show your working and explain why.