

Register for Certification exam

Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

Week 3

Lecture 12: Measuring CPU Performance

Lecture 13: Choice of Benchmarks

Lecture 14: Summarizing Performance Results

Lecture 15: Amadahl's Law (Part 1)

Lecture 16: Amadahl's Law (Part 2)

Week 3 Lecture Material

Quiz: Week 3 : Assignment 3

Feedback form for Week 3

Week 4

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Thank you for taking the Week 3 : Assignment 3.

Week 3 : Assignment 3

Your last recorded submission was on 2021-08-17, 16:25 IST

Due date: 2021-08-25, 23:59 IST.

1) A processor having clock cycle time of 5ns, will have a clock rate of _____ MHz.

1 point

2) Suppose a program requires 1000 instructions to execute. The average number of cycles per instruction (CPI) is 1.5. The clock frequency of the machine is 2.0 GHz. Time required to execute the program will be _____ nanoseconds.

1 point

3) Consider a program whose instruction count is 1,500, average CPI is 2, and clock cycle time is 1 nanosecond. Suppose we use a new compiler on the same program for which the new instruction count is 2,500, and new CPI is 1.5, which is running on a faster machine with clock cycle time of 0.5 nanosecond. The speedup achieved will be:

- a. 1.66
- b. 0.63
- c. 1.60
- d. 1.33

1 point

- a.
- b.
- c.
- d.

4) On which of the following does CPI depend on?

1 point

- a. Instruction Set Architecture
- b. Compiler
- c. CPU organization
- d. All of these

- a.
- b.
- c.
- d.

5) Consider the following statements:

1 point

- (i) RISC architecture increases number of instructions per program.
- (ii) RISC architecture increases CPI and clock cycle time.

Which of the following is correct?

- a. Only (i) is true
- b. Only (ii) is true
- c. Both (i) and (ii) are true
- d. Both (i) and (ii) are false

- a.
- b.
- c.
- d.

6) Suppose that a machine X executes a program with an average CPI of 2.5. Consider another machine Y (with same instruction set and a little better compiler) that executes the same program with 10% less instructions and with the CPI of 1.5 at 4GHz. What should be the clock frequency of X so that both the machines have same performance?

1 point

- a. 7.40GHz
- b. 7.40MHz
- c. 7.40KHz
- d. 7.40Hz

- a.
- b.
- c.
- d.

7) Suppose for a CISC ISA implementation, there are four instruction types LOAD, STORE, ALU and BRANCH with relative frequencies of 25%, 25%, 40% and 10% respectively, and CPI values of 3, 2.5, 1 and 6 respectively. The overall CPI will be _____. (Provide answer up-to 2 decimal places)

2.37

1 point

8) Consider the following statements:
(i) MIPS rating is used to compare performance of two processors.
(ii) Higher MIPS rating indicates better performance.
Which of the following is correct?

1 point

- a. Only (i) is true
- b. Only (ii) is true
- c. Both (i) and (ii) are true
- d. Both (i) and (ii) are false

- a.
- b.
- c.
- d.

9) Consider a program with 50 million instructions, a machine requires 25 milliseconds to execute this program. What will be the MIPS rating of the machine?

1 point

- a. 20
- b. 200
- c. 2000
- d. 20000

- a.
- b.
- c.
- d.

10) Which of the following statements is/are true with respect to Amdahl's law?

1 point

- a. It express the law of diminishing returns.
- b. It provides a measure to compare execution time of two machines.
- c. It expresses the maximum speedup that can be achieved.
- d. All of these

- a.
- b.
- c.
- d.

You may submit any number of times before the due date. The final submission will be considered for grading.

Submit Answers