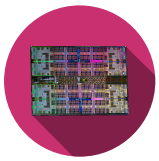


Performance

Student Solutions
Exercises Computer Architecture

1 Processor Benchmark & Performance

1.1 Which of the following statements are correct?

Three statements are true one is false.

per/benchmark-01

1.2 What is the throughput?

One statement is true and three are false.

per/benchmark-02

1.3 What is the SPEC?

One statement is true and three are false.

per/benchmark-03

1.4 What is the goal of the EEMBC Benchmark?

One statement is correct and three are false

per/benchmark-04

1.5 Which of the following is an energy efficiency metric?

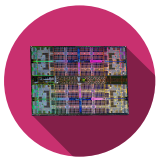
One statement is correct and three are false.

per/benchmark-05

1.6 Both power consumption and performance per watt matters for an embedded system.

50/50 change. Think.

per/benchmark-06



1.7 Processor performance

a) $30\mu s$
b) $2\frac{\text{cycles}}{\text{instruction}}$
c) $5\frac{\text{cycles}}{\text{instruction}}$
d) $292\mu s$
e) Processor B is 1.29 times faster than processor A.

per/performance-01

1.8 Processor performance

a) $\text{CPI}_{\text{Avg\_A}} = 3.775\frac{\text{cycle}}{\text{instr}}$ & $\text{CPI}_{\text{Avg\_A}} = 2.52\frac{\text{cycle}}{\text{instr}}$
b) Computer B is 1.35 times faster than Computer A.
c) 2.69GHz

per/performance-02

1.9 Processor performance

$\text{Execution\_time} = 8.75\text{ms}$

per/performance-03

1.10 Processor performance

Variant 2

per/performance-04

1.11 Processor performance

a) CPU_A is better when
   a) $w_{p_1} > 90.\overline{90}\%$
   b) $w_{p_2} < 9.\overline{09}\%$
b) CPU_B is better when
   a) $w_{p_1} > 90\%$
   b) $w_{p_2} < 10\%$
c) CPU_C is better when
   a) $w_{p_1} > 50\%$
   b) $w_{p_2} < 50\%$

per/performance-05

1.12 Processor performance

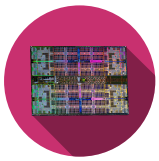
Central-Processing-Unit (CPU) A is the fastest!

per/performance-06

1.13 Processor performance

The clock frequency of the CPU is 2 GHz

4.65



per/performance-07

1.14 What is the best metric for comparinc performance?

One statement is true the others are false.

per/performance-08

1.15 Processor performance

$T = 3.2\overline{3}\text{ms}$

per/performance-09

1.16 Amdahl's Law

$S = 5.263\%$

per/amdahls-law-01

1.17 Amdahl's Law

$f = 66.\overline{6}\%$

per/amdahls-law-02

1.18 Amdahl's Law

Optimization A is 1.28 times better than Optimization B.

per/amdahls-law-03