

0907702 Computer Performance Evaluation (Summer 2018)
Midterm Exam

الاسم:

رقم التسجيل:

رقم التسلسل:

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Instructions: Time **50** min. Open book and notes exam. No electronics. Please answer all problems in the space provided and limit your answer to the space provided. No questions are allowed. There are six problems and each problem has 5 points.
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P1. Assume that you want to evaluate a new multi-core design that uses new chip interconnection network and new cache coherence protocol for shared-memory applications.

a) Among the three main evaluation techniques, which one do you use? State your assumptions and justification for the selection you make.

Assuming that I don't have the system to perform measurements, I would use simulation because such detailed design options cannot be accurately evaluated using analytical modeling.

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b) How would you validate the results of your selected technique?

Using measurements on a similar system.

We set the simulator to model the existing similar system.

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P2. An engineer studied the performance of a web application for the customers that use this application. Her primary performance metric was throughput in requests per second. What is wrong in this metric and what is a better metric?

Throughput is useful for overall system performance studies.

It does not give idea about the individual user experience.

Response time in seconds is a better metric for users.

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P3. In TPC-C, how the metric \$/tpmC is measured?

Sum the total system cost over some usage period.

Measure the maximum throughput in tpmC without exceeding some response time criteria.

Divide the total cost by the maximum throughput to get \$/tpmC.

P4. Given the following performance of two systems on three benchmarks,

Benchmark	System A (tps)	System B (tps)
I	1000	2000
II	2000	1600
III	60	30

Using ratio games, how the makers of System B would advertise the advantage of their system?

As the metric is higher is better, we use System A as reference.

Benchmark	System A	System B
I	1	2.0
II	1	0.8
III	1	0.5
Average	1	1.1

Therefore, makers of System B would advertise that their system has a relative performance of 10% higher than System A using these three benchmarks.

P5. An engineer instrumented a server application to gather detailed performance data. From this data, he predicted that the server cannot serve more than 1,000 users and suggested that his company purchases two additional servers to satisfy the demands of expected 2,500 users. What is wrong in this analysis and what is a better methodology to estimate the server capacity?

The engineer ignored the server slowdown due to instrumentation.

The engineer should use measurement using external load driver.

P6. Among the four options of simulation languages, what option do you select to test the validity and performance of a new integer multiplication digital circuit and why?

Simulation language such as Verilog.

It reduces development time dramatically.

<Good Luck>