0907532 Computer Performance Evaluation (Fall 2012)

Midterm Exam

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Instructions: Time 50 minutes. Open books and notes. No calculators. Use the exam sheet for your answers. Every question is for 5 marks. **No questions are allowed**.

Good Luck!

Q1. Assume that you want to perform a performance study of a database server used in the registration department of your university. Assume that the purpose of this study is to buy a new server that meets all your university's requirements for such a server. For this study, list the following:

a) Services

Accept database updates

Responds to database queries

b) Performance metrics

TPM, response time, price, power consumption, reliability, availability, disk capacity

c) Workload parameters

Rates and distributions of queries and updates

Types of queries and updates

Database size

d) Factors

Workload

Speed/number/sizes of CPUs, memory, disks, and network

e) Evaluation technique

Measurement

f) Workload

The real workload or TPC-C

Q2. The SPEC and TPC benchmarks are frequently used in performance evaluation. What are the advantages and disadvantages of using such benchmarks?

Advantages: Represent wide range of real applications

Can be used to compare the performance of multiple systems

Test various aspects of system performance

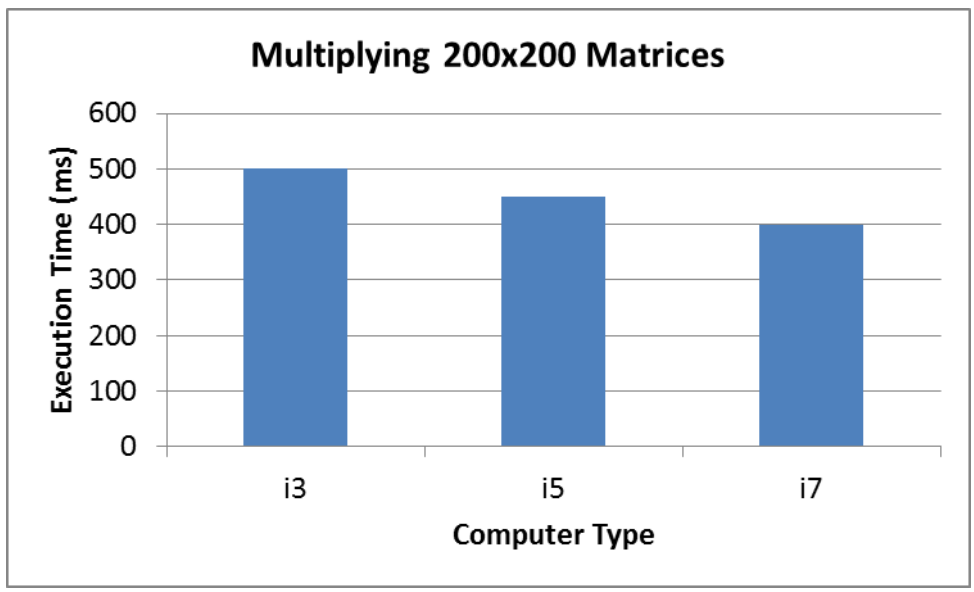
Disadvantages: Very complex and time consuming in simulation or analysis perf. evaluation.

May not represent an organization's real workload

Systems maybe tuned to get high perf. on them, higher than on real workloads.

Q3. The execution times in milliseconds of multiplying 200 by 200 matrices on three systems are shown in the following table. Represent this data graphically.

Computer	T
i3	500
i5	450
i7	400



Q4. Given the following performance of three systems on three benchmarks,

Benchmark	System A	System B	System C
I	30	25	20
II	40	40	40
III	45	60	60

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

Performance is 'higher is better' metric. So we try System B and System C as base systems.
We find the average relative performance for both cases.
We select the base that gives highest average relative performance for System A.

Benchmark	System A / B	System A / C
I	1.2	1.5
II	1.0	1.0
III	0.75	0.75
Average	0.98	1.08

So should select C as base and report that A is higher than C by 8%.

Q5. Describe how events are generated and processed in an event-driven simulator.

The initialization routine inserts seed events in the event scheduler.

The simulator's main loop pulls events from the event scheduler and calls the relevant event routines.

The event routines insert future events in the event scheduler.