

UMASS CICS  
CS677 Spring 2019  
Prof. Prashant Shenoy

Assignment #1

Due Date: Feb 13, 2019 23:59 hrs.

**Submission Instructions**

- Generate a PDF solution and upload it to Gradescope
- Please make sure you highlight your solutions appropriately i.e. Mark which pages of your PDF solution correspond to questions of the assignment
- Check here for helpful tips on uploading PDF assignments to Gradescope: <https://gradescope.com/help#help-center-section-student-workflow>

Q1: What is replication transparency? Give an example where it is beneficial for the system to be replication transparent to users.

Q2: What is the difference between the processor pool model and the traditional client server model that were discussed in Lecture 1?

Q3: Why is the event-based architecture also referred to as the publish-subscribe architecture?

Q4: For multi-tiered architecture, give an example of when you would put the user interface layer at the client, the data layer at the server and split the application layer between the client and the server.

Q5: In Chord, explain what happens when a node joins the ring at ID  $i$ ?

Q6: Not every node in a peer-to-peer network should become super-peer. What are reasonable requirements that a super-peer should meet?

Q7: Give one advantage of an edge server system.

Q8: Explain why multi-threaded processes can achieve true parallelism, and not just concurrency, in a multiprocessor system?

Q9: What are some advantages of kernel level threads over user-level threads? Do lightweight processes share the advantages of kernel level threads?

Q10. Statically associating only a single thread with a lightweight process is not such a good idea. Why not?