

**CSE 550**  
**Problem Set #2**

Due: 4:30pm, Thursday, November 18, 2010

1. Add to your file buffer cache from problem set #1, the ability to group operations in a transaction, so that operations are atomic, isolated, consistent, and durable with respect to concurrent execution and with respect to recovery from failures. Your transaction manager should support transaction start, commit, and abort, as well as failure recovery from the log. You may assume there's a separate deadlock detector that you don't need to implement.
2. Briefly describe the difference between two phase locking and two phase commit.
3. Explain, and give an example, of how a multiprocessor system with multiple storage modules (e.g., multiple disks and/or multiple memory banks), can (i) execute reads and writes in processor order and still (ii) not be sequentially consistent. You should assume that the communication is asynchronous, or at least, that different memory modules are closer to some processors than others. This is a bit easier to envision if you imagine there are caches close to each processor, such that some reads/writes take much less time than others. However, the answer does not require caches.