

## CS542 Practice Problem on Transaction Management

1. Assume we design a new concurrency control strategy called ONE-PHASE. ONE-PHASE requires a transaction to always first acquire all its needed locks before it starts processing and then to hold onto all its locks until after the transaction is completed and has been successfully committed. Compare your ONE-PHASE strategy against the 2-Phase-Locking (2PL) strategy.
2. Properly implemented transactions are commonly said to meet the ACID test, where ACID stands for the terms A = atomicity, C = consistency, I = isolation, and D = durability. Give a brief definition of each term. Are these properties achieved by the recovery manager, the concurrency control manager, or who, respectively?
3. Draw the precedence graph for the schedule below. Is this schedule conflict serializable?  
 $R_1(A) R_1(B) R_2(A) R_1(A) W_3(C) W_2(B) W_2(C) R_4(C) W_1(C) R_1(A)$
4. Assume the sequence of actions arrives in the order given below to the DBMS, then show the schedule with explicit lock requests and releases that the strict-2-phase-locking protocol would establish.  
 $R_1(X) T_2:R(Y) T_4:W(X) T_2:R(X) T_1:R(Y)$
5. Is the schedule below serializable, conflict-serializable, both, or neither? Explain also in general if a schedule can be serializable, but not conflict-serializable. And, vice versa, if a schedule can be conflict-serializable, but not serializable.  
 $R_1(A) W_2(A) COMMIT_2 W_1(A) COMMIT_1 W_3(A) COMMIT_3$