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605.441 Problem Set 8

1. 17.9 A serial schedule is one in which operations are completed in consecutive order, without and task switching. That is, no two operations are taking place in an interleaved fashion. A serializable schedule is a schedule, that perhaps interleaves operations, that can be transformed into a serial schedule through a series of conflict equivalent transactions.

A serial schedule is considered correct because any set of operations are designed to move the database from one correct state to another. It follows that these operations are correct. A serializable schedule is correct because it is equivalent to a serial schedule.

2. 17.22 c. This is conflict serializable. The equivalent serial schedule is $r_2(X), r_3(X), w_3(X), r_1(X), w_1(X)$
d. This schedule is not serializable.
3. 18.1 A two-phase locking protocol is a method of guaranteeing serializability. A transaction supports this protocol if all lock operations precede any unlock operations. This divides a transaction into two phases, one in which any necessary locks are gathered, and a second where all the locks are released. This ensures serializability because a transaction will not release any resources it has gathered until it has completed all of its operations.