HW 6: due Thursday, December 11

1) Consider the following transactions:

Assume that the database has the following initial state: x = 50000, y = 0, z = 0.

(a) Determine the database state after serial execution of transaction 1 followed by transaction 2.
(b) Determine the database state after serial execution of transaction 2 followed by transaction 1.
(c) Create a complete schedule for concurrent execution of these transactions that results in a database state different from the result of either possible serial execution.

2) For each of the following transaction schedules:

   (a) Is the schedule serial?
   (b) Is the schedule conflict serializable?
   (c) What is the recovery class of the schedule?

S2.1: b1 r1(m) w1(n) c1 b2 r2(n) w2(m) c2
S2.2: b1 r1(m) w1(n) b2 r2(n) w2(m) c1 c2
S2.3: b1 r1(m) b2 r2(n) w2(m) w1(n) c1 c2
S2.4: b1 b3 r1(m) b2 r2(y) w3(z) w2(m) w1(n) a3 c1 c2
S2.5: b1 b2 b3 r1(B) r2(B) w3(A) r2(C) w2(D) c2 r1(B) w1(A) c1 w3(C) c3
S2.6: b1 b2 b3 r1(C) r3(A) w2(B) r3(A) w2(C) w2(D) c2 r1(B) r3(B) c1 r3(C) c3

3) Determine if each of the following schedules is possible under each of the following locking protocols:

   (a) basic two-phase locking
   (b) conservative two-phase locking
   (c) strict two-phase locking

S3.1: b1 s1(x) x1(y) r1(x) w1(y) u1(y) u1(x) c1 b2 s2(y) x2(z) r2(y) w2(z) u2(y) u2(z) c2
S3.2: b1 s1(x) x1(y) r1(x) w1(y) u1(y) u1(x) c1 b2 s2(y) x2(z) r2(y) u2(y) w2(z) u2(z) c2
S3.3: b1 s1(x) x1(y) r1(x) x1(y) w1(y) u1(y) u1(x) c1 b2 s2(y) x2(z) r2(y) w2(z) u2(y) u2(z) c2
S3.4: b1 s1(x) x1(y) r1(x) b2 x2(z) w2(z) w1(y) u1(y) u1(x) c1 s2(y) r2(y) u2(y) u2(z) c2
S3.5: b1 s1(x) x1(y) r1(x) b2 x2(z) w2(z) u2(z) w1(y) u1(y) u1(x) c1 s2(y) r2(y) u2(y) c2

4) Have the following partial transaction schedules resulted in deadlock?

S4.1: b1 s1(z) b2 s2(y) x2(z) x1(y) ...
S4.2: b1 s1(x) b2 s2(y) x2(z) x1(y) ...