Tutorial 9: Transaction Processing Concepts and Theory

CS3402 Database Systems

Question 1

- Which of the following schedules is (conflict) serializable? For each serializable schedule, determine the equivalent serial schedules.
  a) A: $r_1(X)$; $r_3(X)$; $w_1(X)$; $r_2(X)$; $w_3(X)$;
  b) B: $r_1(X)$; $r_3(X)$; $w_3(X)$; $w_1(X)$; $r_2(X)$;
  c) C: $r_3(X)$; $r_2(X)$; $w_3(X)$; $r_1(X)$; $w_1(X)$;

Question 2

- Consider the following concurrent schedule S. Draw the serialization graph for the schedule. Is it conflict serializable?

T_1	T_2	T_3
	Read(X)	
Write(Y)		
		Read(Y)
	Write(Y)	
Write(X)		
	Commit	
		Write(Z)
Commit		
		Commit

Question 3

- Consider schedules S_1, S_2 and S_3 below. Determine whether each schedule is strict, cascadeless, recoverable, or nonrecoverable. Determine the strictest recoverability condition that each schedule satisfies.
  a) S_1: $r_1(X)$; $w_1(X)$; $r_2(X)$; $r_1(Y)$; $w_2(X)$; c_2; c_1;
  b) S_2: $r_1(X)$; $w_1(X)$; $r_2(X)$; $r_1(Y)$; $w_2(X)$; $w_1(Y)$; c_1; c_2;
  c) S_3: $r_1(X)$; $w_1(X)$; $w_2(X)$; $w_1(Y)$; c_1; $r_2(X)$; c_2;

  Can you change schedule S_3 into a strict schedule?