DB - Assignment # 4

Submission deadline Wednesday December 9, 2020 @ 11:55 PM

(ONLY SLATE SUBMISSIONS ALLOWED) (NO EMAIL SUBMISSIONS) (NO DEADLINE EXTENSIONS)

Question # 1:

Consider the three transactions T_1, T_2, and T_3, and the schedules S_1 and S_2 given below. Draw the serializability (precedence) graphs for S_1 and S_2, and state whether each schedule is serializable or not. If a schedule is serializable, write down the equivalent serial schedule(s).

T_1: $r_1(X)$; $r_1(Z)$; $w_1(X)$;
T_2: $r_2(Z)$; $r_2(Y)$; $w_2(Z)$; $w_2(Y)$;
T_3: $r_3(X)$; $r_3(Y)$; $w_3(Y)$;
S_1: $r_1(X)$; $r_2(Z)$; $r_1(Z)$; $r_3(X)$; $r_3(Y)$; $w_1(X)$; $w_3(Y)$; $r_2(Y)$; $w_2(Z)$; $w_2(Y)$;
S_2: $r_1(X)$; $r_2(Z)$; $r_3(X)$; $r_1(Z)$; $r_2(Y)$; $r_3(Y)$; $w_1(X)$; $w_2(Z)$; $w_3(Y)$; $w_2(Y)$;

Question 2: List all possible schedule for transactions T1 and T2 given below, and determine which are conflict serializable (correct) and which are not.

T_1	T_2

read_item(X);
$X := X - N$;
write_item(X);
read_item(Y);
$Y := Y + N$;
write_item(Y);
	read_item(X);
	$X := X + M$;
	write_item(X);

The transactions given above can be written as follows using shorthand notation:
T 1 : r 1 (X); w 1 (X); r 1 (Y); w 1 (Y);
T 2 : r 2 (X); w 2 (X);

HINT:
In this case:
m = 2, (total number of transactions), and
n1 = 4, (number of operations in transaction 1), and
n2 = 2, (number of operations in transaction 2).

The generic formula for calculating the total number of schedules is: (n1+n2)! / (n1! * n2!)
So, the total number of possible schedules in this case will be:
(4+2)! / (4! * 2!) = 6*5*4*3*2*1/ 4*3*2*1*2*1 = **15**