

CS 143- HW5

1.

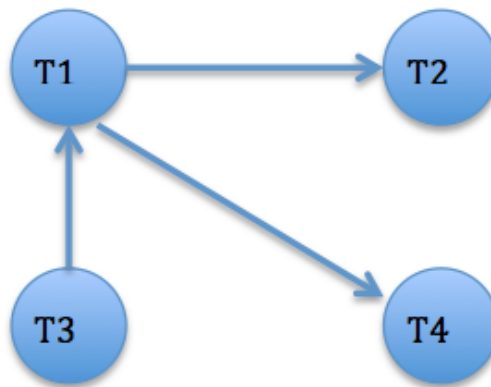
a)

Given training schedule S, we can write S as:

$S = W_3(A)R_1(A)W_1(B)R_2(B)W_2(C)R_4(B)$

From this we can clearly see that S is serial.

b) We can draw a precedence graph of the given schedule as shown below:



We see that this graph is acyclic. Thus, S is conflict serializable.

T3-T1-T2-T4 and T3-T1-T4-T2

2.

(a) If all three transactions are under the SERIALIZABLE isolation level, the possible orders of execution are as follows:

- i. T1->T2->T3: In this case, the value of T1 will be: 30
- ii. T1->T3->T2: In this case also, the value returned by T1 is 30.
- iii. T2->T1->T3: in this case, T1 returns 42 since T2 is executed first.
- iv. T2->T3->T1: in this T1 returns 36, since T1 is executed last, after T2 and T3.
- v. T3->T1->T2: in this case, T1 returns 25 since T3 is executed before T1.
- vi. T3->T2->T1: in this case, T1 returns 37.

Thus, the possible values T1 returns are 25, 30, 36, 37 and 42.

(b)

Possible order of executions lead to the following results:

- i. T1->first line of T2-> T1
- ii. T2->T1
- iii. First line of T3->T1

- iv.  $T3 \rightarrow T1$
- v.  $T3 \rightarrow T2 \rightarrow T1$
- vi.  $T2 \rightarrow T3 \rightarrow T1$

Thus, the possible values returned are: 25, 30, 32, 36, 37, 40 and 42.