

## Transactions & Scheduling

Considering our RideEasy database, let us assume two transactions  $T_1$  &  $T_2$  as follows:

$T_1$ : It decrements rating of driver with ID 5 by 1 and increments rating of driver with ID 10 by 1.

$\therefore T_1$  is:

[Begin  $A = A - 1$ ,  $B = B + 1$  End]

where  $A$  represents rating of driver with ID 5 and  $B$  represents rating of driver with ID 10.

$T_2$ : It makes ratings of driver with ID 5 and ID 10 twice of their initial values.

$\therefore T_2$  is:

[Begin  $A = 2 * A$ ,  $B = 2 * B$  End]

where  $A$  represents rating of driver with ID 5 and  $B$  represents rating of driver with ID 10.

According to our database,

initial ratings (at start) of driver with ID 5 and 10 are 2 and 1 respectively.



Considering 1<sup>st</sup> Serial Schedule of three transactions:

T1	T2
R(A)	
A=A-1	
W(A)	
R(B)	
B=B+1	
W(B)	
Commit	
	R(A)
	A=A*2
	W(A)
	R(B)
	B=B*2
	W(B)
	Commit

∴ After running 1<sup>st</sup> Serial schedule, (on initial values)

$$A \text{ becomes } \Rightarrow (2-1)*2$$

$$= \textcircled{2}$$

$$B \text{ becomes } \Rightarrow (1+1)*2$$

$$= \textcircled{4}$$

Considering 2<sup>nd</sup> Serial Schedule:

T1	T2
	R(A)
	A=A*2
	W(A)
	R(B)
	B=B*2
	W(B)
	Commit
R(A)	
A=A-1	
W(A)	
R(B)	
B=B+1	
W(B)	
Commit	



∴ After running 2<sup>nd</sup> Serial Schedule, (on initial values)

$$A \text{ becomes } \Rightarrow (2 * 2) - 1 \\ = 3$$

$$B \text{ becomes } \Rightarrow (1 * 2) + 1 \\ = 3$$

Now considering a Conflict Serializable Schedule for transactions 1 & 2,

T <sub>1</sub>	T <sub>2</sub>
R(A) A = A - 1 W(A)	R(A) A = A * 2 W(A)
R(B) B = B + 1 W(B)	R(B) B = B * 2 W(B)
commit	commit

Now after running this schedule, (on initial values)

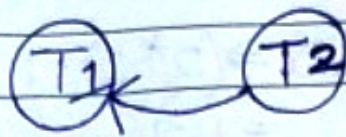
$$A \text{ becomes } \Rightarrow (2 - 1) * 2 \\ = 2$$

$$B \text{ becomes } \Rightarrow (1 + 1) * 2 \\ = 4$$

Since these results match with 1<sup>st</sup> Serial schedule  
∴ the above schedule is Serializable.



Also drawing Precedence graph for this schedule,



Since the graph is acyclic, thus the schedule is Conflict Serializable.

Now considering a Non-Conflict Serializable schedule for T1 & T2,

T1	T2
R(A)	R(A)
	$A = A * 2$
	W(A)
	R(B)
	$B = B * 2$
	W(B)
$A = A - 1$	
W(A)	
R(B)	
$B = B + 1$	
W(B)	
Commit	Commit

Now after running the schedule, (on initial values)

$$A \text{ becomes } \Rightarrow (2 * 2) - 1 = 3$$

$$B \text{ becomes } \Rightarrow (1 * 2) + 1 = 3$$

Since these results match with 2<sup>nd</sup> Serial Schedule hence the above schedule is Serializable.



Now drawing the precedence graph for this Schedule,



Since the graph is cyclic, thus the Schedule is Non-conflict Serializable.