

Conflict Serializability

Check whether the given schedule S is conflict serializable or not-

$S : R_1(A) , R_2(A) , R_1(B) , R_2(B) , R_3(B) , W_1(A) , W_2(B)$

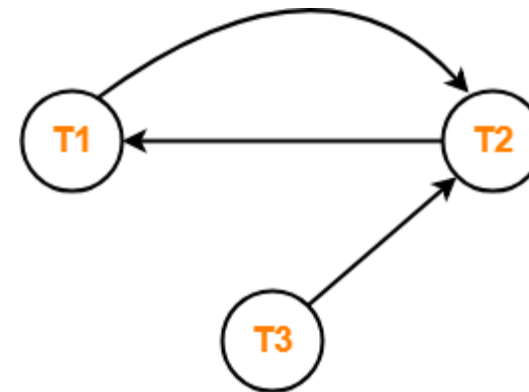
- List all the conflicting operations and determine the dependency between the transactions-
- R2(A) , W1(A) ($T2 \rightarrow T1$)
- R1(B) , W2(B) ($T1 \rightarrow T2$)
- R3(B) , W2(B) ($T3 \rightarrow T2$)
-

S : R1(A) , R2(A) , R1(B) , R2(B) ,
R3(B) , W1(A) , W2(B)

R2(A) , W1(A) ($T2 \rightarrow T1$)

R1(B) , W2(B) ($T1 \rightarrow T2$)

R3(B) , W2(B) ($T3 \rightarrow T2$)

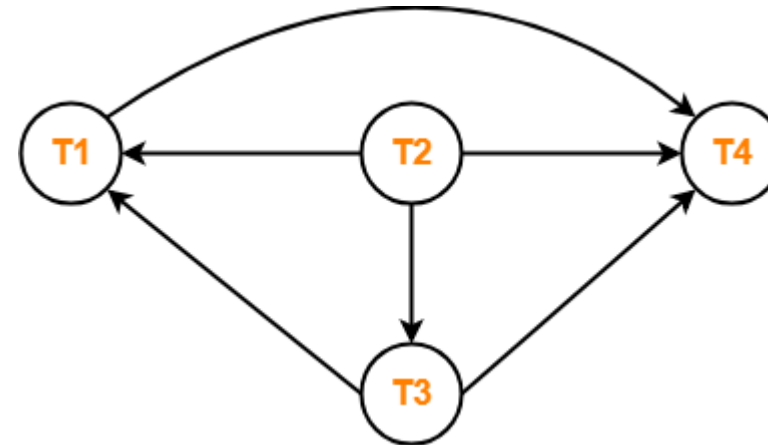


Check whether the given schedule S is conflict serializable and recoverable or not-

T1	T2	T3	T4
	R(X)		
		W(X) Commit	
W(X) Commit			
	W(Y) R(Z) Commit		
			R(X) R(Y) Commit

$R2(X),$
 $W3(X), C3, W1(X), c1, w2(y)$
 $R2(Z), c2, R4(X), R4(Y) C4$

$R2(X), W3(X) (T2 \rightarrow T3)$
 $R2(X), W1(X) (T2 \rightarrow T1)$
 $W3(X), W1(X) (T3 \rightarrow T1)$
 $W3(X), R4(X) (T3 \rightarrow T4)$
 $W1(X), R4(X) (T1 \rightarrow T4)$
 $W2(Y), R4(Y) (T2 \rightarrow T4)$

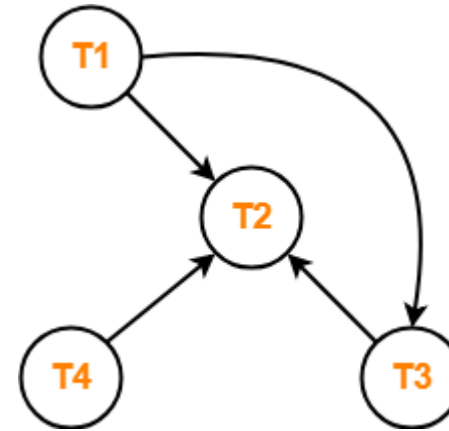


- Clearly, there exists no cycle in the precedence graph.
- Therefore, the given schedule S is **conflict serializable**.
- Conflict serializable schedules are always **recoverable**.
- Therefore, the given schedule S is recoverable. There exists no dirty read operation.
- This is because all the transactions which update the values commits immediately.
- Therefore, the given schedule S is recoverable.
- Also, S is **a Cascadeless Schedule**.
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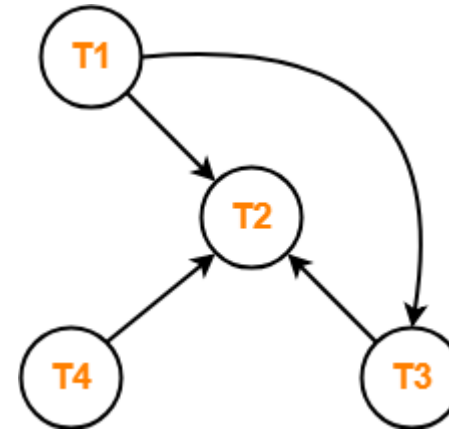
Check whether the given schedule S is conflict serializable or not. If yes, then determine all the possible serialized schedules-

T1	T2	T3	T4
			R(A)
	R(A)		
		R(A)	
W(B)			
	W(A)		
		R(B)	
	W(B)		

- $R_4(A), W_2(A) (T_4 \rightarrow T_2)$
- $R_3(A), W_2(A) (T_3 \rightarrow T_2)$
- $W_1(B), R_3(B) (T_1 \rightarrow T_3)$
- $W_1(B), W_2(B) (T_1 \rightarrow T_2)$
- $R_3(B), W_2(B) (T_3 \rightarrow T_2)$
-



- $R_4(A)$, $W_2(A)$ ($T_4 \rightarrow T_2$)
- $R_3(A)$, $W_2(A)$ ($T_3 \rightarrow T_2$)
- $W_1(B)$, $R_3(B)$ ($T_1 \rightarrow T_3$)
- $W_1(B)$, $W_2(B)$ ($T_1 \rightarrow T_2$)
- $R_3(B)$, $W_2(B)$ ($T_3 \rightarrow T_2$)
-



After performing the topological sort, the possible serialized schedules are-

$T_1 \rightarrow T_3 \rightarrow T_4 \rightarrow T_2$

$T_1 \rightarrow T_4 \rightarrow T_3 \rightarrow T_2$

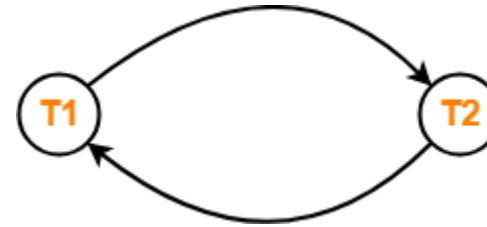
$T_4 \rightarrow T_1 \rightarrow T_3 \rightarrow T_2$

Determine all the possible serialized schedules for the given schedule-

T1	T2
R(A)	
A = A-10	
	R(A)
	Temp = 0.2 x A
	W(A)
	R(B)
W(A)	
R(B)	
B = B+10	
W(B)	
	B = B+Temp
	W(B)

T1	T2
R(A)	R(A) W(A) R(B)
W(A) R(B) W(B)	W(B)

- $R1(A) , W2(A) (T1 \rightarrow T2)$
- $R2(A) , W1(A) (T2 \rightarrow T1)$
- $W2(A) , W1(A) (T2 \rightarrow T1)$
- $R2(B) , W1(B) (T2 \rightarrow T1)$
- $R1(B) , W2(B) (T1 \rightarrow T2)$
- $W1(B) , W2(B) (T1 \rightarrow T2)$



Clearly, there exists a cycle in the precedence graph.
Therefore, the given schedule S is not conflict serializable.
Thus, Number of possible serialized schedules = 0.