

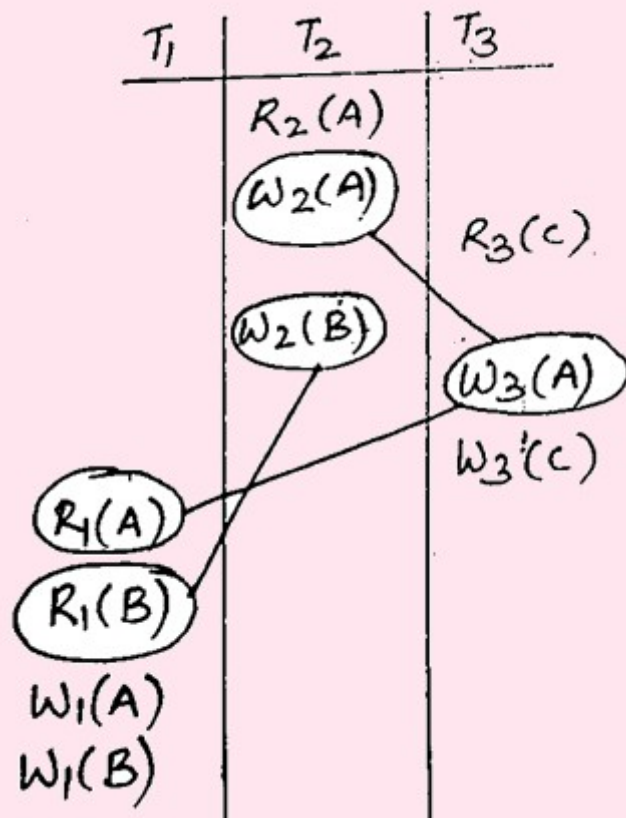
Questions on Conflict Serializable

- By [admin](#) |
- October 21, 2015 |
- [Database, Some Solved Questions on DBMS, Transaction in DBMS](#)

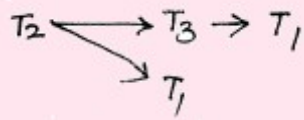
Questions on Conflict Serializable

Question 1 : Check whether the schedules is conflict serializable or not S :
R2(A); W2(A); R3(C); W2(B); W3(A); W3(C); R1(A); R1(B); W1(A); W1(B)

Solution :



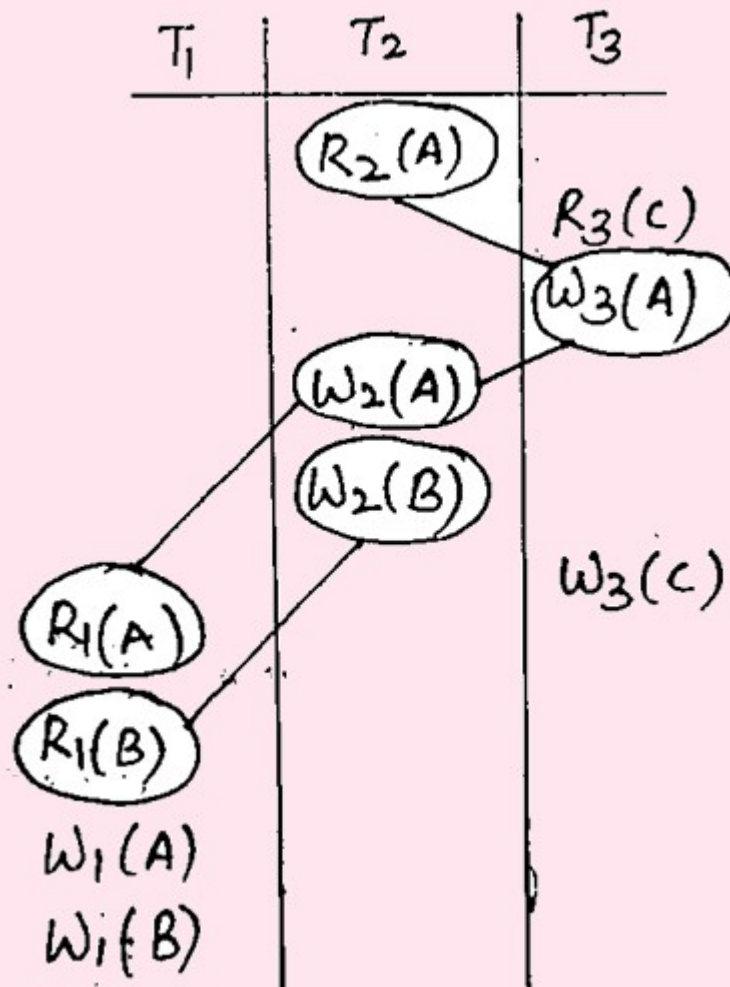
Conflict Pairs	Dependency Relation
W2(A) W3(A)	$T_2 \rightarrow T_3$
W3(A) R1(A)	$T_3 \rightarrow T_1$
W2(B) R1(B)	$T_2 \rightarrow T_1$

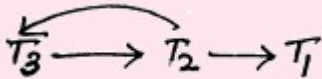


⇒ No cycle formed. Therefore, conflict serializable schedule and the equivalent serial schedule is $T_2 \rightarrow T_3 \rightarrow T_1$.

Question 2 : Check whether the schedule are conflict serializable or not S : $R_2(A); R_3(C); W_3(A); W_2(A); W_2(B); W_3(C); R_1(A); R_1(B); W_1(A); W_1(B)$

Solution :



Conflict Pairs	Dependency Relation
R1(A) W3(A)	$T2 \rightarrow T3$
W3(A) W2(A)	$T3 \rightarrow T2$
W2(A) R1(A)	$T2 \rightarrow T1$
W2(B) R1(B)	$T2 \rightarrow T1$
	

⇒ No cycle formed. Therefore, conflict serializable schedule and the equivalent serial schedule is $T2 \rightarrow T3 \rightarrow T1$.

Question 3 : Check whether the schedule is conflict serializable or not? S:
R1(A); R2(A); R3(B); W1(A); R2(C); R2(B); W2(B); W1(C)

Solution :

S: $\frac{R_1(A)}{3} \quad \frac{R_2(A)}{3} \quad \frac{R_3(B)}{2} \quad \frac{W_1(A)}{c} \quad \frac{R_2(C)}{1} \quad R_2(B) \quad \frac{W_2(B)}{b} \quad \frac{W_1(C)}{a}$

Step 1 : Create a node for each transaction.

Step 1 :



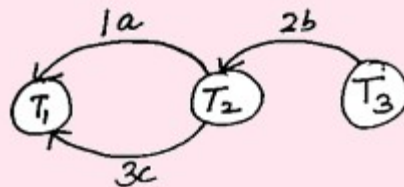
Step 2 : Find the conflict pairs (RW, WR, WW) on same variable by different transactions.

$R_2(C); W_1(C)$

$R_3(B); W_2(B)$

$R_2(A); W_1(A)$

Step 3 : Draw an edge for each conflict pair.



As Cycle formed, Therefore Schedule is not a conflict serializable schedule.

Question 4 : Check whether the schedule is conflict serializable or not? S: $W_3(A); R_1(A); W_1(B); R_2(B); W_2(C); R_3(C)$

Solution :

S: $\frac{W_3(A)}{3} \quad \frac{R_1(A)}{1} \quad \frac{W_1(B)}{2} \quad \frac{R_2(B)}{b} \quad \frac{W_2(C)}{1} \quad \frac{R_3(C)}{a}$

Step 1 : Create a node for each transaction.

(performed in question 3)

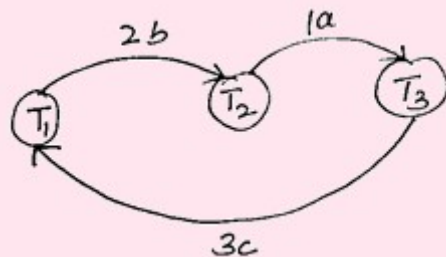
Step 2 : Find the conflict pairs (RW, WR, WW) on same variable by different transactions.

W2(C); R3(C)

W1(B); R2(B)

W3(A); R1(A)

Step 3 : Draw an edge for each conflict pair.



As Cycle formed, Therefore Schedule is not a conflict serializable schedule.

Question 5 : Check whether the schedule is conflict serializable or not? S:
R2(x); W3(x); W1(y); R2(y); W2(z)
Solution :

S: $\frac{R_2(x)}{2}; \frac{W_3(x)}{b}; \frac{W_1(y)}{1}; \frac{R_2(y)}{a}; W_2(z)$

Step 1 : Create a node for each transaction.

Step 1:

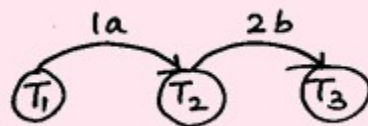


Step 2 : Find the conflict pairs (RW, WR, WW) on same variable by different transactions.

$R_2(x); W_3(x)$

$W_1(y); R_2(y)$

Step 3 : Draw an edge for each conflict pair.



As No Cycle formed, Therefore Schedule is conflict serializable

and equivalent serial schedule is $T1 \rightarrow T2 \rightarrow T3$.

Question 6 : Consider three data items D1, D2, and D3, and the following execution schedule of transactions T1, T2, and T3. In the diagram, R(D) and W(D) denote the actions reading and writing the data item D respectively. S: R2(D3); R2(D2); W2(D2); R3(D2); R3(D3); R1(D1); W1(D1); W3(D2); W3(D3);

T_1	T_2	T_3
	$R_2(D_3)$	
	$R_2(D_2)$	
	$W_2(D_2)$	
$R_1(D_1)$		$R_3(D_2)$
$W_1(D_1)$		$R_3(D_3)$
		$W_3(D_2)$
		$W_3(D_3)$
	$R_2(D_1)$	
$R_1(D_2)$		
$W_1(D_2)$		

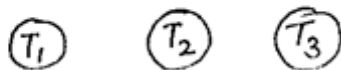
$R_2(D_1); R_1(D_2); W_1(D_2); W_2(D_1)$
 $W_2(D_1)$

Solution :

$$\begin{array}{ccccc}
 \frac{R_2(D_3)}{3} & R_2(D_2) & \frac{W_2(D_2)}{4} & \frac{R_3(D_2)}{f} & R_3(D_3) \\
 R_1(D_1) & \frac{W_1(D_1)}{1} & \frac{W_3(D_2)}{2} & \frac{W_3(D_3)}{e} & \frac{R_2(D_1)}{d} \\
 \frac{R_1(D_2)}{c} & \frac{W_1(D_2)}{b} & \frac{W_2(D_1)}{a} & &
 \end{array}$$

Step 1 : Create a node for each transaction.

Step 1:



Step 2 : Find the conflict pairs (RW, WR, WW) on same variable by different transactions.

W1(D1); W2(D1) [1a]

W1(D1); R2(D1) [1d]

R2(D3); W3(D3) [3e]

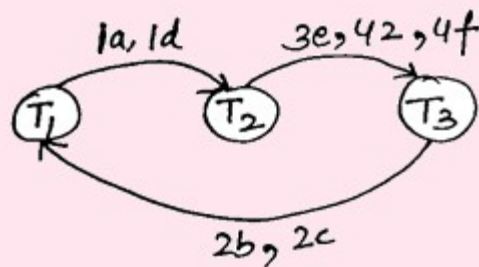
W2(D2); W3(D2) [42]

W2(D2); R3(D2) [4f]

W3(D2); W1(D2) [2b]

W3(D2); R1(D2) [2c]

Step 3 : Draw an edge for each conflict pair.



As Cycle formed, Therefore Schedule is not a conflict serializable schedule.

Question 7 : Check whether the schedule is conflict serializable or not? S:
R3(y); R3(z); R1(x); W1(x); W3(y); W3(z); R2(z); R1(y); W1(y); R2(y); W2(y);

T1	T2	T3
		R3(y)
		R3(z)
R1(x)		
W1(x)		
		W3(y)
		W3(z)
	R2(z)	
R1(y)		
W1(y)		
	R2(y)	
	W2(y)	
	R2(x)	
	W2(x)	

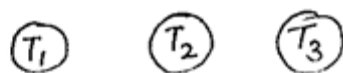
R2(x); W2(x)

Solution :

$$\begin{array}{cccccc} R_3(y) & R_3(z) & R_1(x) & \frac{W_1(x)}{1} & \frac{W_3(y)}{3} & \frac{W_3(z)}{4} & \frac{R_2(z)}{f} \\ \frac{R_1(y)}{e} & \frac{W_1(y)}{2} & \frac{R_2(y)}{d} & \frac{W_2(y)}{c} & \frac{R_2(x)}{b} & \frac{W_2(x)}{a} \end{array}$$

Step 1 : Create a node for each transaction.

Step 1 :



Step 2 : Find the conflict pairs (RW, WR, WW) on same variable by

different transactions.

W1(x); W2(x)

W1(x); R2(x)

W1(y); W2(y)

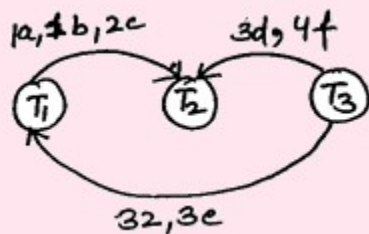
W3(y); R2(y)

W3(z); R2(z)

W3(y); W1(y)

W3(y); R1(y)

Step 3 : Draw an edge for each conflict pair.



As no Cycle formed, therefore Schedule is conflict serializable

schedule and serial schedule is $T3 \rightarrow T1 \rightarrow T2$.

Question 8 : Check whether the schedule is conflict serializable or not? S:
R3(y); R3(z); R1(x); W1(x); W3(y); W3(z); R2(z); R1(y); W1(Y); R2(y); W2(y)
Solution :

$$S: \begin{array}{cccccc} \frac{R_3(y)}{1} & \frac{R_3(z)}{2} & R_1(x) & W_1(x) & \frac{W_3(y)}{2} & \frac{W_3(z)}{4} \\ \frac{R_2(z)}{e} & \frac{R_1(y)}{d} & \frac{W_1(y)}{b} & \frac{R_2(y)}{c} & \frac{W_2(y)}{a} & \end{array}$$

Step 1 : Create a node for each transaction.

Step 1:



Step 2 : Find the conflict pairs (RW, WR, WW) on same variable by different transactions.

$W_1(y); W_2(y)$

$R_1(y); W_2(y)$

$W_3(y); W_2(y)$

$R_3(y); W_2(y)$

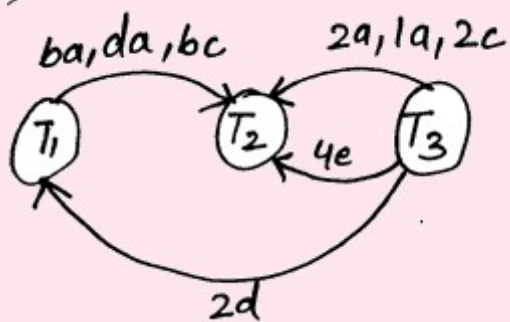
$W_1(y); R_2(y)$

$W_3(y); R_2(y)$

$W_3(y); W_1(y)$

$W_3(z); R_2(z)$

Step 3 : Draw an edge for each conflict pair.



As Cycle formed, therefore Schedule is not a conflict serializable schedule.

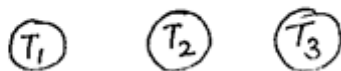
Question 9 : Check whether the schedule is conflict serializable or not? S: R2(A); R1(B); W2(A); R3(A); W2(B); W3(A); R2(B); W2(B)

Solution :

S: R₂(A) $\frac{R_1(B)}{1}$ $\frac{W_2(A)}{2}$ $\frac{R_3(A)}{d}$ $\frac{W_2(B)}{c}$ $\frac{W_3(A)}{b}$ $\frac{R_2(B)}{a}$ $\frac{W_2(B)}{a}$

Step 1 : Create a node for each transaction.

Step 1:



Step 2 : Find the conflict pairs (RW, WR, WW) on same variable by different transactions.

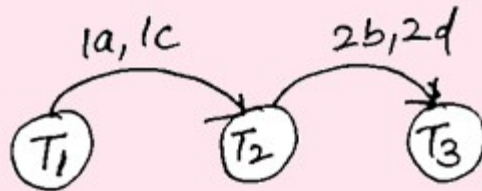
R1(B); W2(B) [1a]

R1(B); W2(B) [1c]

W2(A); W3(A) [2b]

W2(A); R3(A) [2d]

Step 3 : Draw an edge for each conflict pair.



As No cycle formed, therefore Schedule is conflict serializable

and serial schedule is $T_1 \rightarrow T_2 \rightarrow T_3$

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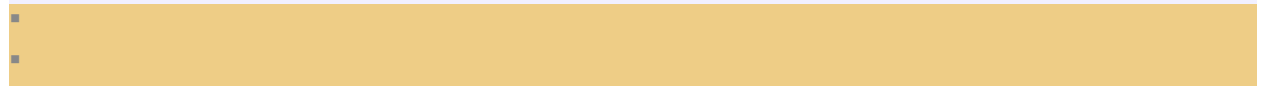
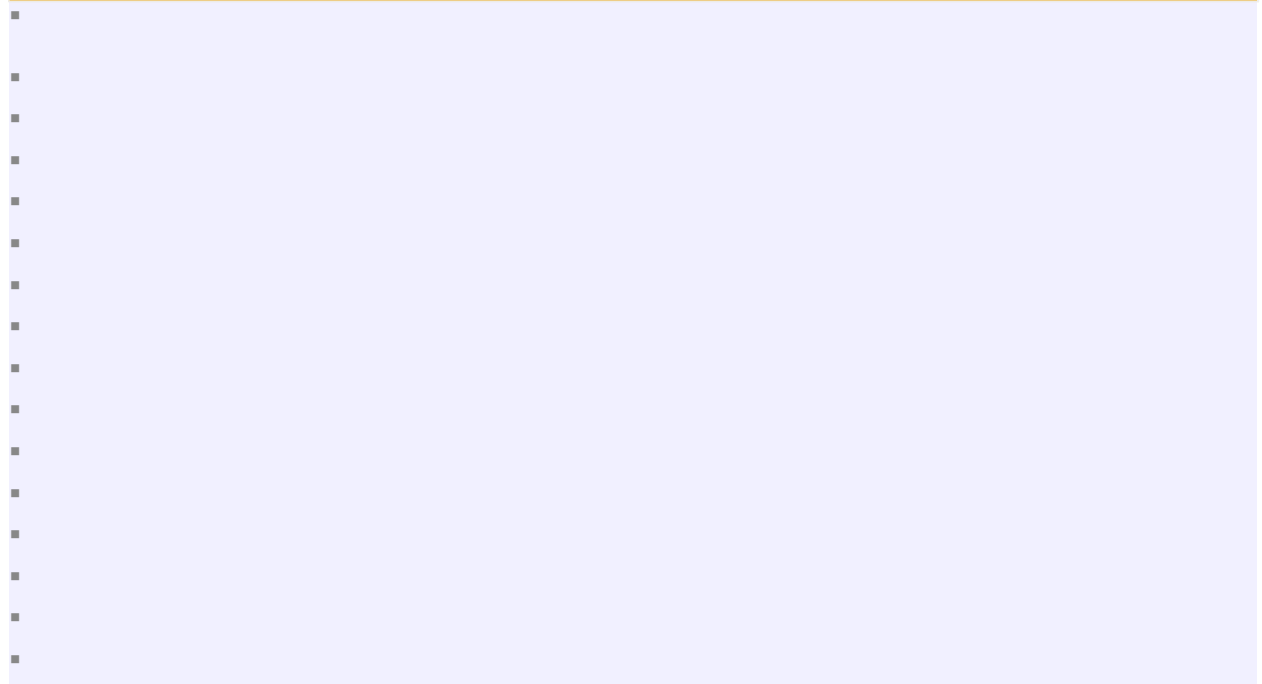
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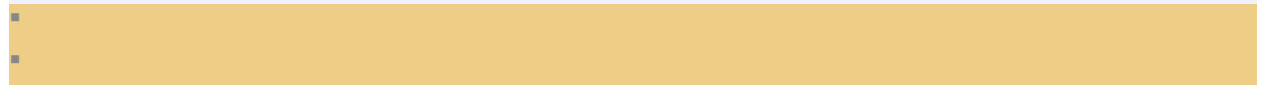
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