Marked by
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FIT9132

Assignment 2B

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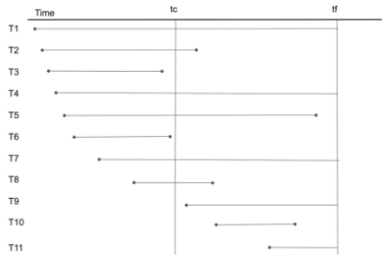


In the below representation:

- All green-shaded cells indicate that the transactions were finished and committed after the checkpoint,
- While white-shaded cells indicate that they were not completed at the time of failure.
- The cells with yellow coloring can be ignored because they were committed before the check point; the data will be written to the database at the check point.

Transaction log:

T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11

The 3-stage process to recover are as follows:

Stage 1: Compile REDO & UNDO LIST using log: The transaction logs are used to create REDO and UNDO lists, which determine which transactions need to be redone or rolled back

REDO LIST				UNDO LIST			
T2	T5	T8	T10	T1	T4	T7	T11

X

T9?

Stage 2: Transactions in the UNDO list that were aborted before reaching their commit point must be rolled back using their prior images to restore the database to a consistent state.

UNDO LIST			
T11	T7	T4	T1

Stage 3: All committed transactions are properly recorded in the database, transactions from the REDO list will be reapplied, beginning with the oldest.

REDO LIST			
T2	T5	T8	T10

TIME	TRANS	ACTION	A	B	C	D	E	F	G	H
0	T1	Read A	S(T1)							
1	T2	Read B		S(T2)						
2	T1	Read C			S(T1)					
3	T4	Read D				S(T4)				
4	T5	Read A	S(T5)							
5	T2	Read E					S(T2)			
6	T2	Update E					X(T2)			
7	T3	Read F						S(T3)		
8	T2	Read F						S(T2)		
9	T5	Update A	T5 WAIT T1							
10	T1	commit	X(T5)							
11	T6	Read A	T6 wait for T5							
12	T5	Rollback	S(T6)							
13	T6	Read C			S(T6)					
14	T6	Update C			X(T6)					
15	T7	Read G							S(T7)	
16	T8	Read H								S(T8)
17	T9	Read G							S(T9)	
18	T9	Update G							T9 WAIT FOR T7	
19	T8	Read E					T8 WAIT FOR T2			
20	T7	Commit							X(T9)	
21	T9	Read H								S(T9)
22	T3	Read G							T3 WAIT FOR T9	
23	T10	Read A	S(T10)							
24	T9	Update H								T9 WAIT FOR T8
25	T6	Commit			-					
26	T11	Read C			S(T11)					
27	T12	Read D				S(T12)				
28	T12	Read C			S(T12)					
29	T2	Update F						T2 WAIT FOR T3		

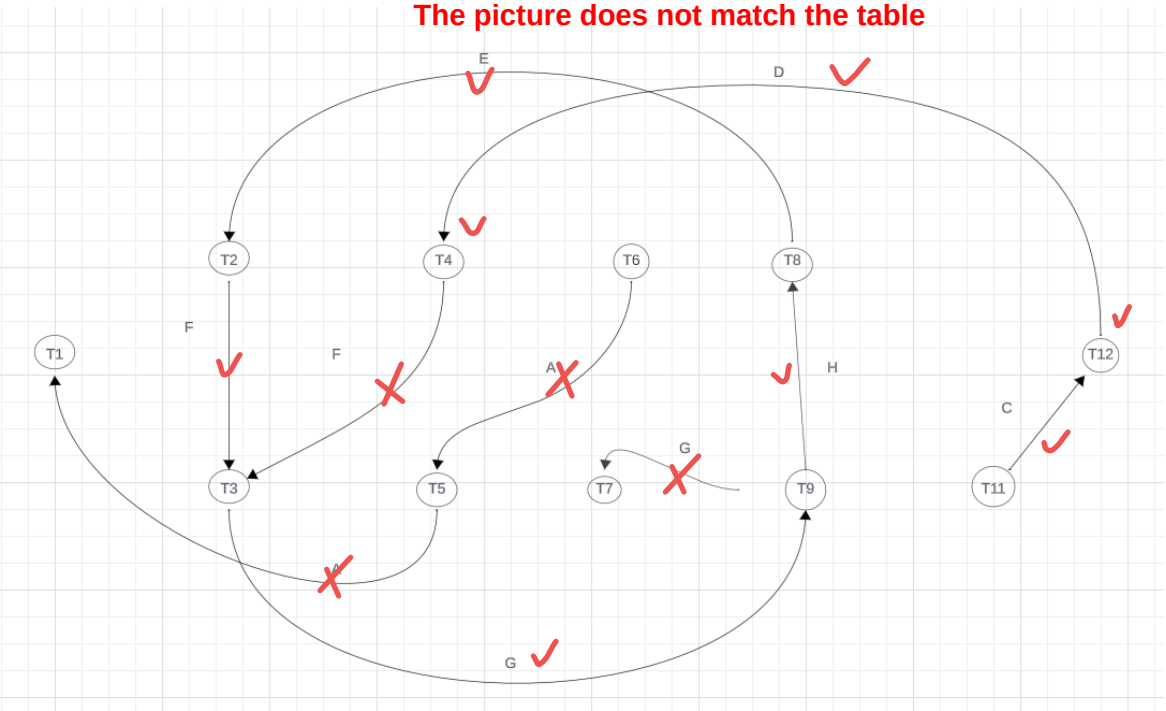
30	T11	Update C			T11 WAIT FOR T12					
31	T12	Read A	S(T12)							
32	T10	Update A	T10 WAIT FOR T12							
33	T12	Update D				T12 WAIT FOR T4				
34	T4	Read G						T4 WAIT FOR T3		

What is the order of this list?

i)
Item A: T5 wait for T1
Item A: T6 wait for T5
Item G: T9 wait for T7
Item E: T8 wait for T2
Item G: T3 wait for T9
Item H: T9 wait for T8
Item F: T2 wait for T3
Item C: T11 wait for T12
Item D: T12 wait for T4
Item F: T4 wait for T3

The picture does not match the table

ii)



iii) According to the above weighted graph, there is a dead lock between transactions T3, T9, T8, T2. Below is their list.

Item E: T8 wait for T2
Item G: T3 wait for T9
Item H: T9 wait for T8
Item F: T2 wait for T3