

Assignment 4: Concurrency and OLAP

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Time	T1	T2	T3	LM
1	S(D)			G
2	S(A)			G
3		S(A)		G
4		X(B)		G
5	X(C)			G
6			S(C)	B
7	S(B)			B

Figur 1: Table showing how LM is handling lock requests.

1 Deadlock Detection

- 1.1 Determine which lock request will be granted, blocked by the lock manager (LM)
- 1.2 wait-for graph for the lock requests in the table showed in Figur: 1

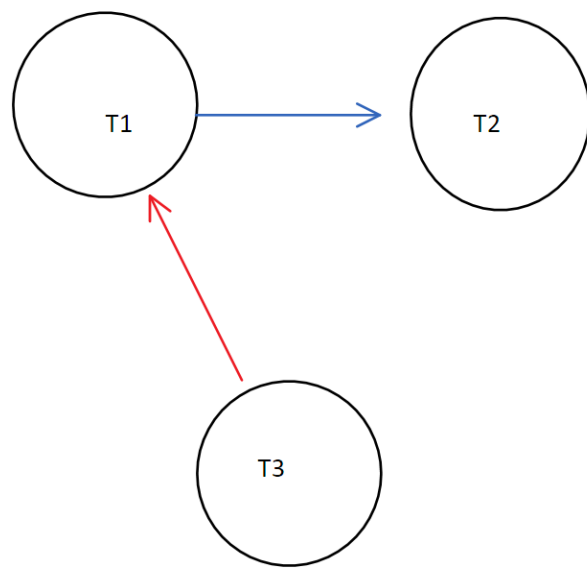


Figure 2:

Figure 3: Wait-for graph of LM

1.3 Determine whether there exists a deadlock in the lock requests in the table above and briefly explain why

There are no deadlock since the wait-for graph (Figur 3) is acyclic.

Time	T1	T2	T3	LM1	LM2	LM3
1	S(D)			G		
2			X(B)	G		
3	S(A)			G		
4		S(C)		G		
5	X(C)			B		
6		X(B)		B		
7			X(A)	B		

Figure 4: Table showing how LM1 is handling lock requests.

2 Deadlock prevention

2.1 Determine which lock request will be granted, blocked or aborted by the lock manager 1 (LM1)

2.2 Give the wait-for graph for the lock request in the table (Figure 4). Give one reason why LM1 Results in a deadlock

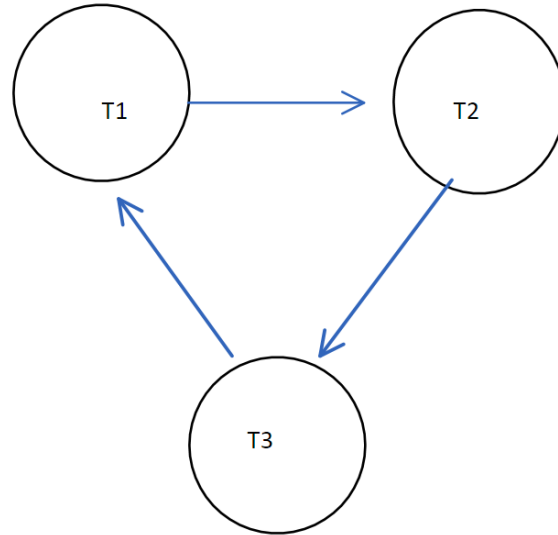
Since the graph (Figure 6) contains a cycle in such a way that T1, T2, T3 is waiting for each other, this results in a deadlock

2.3 Deadlock prevention with LM2

Please note that we have created a table (Figure 8) that illustrates the task of section 2.3 and section 2.4.

- **LM2 with Wait-Die policy.**

- S(D) on T1 is granted.
- X(B) on T3 is granted
- S(A) on T1 is granted
- S(C) on T2 is granted
- X(C) on T1 is blocked
- X(B) on T2 is blocked
- X(A) on T3 is aborted



Figur 5:

Figur 6:

2.4 Deadlock prevention with LM3

- **LM2 with Wound-wait policy.**

- S(D) on T1 is granted.
- X(B) on T3 is granted
- S(A) on T1 is granted
- S(C) on T2 is granted
- Abort S(C) on T2
- Abort X(B) on T3
- X(A) on T3 is blocked

Time	T1	T2	T3	LM1	LM2	LM3
1	S(D)			G	G	G
2			X(B)	G	G	G
3	S(A)			G	G	G
4		S(C)		G	G	G
5	X(C)			B	B	A T2
6		X(B)		B	B	A T3
7			X(A)	B	A	B

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Figur 7:

Figur 8: