Assignment 4: Concurrency and OLAP

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25. november 2015

Indhold

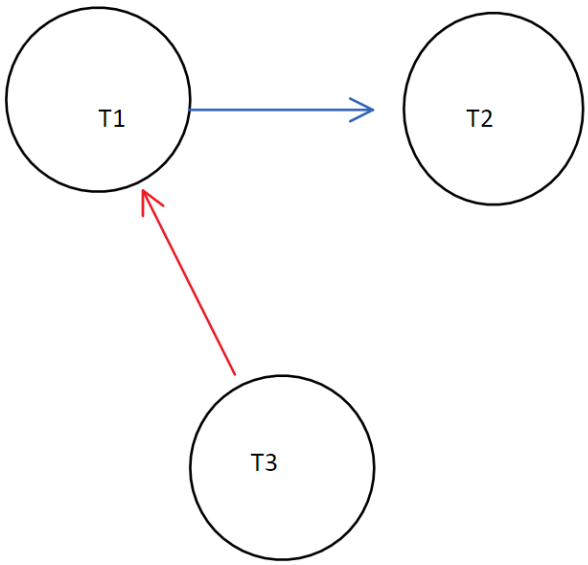
1 Deadlock Detection

1.1 Determine which lock request will be granted, blocked by the lock manager (LM)

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.

1.2 wait-for graph for the lock requests in the table in section 1.1 showed in Figur: 1



Figur 2:

Figur 3: Wait-for graph of LM

1.3 Determine whether there exists a deadlock in the lock requests showed in the table in section 1.1 (Figur 1) and briefly explain why

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

2 Deadlock prevention

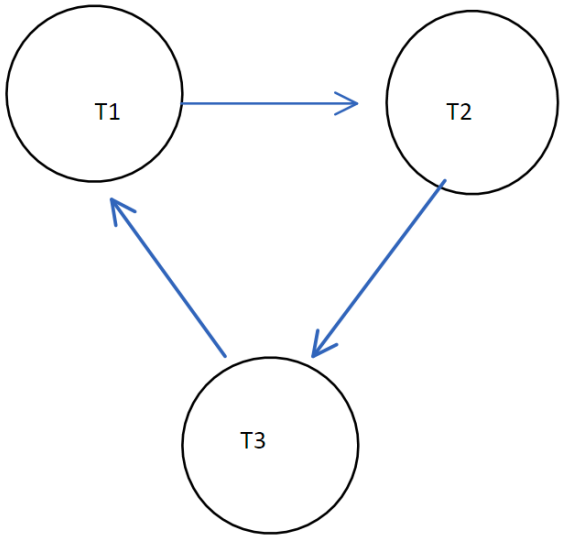
2.1 Determine which lock request will be granted, blocked or aborted by the lock manager 1 (LM1)

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		

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

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

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



Figur 5:

Figur 6:

2.3 Deadlock prevention with LM2

Please note that we have created a table (Figur 7) 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

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

Table depicting lock requst handling of LM1, LM2 and LM3 The table (Figur: 7) presentates how LM1, LM2 and LM3 handle locks differently. This table is created from the information based on section 2.1, section 2.3 and section 2.4.

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

Figur 7: This is table is a visualization on LM1, LM2 and LM3.