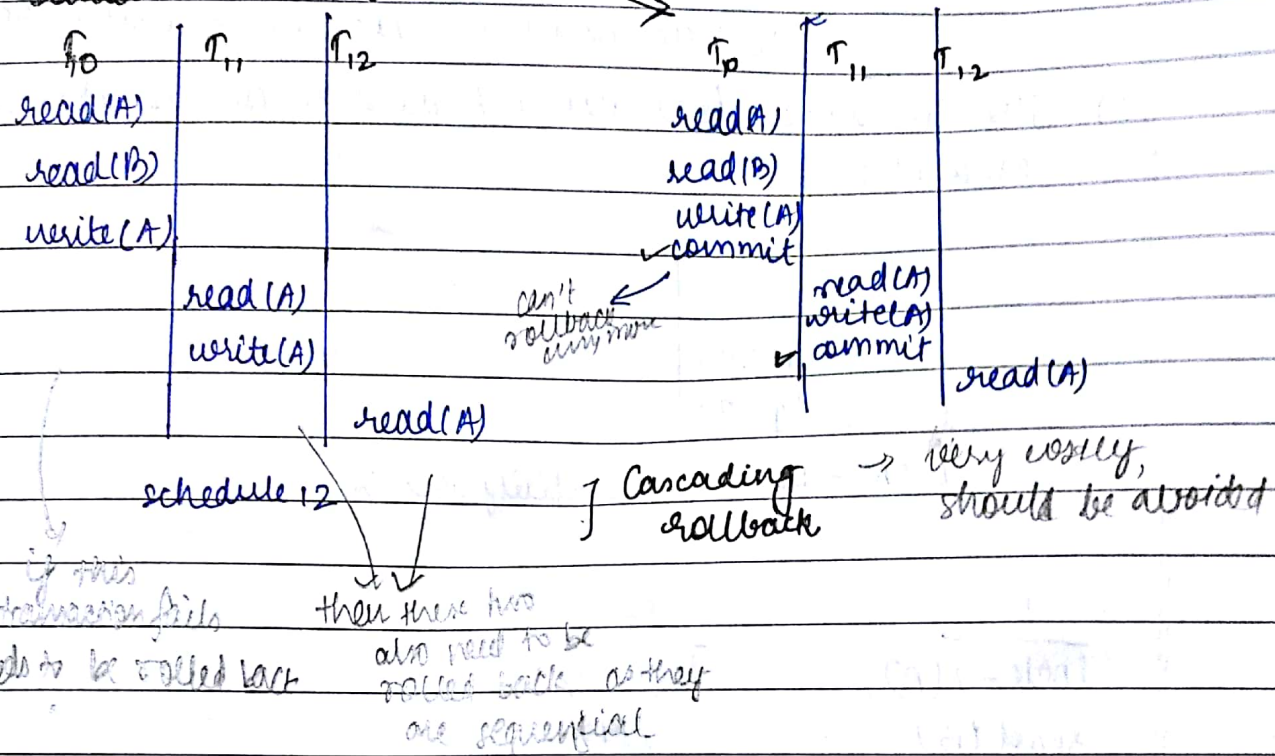
Lecture-28
SSK

04/04/18

Transaction management
Recoverability

Cascadeless schedules →



Cascadeless schedule → schedule not having sequencial transactions that can cause cascading rollback.
We can add 'commit' at the end of each transaction to make cascadeless schedule.
If T_i and T_j are sequencial transactions then read in T_j will occur after commit of T_i.

Scanned by CamScanner

Implementation of isolation

Implement locks on data items to make it isolated from other transactions.

Locks

1. Shared → S(Q) ⇒ read(Q)
2. Exclusive → X(Q) ⇒ read(Q), write(Q)

Concurrency control manager → manages lock on data items

Lock compatibility function -

T_i:

T_j: $T_j \rightarrow B(Q)$

T_j has acquired lock on Q (data item) using lock mode B

$T_i \rightarrow A(Q)$

T_i has acquired lock on Q using lock mode A

⇒ This means, lock mode A and B are compatible with each other.

	S	X
S	True	False
X	False	False

LCM - lock compatibility matrix

T_1	T_2
lock-X(B);	lock-S(A);
read(B);	read(A);
B := B-50;	unlock(A);
write(B);	lock-S(B);
lock-X(A);	read(B);
read(A);	unlock(B);
A := A+50;	display(A+B);
write(A);	
unlock(A);	

Scanned by CamScanner

T_1	T_2	concurrency control manager
lock-X(B)		~~grant-X(B, T_1)~~
		grant-X(B, T_1)
read(B)		
B := B-50		
write(B)		
unlock(B)		
	lock-S(A)	
		grant-S(A, T_2)
	read(A)	
	unlock(A)	
	lock-S(B)	
		grant-S(B, T_2)
	read(B)	
	unlock(B)	
	display(A+B)	
~~lock~~		grant-X(A, T_2)
lock-X(A)		
read(A)		
A := A+50		
write(A)		
unlock(A)		

Scanned by CamScanner