

B561 – Selected Solutions for Assignment 6

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December 8, 2007

Solutions

- Exercise 16.3
1. The following schedule results in a write-read conflict:
T2:R(X), T2:R(Y), T2:W(X), T1:R(X) ...
T1:R(X) is a dirty read here.
 2. The following schedule results in a read-write conflict:
T2:R(X), T2:R(Y), T1:R(X), T1:R(Y), T1:W(X) ...
Now, T2 will get an unrepeatable read on X.
 3. The following schedule results in a write-write conflict:
T2:R(X), T2:R(Y), T1:R(X), T1:R(Y), T1:W(X), T2:W(X) ...
Now, T2 has overwritten uncommitted data.
 4. Strict 2PL resolves these conflicts as follows:
 - (a) In S2PL, T1 could not get a shared lock on X because T2 would be holding an exclusive lock on X. Thus, T1 would have to wait until T2 was finished.
 - (b) Here T1 could not get an exclusive lock on X because T2 would already be holding a shared or exclusive lock on X.
 - (c) Same as above.
- Exercise 18.5
1. LSN 00 is stored in the master log record as it is the LSN of the begin checkpoint record.
 2. During analysis the following happens:
LSN 20 Add (T1,20) to TT and (P1,20) to DPT
LSN 30 Add (T2,30) to TT and (P2,30) to DPT
LSN 40 Add (T3,40) to TT and (P3,40) to DPT
LSN 50 Change status of T2 to C

LSN 60 Change (T3,40) to (T3,60)
LSN 70 Remove T2 from TT
LSN 80 Change (T1,20) to (T1,70) and add (P5,70) to DPT
LSN 90 No action

At the end of analysis, the transaction table contains the following entries: (T1,80), and (T3,60). The Dirty Page Table has the following entries: (P1,20), (P2,30), (P3,40), and (P5,80).

3. Redo starts from LSN20 (minimum recLSN in DPT).

LSN 20: Check whether P1 has pageLSN more than 10 or not. Since it is a committed transaction, we probably need not redo this update.

LSN 30: Redo the change in P2
LSN 40: Redo the change in P3
LSN 50: No action
LSN 60: Redo the changes on P2
LSN 70: No action
LSN 80: Redo the changes on P5
LSN 90: No action

4. ToUndo consists of (80, 60).

LSN 80: Undo the changes in P5. Append a CLR: Undo T1 LSN 80, set undonextLSN = 20. Add 20 to ToUndo.

ToUndo consists of (60, 20).

LSN 60: Undo the changes on P2. Append a CLR: Undo T3 LSN 60, set undonextLSN = 40. Add 40 to ToUndo.

ToUndo consists of (40, 20).

LSN 40: Undo the changes on P3. Append a CLR: Undo T3 LSN 40, T3 end

ToUndo consists of (20).

LSN 20: Undo the changes on P1. Append a CLR: Undo T1 LSN 20, T1 end