

COMP 3311: Database Management Systems

Lecture 23 Exercises Recovery System

Exercise 1: The log on the right corresponds to a schedule of three serially executing transactions T_1 , T_2 , and T_3 where a system failure occurs at the point indicated. Assume that we use the *immediate update protocol*.

(a) Which transactions are undone?

(b) Which transactions are redone?

Log File
< T_1 start >
< T_1 , B, 15, 12 >
< T_1 commit >
< T_2 start >
< T_2 , B, 12, 18 >
< T_2 , D, 25, 26 >
< T_2 commit >
< T_3 start >
< T_3 , D, 20, 25 >

← system failure

Exercise 2: The log on the right corresponds to a schedule of three concurrently executing transactions T_1 , T_2 , and T_3 where a system failure occurs at the point indicated. Assume that we use the *immediate update protocol* with checkpointing.

(a) Which transactions are undone?

(b) Which transactions are redone?

Log File
< T_1 start >
< T_1 , A, 2, 5 >
< T_1 , B, 1, 2 >
< T_2 start >
< T_1 , C, 2, 8 >
< T_2 , B, 2, 5 >
< checkpoint { T_1 , T_2 } >
< T_1 commit >
< T_2 , B, 5, 6 >
< T_3 start >
< T_3 , A, 5, 3 >
< T_3 commit >
< T_2 , C, 8, 2 >
< T_2 , A, 3, 5 >

← system failure

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Exercise 3: The log on the right corresponds to a schedule of three serially executing transactions T_1 , T_2 , and T_3 where a system failure occurs at the point indicated. Assume that we use the *immediate update protocol* with checkpointing.

(c) Which transactions are undone?

(d) Which transactions are redone?

Log File
< T_1 start>
< T_1 , A, 1, 2>
< T_1 , B, 5, 12>
<checkpoint>
< T_1 commit>
< T_2 start>
< T_2 , B, 12, 18>
< T_2 commit>
< T_3 start>
< T_3 , D, 25, 26>
< T_3 commit>
< T_4 start>
< T_4 , A, 20, 25>

← system failure

Exercise 4: The log on the right corresponds to a schedule of three concurrently executing transactions T_1 , T_2 , and T_3 where a system failure occurs at the point indicated. Assume that we use the *immediate update protocol* with checkpointing.

(a) Which transactions are undone?

(b) Which transactions are redone?

Log File
< T_3 start>
< T_3 , B, 15, 12>
< T_2 start>
< T_2 , B, 12, 18>
<checkpoint { T_2 , T_3 }>
< T_2 commit>
< T_1 start>
< T_1 , D, 20, 25>
< T_1 , D, 25, 26>

← system failure