COMP 3311: Database Management Systems

Lecture 22 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 the _immediate update protocol_ is used.

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 the _immediate update protocol_ with checkpointing is used.

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 four _serially executing_ transactions T_1, T_2, T_3 and T_4 where a system failure occurs at the point indicated. Assume that the *immediate update protocol* with checkpointing is used.

a) Which transactions are undone?

b) 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 the *immediate update protocol* with checkpointing is used.

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