Quiz 7: Transactions

Due Jul 6 at 11:59pm **Points** 100 **Questions** 5
Available Jun 29 at 12am - Jul 6 at 11:59pm 8 days **Time Limit** 60 Minutes
Allowed Attempts 2

This quiz was locked Jul 6 at 11:59pm.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	33 minutes	50 out of 100

ⓘ Answers will be shown after your last attempt

Score for this attempt: **50** out of 100
Submitted Jul 6 at 12:54pm
This attempt took 33 minutes.

Question 1 — 20 / 20 pts

Fill in the blanks:

A serializable schedule is in some way equivalent to a schedule that is [serial] . Two-phase locking is designed to ensure a schedule that is [serializable] . Strict two-phase locking requires that a transaction hold onto all [exclusive] locks until it commits or aborts, and ensures [cascadeless] schedules. A danger with locking is that it reduces performance and in the worst case may cause [deadlock] .

Answer 1:

serial

Answer 2:

serializable

Answer 3:

exclusive

Answer 4:

cascadeless

Answer 5:

deadlock

Question 2

15 / 20 pts

1. Slide 28 in the slides on transactions shows a schedule that is not recoverable. What could go wrong if we did not prevent this schedule?
2. What locking scheme ensures cascadeless schedules?

Your Answer:

1. Cascading rollbacks would cause the loss of multiple transactions because the writing changes were not committed.
2. Strict two-phase locking will ensure cascadesless schedules.

1. T2 reads the updates of T1, but commits after the commit of T1. T1 may abort, forcing T2 to abort, violating durability.

Question 3

15 / 20 pts

Consider pessimistic timestamp-based concurrency control, for conflict serializable schedules. Each transaction T has a timestamp TS(T). Each variable has a read timestamp R-Timestamp(A) and a write timestamp W-Timestamp(A).

1. What conditions must be true on the timstamps for a write (of A by T) to succeed?
2. What conditions must be true on the timestamps for a read (of A by T) to succeed?

Your Answer:

1. TS(T) > W - Timestamp(A)
2. TS(T) > R - Timestamp(A)

1. Also TS(T) > R-TS(A)

Incorrect

Question 4

0 / 20 pts

Assume there are three transactions T_1, T_2, T_3 that execute with timestamp-based concurrency control. The timestamp of transaction T_i is i. There are 2 variables X and Y. Show the read and write timestamps of X and Y after each of the following steps, where $r_i(X)$ and $w_i(X)$ represent reads and writes respectively of variable X by transaction T_i. Show where any transaction aborts, by writing "abort" for **both** the read and write timestamps. Assume that we are only interested in achieving conflict serializable schedules.

$r_2(X)$

$r_1(X)$

$w_2(X)$

$r_1(Y)$

$r_3(Y)$

$w_1(Y)$

$w_3(Y)$

$w_2(Y)$

	R-TS(X)	W-TS(X)	R-TS(Y)	W-TS(Y)
$r_2(X)$	T2	T1	abort	abort
$r_1(X)$	T1	T2	abort	abort
$w_2(X)$	T2	T3	abort	abort
$r_1(Y)$	abort	abort	T1	T2
$r_3(Y)$	abort	abort	T2	T3
$w_1(Y)$	abort	abort	T1	T2
$w_3(Y)$	abort	abort	abort	abort
$w_2(Y)$	abort	abort	T2	T3

Answer 1:

T2

Answer 2:

T1

Answer 3:

abort

Answer 4:

abort

Answer 5:

T1

Answer 6:

T2

Answer 7:

abort

Answer 8:

abort

Answer 9:

T2

Answer 10:

T3

Answer 11:

abort

Answer 12:

abort

Answer 13:

abort

Answer 14:

abort

Answer 15:

T1

Answer 16:

T2

Answer 17:

abort

Answer 18:

abort

Answer 19:

T2

Answer 20:

T3

Answer 21:

abort

Answer 22:

abort

Answer 23:

T1

Answer 24:

T2

Answer 25:

abort

Answer 26:

abort

Answer 27:

abort

Answer 28:

abort

Answer 29:

abort

Answer 30:

abort

Answer 31:

T2

Answer 32:

T3

Incorrect

Question 5

0 / 20 pts

Match the isolation level on the left with the form of read it is intended to prevent on the right.

read committed	phantom read
repeatable read	phantom read
serializable	dirty read

Quiz Score: **50** out of 100