

Question 1

Not yet answered

Marked out of 2.00

Consider the following two transactions:

- T1: R(C); R(A); W(B); R(D);
- T2: R(B); R(D); W(A); R(C);

Mark all listed schedules that are compatible with the 2PL protocol.

You get one point for each correct check. For each wrong answer one point is subtracted. The minimum number of points for this question is 0.

Select one or more:

- ☐ a. R1(C); R1(A); R2(B); R2(D); W1(B); W2(A); R1(D); R2(C); C1; C2
- ☐ b. R1(C); R1(A); R2(B); R2(D); W2(A); W1(B); R1(D); R2(C); C2; C1
- ☐ c. R2(B); R2(D); R1(C); W2(A); R2(C); R1(A); W1(B); R1(D); C2; C1
- ☐ d. R1(C); R1(A); W1(B); R1(D); C1; R2(B); R2(D); W2(A); R2(C); C2;

Question 2

Not yet answered

Marked out of 4.00

Consider a relation **R** holding information about the employees **e** in a large organization.

Assume that the percentage of young employees (aged below 45) is 97% and the percentage of old employees (45 and above) is 3%.

Let **L(e)** denote a single lock request, and **L(e)...** a series of identical lock requests of the lock type **L** on one or more employee tuples respectively.

For each of the following database operations, select the most efficient sequence of locks to be acquired by the enclosing transaction T. You can assume that the transaction queries use an index on the employee's age to filter out old employees.

Compute the maximum young employee salary SY and reduce the salaries of the old employees when necessary, such that their salary does not exceed SY.

Increase the salary of all old employees by 5%.

Increase the salary of all young employees by 5%.

Question 3

Not yet answered

Marked out of 2.00

Which of the following application scenarios are suitable for optimistic concurrency control.

You get one point for each correct check. For each wrong answer one point is subtracted. The minimum number of points for this question is 0.

High-Frequency Trading

A high-frequency trading system is subject to frequent concurrent updates corresponding to the trading actions taken by the participating agents.

Your Family Weblog

Your private weblog, followed by many, but maintained exclusively by members of your family!

Online Concert Tickets Retailer

An online ticket retailer like Eventim. Ticket purchase actions for artists in demand (e.g. Depeche Mode, Lady Gaga, Rammstein) are characterized by high contention and a lot of simultaneous purchases immediately after concert tickets for the artist become available. Customer satisfaction is a priority.

Livescore.com

Livescore offers real-time updates of the scores of the football games. Each game is assigned to and updated by a unique Livescore employee.

Select one or more:

- ☐ a. Online Concert Tickets Retailer
- ☐ b. High-Frequency Trading
- ☐ c. Your Private Weblog
- ☐ d. Livescore.com

Question 4

Not yet answered

Marked out of 2.00

Please check ALL correct statements concerning Serializability theory below.

You get one point for each correct check. For each wrong answer one point is subtracted. The minimum number of points for this question is 0.

Select one or more:

- ☐ a. All non-serializable schedules will cause database inconsistencies.
- ☐ b. Even serializable schedules may cause inconsistent database states.
- ☐ c. Precedence graphs can be used for consistency checks at runtime.
- ☐ d. All serializable schedules are correct.

Question 5

Not yet answered

Marked out of 2.00

Consider the following three transactions:

- T1: R(A); R(B); W(C);
- T2: R(A); R(B); W(A); W(B);
- T3: R(C); R(B); W(C);

Mark all listed schedules that are serializable.

You get one point for each correct check. For each wrong answer one point is subtracted. The minimum number of points for this question is 0.

Select one or more:

- ☐ a. R2(A); R1(A); R2(B); R1(B); W1(C); R3(C); R3(B); W2(A); C1; W2(B); C2; W3(C); C3
- ☐ b. R1(A); R2(A); R2(B); W2(A); R1(B); W2(B); W1(C); C1; R3(C); C2; R3(B); W3(C); C3
- ☐ c. R1(A); R2(A); R2(B); W2(A); R1(B); W2(B); R3(C); C2; W1(C); C1; R3(B); W3(C); C3
- ☐ d. R2(A); R1(A); R2(B); W2(A); W2(B); R1(B); C2; W1(C); C1

