

45 Lecture - CS403

Important Subjective

1. **What is locking and how does it work in a database management system?**

Answer: Locking is a mechanism used in a database management system to prevent concurrent access to shared resources by multiple transactions. It works by granting exclusive access to a resource to a transaction, and then releasing the lock when the transaction is complete.

What is the difference between shared and exclusive locks?

Answer: A shared lock allows multiple transactions to access a resource simultaneously for read-only purposes, while an exclusive lock allows only one transaction to access the resource for write purposes.

How can a deadlock occur in a locking mechanism?

Answer: A deadlock occurs when two or more transactions are waiting for each other to release the locks they are holding, resulting in a circular wait that cannot be resolved.

What is lock granularity and why is it important?

Answer: Lock granularity is the size of the resource that will be locked by a transaction. It is important to determine the appropriate level of granularity to ensure efficient use of resources and prevent excessive locking.

What is lock escalation and how does it work?

Answer: Lock escalation is the process of converting a large number of low-level locks into a smaller number of higher-level locks to reduce the overhead associated with managing locks. It works by releasing lower-level locks and acquiring higher-level locks when the number of locks held by a transaction exceeds a threshold.

What is a timeout in locking and how is it used?

Answer: A timeout is a mechanism used to release a lock after a specified time period to prevent a transaction from waiting indefinitely for a resource. It is used to ensure that transactions do not get stuck waiting for a resource that may never become available.

What is a lock manager and what is its role in a database management system?

Answer: A lock manager is a component of a database management system that manages the acquisition and release of locks. Its role is to ensure that transactions have access to the resources they need while preventing conflicts between transactions.

How does locking impact database performance?

Answer: Locking can impact database performance by introducing overhead associated with managing locks and waiting for resources. It is important to optimize locking to minimize the impact on performance.

What are some common locking strategies used in database management systems?

Answer: Some common locking strategies include optimistic locking, pessimistic locking, two-

phase locking, and multi-version concurrency control.

What are some best practices for implementing locking in a database management system?

Answer: Some best practices include minimizing the size and duration of locks, optimizing lock granularity, implementing lock escalation, using timeouts, and minimizing the number of conflicts between transactions.