

# 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.