Concurrency control

3 most common data integrity and consistency problem:

1. Lost update

2. Uncommitted data

3. Inconsistent retrieval

If two transactions are trying to do something on two pieces of unrelated data

Lock

Lock manager

Lock granularity:

1. database level

2. table level

3. page level

4. row level

5. field level

Types of lock:

1. binary lock

2. exclusive lock

3. shared lock

Two phase locking protocol:

1. growing phase

2. shrinking phase

1. two transactions cannot have conflict locks

2. no unlock operations before a lock operation

3. no data affected until all locks obtained

Deadlock detection:

Prevention

Avoidance

Timestamping approach

Optimistic approach:

1. read phase

2. validate phase

3. write phase