Concurrency phenomena: Dirty Read, Non-repeatable read, phantom read, lost update.

Lost update: Locks

Pessimistic lock: for share, for update

Optimistic locks: version. Restrictions: All persistent stateful changes can all be rolled back. If only partial persistent changes can be rolled back, then choose pessimistic locks.

| **Transaction isolation level** | **Dirty reads** | **Non-repeatable reads** | **Phantoms** |
| --- | --- | --- | --- |
| Read uncommitted | X | X | X |
| Read committed | -- | X | X |
| Repeatable read | -- | -- | X |
| Serializable | -- | -- | -- |