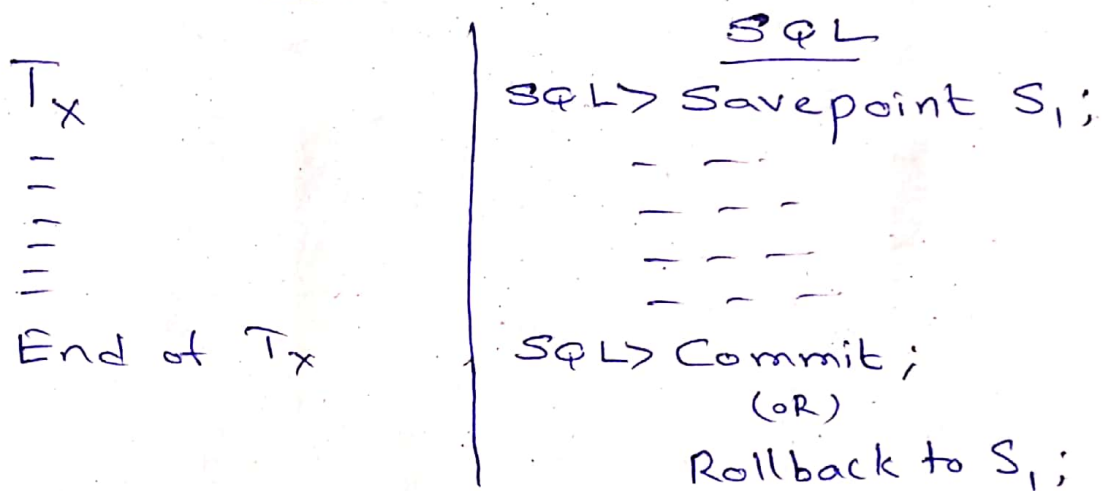


Unit - IV

Transaction Management:

Transaction refers to a collection of operations that form a single logical unit of work.

Transaction is represented with the symbol - T_x , where x represents the Transaction Id.



Example: If a bank has to transfer Rs. 1,000 from account A to account B, then the following steps are required before the transfer is successful.

- (i) Reduce the balance of the account A by the amount of Rs. 1,000.
- (ii) Increase the balance of the account B by the amount of Rs. 1,000.

If any one of the statements fail, the both transaction would not be successful.

Properties of Transaction: **Imp**

Every database system has 4 Transaction properties

- 1) Atomicity
 - 2) Consistency
 - 3) Isolation
 - 4) Durability
- } ACID properties.

Atomicity: This property states that a transaction must be treated as an atomic unit, i.e., either all of its operations are executed or none.

There are no transactions which are left partially completed.

Consistency: Database should be consistent before and after the execution of the transaction. No transaction should have any adverse effect on the data residing in the database.

Isolation: Multiple transactions execute concurrently. Database system must provide a mechanism to isolate transactions from the effects of other concurrently executing transactions.

Durability: Once the transaction is successful, the changes made to the database persist (store permanently), even if there are system failures.

States of Transaction:

Committed: A transaction that completes its execution successfully is called Committed Transaction

Roll back: A transaction which is not completed successfully must be Rolled back (undone the changes, if any)

Abort: A transaction may not always complete its execution successfully. This state is called Aborted.

Failed: A transaction is said to be in failed state after the system determines that the transaction can no longer proceed with its normal execution because of some hardware or software error. Such Transaction must be rolled back.

Partially Committed: In a partially committed state, a transaction executes its final

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