Transaction Concepts – ACID Properties – Schedules – Serializability – Concurrency Control – Need for Concurrency – Locking Protocols – Two Phase Locking – Deadlock – Transaction Recovery - Save Points – Isolation Levels – SQL Facilities for Concurrency and Recovery

SAVE POINTS

- It is possible for a transaction to create a savepoint.

- It is used to store intermediate results

- So that it will rollback to a previously established savepoint whenever any recovery process starts. Create: Savepoint <savepoint_name>;

- Rollback: Rollback to <savepoint_name>; Drop: Release <savepoint_name>;

- **SQL**
- **COMMIT**: Used to made the changes permanently in the Database.
- **SAVEPOINT**: Used to create a savepoint or a reference point.

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- **ROLLBACK:** Similar to the undo operation. Example:

- SQL> select * from customer;

CUSTID PID QUANTITY

CUSTID	PID	QUANTITY
100	1234	10
101	1235	15
102	1236	15
103	1237	10

- SQL> savepoint s1; Savepoint created.
- SQL> Delete from customer where custid=103;

CUSTID PID   QUANTITY

CUSTID	PID	QUANTITY
100	1234	10
101	1235	15
102	1236	15

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- SQL> rollback to s1; Rollback complete.

- SQL> select * from customer;

CUSTID   PID   QUANTITY

CUSTID	PID	QUANTITY
100	1234	10
101	1235	15
102	1236	15
103	1237	10

- SQL> commit;

ISOLATION LEVEL

- Degree of interference

- An isolation levels mechanism is used to isolate each transaction in a multi-user environment

- **Dirty Reads:** This situation occurs when transactions read data that has not been committed.

- **Nonrepeatable Reads:** This situation occurs when a transaction reads the same query multiple times and results are not the same each time

- **Phantoms:** This situation occurs when a row of data matches the first time but does not match subsequent times

- Types
- Higher isolation level (Repeatable read)
    - Less interference
    - Lower concurrency
  - All schedules are serializable Lower isolation level(cursor stability)
    - More interference
    - Higher concurrency
    - Not a serializable
- One special problem that can occur if transaction operates at less than the maximum isolation level (i.e) less then repeatable read level is called phantom problem.

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Thank You…….