1. What are Anomalies? Update Anomaly in SQL?

In databases, anomalies are problems or inconsistencies that arise when data is stored in an unstructured or poorly designed database (usually when data is in a single table without normalization).

There are three main types of anomalies:

1. Insertion Anomaly → Difficulty adding new data due to missing other data.
2. Update Anomaly → Inconsistent data after updating.
3. Deletion Anomaly → Unintended loss of data when deleting.

An Update Anomaly occurs when the same piece of data is stored in multiple rows, and updating one row but not the others causes inconsistency.

Example:
Suppose we have a table:

StudentID	StudentName	Course	Instructor
1	Alice	DBMS	Prof. Rao
2	Bob	DBMS	Prof. Rao
3	Charlie	DBMS	Prof. Rao

- Here, *Instructor = Prof. Rao* is repeated.
- If Prof. Rao's name changes to *Prof. Sharma* and we update only Alice's row, the database becomes inconsistent.
- This is an Update Anomaly.

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2. What is Normalization? State the types of Normalization.?

Normalization is the process of organizing data in a database to reduce redundancy and eliminate anomalies (Insertion, Update, Deletion).

- It breaks large unstructured tables into smaller, well-structured tables.
- Ensures data integrity and efficient storage.

1. First Normal Form (1NF)
    - No repeating groups or arrays (each cell must hold a single value).
    - Each record is unique.
2. Second Normal Form (2NF)
    - Must be in 1NF.
    - No partial dependency (non-key attribute should not depend on part of a composite key).
3. Third Normal Form (3NF)
    - Must be in 2NF.
    - No transitive dependency (non-key attribute should not depend on another non-key attribute).