An **anomaly** means **problems or issues in data** that happen if a database is **not normalized**.

**🔹 Types of Anomalies**

There are mainly **3 types**:

1. **Insertion Anomaly**
   * Problem while **adding (inserting)** new data.
   * Example: You want to add a new department “Finance” but no employee has joined it yet.
     + If dept info is stored inside employee table, you **cannot insert dept without employee**.
2. **Update Anomaly**
   * Problem while **updating** data.
   * Example: Ravi works in “HR” and Priya also works in “HR”. If HR dept name changes to “Human Resources”, you must update in many rows.
     + If you forget one row, data becomes **inconsistent**.
3. **Deletion Anomaly**
   * Problem while **deleting** data.
   * Example: If you delete the last employee of “Sales” dept, the dept info also gets deleted (lost forever), even though the dept still exists.

**xample Table (Not Normalized)**

| **Emp\_ID** | **Emp\_Name** | **Dept\_Name** | **Dept\_Location** |
| --- | --- | --- | --- |
| 101 | Ankit | HR | Mumbai |
| 102 | Priya | HR | Mumbai |
| 103 | Ravi | IT | Pune |

**1. Insertion Anomaly**

Suppose a **new department** “Finance” starts in Delhi, but no employees have joined yet.

* In this table, we **cannot insert Finance dept info** without an employee record.
* Dept info is tied to employee → problem!

**2. Update Anomaly**

Suppose the **HR department shifts from Mumbai → Bangalore**.

* We must update location in **all rows where Dept = HR** (for Ankit, Priya).
* If we update only one row and forget others → **inconsistent data**.

**3. Deletion Anomaly**

Suppose Ankit and Priya (HR employees) both leave the company and their rows are deleted.

* Then **Dept HR also gets deleted** from the database, even though the department still exists.
* Important info about dept lost → anomaly.