Anomalies in DBMS

There are three types of anomalies that occur when the database is not normalized. These are insertion, update and deletion anomaly.

Example

Suppose a manufacturing company stores the employee details in a table named EMPLOYEE that has four attributes: emp_id, emp_name, emp_address and emp_dept.

Emp_id	Emp_name	Emp_address	Emp_dept
101	ABC	Delhi	D001
101	ABC	Delhi	D002
123	PQR	Agra	D890
166	XYZ	Chennai	D900
166	XYZ	Chennai	D004

The above table is not normalized. We will see the problems that we face when a table is not normalized.

Update anomaly

In the above table we have two rows for employee ABC belonging to two departments of the company. If we want to update the address of ABC then we have to update the same in two rows or the data will become inconsistent. If somehow, the correct address gets updated in one department but not in other then as per the database, ABC would be having two different addresses, which is not correct and would lead to inconsistent data.

Insert anomaly

Suppose a new employee joins the company, who is under training and currently not assigned to any department then we would not be able to insert the data into the table if emp_dept field doesn't allow nulls.

Delete anomaly

Suppose, if at a point of time the company closes the department D890 then deleting the rows that are having emp_dept as D890 would also delete the information of employee PQR since PQR is assigned only to this department.

To overcome these anomalies we need to normalize the data.