Normalization Examples

Consider Student Table / Relation

Sid	Sname	Credits	Dept	Bldg	Roomno
1	Harsh	5	CSE	1	101
2	Raj	6	CSE	1	101
3	Kunj	7	IT	2	201
4	Diya	4	EE	2	301
5	Rahul	5	EXTC	3	401
6	Rajiv	6	CIVIL	2	501
7	Preksha	7	CSE	1	101
8	Kajal	8	IT	2	201

Redundant data:

Sid	Sname	Credits	Dept	Bldg	Roomno
1	Harsh	5	CSE	1	101
2	Raj	6	CSE	1	101
3	Kunj	7	IT	2	201
4	Diya	4	EE	2	301
5	Rahul	5	EXTC	3	401
6	Rajiv	6	CIVIL	2	501
7	Preksha	7	CSE	1	101
8	Kajal	8	IT	2	201

To remove redundency from database, We use Normalization.

Insertion Anomaly:

We want to insert ME department in the table, still students are not enrolled in the department. Sid is PK, that can not be NULL.

We should have atleast one student enrolled in ME department.

Sid	Sname	Credits	Dept	Bldg	Roomno
1	Harsh	5	CSE	1	101
2	Raj	6	CSE	1	101
3	Kunj	7	IT	2	201
4	Diya	4	EE	2	301
5	Rahul	5	EXTC	3	401
6	Rajiv	6	CIVIL	2	501
7	Preksha	7	CSE	1	101
8	Kajal	8	IT	2	201
			ME	1	201

Updation Anomaly:

We want to update CSE departments building to 3 and Roomno to 201. So in every CSE department, we need to update these things. So if update the date in some rows and forget to update in remaining row. Then it is inconsistent. This is called as Updation Anamoly.

Deletion Anomaly:

If we delete Sid 4, then we are losing deprtment details as only one student is present in EE department. So data loss is occuring. This is called as Deletion Anomaly.

Sid	Sname	Credits	Dept	Bldg	Roomno
1	Harsh	5	CSE	1	101
2	Raj	6	CSE	1	101
3	Kunj	7	IT	2	201
4	Diya	4	EE	2	301
5	Rahul	5	EXTC	3	401
6	Rajiv	6	CIVIL	2	501
7	Preksha	7	CSE	1	101
8	Kajal	8	IT	2	201

Solution is to decompose the relation into multiple relations.

Student:

Sid	Sname	Credits	Dept
1	Harsh	5	CSE
2	Raj	6	CSE
3	Kunj	7	IT
4	Diya	4	EE
5	Rahul	5	EXTC
6	Rajiv	6	CIVIL
7	Preksha	7	CSE
8	Kajal	8	IT

Department:

Dept	Bldg	Roomno
CSE	1	101
IT	2	201
EE	2	301
EXTC	3	401
CIVIL	2	501