DBMS LAB Assignment - 6

NORMALISATION:

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1) The table is not in INF, because the attribute courses contains more than 1 value for eg: I.D - 1 courses → 'OS, DBMS', so as it is, not in INF, it can't be in 2NF & 3NF.

Converted table:

ID	Name	Age	location	Courses
1	Sachin	22	Delhi	OS
1	Sachin	22	Delhi	DBMS
2	Ram	22	Jamshedpur	DAA
2	Ram	22	Jamshedpur	DBMS
3	Mike	23	Chennai	ML
3	Mike	23	chennai	OS
4	Sameer	21	Banglore	DAA
4	Sameer	21	Banglore	ML
5	Vijay	22	Mumbai	ML
5	Vijay	22	Mumbai	DBMS

The above table is in INF

prime attributes → ID & Name

Non-prime attributes → Age, Location, Courses

FD → ID → Age, location, Courses

⇒ The second table mentioned in the question is in 1NF.

2) a) This is not in 2NF because there is partial dependency {Duty-shift-ID} → Dutyshift

For a table to be in 2NF, all the non key attributes should be functionally dependent on the entire primary key.

The primary key is {Emp-ID, Duty-shift-ID} But {Duty-Shift-ID} → Duty-shift, Hence partial dependency exists 2NF would be primary key.

Emp ID	Duty-shift-ID	Name	Age
101	1	Arun	26
102	2	Bobby	28
103	3	Suresh	32
104	1	Sita	24

Name, age are non-prime attributes.

Primary key

Duty-shift-ID	Duty-shift
1	Morning
2	Afternoon
3	Night

Duty-shift is non-prime attribute

(b) This is not in 2NF because there exists partial dependency

{project-ID} → {Proj-Name}

The primary key is {Emp ID, Project-ID}. All the non prime attributes Name, Proj-Name, No of hours should completely depend on primary key.

2NF would be

Emp-ID	Project-ID	Name	No of hours
123	Prj-21	Ajay	10
321	Prj-45	charu	15
546	Prj-24	Rajesh	23
765	Prj-11	Abhishek	16

{Emp-ID, project-ID} → primary key

project-ID	Proj-Name
Prj-21	Speech-system
Prj-45	HR System
Prj-24	Automatic tickets
Prj-11	NLP

{project-ID} → primary key.

3) a) Not in 3NF, there exists transitive dependency between {cust-address} & {cust-loc} on a non-primary key which is {cust-postcode}

3NF would be

Cust-ID	Cust Name	cust-postcode
25	Dell	560037
45	Lenovo	560046
89	Acer	210067
90	Samsung	4500078

{cust-ID} ⟶ primary key

Cust-postcode	Cust-Address	Cust-Loc
560037	white-field	Banglore
560046	Marathahalli	Banglore
210067	Bandra	Mumbai
4500078	Delhi Central	Delhi

{cust-postcode} ⟶ primary key.

b) Here, there exists transitive dependency so, it is not in 3NF

{contractor} ⟶ {Fee}

There should be no transitive dependency in 3NF.

{Building} → primary key

{Contractor, Builder Fee} → Non-prime attributes.

3NF would be

Building	Contractor	Builder
B-2156	Taylor	Prestige
B-8765	Sandeep	Hiranandani
B-4567	Vishaka	Tata

primary key - {Contractor, Fee}

Contractor	Fee
Taylor	2567891
Sandeep	3567356
Vishaka	4567990