

DBMS LAB ASSIGNMENT - 6

NORMALISATION

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Ans 1) The table is not in 1NF, because the attribute courses contains more than 1 value. for eg:

ID - 1 Courses \rightarrow 'OS, DBMS'. So as it is not in 1NF, 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	MC
3	Mike	23	Chennai	OS
4	Sameer	21	Bangalore	DAA
4	Sameer	21	Bangalore	MC
5	Vijay	22	Mumbai	MC
5	Vijay	22	Mumbai	DSMS

The above table is in 1NF.

prime attributes \rightarrow ID & Name

Non-prime \rightarrow Age, Location, Courses.

FD \rightarrow ID \rightarrow 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 $\{Duty-shift-ID\} \rightarrow Dutyshift$.
 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 $\{Duty-shift-ID\} \rightarrow Duty-shift$,
 Hence partial dependency exists.

2NF would be

Primary Key		Name	Age
Emp-ID	Duty-shift-ID		
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.

$\{project-ID\} \rightarrow \{proj-name\}$

The primary key is $\{\text{Emp-ID}, \text{project-ID}\}$. 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

$\{\text{Emp-ID}, \text{project-ID}\} \rightarrow$ primary key.

project-ID	proj-Name
Prj-21	Speech-System
Prj-45	HR system
Prj-24	Automate tickets
Prj-11	NLP.

$\{\text{project-ID}\} \rightarrow$ primary key.

3) (b) Here, there exists transitive dependency. So, it is not in 3NF. $\{\text{Contractor}\} \rightarrow \{\text{fee}\}$

There should be no transitive dependency in 3NF.

$\{\text{Building}\} \rightarrow$ primary key.

$\{\text{Contractor}, \text{Builder}, \text{fee}\} \rightarrow$
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.

(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	560034
45	Lenovo	560046
89	Acer	210067
90	Samsung	4500078

{Cust-ID} → primary key.

Cust - postcode	Cust - Address	Cust - loc
560037	whitefield	Bangalore
560046	Marathahalli	Bangalore
210067	Bandra	Mumbai
4500078	Delhi Central	Delhi

{cust - postcode} → primary key.