

DBMS LAB ASSIGNMENT – 6

(NORMALIZATION)

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ROLL NO: 19BCS053

Q-1: Convert the tables to 1NF.

Sol:

(i).

Given Table

Id	Name	Age	Location	Course
1	Sachin	22	Delhi	OS, DBMS
2	Ram	22	Jamshedpur	DAA, DBMS
3	Mike	23	Chennai	ML, OS
4	Sameer	21	Bengaluru	DAA, ML
5	Vijay	22	Mumbai	ML, DBMS

The table is not in 1NF because the course column has multiple values. As per the 1NF, we need to ensure that there are no repeating groups of data and it must contain atomic values in each column.

After converting the above table into 1NF.

Id	Name	Age	Location	Course
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	Bengaluru	DAA
4	Sameer	21	Bengaluru	ML
5	Vijay	22	Mumbai	ML
5	Vijay	22	Mumbai	DBMS

The above table is in 1NF.

Primary key - Id

Candidate key - Id, Name, Location

Prime attribute - Id, Name, Location.

Non-prime attribute - Age, Course.

(ii).

Given table

ID	Name	Phone	State	Country
1	Kailley	9716245698	Karnataka	INDIA
2	Janet	9876543261	Maharashtra	INDIA
3	Robert	9456735678	Andhra Pradesh	INDIA
4	Thomas	9966744381	Kerala	INDIA

The above table is in 1NF form. So, no need to convert.

Primary key - Id

Candidate key - Id, Name, Phone, State

Prime attribute - Id, Name, Phone, State

Non-prime attribute - Country.

Q-2: Convert the tables into 2NF.

Sol:

(i).

Given table -

Emp_ID	Duty_shift_ID	Name	Age	Duty_shift
101	1	Arun	26	Morning
102	2	Bobby	28	Afternoon
103	3	Suresh	32	Night
104	1	Sita	24	Morning

The above table is not in 2NF because in the above table as there exists partial dependency between columns Duty_shift_ID, Duty_shift. For a table to be in 2NF, all the non key attributes should be functionally dependent on entire primary key.

So, after converting the above table into 2NF.

Emp_ID	Duty_shift_ID	Name	Age
101	1	Arun	26
102	2	Bobby	28
103	3	Suresh	32
104	1	Sita	24

Duty_shift_ID	Duty_shift
1	Morning
2	Afternoon
3	Night

Primary key - Emp_ID

Candidate keys - Emp_ID, Name, Age

Prime attributes - Emp_ID, Name, Age

Non-prime attributes - Duty_Shift_ID, Duty_Shift

(ii).

Given table -

Emp_ID	Project_ID	Name	Proj_Name	No_of_hours
123	Prj_21	Ajay	Speech_system	10
321	Prj_45	Charu	HR_System	15
546	Prj_24	Rajesh	Automate Tickets	23
765	Prj_11	Abhishek	NLP	16

The above table is not in 2NF because in the above table as there exists partial dependency between Project_ID, Proj_Name and No_of_hours.

So, after converting the above table into 2NF.

Emp_ID	Project_ID	Name
123	Prj_21	Ajay
321	Prj_45	Charu
546	Prj_24	Rajesh
765	Prj_11	Abhishek

Project_ID	Proj_Name	No_of_hours
Prj_21	Speech_system	10
Prj_45	HR_System	15
Prj_24	Automate Tickets	23
Prj_11	NLP	16

Primary key - Emp_ID

Candidate keys - Emp_ID, Project_ID, Name, Proj_Name, No_of_hours.

Prime Attributes - Emp_ID, Project_ID, Name, Proj_Name, No_of_hours

Non-Prime Attributes - ---

Q-3: Convert the tables into 3NF.

(i).

Given table -

Cust_ID	Cust_name	Cust_postcode	Cust_address	Cust_loc
25	Dell	560037	Whitefield	Bangalore
45	Lenovo	560046	Marathahalli	Bangalore
89	Acer	210067	Bandra	Mumbai
90	Samsung	4500078	Delhi Central	Delhi

The above table is not in 3NF because there exists a transitive dependency between columns Cust_address, Cust_loc on a primary key attribute which is Cust_postcode.

So, after converting it into 3NF.

Cust_ID	Cust_name	Cust_postcode
25	Dell	560037
45	Lenovo	560046
89	Acer	210067
90	Samsung	4500078

Cust_postcode	Cust_address	Cust_loc
560037	Whitefield	Bangalore
560046	Marathahalli	Bangalore
210067	Bandra	Mumbai
4500078	Delhi Central	Delhi

Primary key - Cust_ID

Candidate keys - Cust_ID, Cust_Name, Cust_postcode

Prime Attributes - Cust_ID, Cust_Name, Cust_postcode

Non-Prime Attributes - Cust_address, Cust_loc

(ii).

Building	Contractor	Builder	Fee
B_2156	Taylor	Prestige	2567891
B_8765	Sandeep	Hiranandani	3567356
B_4567	Vishaka	Tata	4567990

The table given in the question is not in 3NF as the fee depends on a prime attribute contractor.

Building	Contractor	Builder
B_2156	Taylor	Prestige
B_8765	Sandeep	Hiranandani
B_4567	Vishaka	Tata

Contractor	Fee
Taylor	2567891
Sandeep	3567356
Vishaka	4567990

Primary key - Building

Candidate keys - Building, Contractor, Builder

Prime Attributes - Building, Contractor, Builder

Non-Prime Attributes - Fee