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REGISTRATION NUMBER: 19BCS050
DBMS LAB ASSIGNMENT – 6

1. **Convert the table to 1NF.**

a)

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,DSMS

Primary key: ID
Candidate keys: ID, Name, Location
Prime Attributes: ID, Name, Location
Non-Prime Attributes: Age, Course

The table is not in 1NF because the column "Course" has multiple values. This violates the rule that for a table to exist as 1NF, it must contain atomic values in each column.

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

b)

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

Primary key: ID
Candidate keys: : ID, Name, Phone, State
Prime Attributes: ID, Name, Phone, State
Non-Prime Attributes: Country
The table is already in 1NF. So, no need to convert.

2. Convert the table to 2NF.

a)

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

Primary key: Emp_ID
Candidate keys: Emp_ID, Name, Age
Prime Attributes: Emp_ID, Name, Age
Non-Prime Attributes: Duty_Shift_ID and Duty_Shift.

The table is already in 1NF. The table is in 2NF as there exists partial dependency between columns Duty_Shift_ID and Duty_Shift.

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

b)

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

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: ---

The table is already in 1NF. The table is in 2NF as there exists partial dependency between columns Project_ID and Proj_Name and No_of_hours.

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

3. Convert the table to 3NF.

a)

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

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

The table given in the question is not in 3NF as Cust_Address and Cust_loc attributes depend transitively i.e., on a primary key attribute which is Cust_Postcode.

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

b)

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

Primary key: Building
Candidate keys: Building, Contractor, Builder
Prime Attributes: Building, Contractor, Builder
Non-Prime Attributes: Fee

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

Bulding	Contactor	Builder
B_2156	Taylor	Prestige
B_8765	Sandeep	Hiranandani
B_4567	Vishaka	Tata

Contactor	Fee
Taylor	2567891
Sandeep	3567356
Vishaka	4567990