DBMS assignment

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1)
i) The table is not in 1nf because the table contains multi valued attribute – course.

Therefore, decomposition into 1NF gives

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

Primary key : Id
Candidate keys : Id, Name, Location
Prime attributes: Id, Name, Location
Non-prime attributes : Age, Course

ii) The table is already in 1NF

Primary key : Id
Candidate keys : Id, Name, Phone, State
Prime attributes : ID, Name, Phone, State
Non-prime attributes : Country

2)
i) The table is already in 1NF. The table is not in 2NF as there is partial dependency between columns Duty_shift_ID and Duty_shift

Therefore, decomposition inti 2NF gives

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) The table is already in 1NF. The table is not in 2NF as there is partial dependency between columns Project_ID, Project_name and No.of hours

Therefore, decomposition into 2NF gives

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

Project_ID	Project_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, Project_name, No.of hours
Prime attributes : Emp_ID, Project_Id, Name, Project_name, No.of hours
Non-prime attributes : --------

3)
i) The table is not in 3NF as there exists a transitive dependency between Cust_Address and Cust_loc on a non primary key which is Cust_postcode

Therefore, decomposition into 3NF gives

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	Banglore

560046	Marathahalli	Banglore
210067	Bandra	Mumbai
4500078	Delhi central	Delhi

Primary key : Cust_ID

Candidate keys : Cust_ID, Cust_Name,Cust_postcode, Cust_address

Prime attributes : Cust_ID, Cust_Name,Cust_postcode, Cust_address

Non-prime attributes : Cust_loc

ii) The table is not in 3NF as there exists a transitive dependency between contractor and fee

Therefore, decomposition into 3NF gives

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

Contractor	Fee
Taylor	25667891
Sandeep	3567356
Vishaka	4567990

Primary key : Building

Candidate keys : Building , Contractor, Builder, Fee

Prime attributes : Building , Contractor, Builder, Fee

Non-Prime attributes : -------