DBMS Assignment 6

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1. For the first Question (2 Tables [1.1 and 1.2])

1 A) The Table 1.1 is not in 1NF because attribute courses contains more than one value, for example: ID 1 has courses 'OS, DBMS'. As it's not in 1NF it can't be in 2NF & 3NF.

Converted Table (1NF):

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	Bengaluru	DAA
4	Sameer	21	Bengaluru	ML
5	Vijay	22	Mumbai	ML
5	Vijay	22	Mumbai	DBMS

The Table 1.2 is already in 1NF.

2 A) For Table 1.1

Primary Key: Id

Candidate Key: Id, Name, Location

Prime Attributes: Id, Name, Location

Non Prime Attributes: Age, Course

For Table 1.2

Primary Key: Id

Candidate Key: Id, Name, Phone, State

Prime Attributes: Id, Name, Phone, State

Non Prime Attributes: Country

3A) No transitive and partial dependencies are taking place.

2. For the second Question (2 Tables [2.1 and 2.2])

1 A) The Table 2.1 is not in 2NF because it's not fully functionally independent as:

Emp_ID -> Name, Age

Emp_ID, Duty_shift_ID -> Duty_shift

Converted Tables (2NF):

Table - 1 (Emp_ID)

Emp_ID	Name	Age
101	Arun	26
102	Bobby	28
103	Suresh	32
104	Sita	24

Table - 2 (Duty_shift_ID)

Emp_ID	Duty_shift_ID	Duty_shift
101	1	Morning
102	2	Afternoon
103	3	Night
104	1	Morning

The Table 2.2 is not in 2NF because it's not fully functionally independent as:

Emp_ID -> Name

Emp_ID, Project_ID -> Proj_Name, No_of_hours

Converted Tables (2NF):

Table – 1

Emp_ID	Name
123	Ajay
321	Charu
546	Rajesh
765	Abhishek

Table - 2

Emp_ID	Project_ID	Proj_Name	No_of_hours
123	Prj_21	Speech_system	10
321	Prj_45	HR System	15
546	Prj_24	Automate Tickets	23
765	Prj_11	NLP	16

2 A) For Table 2.1

Primary Key: Emp_ID

Candidate Key: Emp_ID, Name, Age

Prime Attributes: Emp_ID, Name, Age

Non Prime Attributes: Duty_shift_ID , Duty_shift

For Table 2.2

Primary Key: Emp_ID

Candidate Key: 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: Nil

3A) In Table 2.1,there is no transitive dependency and "Duty_shift" is dependent on "Duty_shift_ID" which is a part of Primary Key, so there's a partial dependeny.

3. For the third Question (2 Tables [3.1 and 3.2])

1 A) The Table 3.1 is not in 3NF as there exists a transitive dependency between {Cust_address} & {Cust_loc} on a Non Primary Key which is {Cust_postcode} and there should be no transitive dependency in 3NF.

Converted Tables (3NF):

Table - 1

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

Table - 2

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

The Table 3.2 is not in 3NF as there exists a transitive dependency between {Contractor} & {Fee} and there should be no transitive dependency in 3NF.

Converted Tables (3NF):

Table - 1

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

Table - 2

Contractor	Fee
Taylor	2567891
Sandeep	3567356
Vishaka	4567990

2A) For Table 3.1

    Primary Key: Cust_ID

    Candidate Key: Cust_ID, Cust_name, Cust_postcode, Cust_address

    Prime Attributes: Cust_ID, Cust_name, Cust_postcode, Cust_address

    Non Prime Attributes: Cust_loc

  For Table 3.2

    Primary Key: Building

    Candidate Key: Building, Constructor, Builder, Fee

    Prime Attributes: Building, Constructor, Builder, Fee

    Non Prime Attributes: Nil

3A) In Table 3.1 there exists a transitive dependency between {Cust_address} & {Cust_loc} on a Non Primary Key which is {Cust_postcode} and no partial dependencies.

In Table 3.2 there exists a transitive dependency between {Contractor} & {Fee} and no partial dependencies.

THE END