

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 into 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 : -----