# DBMS LAB EXAM

**Date**:15,May,2021

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**1.Retrieve the details of all the employee who have a dependent with the same last name and sex as the employee**.

Sol)

```
SELECT    Emp.Lname
FROM      Employee AS Emp
WHERE     Emp.SSN IN (SELECT Emp.SSN
                      FROM   Dependent
WHERE  Emp.LNAME =Dep_name  AND Emp.Sex=Sex);
```

**2. For each project on which more than 2 employees word, retrieve the project number, the project name, and the number of employees who work on the project.**

**Sol)**

```
SELECT    Pnumber, Pname,Count(*)
FROM      Project,Works_on
WHERE     Pnumber=Pno
GROUP BY  Pnumber,Pname
HAVING    COUNT(*)>2;
```

**3. For each department that has more than 3 employees, retrieve the department number and the number of employees who are making more than Rs50,000**

**sol)**

```
SELECT    Dnumber, Count(*)
FROM      Department,Employee
WHERE     Dnumber=Dno AND Salary >50000 AND
          Dno IN  (SELECT     DNO
                   FROM       Employee
                   GROUP BY   Dno
                   HAVING     Count(*)>3)
GROUP BY  Dnumber;
```

**4. Retrieve details of all the employees and their dependents who has been managers with department more than once and has more than 10 employees.**

**Sol:**

```
SELECT * from Employee E
WHERE E.Eno in (SELECT Eno FROM Dependent WHERE Relation =
                'Manager' GROUP BY relation HAVING
                count()>1);
GROUP BY Eno
HAVING count()>10;
```

**5. Retrieve the department details with more than one project, where these projects are located in multiple locations.**

```
SELECT *
FROM        Department ,Project
WHERE       Department.Dno=Project.Dnum
GROUP BY    Pno
HAVING      Count(Pno)>1 AND Count(Plocation)>1
```

**Normalization:**

**1. Convert the table into 1nf, 2nf, 3nf**

**Solution 1:**

Based on the closure of given functional dependencies, we arrive at a result of two candidate keys possible. They are:

- {PropertyId}
- {CountryName, Plot}

Prime Attributes: PropertyId, CountryName, Plot

Non-prime attributes: Area, Price, TaxRate

Since, the minimal amongst candidate keys is the primary key, {PropertyId} is the primary key of the table PLOT.

**1NF Normalization:**

The table PLOT is already in 1NF. Thus, the 1NF Normalized form shall be:

| PropertyId | CountryName | Plot | Area | Price | TaxRate |
|---|---|---|---|---|---|

The table PLOT is not in 2NF because of the functional dependency CountryName → TaxRate. Thus, TaxRate is partially dependent on the candidate key {CountryName, Plot}.

**The 2NF Normal form shall be:**

| PLOT_Table1 | | | | |
|---|---|---|---|---|
| PropertId (primary key) | CountryName | Plot | Area | Price |

The other table shall be:

| PLOT_Table2 | |
|---|---|
| CountryName (primary key) | TaxRate |

**3NF Normalization:**

The table PLOT_Table1 is not in 3NF because of the existence of transitive dependency due to Area → Price. Area is not a superkey and Price is not a prime attribute. Thus, PLOT_Table1 should be divided into PLOT_Table1A and PLOT_Table1B.

| PLOT_Table1A | | | |
|---|---|---|---|
| PropertId (primary key) | CountryName | Plot | Area |

The other table shall be:

| PLOT_Table1B |
|---|

| Area (primary key) | Price |
| --- | --- |