

National University of Computer and Emerging Sciences, Lahore Campus



Course:	Database Systems
Program:	BS(Computer Science)
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Practice Problem:	SQL (4) - SOLUTION
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Question 1: Use the two relations given below to write the following queries in SQL:

EMP (SSN, FirstName, LastName, Title, Salary, **DeptId**, **MgrId**)

DEPT (Did, DepartmentName, TotalBudget)

Foreign Keys: DeptId references DEPT.Did and MgrId references EMP.SSN

1. Find the name, total budget of departments in which the total salary of all people working in that department exceeds the total budget of the department.
2. Find the first and last name of employees whose salary is greater than the salary of their manager.
3. Find name of departments that does not have any employees with title "Vice President" working in them.

Answer.

1.

```
SELECT D.dept_name, D.totalbudget
FROM Employee E JOIN Department D ON E.dept_id = D.dept_id
GROUP BY D.dept_id, D.dept_name, D.totalbudget
HAVING D.totalbudget < sum(E.salary)
```

2.

```
SELECT E.firstname, E.lastname
FROM Employee E JOIN Employee M ON E.mrg_id = M.ssn
WHERE E.salary > M.salary
```

3.

```
SELECT D.departmentname
FROM Department D
WHERE D.dept_id NOT IN
    (SELECT D1.dept_id
     FROM Department D1 JOIN Employee E ON D1.dept_id = E.dept_id
     WHERE E.title='Vice President')
```

Question 2: Consider the following database schema of computer products:

Computer (maker, model, category)

Model (num, speed, ram, hd, price)

Maker (name, address, phone)

Where

- maker indicates the manufacturer of the computer;
- category takes values such as 'desktop', 'laptop', 'server';
- maker and model attributes are foreign keys;

Express following queries in SQL:

1. Find all the makers who make at most one model or don't make any model.
2. Find all desktop models with the highest speed, and return them along with their makers.
3. Display *maker, model_count* of all the makers who make at least three different desktop models.

Answer.

1.

```
SELECT maker FROM computer
GROUP BY maker HAVING COUNT(model) = 1
UNION
SELECT name FROM maker
WHERE NOT EXISTS (SELECT * FROM computer WHERE name = maker)
```

2.

```
SELECT C.maker, C.model
FROM Computer C JOIN Model M ON C.model = M.num
WHERE C.category = 'desktop'
AND M.speed IN (SELECT MAX(speed)
                FROM Computer C JOIN Model M ON C.model = M.num
                WHERE C.category = 'desktop' )
```

3.

```
SELECT maker, COUNT(model) AS model_count
FROM Computer
WHERE category = 'desktop'
GROUP BY maker
HAVING COUNT(model) >= 3
```