## **DBMS Lab - Session-4**

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1. With continuation to Session 03 exercise, execute all the example queries provided in Subsection 7.1.1 to 7.4.2 (excluding keywords 'TRIGGER', 'VIEW', 'EXCEPT' and 'CONTAINS').

```
1)SELECT Fname, Lname FROM EMPLOYEE WHERE Super_ssn IS NULL;
 +----+
 | Fname | Lname |
 +----+
 | James | Borg |
 +----+
2)SELECT DISTINCT Pnumber
FROM PROJECT
WHERE Pnumber IN
 ( SELECT Pnumber
 FROM PROJECT, DEPARTMENT, EMPLOYEE
 WHERE Dnum = Dnumber AND Mgr_ssn = Ssn AND Lname = 'Smith' );
 Empty set (0.00 sec)
3)SELECT Lname, Fname
FROM EMPLOYEE
WHERE Salary > ALL
 ( SELECT Salary
 FROM EMPLOYEE
 WHERE Dno = 5);
 +----+
 |Lname | Fname |
 +----+
 | Borg | James |
 | Wallace | Jennifer |
 +----+
4)SELECT E.Fname, E.Lname
FROM EMPLOYEE AS E
WHERE E.Ssn IN
 ( SELECT D.Essn
 FROM DEPENDENT AS D
```

```
WHERE E.Fname = D.Dependent_name AND E.Sex = D.Sex );
 Empty set (0.00 sec)
5)SELECT E.Fname, E.Lname
FROM EMPLOYEE AS E
WHERE EXISTS ( SELECT *
FROM DEPENDENT AS D
WHERE E.Ssn = D.Essn AND E.Sex = D.Sex AND E.Fname = D.Dependent_name);
 Empty set (0.00 sec)
6)SELECT Fname, Lname
FROM EMPLOYEE
WHERE
EXISTS (SELECT *
FROM DEPENDENT
WHERE Ssn = Essn )
AND
EXISTS (SELECT *
FROM DEPARTMENT
WHERE Ssn = Mgr_ssn );
 +----+
 |Fname | Lname |
 +----+
 | Franklin | Wlong |
 | Jennifer | Wallace |
 +----+
7) SELECT Lname, Fname
FROM EMPLOYEE
WHERE
NOT EXISTS ( SELECT *
FROM WORKS_ON B
WHERE (B.Pno IN
( SELECT Pnumber
FROM PROJECT
WHERE Dnum = 5)
AND
NOT EXISTS ( SELECT *
FROM WORKS_ON C
WHERE C.Essn = Ssn
AND C.Pno = B.Pno )));
```

```
8) SELECT DISTINCT Essn
FROM WORKS ON
WHERE Pno IN (1, 2, 3);
 +----+
 |Essn |
 +----+
 | 123456789 |
 | 453453453 |
 | 333445555 |
 | 666884444 |
 +----+
9)SELECT Fname, Lname, Address
FROM (EMPLOYEE JOIN DEPARTMENT ON Dno = Dnumber)
WHERE Dname = 'Research';
+----+
|Fname |Lname |Address
+-----+
| Jhon | Smith | 731 Fondren, Houston,
TX I
| Franklin | Wlong | 638 Voss, Houston,
TX |
| Joyce | English | 5631 Rice, Houston,
TX |
| Ramesh | Narayan | 975 Fire Oak,
Humble, TX |
+-----+
10)SELECT E.Lname AS Employee name, S.Lname AS Supervisor name
FROM (EMPLOYEE AS E LEFT OUTER JOIN EMPLOYEE AS S ON E.Super_ssn = S.Ssn);
+----+
| Employee_name | Supervisor_name |
+----+
| Smith
       | Vvic. [
| Borg
        | Wlong
| Wlong
| English | Wlong
```

```
| Narayan
        | Wlong
| Borg
        | NULL
| Wallace | Borg
| Jabbar
         | Wallace
| Zelaya
        | Wallace
11)SELECT SUM(Salary),MAX(Salary),MIN(Salary),AVG(Salary)
FROM EMPLOYEE;
+----+
| SUM(Salary) | MAX(Salary) | MIN(Salary) | AVG(Salary) |
+-----+
| 281000.00 | 55000.00 | 25000.00 | 35125.000000 |
+-----+
12)SELECT COUNT (*)
FROM EMPLOYEE, DEPARTMENT
WHERE DNO = DNUMBER AND DNAME = 'Research';
+----+
| COUNT(*) |
+----+
   4 |
+----+
13)SELECT Pnumber, Pname, COUNT(*)
FROM PROJECT, WORKS ON
WHERE Pnumber = Pno
GROUP BY Pnumber, Pname;
+----+
| Pnumber | Pname | COUNT(*) |
+----+
   10 | Computerization |
  30 | Newbenefits |
                    3 |
   1 | ProductX
                   2 |
  2 | ProductY
                  3 |
   3 | ProductZ
                   2 |
  20 | Reorganization |
```

## 2. Execute the following Queries over the Company Schema you have already created.

a. For each department whose average employee salary is more than 30,000, retrieve the department name and the number of employees working for that department.

SELECT D.Dname, COUNT(E.Ssn) AS NumberOfEmployees

FROM DEPARTMENT D

JOIN EMPLOYEE E ON D.Dnumber = E.Dno

GROUP BY D.Dname

HAVING AVG(E.Salary) > 30000;

	Dname	NumberOfEmployees
•	Research	4
	Headquarters	1
	Administration	3

b.

i. Retrieve the number of female employees in each department making more than 30,000.

SELECT D.Dname, COUNT(E.Ssn) AS NumberOfFemaleEmployees

FROM DEPARTMENT D

JOIN EMPLOYEE E ON D.Dnumber = E.Dno

WHERE E.Salary > 30000 AND E.Sex = 'F'

GROUP BY D.Dname;

	Dname	NumberOfFemaleEmployees
•	Administration	1

ii. For each department whose average employee salary is more than 30,000, retrieve the department name and number of male employees working for that department.

SELECT D.Dname, COUNT(E.Ssn) AS NumberOfMaleEmployees

FROM DEPARTMENT D

JOIN EMPLOYEE E ON D.Dnumber = E.Dno

WHERE E.Sex = 'M'

**GROUP BY D.Dname** 

HAVING AVG(E.Salary) > 30000;

	Dname	NumberOfMaleEmployees
•	Research	3
	Headquarters	1

c. Retrieve the names of all employees who work in the department that has the employee with the highest salary among all employees.

SELECT E.Fname, E.Minit, E.Lname

FROM EMPLOYEE E

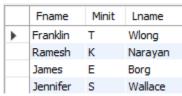
WHERE E.Dno = (

SELECT E1.Dno



d. Retrieve the names of employees who make at least 10,000 more than the employee who is paid the least in the company.

SELECT E.Fname, E.Minit, E.Lname
FROM EMPLOYEE E
WHERE E.Salary >= (
 SELECT MIN(Salary) + 10000
 FROM EMPLOYEE
);
Fname Minit Lname



e. Retrieve the names of all employees in department 5 who work more than 10 hours per week on the Product X's project.

SELECT E.Fname, E.Minit, E.Lname
FROM EMPLOYEE E
JOIN WORKS\_ON W ON E.Ssn = W.Essn
JOIN PROJECT P ON W.Pno = P.Pnumber
WHERE E.Dno = 5 AND P.Pname = 'Product X' AND W.Hours > 10;
Fname Minit Lname

f. List the names of all employees who have a dependent with the same first name as themselves.

SELECT E.Fname, E.Minit, E.Lname
FROM EMPLOYEE E
JOIN DEPENDENT D ON E.Ssn = D.Essn
WHERE E.Fname = D.Dependent\_name;
Fname Minit Lname

g. Find the names of all employees who are directly supervised by 'Tejaswi Kumar'.

SELECT E.Fname, E.Minit, E.Lname

FROM EMPLOYEE E

JOIN EMPLOYEE S ON E.Super ssn = S.Ssn

WHERE S.Fname = 'Tejaswi' AND S.Lname = 'Kumar';



h. Find the names of employees who work on all the projects controlled by department number 5.

```
SELECT E.Fname, E.Minit, E.Lname
FROM EMPLOYEE E
WHERE NOT EXISTS (
  SELECT P.Pnumber
 FROM PROJECT P
 WHERE P.Dnum = 5
 AND NOT EXISTS (
    SELECT W.Essn
   FROM WORKS ON W
   WHERE W.Pno = P.Pnumber
   AND W.Essn = E.Ssn
 )
);
    Fname
          Minit
              Lname
```

i. For each project, list the project name and the total hours per week (by all employees) spent on that project.

SELECT P.Pname, SUM(W.Hours) AS TotalHours FROM PROJECT P JOIN WORKS\_ON W ON P.Pnumber = W.Pno GROUP BY P.Pname;

	Pname	TotalHours	
•	Computerization	55.0	
	Newbenefits	55.0	
	ProductX	52.5	
	ProductY	37.5	
	ProductZ	50.0	
	Reorganization	40.0	

j. Retrieve the names of all employees who work on every project.

SELECT E.Fname, E.Minit, E.Lname
FROM EMPLOYEE E
WHERE NOT EXISTS (
 SELECT P.Pnumber
 FROM PROJECT P
 WHERE NOT EXISTS (
 SELECT W.Essn
 FROM WORKS\_ON W
 WHERE W.Pno = P.Pnumber
 AND W.Essn = E.Ssn
 )
);
Fname Minit Lname

k. Retrieve the names of all employees who do not work on any project.

SELECT E.Fname, E.Minit, E.Lname

FROM EMPLOYEE E

WHERE NOT EXISTS (

SELECT W.Essn

WHERE W.Essn = E.Ssn
);
Fname Minit Lname

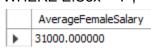
FROM WORKS ON W

I. Retrieve the average salary of all female employees.

SELECT AVG(E.Salary) AS AverageFemaleSalary

FROM EMPLOYEE E

WHERE E.Sex = 'F';



m. Find the names and addresses of all employees who work on at least one project located in Madurai but whose department has no location in Madurai.

SELECT DISTINCT E.Fname, E.Minit, E.Lname, E.Address
FROM EMPLOYEE E
JOIN WORKS\_ON W ON E.Ssn = W.Essn
JOIN PROJECT P ON W.Pno = P.Pnumber
WHERE P.Plocation = 'Madurai'
AND NOT EXISTS (
SELECT DL.Dlocation
FROM DEPT LOCATIONS DL

WHERE DL.Dnumber = E.Dno AND DL.Dlocation = 'Madurai' );

Lname

Borg

n. List the last names of all department managers who have no dependents.

SELECT E.Lname
FROM EMPLOYEE E
JOIN DEPARTMENT D ON E.Ssn = D.Mgr\_ssn
WHERE NOT EXISTS (
SELECT Dp.Essn
FROM DEPENDENT Dp
WHERE Dp.Essn = E.Ssn
);

o. Display employee names (e") who are supervised by an e' who is immediately supervised by an employee with Iname "XYZ".

SELECT E2.Fname, E2.Minit, E2.Lname
FROM EMPLOYEE E2
JOIN EMPLOYEE E1 ON E2.Super\_ssn = E1.Ssn
JOIN EMPLOYEE E0 ON E1.Super\_ssn = E0.Ssn
WHERE E0.Lname = 'XYZ';
Fname Minit Lname

p. Display names of all employees who work on some project controlled by department number 10.

SELECT DISTINCT E.Fname, E.Minit, E.Lname
FROM EMPLOYEE E
JOIN WORKS\_ON W ON E.Ssn = W.Essn
JOIN PROJECT P ON W.Pno = P.Pnumber
WHERE P.Dnum = 10;
Fname Minit Lname

q. Print all the ssn and the first name of supervisors who supervise at least 2 projects in ascending order of the number of employee he/she supervise under him/her.

SELECT E.Super\_ssn, S.Fname, COUNT(DISTINCT P.Pnumber) AS ProjectCount FROM EMPLOYEE E

JOIN WORKS\_ON W ON E.Ssn = W.Essn

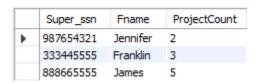
JOIN PROJECT P ON W.Pno = P.Pnumber

JOIN EMPLOYEE S ON E.Super ssn = S.Ssn

GROUP BY E.Super ssn, S.Fname

HAVING COUNT(DISTINCT P.Pnumber) >= 2

ORDER BY ProjectCount ASC;



r. Display all male employee names who also have dependents along with their dependent names.

SELECT E.Fname, E.Minit, E.Lname, D.Dependent\_name FROM EMPLOYEE E JOIN DEPENDENT D ON E.Ssn = D.Essn WHERE E.Sex = 'M':

	Fname	Minit	Lname	Dependent_name
•	Jhon	В	Smith	Alice
	Jhon	В	Smith	Elizabeth
	Jhon	В	Smith	Michae
	Franklin	Т	Wlong	Alice
	Franklin	T	Wlong	Joy
	Franklin	Т	Wlong	Theodore

s. Display those employees whose salary exceeds the department managers salary that the employee(s) work for.

SELECT E.Fname, E.Minit, E.Lname
FROM EMPLOYEE E
JOIN DEPARTMENT D ON E.Dno = D.Dnumber
JOIN EMPLOYEE M ON D.Mgr\_ssn = M.Ssn
WHERE E.Salary > M.Salary;
Fname Minit Lname

t. Display employee names who either work in CS department or supervise an employee working for CS department.

SELECT DISTINCT E.Fname, E.Minit, E.Lname
FROM EMPLOYEE E
JOIN DEPARTMENT D ON E.Dno = D.Dnumber
WHERE D.Dname = 'CS'
UNION
SELECT DISTINCT E.Fname, E.Minit, E.Lname
FROM EMPLOYEE E
JOIN EMPLOYEE S ON E.Ssn = S.Super\_ssn
JOIN DEPARTMENT D ON S.Dno = D.Dnumber
WHERE D.Dname = 'CS';