LAB EXERCISE-5

COMPANY DATABASE

Consider the schema for Company Database:

EMPLOYEE(SSN, Name, Address, Sex, Salary, SuperSSN, DNo)

DEPARTMENT(DNo, Dname, MgrSSN, MgrStartDate)

DLOCATION(DNo, DLoc)

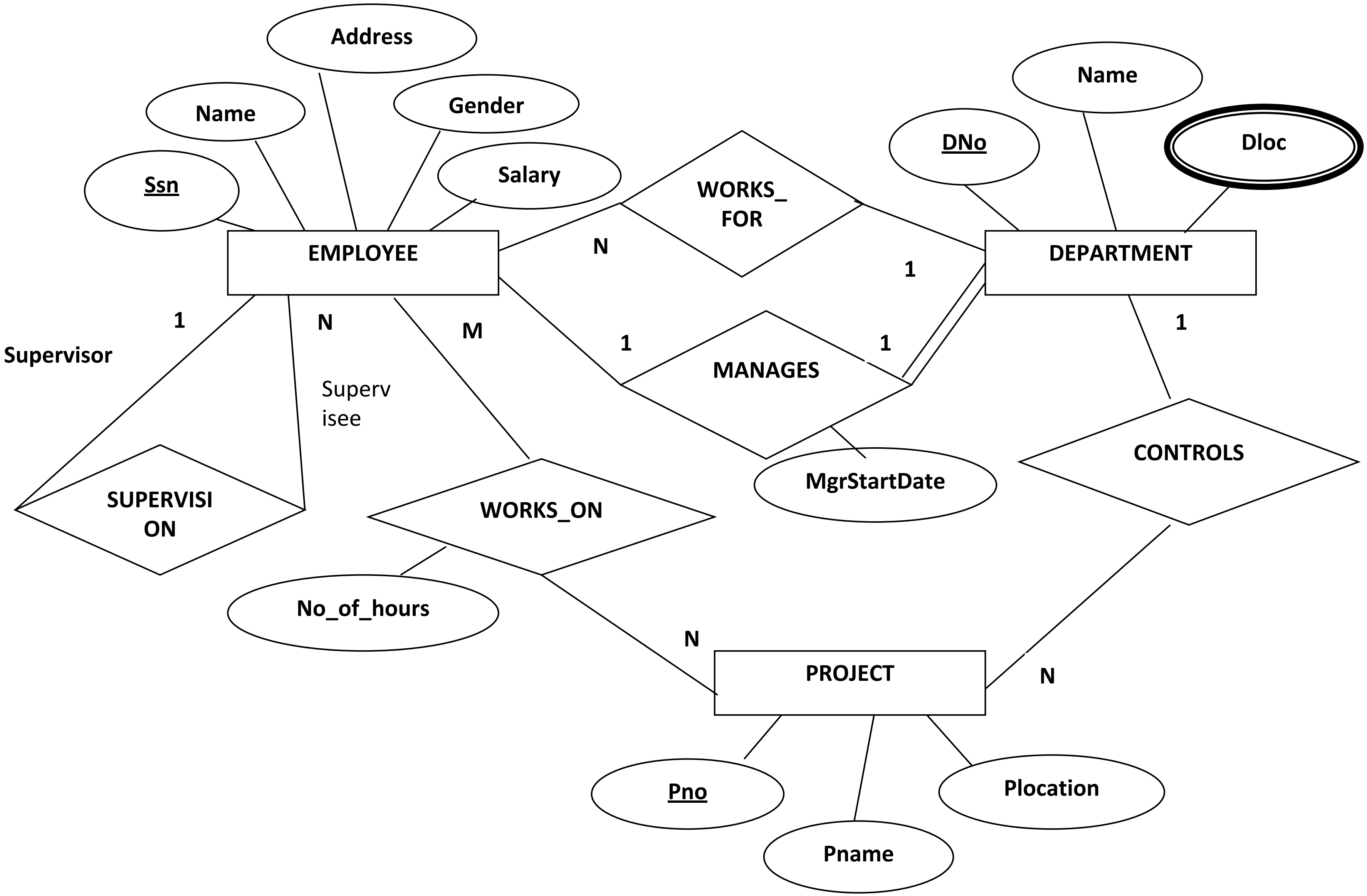
PROJECT(PNo, PName, PLocation, DNo)

WORKS_ON(SSN, PNo, Hours)

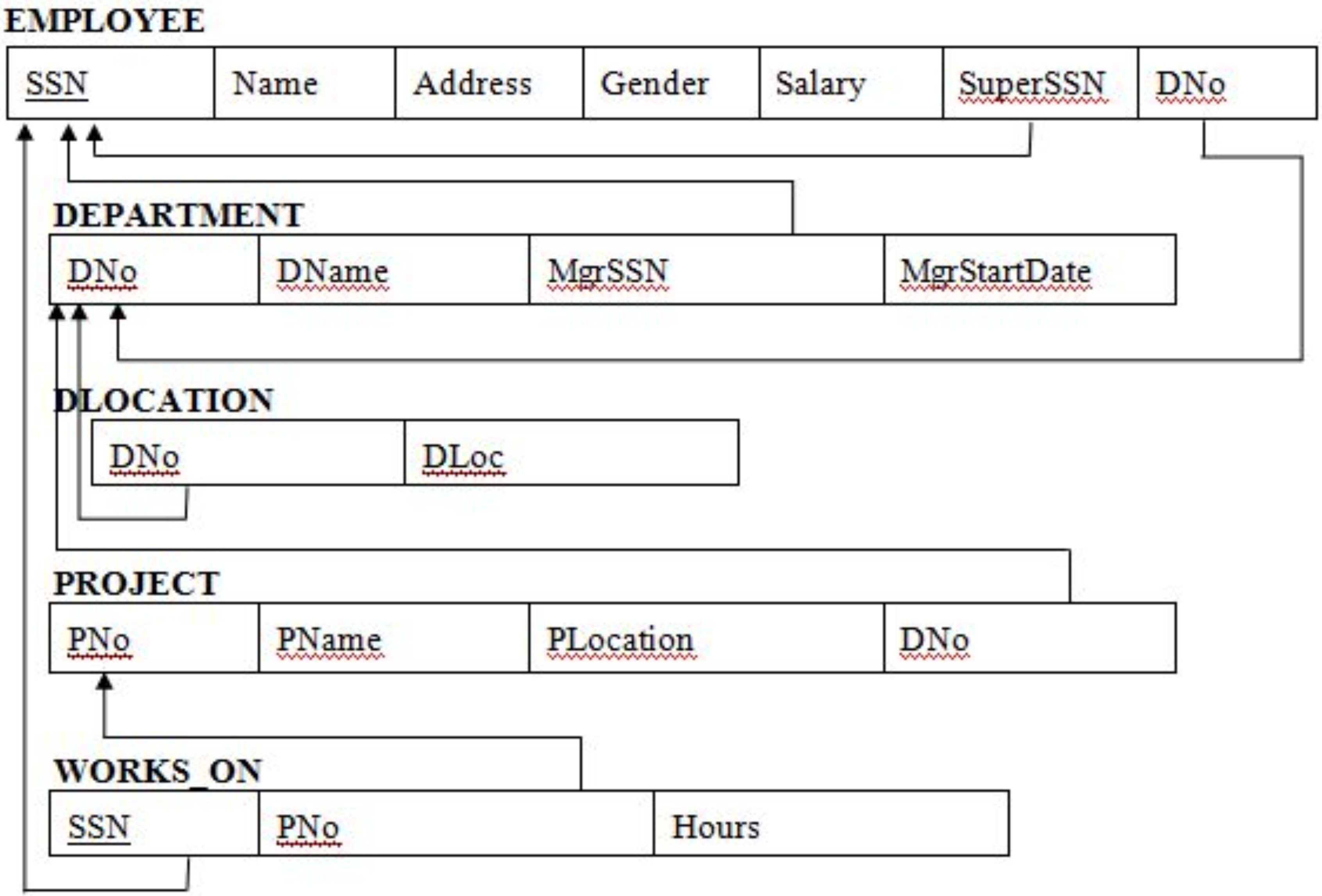
Write SQL queries to

1. **Make a list of all project numbers for projects that involve an employee whose last name is 'Scott', either as a worker or as a manager of the department that controls the project.**
2. **Show the resulting salaries if every employee working on the 'IoT' project is given a 10 percent raise.**
3. **Find the sum of the salaries of all employees of the 'Accounts' department, as well as the maximum salary, the minimum salary, and the average salary in this department**
4. **Retrieve the name of each employee who works on all the projects controlled by department number (use NOT EXISTS operator).**
5. **For each department that has more than five employees, retrieve the department number and the number of its employees who are making more than Rs. 6,00,000.**

ER diagram


Address
Name
Gender
Ssn
Salary
EMPLOYEE
WORKS_
FOR
N
1
Name
DNo
Dloc
DEPARTMENT
1
N
M
1
1
1
Supervisor
Superv
isee
MANAGES
SUPERVISI
ON
WORKS_ON
MgrStartDate
CONTROLS
No_of_hours
N
PROJECT
N
Pno
Pname
Plocation

Schema diagram



EMPLOYEE

SSN	Name	Address	Gender	Salary	SuperSSN	DNo

DEPARTMENT

DNo	DName	MgrSSN	MgrStartDate

DLOCATION

DNo	DLoc

PROJECT

PNo	PName	PLocation	DNo

WORKS_ON

SSN	PNo	Hours

```
CREATE TABLE EMPLOYEE(
  SSN INT PRIMARY KEY,
  NAME VARCHAR2(20),
  ADDRESS VARCHAR2(20),
  GENDER CHAR(1) CHECK(GENDER='M' OR
  GENDER='F'),
  SALARY NUMBER(6),
  SUPERSSN REFERENCES EMPLOYEE(SSN),
  DNO NUMBER);
```

- INSERT INTO EMPLOYEE

  VALUES(1,’Scott’,’Mangaluru’,’F’,35000,1,NULL);

- INSERT INTO EMPLOYEE

  VALUES(2,’Sahana’,’Mangaluru’,’F’,35000,1,NULL);

- INSERT INTO EMPLOYEE

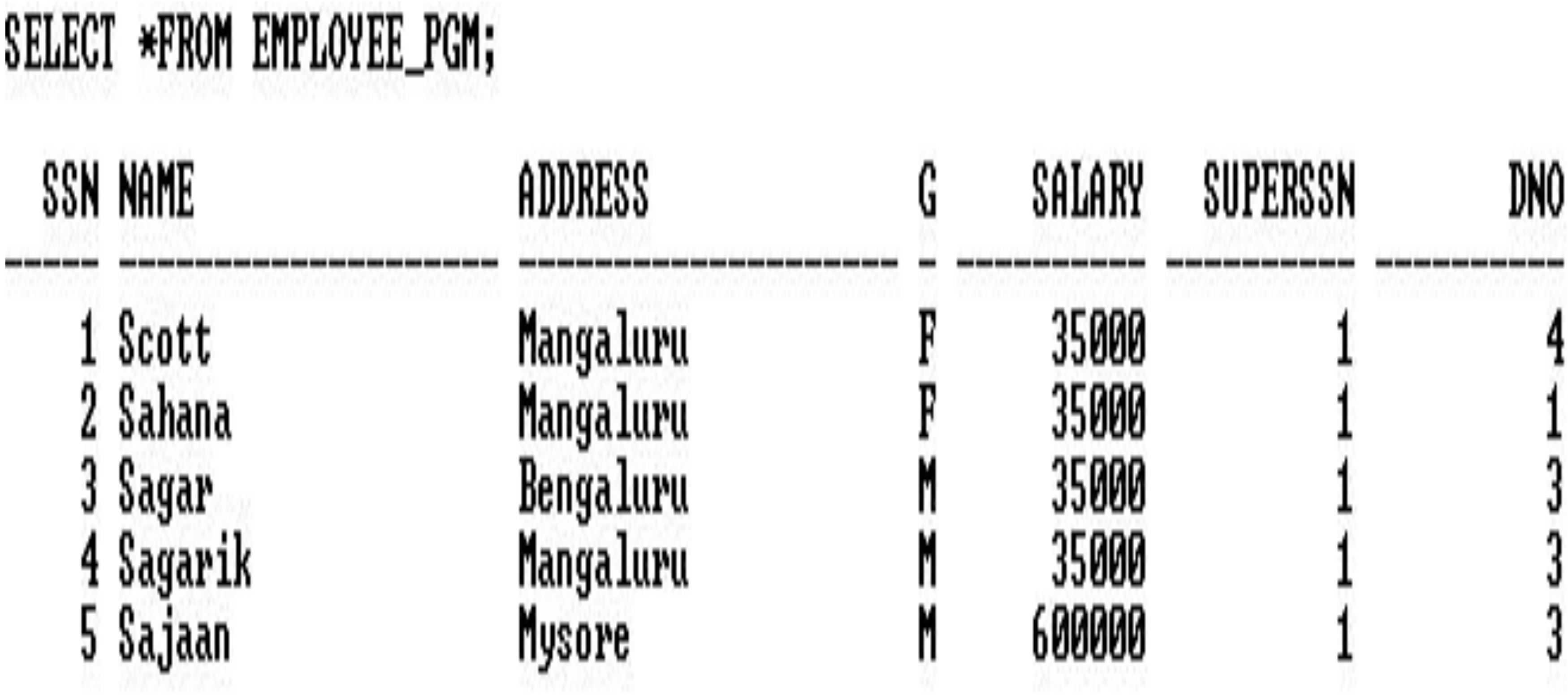
  VALUES(3,’Sagar’,’Bengaluru’,’M’,35000,1,NULL);

- INSERT INTO EMPLOYEE

  VALUES(4,’Sagarik’,’Mangaluru’,’M’,35000,1,NULL);

- INSERT INTO EMPLOYEE

  VALUES(5,’Sajaan’,’Mysore’,’M’,600000,1,NULL);



```
SELECT *FROM EMPLOYEE_PGM;

  SSN NAME                 ADDRESS              G     SALARY   SUPERSSN        DNO
----- -------------------- -------------------- - ---------- ---------- ----------
    1 Scott                Mangaluru            F      35000          1          4
    2 Sahana               Mangaluru            F      35000          1          1
    3 Sagar                Bengaluru            M      35000          1          3
    4 Sagarik              Mangaluru            M      35000          1          3
    5 Sajaan               Mysore               M     600000          1          3
```

```
CREATE TABLE DEPARTMENT_PGM
(DNO NUMBER(5) PRIMARY KEY,
DNAME    VARCHAR2(10) ,
MGRSSN  REFERENCES EMPLOYEE_PGM,
MGRSTARTDATE DATE);
```

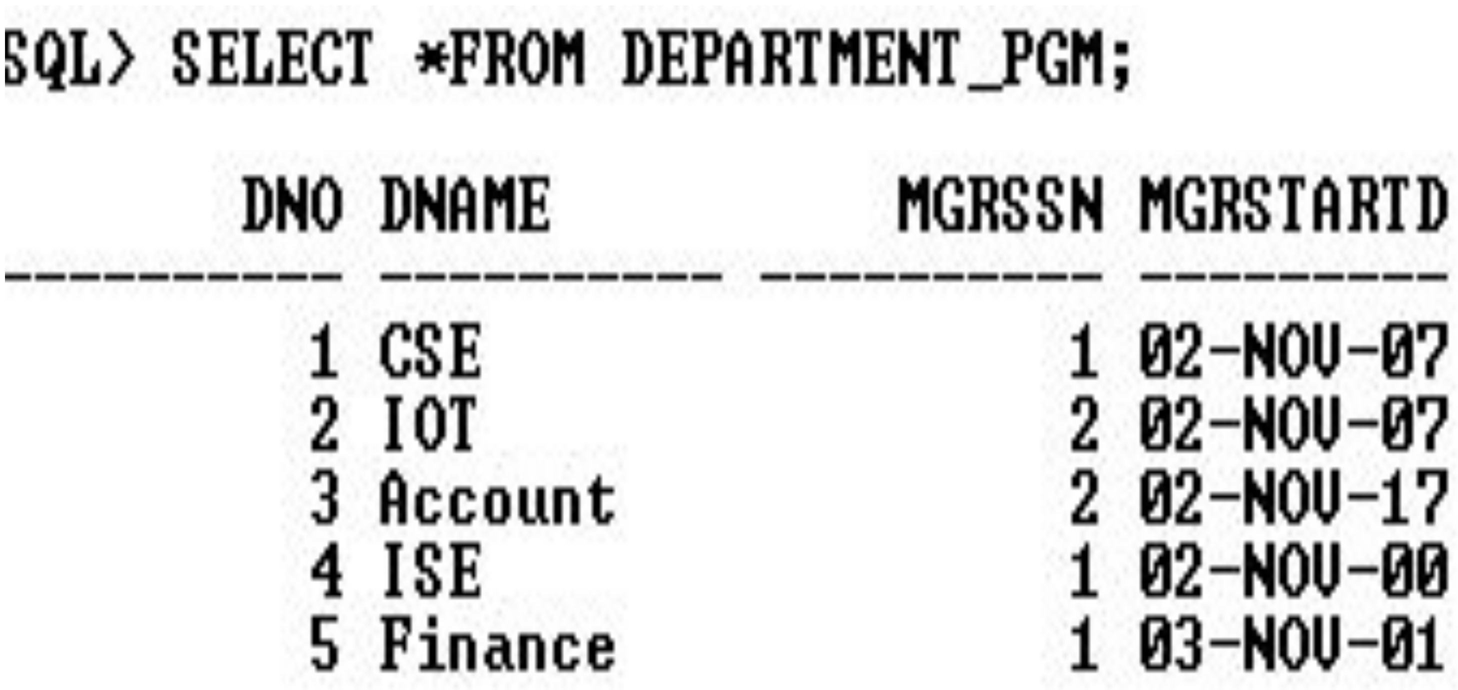
- INSERT INTO DEPARTMENT_PGM VALUES(1,'CSE',1,'2-Nov-2007');

- INSERT INTO DEPARTMENT_PGM VALUES(2,'IOT',2,'2-Nov-2007');

- INSERT INTO DEPARTMENT_PGM VALUES(3,'Account',2,'2-Nov-2017');

- INSERT INTO DEPARTMENT_PGM VALUES(4,'ISE',1,'2-Nov-2000');

- INSERT INTO DEPARTMENT_PGM VALUES(5,'Finance',1,'3-Nov-2001');



```
SQL> SELECT *FROM DEPARTMENT_PGM;

       DNO DNAME                MGRSSN MGRSTARTD
---------- ---------- ---------- ---------
         1 CSE                       1 02-NOV-07
         2 IOT                       2 02-NOV-07
         3 Account                   2 02-NOV-17
         4 ISE                       1 02-NOV-00
         5 Finance                   1 03-NOV-01
```

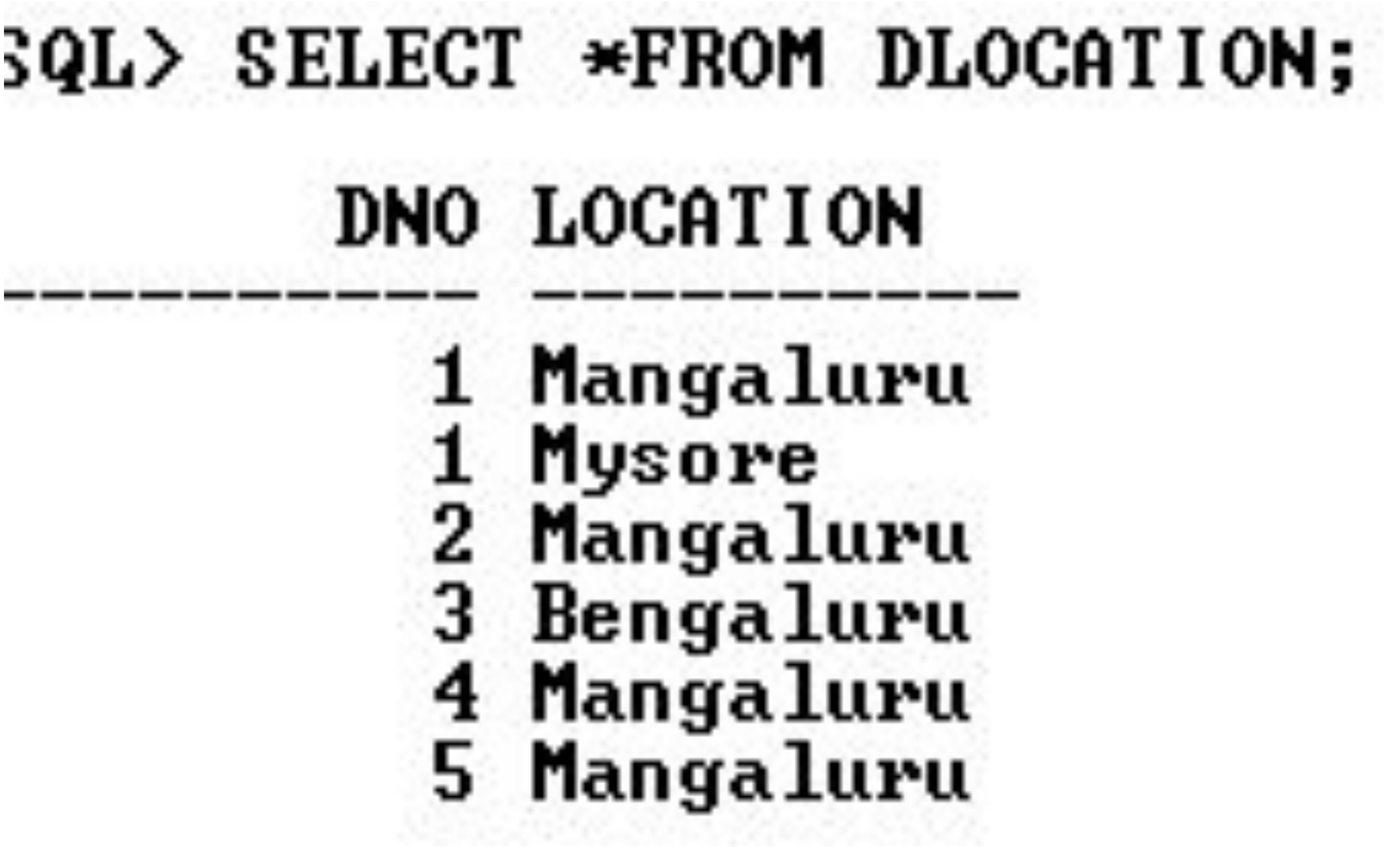
Relating employee and department

- **ALTER TABLE EMPLOYEE_PGM** ADD CONSTRAINT FK FOREIGN KEY(DNO) REFERENCES DEPARTMENT_PGM;

- **Now update employee to set dno:**
- UPDATE EMPLOYEE_PGM SET DNO=&DNO where SSN=&SSN;

- CREATE TABLE **DLOCATION**
  (DNO REFERENCES DEPARTMENT_PGM,
  LOCATION VARCHAR2(10),
  PRIMARY KEY(DNO,LOCATION));

- INSERT INTO DLOCATION VALUES(1,'Mangaluru');
- INSERT INTO DLOCATION VALUES(1,'Mysore');
- INSERT INTO DLOCATION VALUES(2,'Mangaluru');
- INSERT INTO DLOCATION VALUES(3,'Bengaluru');
- INSERT INTO DLOCATION VALUES(4,'Mangaluru');
- INSERT INTO DLOCATION VALUES(5,'Mangaluru');

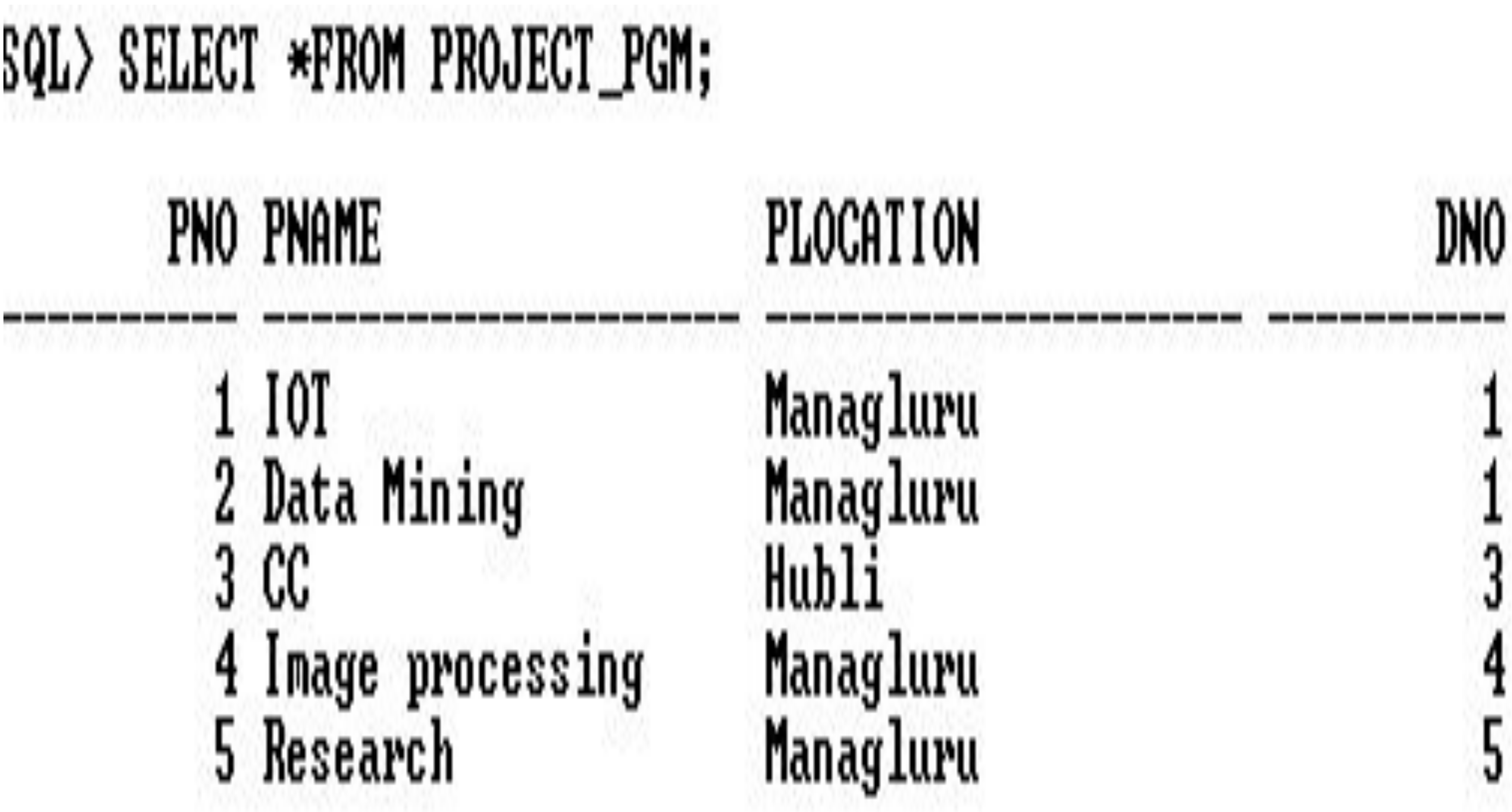


```
SQL> SELECT *FROM DLOCATION;

       DNO LOCATION
---------- ----------
         1 Mangaluru
         1 Mysore
         2 Mangaluru
         3 Bengaluru
         4 Mangaluru
         5 Mangaluru
```

```sql
CREATE TABLE PROJECT_PGM
  (PNO NUMBER(2) PRIMARY KEY,
  PNAME VARCHAR2(20),
  PLOCATION VARCHAR2(20),
  DNO NUMBER  REFERENCES
  DEPARTMENT_PGM);
```

- INSERT INTO PROJECT_PGM VALUES(1,'IOT','Managluru',1);
- INSERT INTO PROJECT_PGM VALUES(2,'Data Mining','Managluru',1);
- INSERT INTO PROJECT_PGM VALUES(3,'CC','Hubli',3);
- INSERT INTO PROJECT_PGM VALUES(4,'Image processing','Managluru',4);
- INSERT INTO PROJECT_PGM VALUES(5,'Research','Managluru',5);

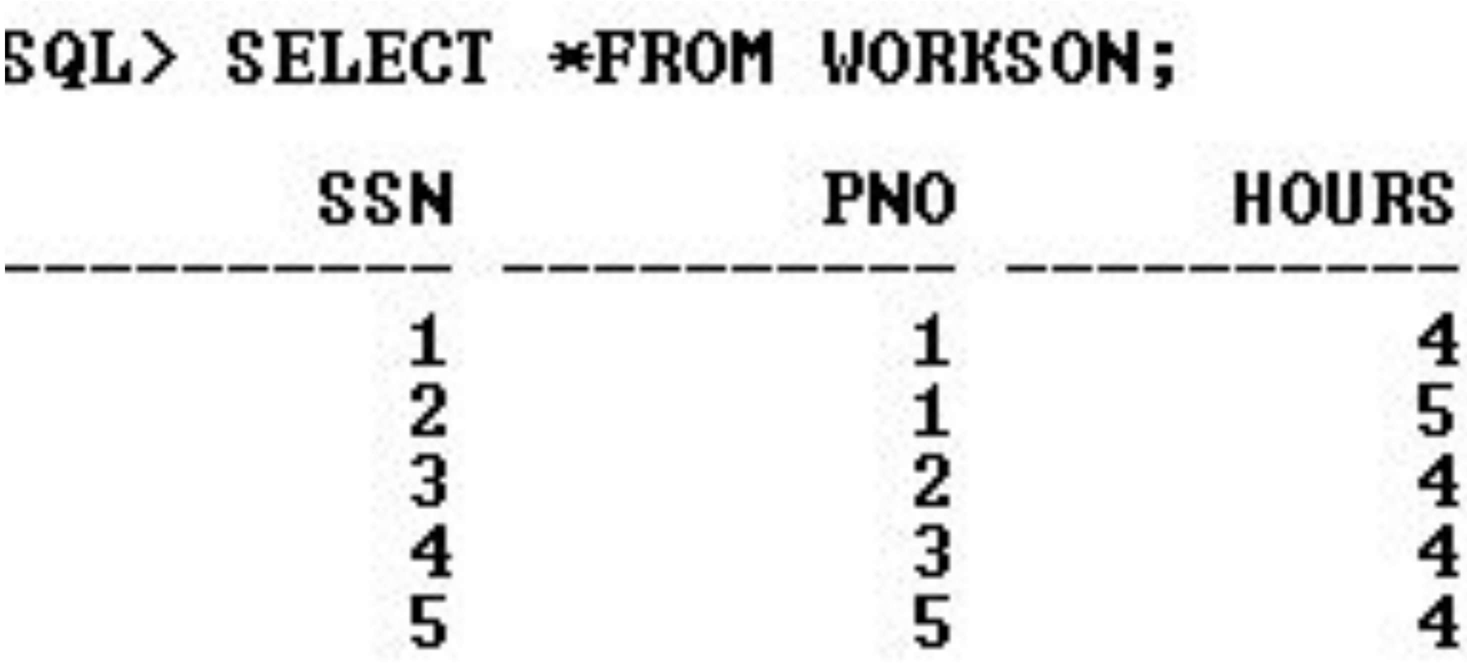


```
SQL> SELECT *FROM PROJECT_PGM;

       PNO PNAME                PLOCATION                   DNO
---------- -------------------- -------------------- ----------
         1 IOT                  Managluru                     1
         2 Data Mining          Managluru                     1
         3 CC                   Hubli                         3
         4 Image processing     Managluru                     4
         5 Research             Managluru                     5
```

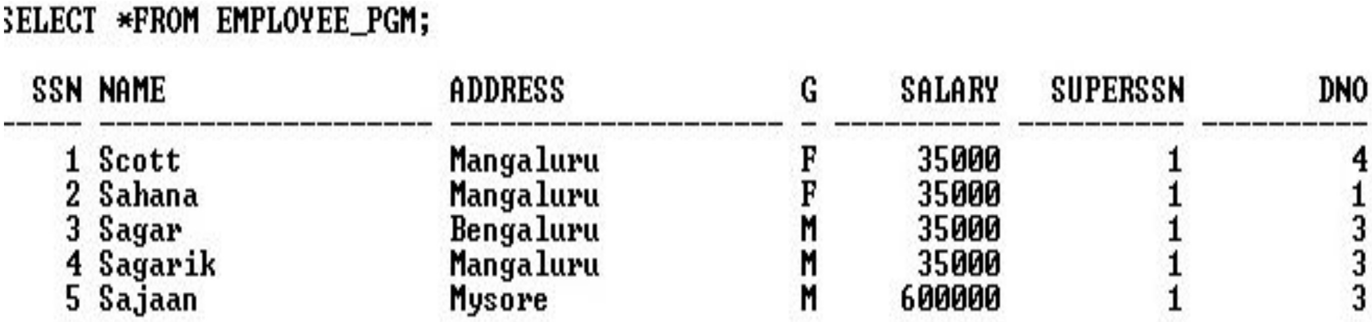
```
CREATE TABLE  WORKSON
  (SSN  NUMBER(5) REFERENCES
  EMPLOYEE_PGM,
  PNO   NUMBER(2) REFERENCES
  PROJECT_PGM,
  HOURS NUMBER(5,2),
  PRIMARY KEY(SSN, PNO));
```

- INSERT INTO WORKSON VALUES(1,1,4);
- INSERT INTO WORKSON VALUES(2,1,5);
- INSERT INTO WORKSON VALUES(3,2,4);
- INSERT INTO WORKSON VALUES(4,3,4);
- INSERT INTO WORKSON VALUES(5,5,4);



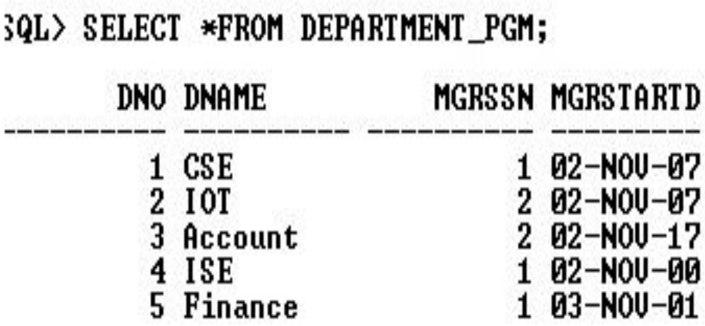
```
SQL> SELECT *FROM WORKSON;

       SSN        PNO      HOURS
---------- ---------- ----------
         1          1          4
         2          1          5
         3          2          4
         4          3          4
         5          5          4
```



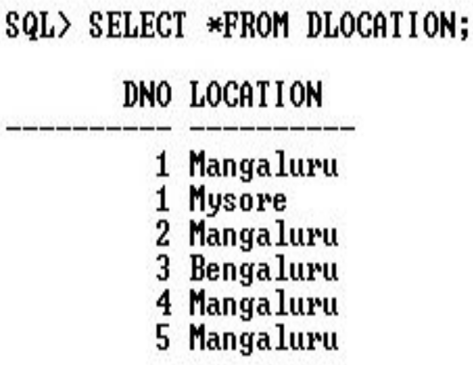
```
SELECT *FROM EMPLOYEE_PGM;

  SSN NAME                 ADDRESS              G     SALARY   SUPERSSN        DNO
----- -------------------- -------------------- - ---------- ---------- ----------
    1 Scott                Mangaluru            F      35000          1          4
    2 Sahana               Mangaluru            F      35000          1          1
    3 Sagar                Bengaluru            M      35000          1          3
    4 Sagarik              Mangaluru            M      35000          1          3
    5 Sajaan               Mysore               M     600000          1          3
```



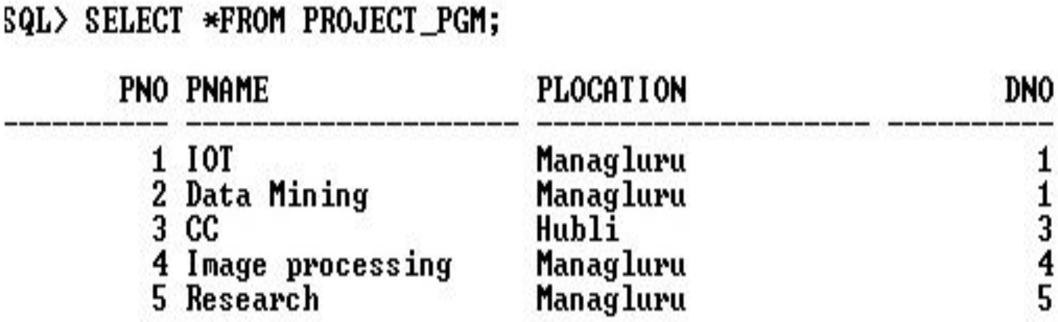
```
SQL> SELECT *FROM DEPARTMENT_PGM;

       DNO DNAME          MGRSSN MGRSTARTD
---------- ---------- ---------- ---------
         1 CSE                 1 02-NOV-07
         2 IOT                 2 02-NOV-07
         3 Account             2 02-NOV-17
         4 ISE                 1 02-NOV-00
         5 Finance             1 03-NOV-01
```



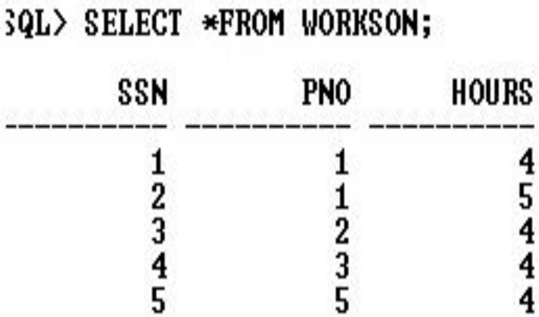
```
SQL> SELECT *FROM DLOCATION;

       DNO LOCATION
---------- ----------
         1 Mangaluru
         1 Mysore
         2 Mangaluru
         3 Bengaluru
         4 Mangaluru
         5 Mangaluru
```



```
SQL> SELECT *FROM PROJECT_PGM;

       PNO PNAME                PLOCATION                   DNO
---------- -------------------- -------------------- ----------
         1 IOT                  Managluru                     1
         2 Data Mining          Managluru                     1
         3 CC                   Hubli                         3
         4 Image processing     Managluru                     4
         5 Research             Managluru                     5
```

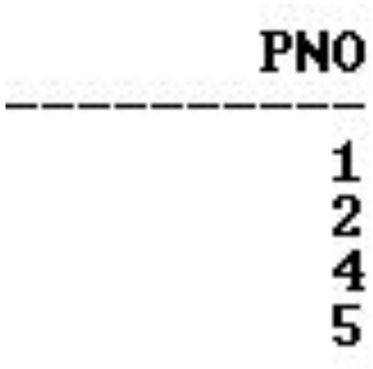


```
SQL> SELECT *FROM WORKSON;

       SSN        PNO      HOURS
---------- ---------- ----------
         1          1          4
         2          1          5
         3          2          4
         4          3          4
         5          5          4
```

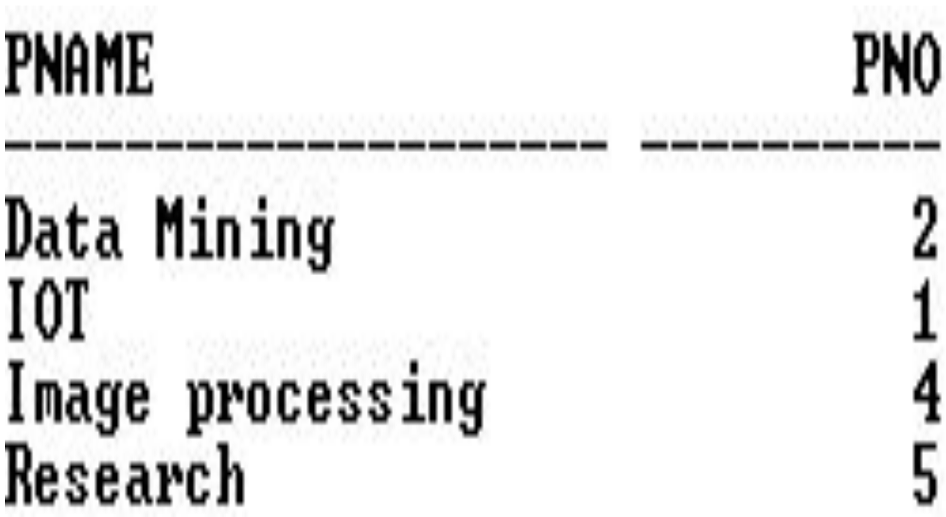
- **Make a list of all project numbers for projects that involve an employee whose last name is ‘Scott’, either as a worker or as a manager of the department that controls the project.**

```
SELECT PNO
FROM PROJECT_PGM
WHERE DNO IN
(SELECT DNO
FROM DEPARTMENT_PGM
WHERE MGRSSN IN
(SELECT SSN
FROM EMPLOYEE_PGM
WHERE NAME ='Scott'))
UNION
(SELECT PNO
FROM WORKSON
WHERE SSN IN
(SELECT SSN
FROM EMPLOYEE_PGM
WHERE NAME='Scott'));
```



```
       PNO
----------
         1
         2
         4
         5
```

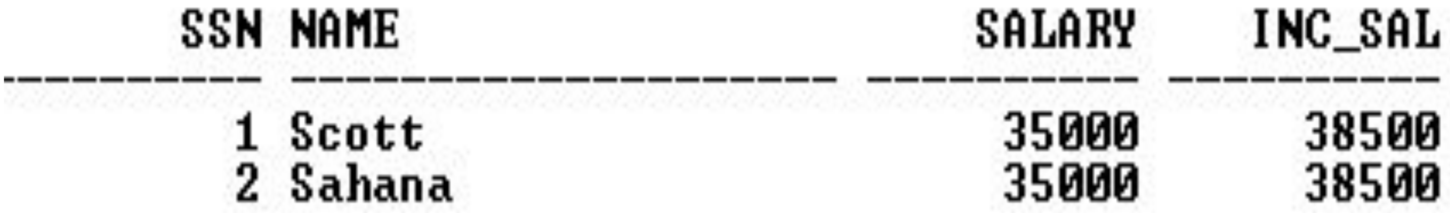
```
(SELECT PNAME, P.PNO
FROM PROJECT_PGM P, DEPARTMENT_PGM
D, EMPLOYEE_PGM E
WHERE NAME = 'Scott' AND MGRSSN = SSN
AND P.DNO = D.DNO)
UNION
(SELECT PNAME, P.PNO
FROM PROJECT_PGM P, WORKSON W,
EMPLOYEE_PGM E
WHERE E.SSN= W.SSN AND W.PNO = P.PNO
AND NAME = 'Scott');
```



```
PNAME                          PNO
-------------------- ----------
Data Mining                      2
IOT                              1
Image processing                 4
Research                         5
```

- **Show the resulting salaries if every employee working on the ‘IoT’ project is given a 10 percent raise.**

```
SELECT SSN, NAME, SALARY,
SALARY+0.1*SALARY as INC_SAL
FROM EMPLOYEE_PGM
WHERE SSN IN
(SELECT SSN
FROM WORKSON
WHERE PNO IN
(SELECT PNO
FROM PROJECT_PGM
WHERE PNAME ='IOT'));
```

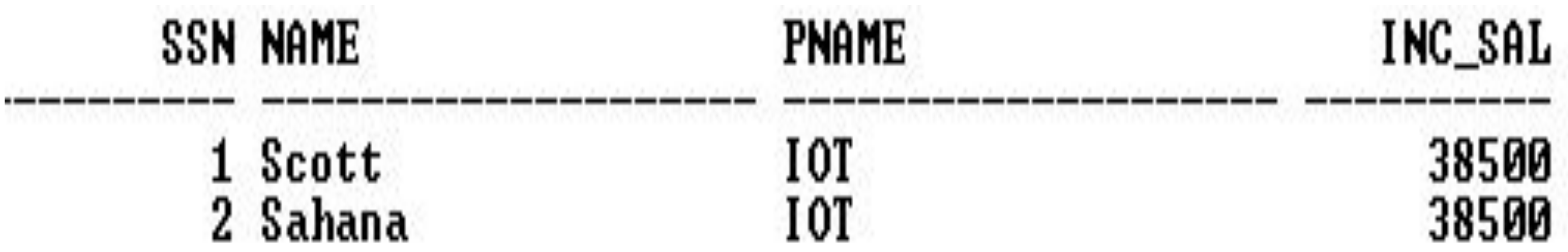


```
       SSN NAME                     SALARY    INC_SAL
---------- -------------------- ---------- ----------
         1 Scott                     35000      38500
         2 Sahana                    35000      38500
```

```
SELECT E.SSN, NAME, PNAME,
SALARY+0.1*SALARY AS INC_SAL
FROM EMPLOYEE_PGM E, WORKSON W,
PROJECT_PGM P
WHERE PNAME = 'IOT' AND E.SSN = W.SSN AND
W.PNO = P.PNO;
```

OR

```
SELECT E.SSN, NAME, PNAME, 1.1*SALARY AS
INC_SAL
FROM EMPLOYEE_PGM E, WORKSON W,
PROJECT_PGM P
WHERE PNAME = 'IOT' AND E.SSN = W.SSN AND
W.PNO = P.PNO;
```

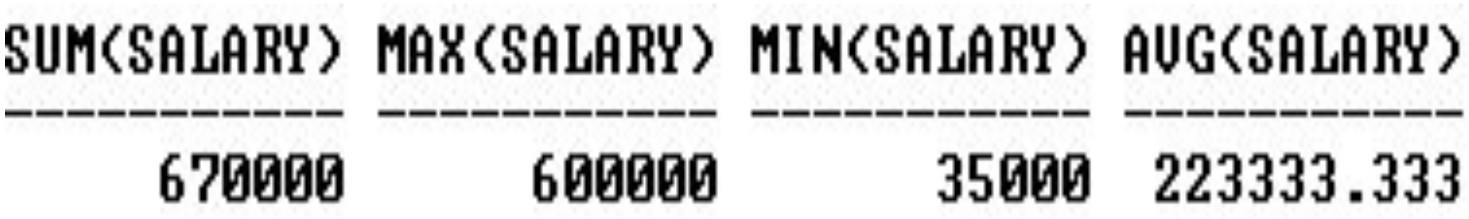


```
       SSN NAME                 PNAME                   INC_SAL
---------- -------------------- -------------------- ----------
         1 Scott                IOT                       38500
         2 Sahana               IOT                       38500
```

- **Find the sum of the salaries of all employees of the ‘Accounts’ department, as well as the maximum salary, the minimum salary, and the average salary in this department**

```
SELECT SUM(SALARY),MAX(SALARY),
MIN(SALARY), AVG(SALARY)
FROM EMPLOYEE_PGM
WHERE DNO IN
(
SELECT DNO
FROM DEPARTMENT_PGM
WHERE DNAME = 'Account');
```

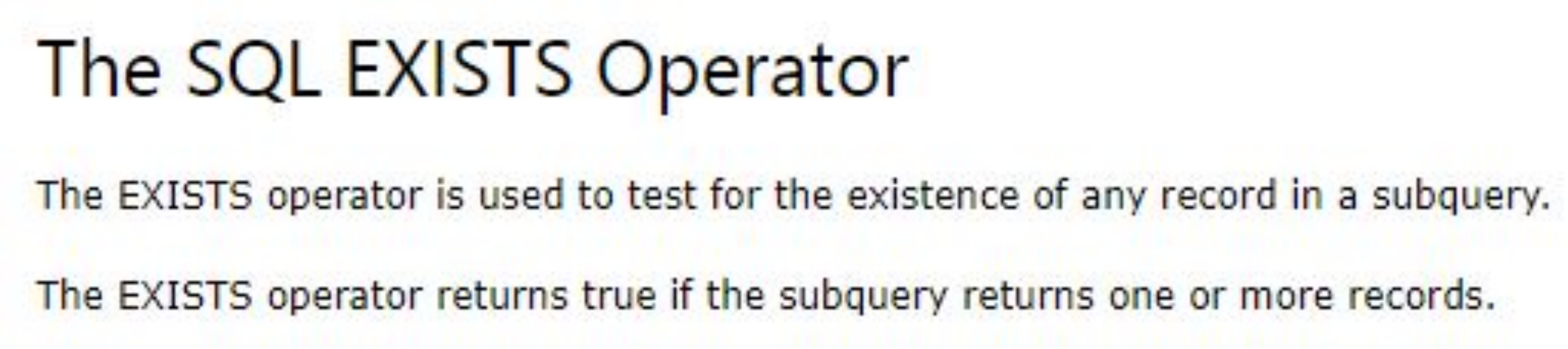
```
SELECT SUM(SALARY),MAX(SALARY),
MIN(SALARY), AVG(SALARY)
FROM EMPLOYEE_PGM E,
DEPARTMENT_PGM D
WHERE E.DNO = D.DNO AND DNAME =
'Account';
```



```
SUM(SALARY) MAX(SALARY) MIN(SALARY) AVG(SALARY)
----------- ----------- ----------- -----------
     670000      600000       35000  223333.333
```

- **Retrieve the name of each employee who works on all the projects controlled by department number 5 (use NOT EXISTS operator).**

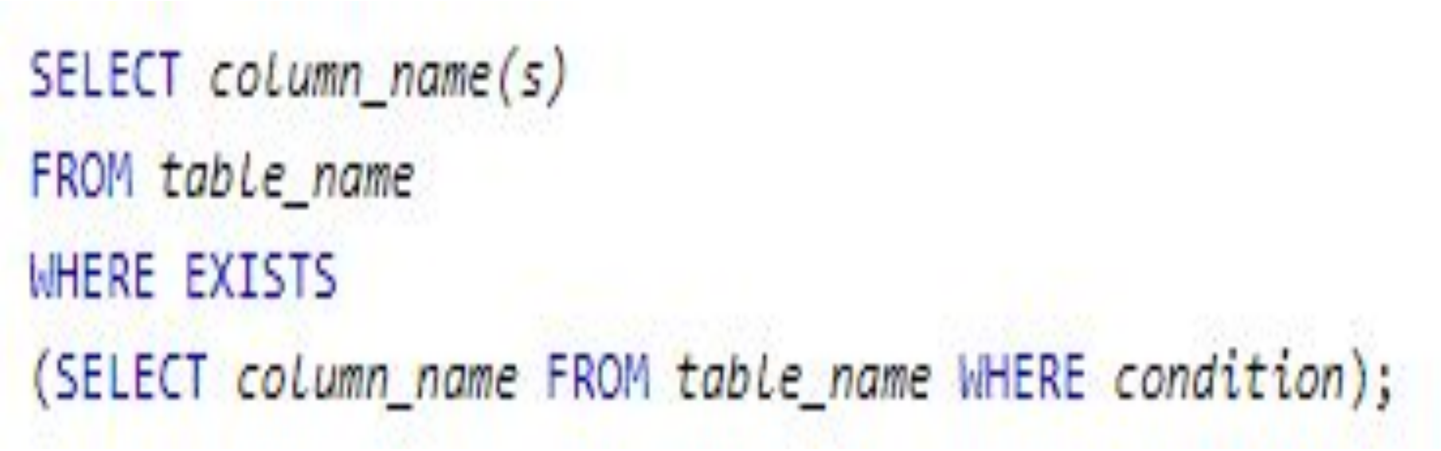
Exists operator



The SQL EXISTS Operator

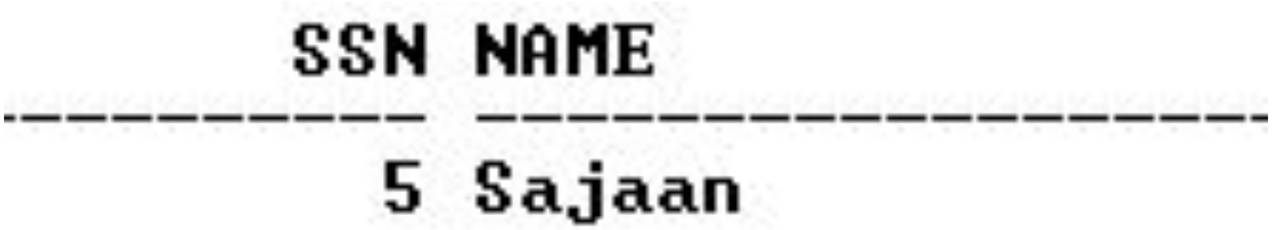
The EXISTS operator is used to test for the existence of any record in a subquery.

The EXISTS operator returns true if the subquery returns one or more records.



```
SELECT column_name(s)
FROM table_name
WHERE EXISTS
(SELECT column_name FROM table_name WHERE condition);
```

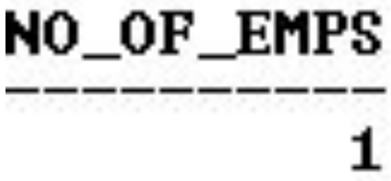
```
SELECT SSN,NAME
FROM EMPLOYEE_PGM E
WHERE NOT EXISTS
(
(SELECT PNO
FROM PROJECT_PGM
WHERE DNO = 5)
MINUS
(SELECT PNO
FROM WORKSON W
WHERE W.SSN = E.SSN));
```



```
       SSN NAME
---------- ------------------
         5 Sajaan
```

- **For each department that has more than five employees, retrieve the department number and the number of its employees who are making more than Rs. 6,00,000.**

```
(SELECT COUNT(SSN) AS NO_OF_EMPS
FROM EMPLOYEE_PGM
WHERE SALARY >= 600000)
UNION
SELECT DNO
FROM EMPLOYEE_PGM
GROUP BY DNO
HAVING COUNT(SSN)>= 5;
```



```
NO_OF_EMPS
----------
         1
```