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/

LAB MANUAL

EXPERIMENT NO. 6

Aim: - Perform Join operations and Complex queries.

Theory:-

1. Different types of Joins.

1. **SQL JOINS:**
   A JOIN clause is used to combine rows from two or more tables, based on a related column between them.

Here are the different types of the JOINs in SQL:

1. **EQUI JOIN:** Most joins are "equi-joins" where the data from a column in one table exactly matches data in the column of another table. (P.K & F.K).

   ```
   SELECT * FROM
   Employee e, department d WHERE
   e.DepartmentID = d.DepartmentID;
   ```

2. **NATURAL JOIN:** Natural join is basically an equijoin followed by removal of the superfluous attributes.

   ```
   SELECT * FROM employee
     NATURAL JOIN department;
   ```

3. **(INNER) JOIN**: Returns records that have matching values in both tables SELECT table1.column1,table1.column2,table2.column1,....

   ```
   FROM table1

   INNER JOIN table2
   ON table1.matching_column = table2.matching_column;
   ```

4. **LEFT (OUTER) JOIN**: Returns all records from the left table, and the matched records from the right table.

   ```
   SELECT table1.column1,table1.column2,table2.column1,....
   FROM table1
   LEFT JOIN table2
   ```

ON table1.matching_column = table2.matching_column;

5. **RIGHT (OUTER) JOIN**: Returns all records from the right table, and the matched records from the left table.

   ```
   SELECT table1.column1,table1.column2,table2.column1,....
   FROM table1

   RIGHT JOIN table2
   ON table1.matching_column = table2.matching_column;
   ```

6. **FULL (OUTER) JOIN**: Returns all records when there is a match in either left or right table.

   ```
   SELECT table1.column1,table1.column2,table2.column1,....
   FROM table1
   FULL JOIN table2
   ON table1.matching_column = table2.matching_column;
   ```

7. **SELF JOIN:** A self-join is joining a table to itself

   ```
   SELECT a.column_name, b.column_name...
   FROM table1 a, table1 b
   WHERE a.common_filed = b.common_field;
   ```

2. Set Comparison & set membership operator :

SET COMPARISON OPERATORS:

A sub query is a Select-From-Where expression that is nested within another query.
Sub query is to perform tests for

1. Set membership
   - o **IN** – tests for presence of set membership
     - ▪ As Value
       - ▪ Select distinct customer-name from borrower where address in (‘Mumbai’, ’Pune’);
     - ▪ As Query
       - ▪ Select distinct customer-name from borrower where customer-name in (select customer-name from depositor);
   - o **NOT IN** – tests for absence of set membership
     - ▪ As Value
       - ▪ Select distinct customer-name from borrower where customer-name not in (‘Smith’, ’Jones’)
     - ▪ As Query
       - ▪ Select distinct customer-name from borrower where customer-name not in (select customer-name from depositor)

2. Make Set comparisons
   - o **Some or any Clause: greater than at least one**

     - o Select b_name from Branch Where assets >some (Select assets from branch where b_city=‘Brooklyn’);

o **all Clause: greater than all**

- **Select b_name from Branch Where assets >all (Select assets from branch where b_city=‘Brooklyn’);**

Lab Exercise:-

1. For the following relational Schema, Solve the queries:

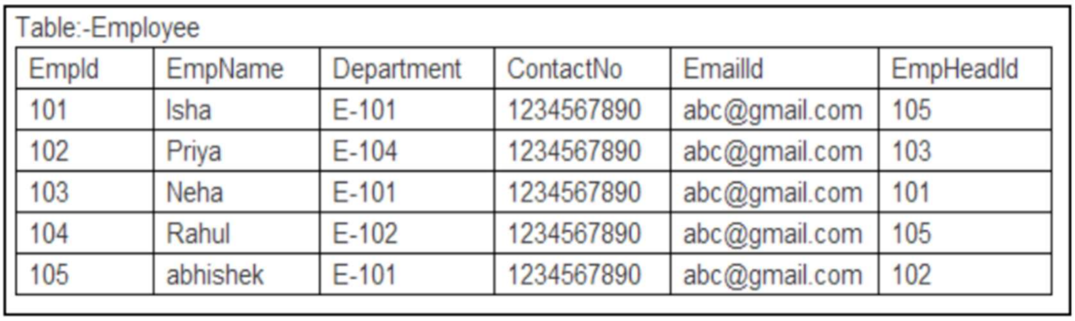


Table:-Employee

EmpId	EmpName	Department	ContactNo	EmailId	EmpHeadId
101	Isha	E-101	1234567890	abc@gmail.com	105
102	Priya	E-104	1234567890	abc@gmail.com	103
103	Neha	E-101	1234567890	abc@gmail.com	101
104	Rahul	E-102	1234567890	abc@gmail.com	105
105	abhishek	E-101	1234567890	abc@gmail.com	102

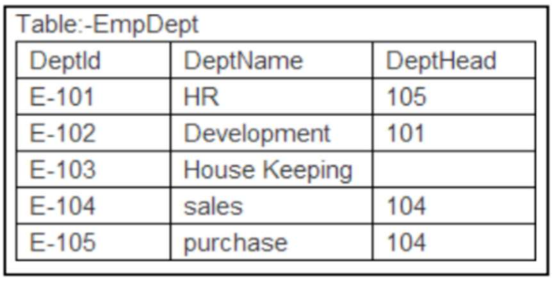


Table:-EmpDept

DeptId	DeptName	DeptHead
E-101	HR	105
E-102	Development	101
E-103	House Keeping	
E-104	sales	104
E-105	purchase	104

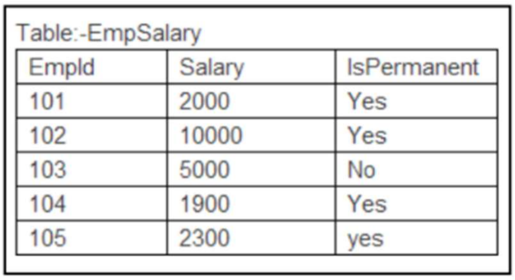
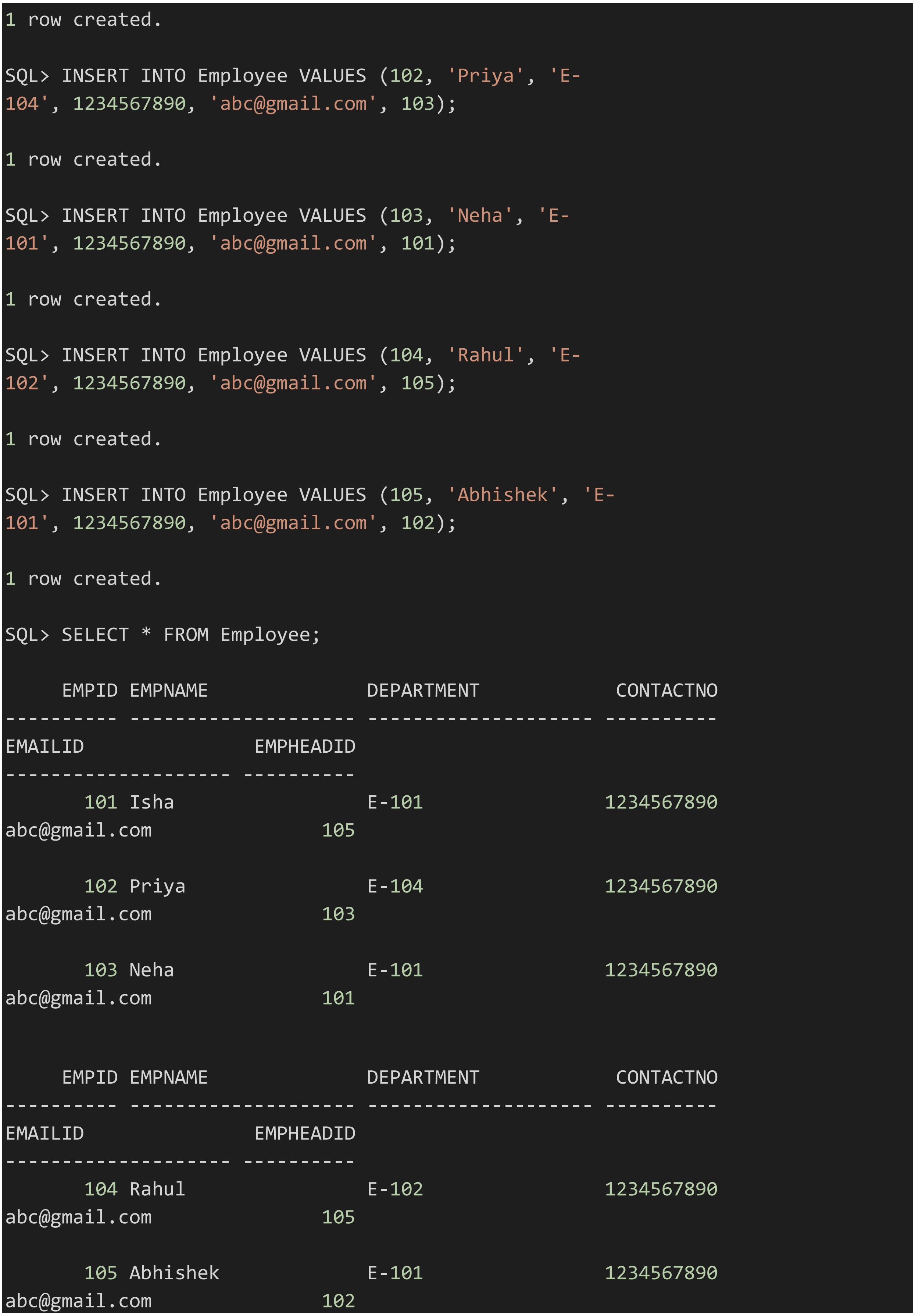


Table:-EmpSalary

EmpId	Salary	IsPermanent
101	2000	Yes
102	10000	Yes
103	5000	No
104	1900	Yes
105	2300	yes

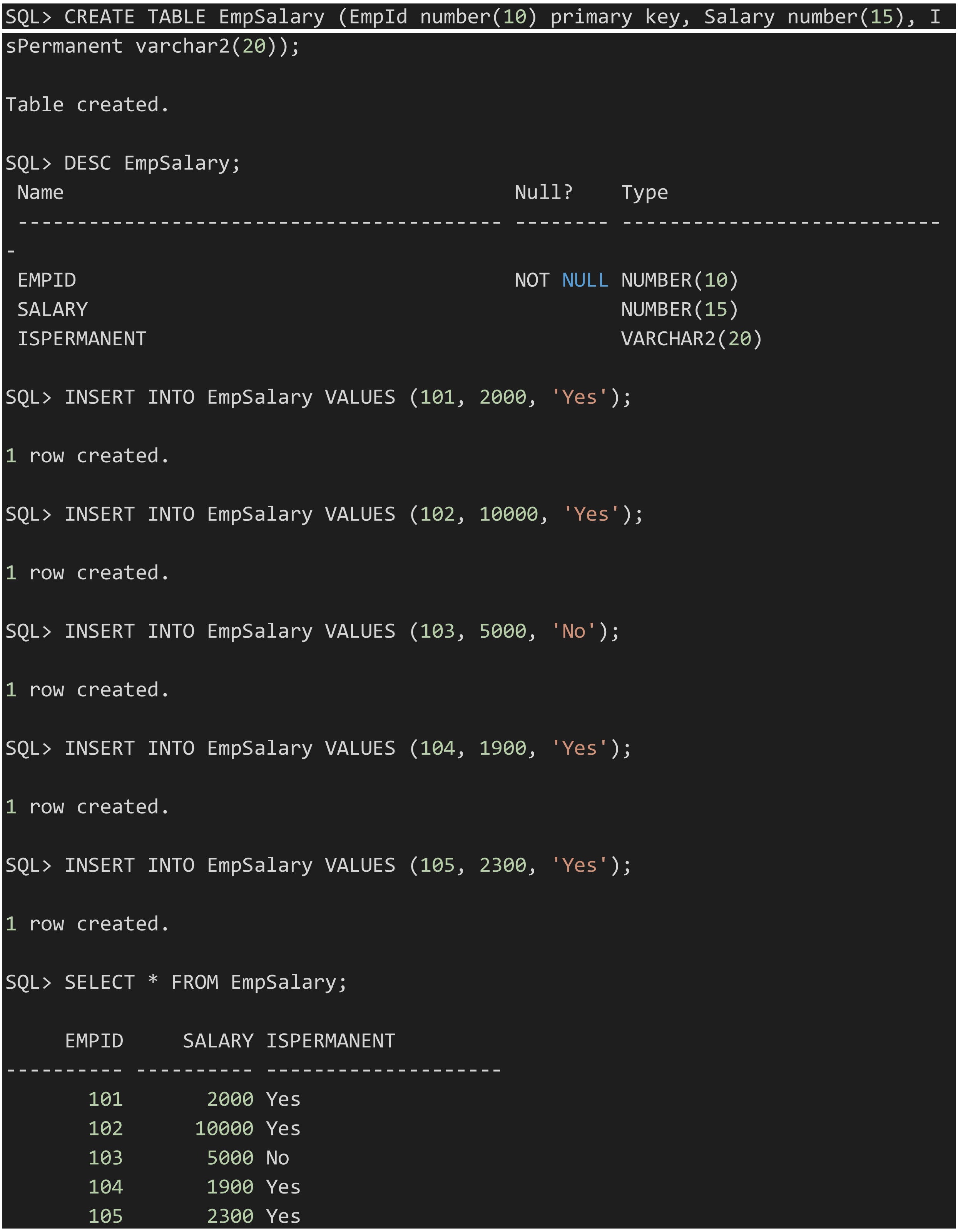
TABLE EMPLOYEE:

```
SQL> CREATE TABLE Employee (EmpId number(10) primary key, EmpName varchar2(20),
 Department varchar2(20), ContactNo number(10), Emailid varchar2(20), EmpHeadId
 number(10));

Table created.

SQL> DESC Employee;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 EMPID                                     NOT NULL NUMBER(10)
 EMPNAME                                            VARCHAR2(20)
 DEPARTMENT                                         VARCHAR2(20)
 CONTACTNO                                          NUMBER(10)
 EMAILID                                            VARCHAR2(20)
 EMPHEADID                                          NUMBER(10)

SQL> INSERT INTO Employee VALUES (101, 'Isha', 'E-
101', 1234567890, 'abc@gmail.com', 105);
```



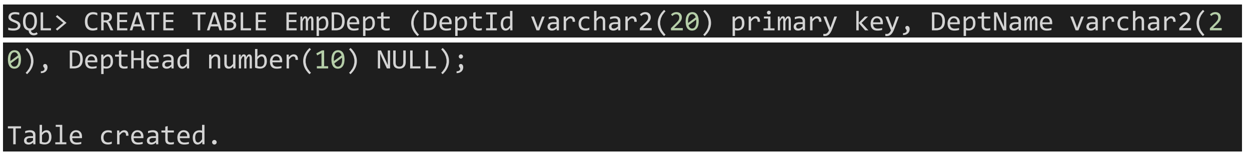
```
1 row created.

SQL> INSERT INTO Employee VALUES (102, 'Priya', 'E-
104', 1234567890, 'abc@gmail.com', 103);

1 row created.

SQL> INSERT INTO Employee VALUES (103, 'Neha', 'E-
101', 1234567890, 'abc@gmail.com', 101);

1 row created.

SQL> INSERT INTO Employee VALUES (104, 'Rahul', 'E-
102', 1234567890, 'abc@gmail.com', 105);

1 row created.

SQL> INSERT INTO Employee VALUES (105, 'Abhishek', 'E-
101', 1234567890, 'abc@gmail.com', 102);

1 row created.

SQL> SELECT * FROM Employee;

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID
-------------------- ----------
       101 Isha                 E-101                1234567890
abc@gmail.com               105

       102 Priya                E-104                1234567890
abc@gmail.com               103

       103 Neha                 E-101                1234567890
abc@gmail.com               101


     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID
-------------------- ----------
       104 Rahul                E-102                1234567890
abc@gmail.com               105

       105 Abhishek             E-101                1234567890
abc@gmail.com               102
```

TABLE EMPSALARY:



```
SQL> CREATE TABLE EmpSalary (EmpId number(10) primary key, Salary number(15), I
sPermanent varchar2(20));

Table created.

SQL> DESC EmpSalary;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
-
 EMPID                                     NOT NULL NUMBER(10)
 SALARY                                             NUMBER(15)
 ISPERMANENT                                        VARCHAR2(20)

SQL> INSERT INTO EmpSalary VALUES (101, 2000, 'Yes');

1 row created.

SQL> INSERT INTO EmpSalary VALUES (102, 10000, 'Yes');

1 row created.

SQL> INSERT INTO EmpSalary VALUES (103, 5000, 'No');

1 row created.

SQL> INSERT INTO EmpSalary VALUES (104, 1900, 'Yes');

1 row created.

SQL> INSERT INTO EmpSalary VALUES (105, 2300, 'Yes');

1 row created.

SQL> SELECT * FROM EmpSalary;

     EMPID     SALARY ISPERMANENT
---------- ---------- --------------------
       101       2000 Yes
       102      10000 Yes
       103       5000 No
       104       1900 Yes
       105       2300 Yes
```

TABLE EMPDEPT:



```
SQL> CREATE TABLE EmpDept (DeptId varchar2(20) primary key, DeptName varchar2(2
0), DeptHead number(10) NULL);

Table created.
```

```
SQL> DESC EmpDept;
 Name                                      Null?    Type
 ----------------------------------------- -------- ---------------------------
-
 DEPTID                                    NOT NULL VARCHAR2(20)
 DEPTNAME                                           VARCHAR2(20)
 DEPTHEAD                                           NUMBER(10)

SQL> INSERT INTO EmpDept VALUES ('E-101', 'HR', 105);

1 row created.

SQL> INSERT INTO EmpDept VALUES ('E-102', 'Development', 101);

1 row created.

SQL> INSERT INTO EmpDept VALUES ('E-103', 'House Keeping', NULL);

1 row created.

SQL> INSERT INTO EmpDept VALUES ('E-104', 'Sales', 104);

1 row created.

SQL> INSERT INTO EmpDept VALUES ('E-105', 'Purchase', 104);

1 row created.

SQL> SELECT * FROM EmpDept;

DEPTID               DEPTNAME               DEPTHEAD
-------------------- -------------------- ----------
E-101                HR                          105
E-102                Development                 101
E-103                House Keeping
E-104                Sales                       104
E-105                Purchase                    104
```

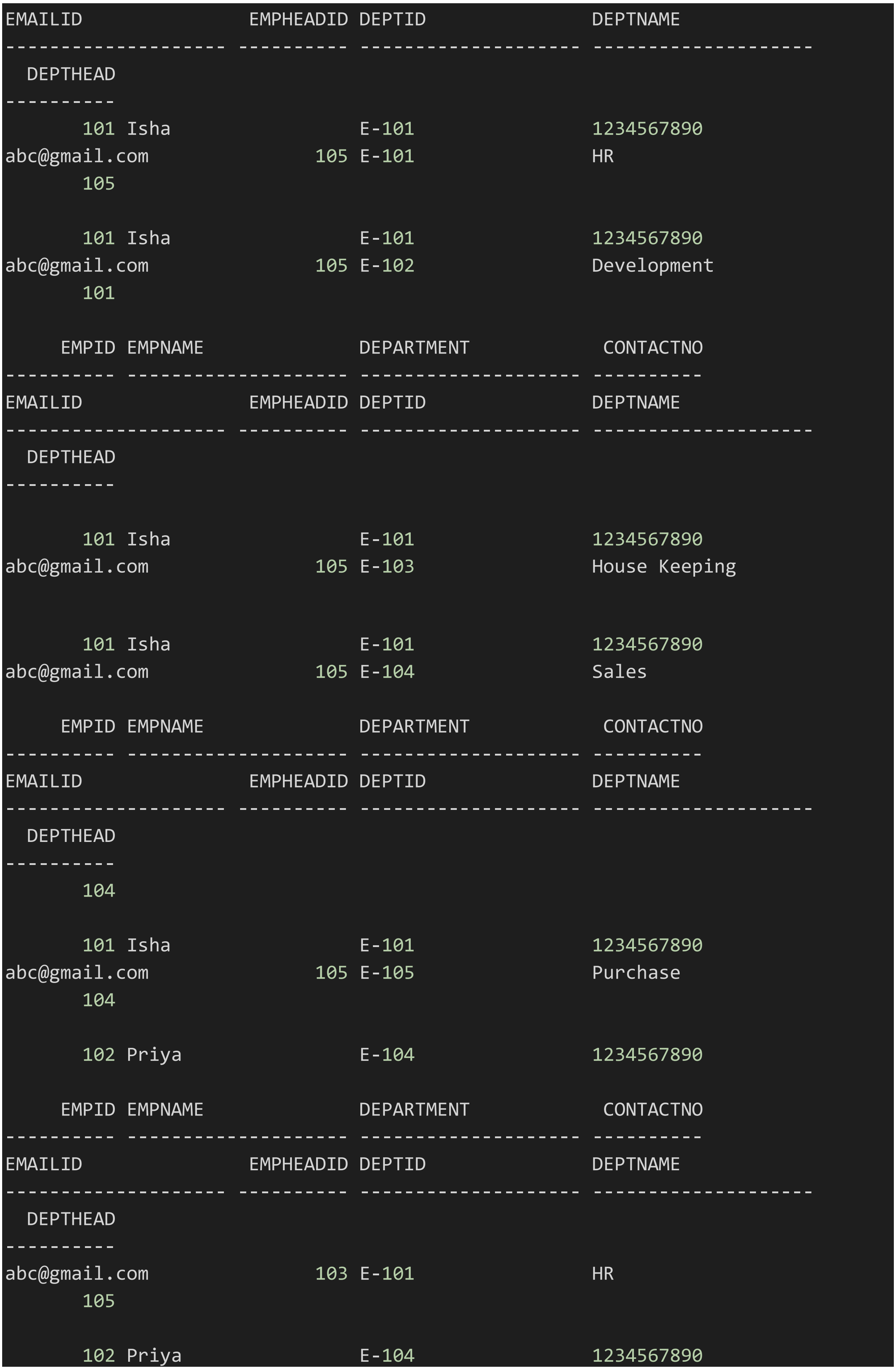
Queries:

1. For the above given Relational Schema, Perform the following Join Operations:

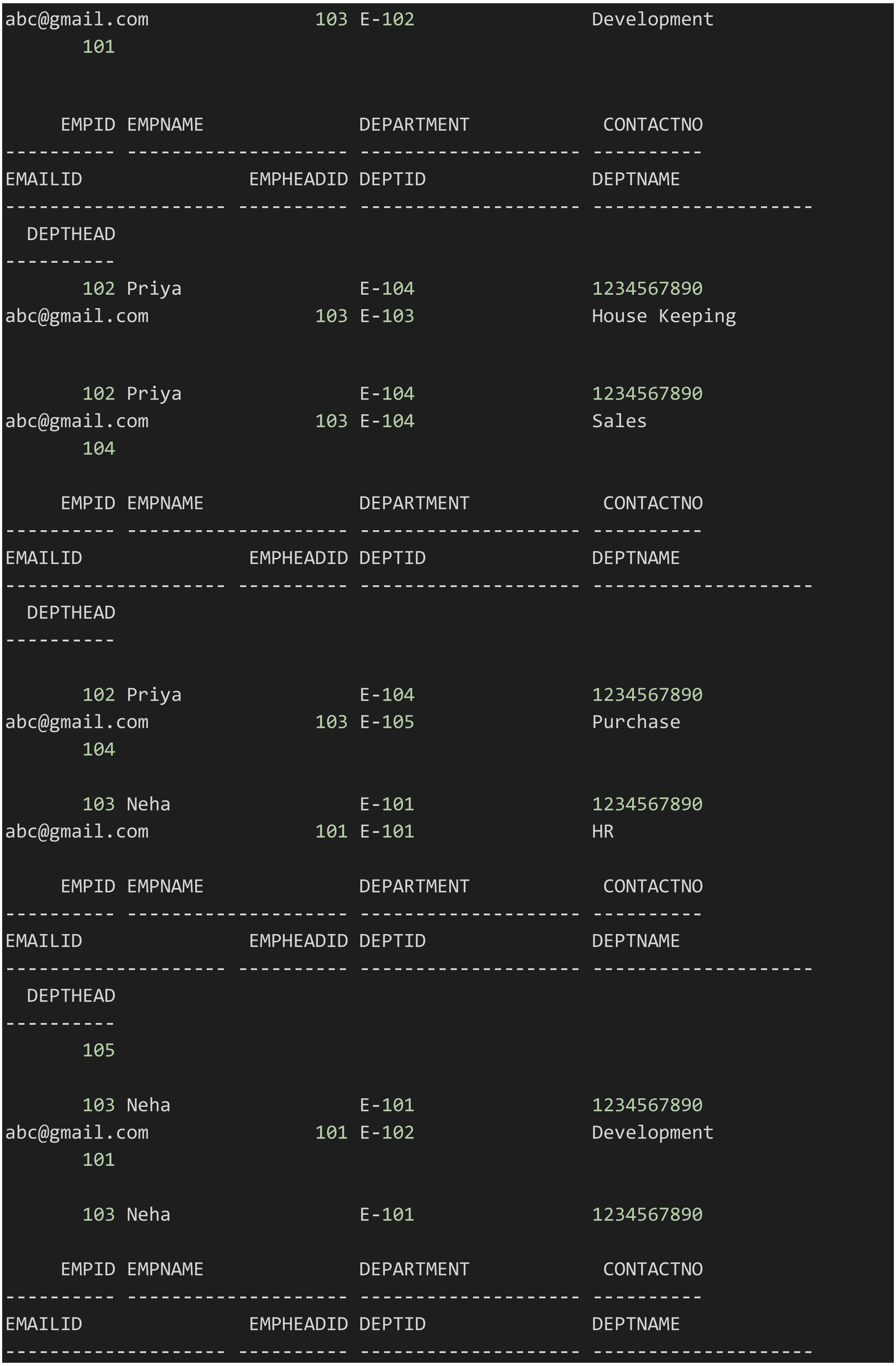
i. Use Natural Join, to join employee and EmpDept tables.

CODE:

```
SQL> SELECT * FROM Employee NATURAL JOIN EmpDept;

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
```

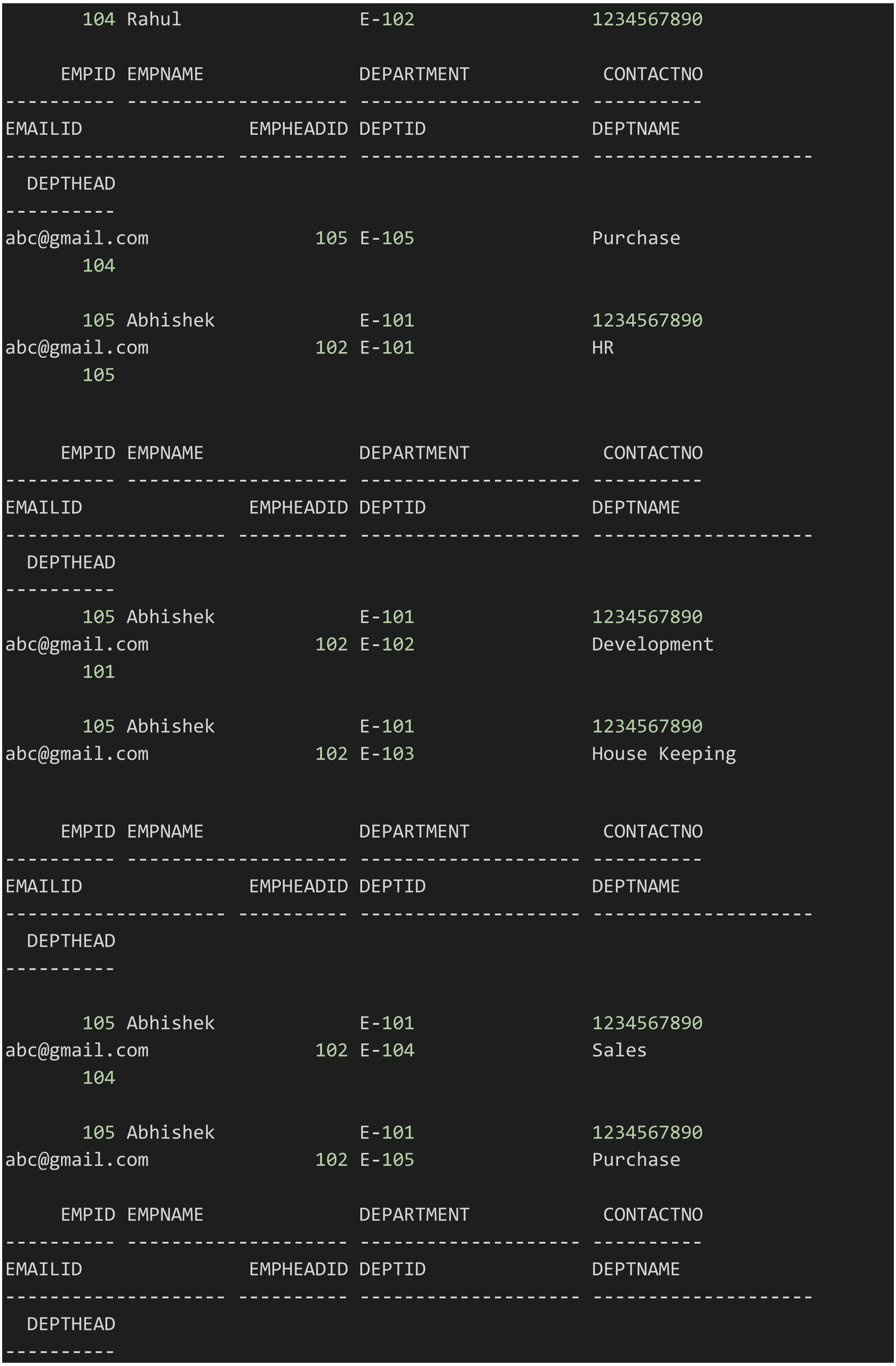


```
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
       101 Isha                 E-101                1234567890
abc@gmail.com               105 E-101                HR
       105

       101 Isha                 E-101                1234567890
abc@gmail.com               105 E-102                Development
       101

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------

       101 Isha                 E-101                1234567890
abc@gmail.com               105 E-103                House Keeping


       101 Isha                 E-101                1234567890
abc@gmail.com               105 E-104                Sales

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
       104

       101 Isha                 E-101                1234567890
abc@gmail.com               105 E-105                Purchase
       104

       102 Priya                E-104                1234567890

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
abc@gmail.com               103 E-101                HR
       105

       102 Priya                E-104                1234567890
```



```
abc@gmail.com               103 E-102                Development
       101


     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
       102 Priya                E-104                1234567890
abc@gmail.com               103 E-103                House Keeping


       102 Priya                E-104                1234567890
abc@gmail.com               103 E-104                Sales
       104

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------

       102 Priya                E-104                1234567890
abc@gmail.com               103 E-105                Purchase
       104

       103 Neha                 E-101                1234567890
abc@gmail.com               101 E-101                HR

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
       105

       103 Neha                 E-101                1234567890
abc@gmail.com               101 E-102                Development
       101

       103 Neha                 E-101                1234567890

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
```

```
  DEPTHEAD
----------
abc@gmail.com               101 E-103                House Keeping


       103 Neha                 E-101                1234567890
abc@gmail.com               101 E-104                Sales
       104


     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID              EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
       103 Neha                 E-101                1234567890
abc@gmail.com               101 E-105                Purchase
       104

       104 Rahul                E-102                1234567890
abc@gmail.com               105 E-101                HR
       105

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID              EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------

       104 Rahul                E-102                1234567890
abc@gmail.com               105 E-102                Development
       101

       104 Rahul                E-102                1234567890
abc@gmail.com               105 E-103                House Keeping

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID              EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------


       104 Rahul                E-102                1234567890
abc@gmail.com               105 E-104                Sales
       104
```

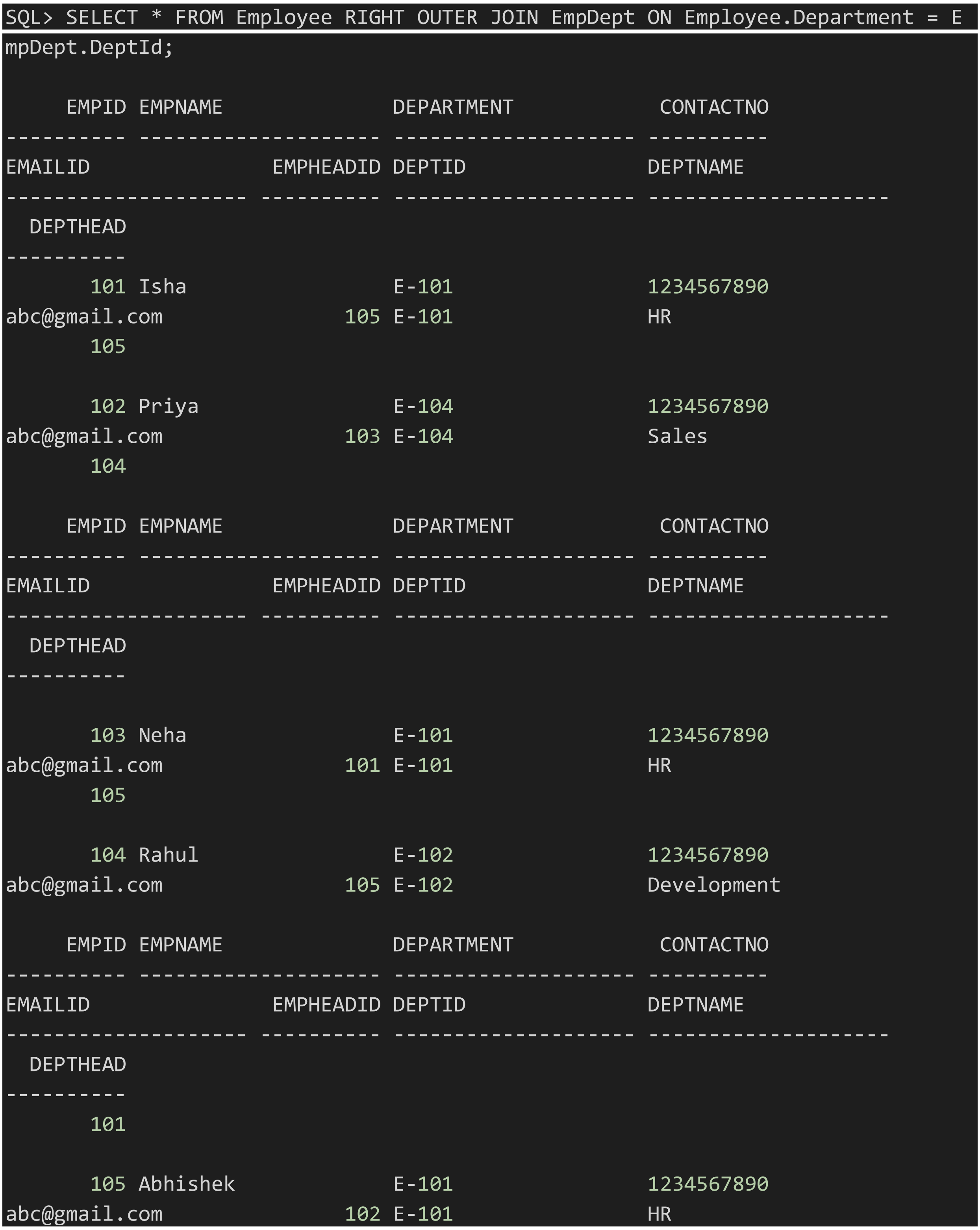


```
       104 Rahul                E-102                1234567890

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
abc@gmail.com               105 E-105                Purchase
       104

       105 Abhishek             E-101                1234567890
abc@gmail.com               102 E-101                HR
       105


     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
       105 Abhishek             E-101                1234567890
abc@gmail.com               102 E-102                Development
       101

       105 Abhishek             E-101                1234567890
abc@gmail.com               102 E-103                House Keeping


     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------

       105 Abhishek             E-101                1234567890
abc@gmail.com               102 E-104                Sales
       104

       105 Abhishek             E-101                1234567890
abc@gmail.com               102 E-105                Purchase

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
```

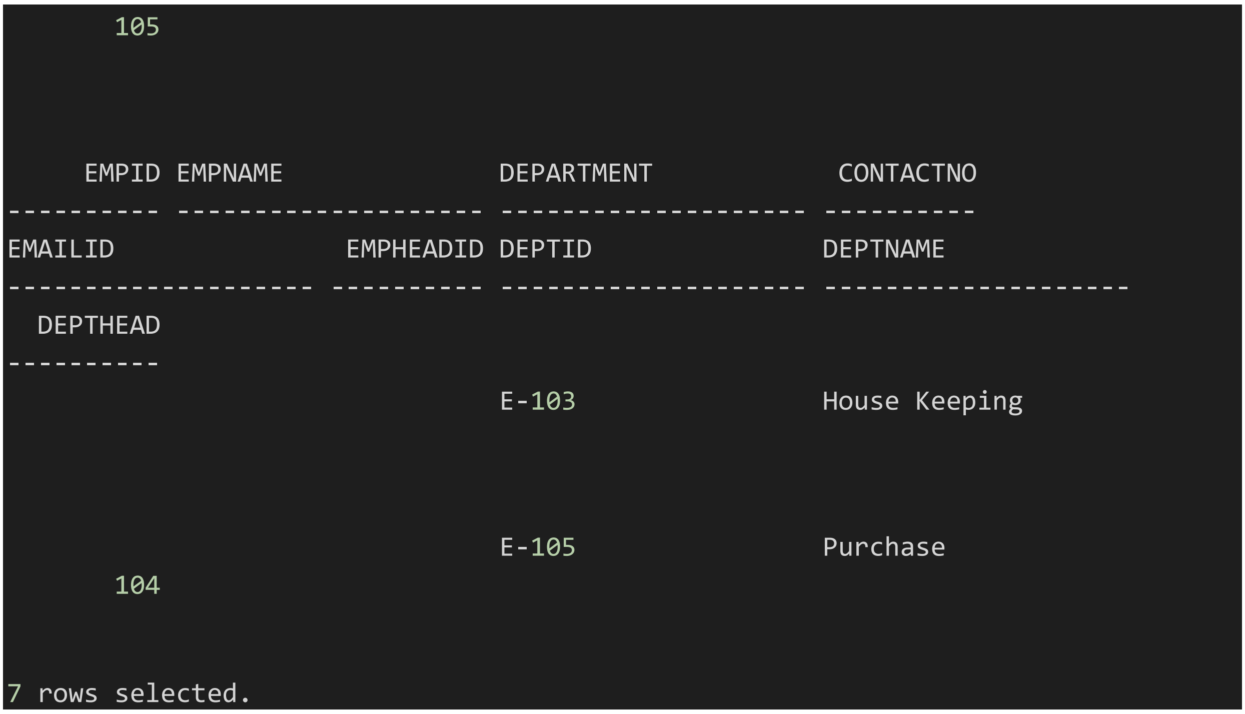
```
       104


25 rows selected.
```

ii. Use Right outer Join, to join employee and EmpDept tables.

CODE:



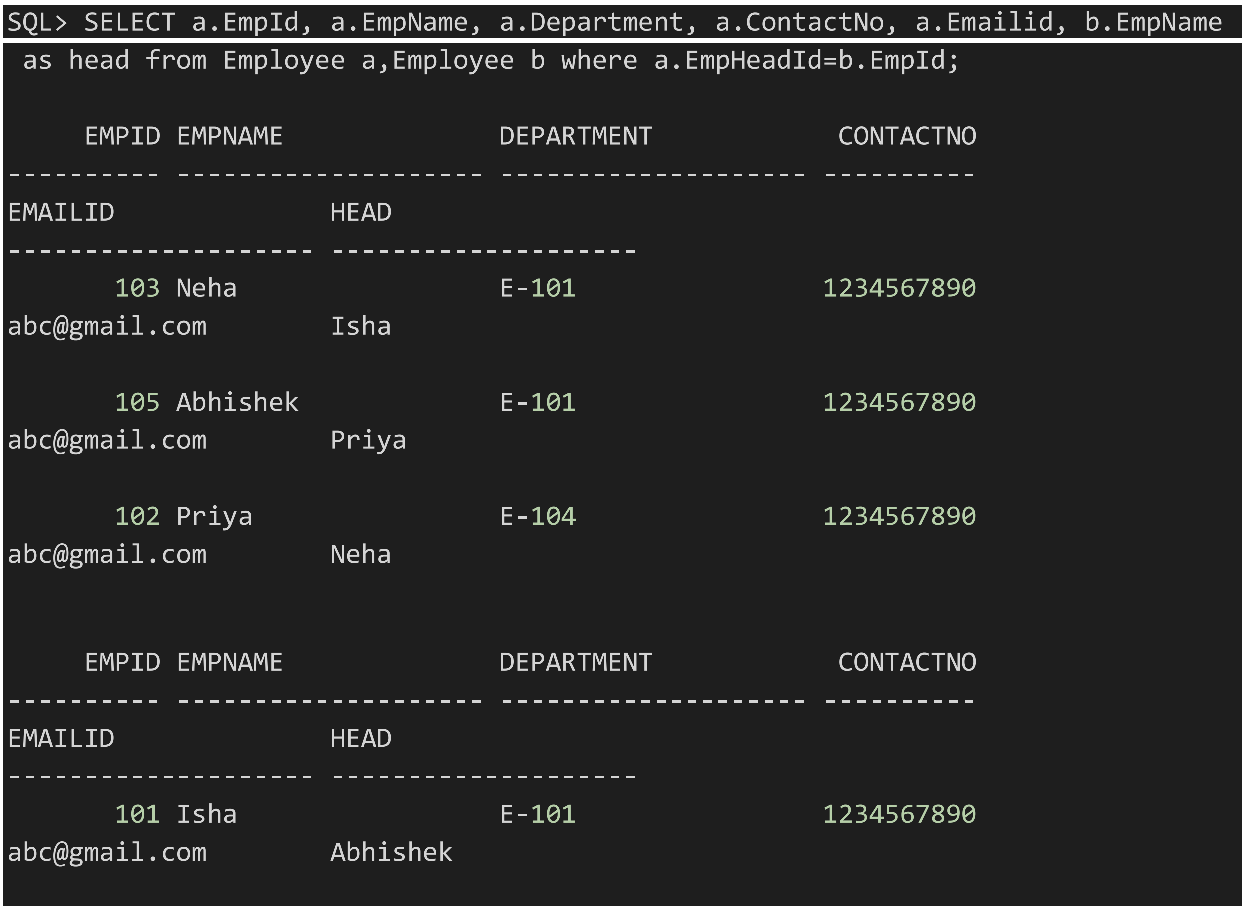
```
SQL> SELECT * FROM Employee RIGHT OUTER JOIN EmpDept ON Employee.Department = E
mpDept.DeptId;

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
       101 Isha                 E-101                1234567890
abc@gmail.com               105 E-101                HR
       105

       102 Priya                E-104                1234567890
abc@gmail.com               103 E-104                Sales
       104

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------

       103 Neha                 E-101                1234567890
abc@gmail.com               101 E-101                HR
       105

       104 Rahul                E-102                1234567890
abc@gmail.com               105 E-102                Development

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
       101

       105 Abhishek             E-101                1234567890
abc@gmail.com               102 E-101                HR
```



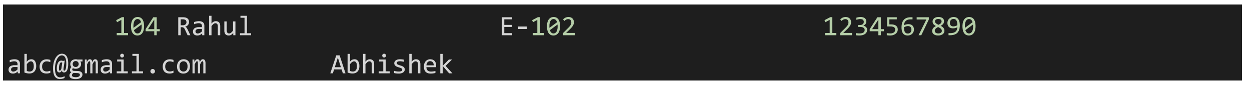
```
       105



     EMPID EMPNAME              DEPARTMENT           CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID              EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
                                E-103                House Keeping



                                E-105                Purchase
       104


7 rows selected.
```

iii. Use Self Join, to display the names of Employee head along with each employee details.

CODE:



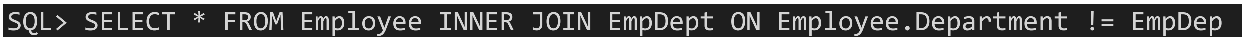
```
SQL> SELECT a.EmpId, a.EmpName, a.Department, a.ContactNo, a.Emailid, b.EmpName
 as head from Employee a,Employee b where a.EmpHeadId=b.EmpId;

     EMPID EMPNAME              DEPARTMENT           CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID              HEAD
-------------------- --------------------
       103 Neha                 E-101                1234567890
abc@gmail.com        Isha

       105 Abhishek             E-101                1234567890
abc@gmail.com        Priya

       102 Priya                E-104                1234567890
abc@gmail.com        Neha


     EMPID EMPNAME              DEPARTMENT           CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID              HEAD
-------------------- --------------------
       101 Isha                 E-101                1234567890
abc@gmail.com        Abhishek
```



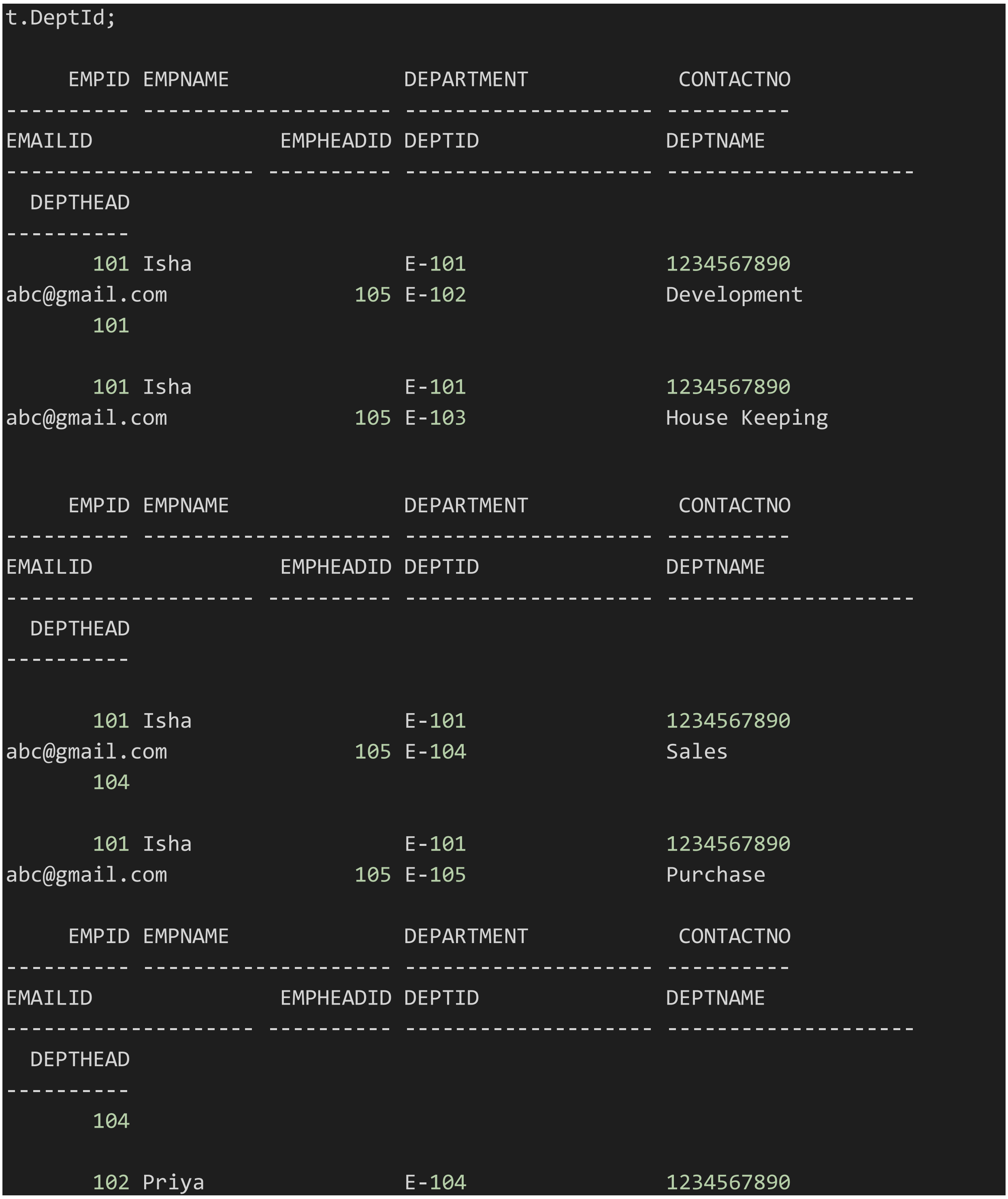
```
       104 Rahul                E-102                1234567890
abc@gmail.com        Abhishek
```

iv. Use Inner Join, to join employee and EmpDept tables for department id doesn’t match.

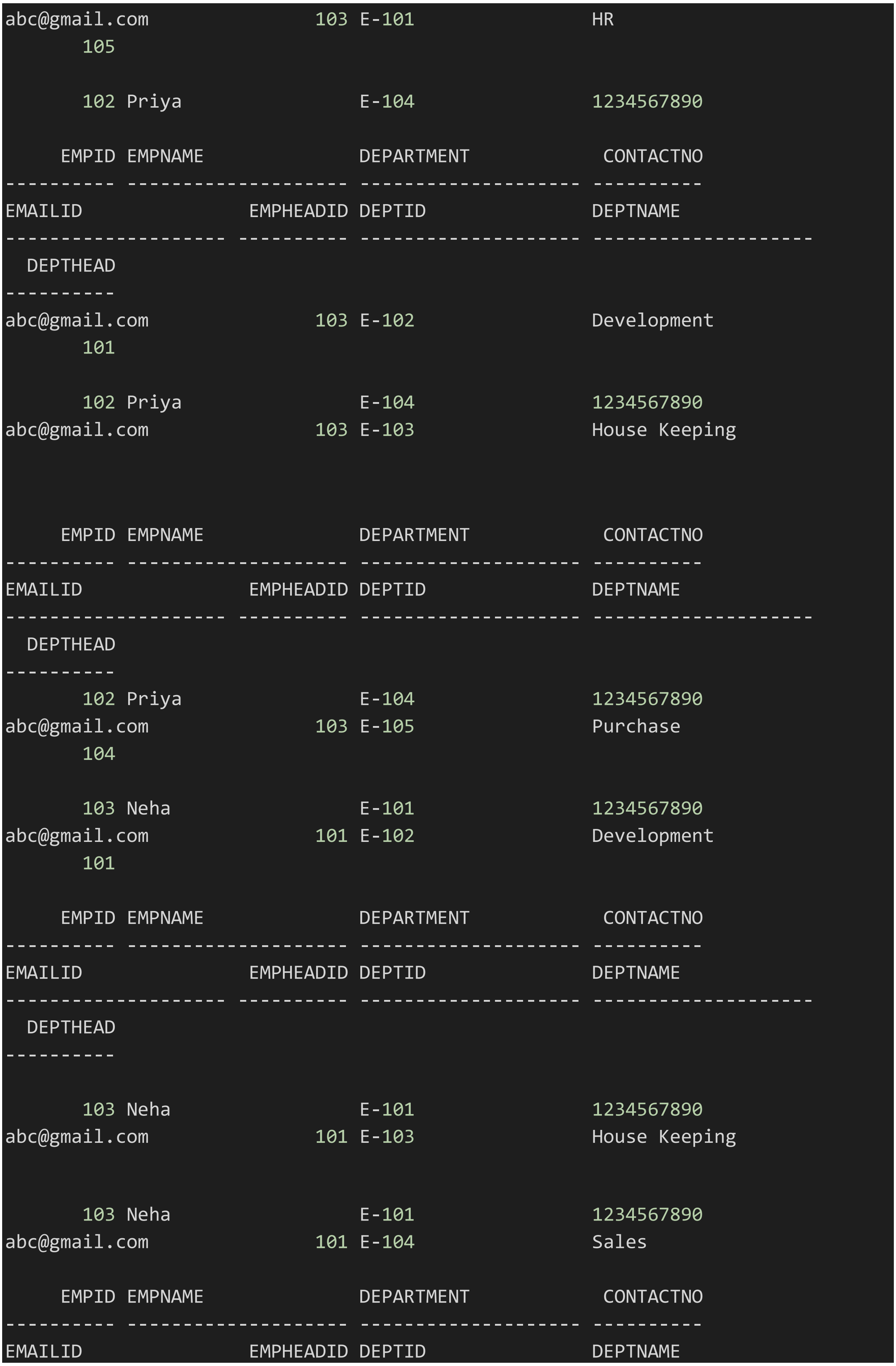
CODE:



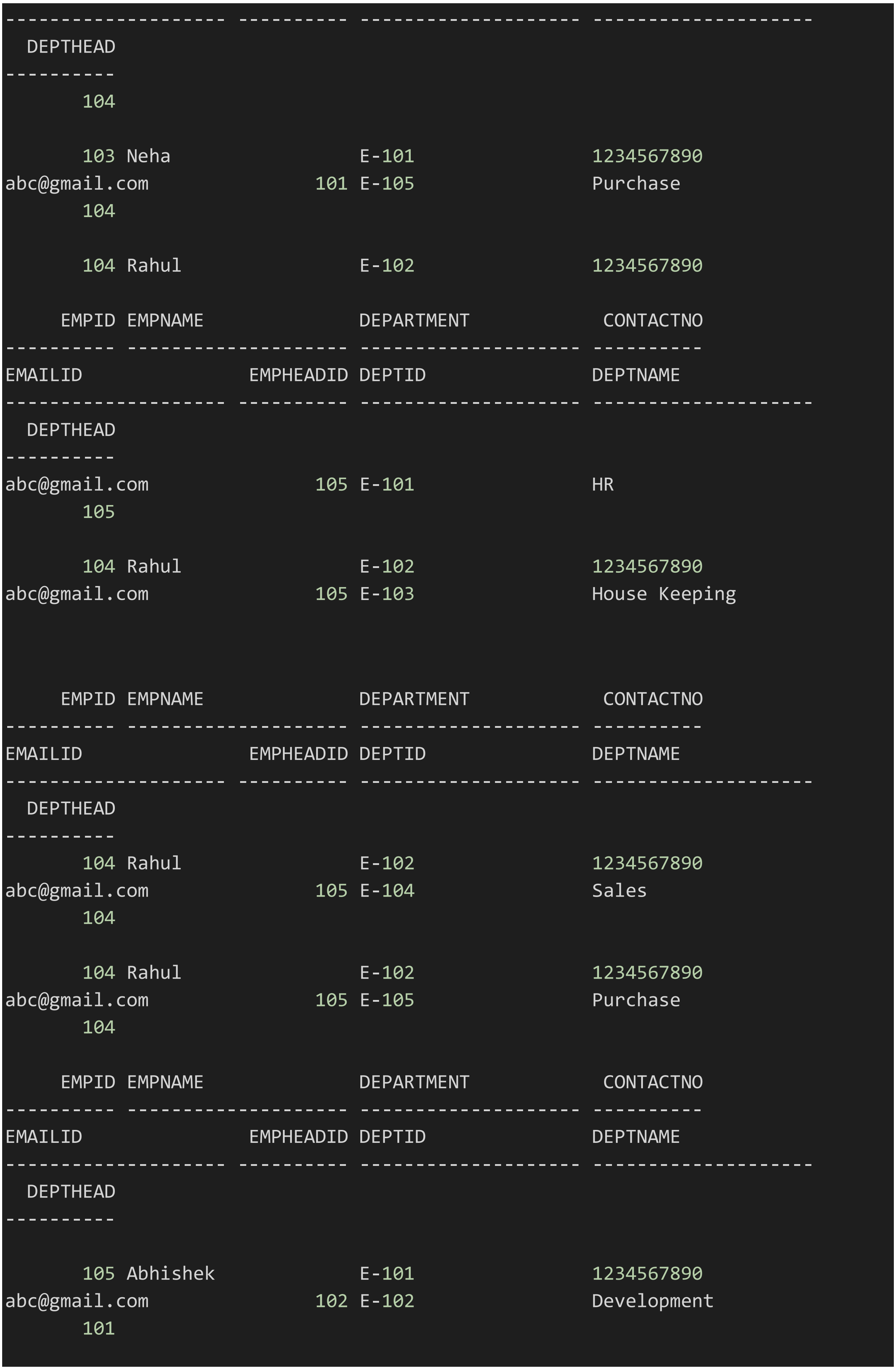
```
SQL> SELECT * FROM Employee INNER JOIN EmpDept ON Employee.Department != EmpDep
```



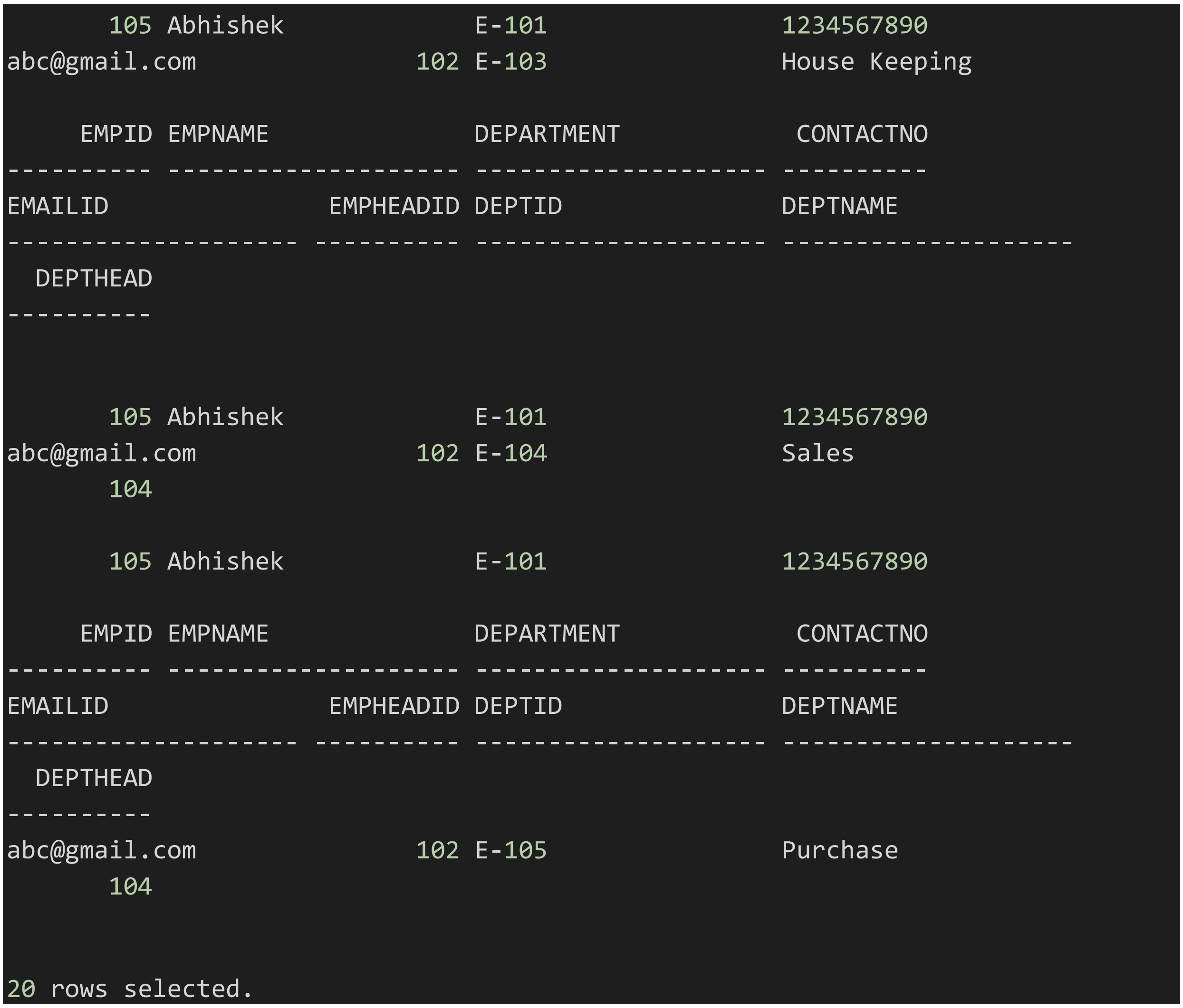
```
t.DeptId;

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID              EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
       101 Isha                 E-101                1234567890
abc@gmail.com               105 E-102                Development
       101

       101 Isha                 E-101                1234567890
abc@gmail.com               105 E-103                House Keeping


     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID              EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------

       101 Isha                 E-101                1234567890
abc@gmail.com               105 E-104                Sales
       104

       101 Isha                 E-101                1234567890
abc@gmail.com               105 E-105                Purchase

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID              EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
       104

       102 Priya                E-104                1234567890
```



```
abc@gmail.com               103 E-101                HR
       105

       102 Priya                E-104                1234567890

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
abc@gmail.com               103 E-102                Development
       101

       102 Priya                E-104                1234567890
abc@gmail.com               103 E-103                House Keeping



     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
       102 Priya                E-104                1234567890
abc@gmail.com               103 E-105                Purchase
       104

       103 Neha                 E-101                1234567890
abc@gmail.com               101 E-102                Development
       101

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------

       103 Neha                 E-101                1234567890
abc@gmail.com               101 E-103                House Keeping


       103 Neha                 E-101                1234567890
abc@gmail.com               101 E-104                Sales

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
```



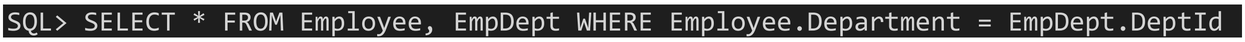
```
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
       104

       103 Neha                 E-101                1234567890
abc@gmail.com                   101 E-105                Purchase
       104

       104 Rahul                E-102                1234567890

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
abc@gmail.com                   105 E-101                HR
       105

       104 Rahul                E-102                1234567890
abc@gmail.com                   105 E-103                House Keeping



     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
       104 Rahul                E-102                1234567890
abc@gmail.com                   105 E-104                Sales
       104

       104 Rahul                E-102                1234567890
abc@gmail.com                   105 E-105                Purchase
       104

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------

       105 Abhishek             E-101                1234567890
abc@gmail.com                   102 E-102                Development
       101
```



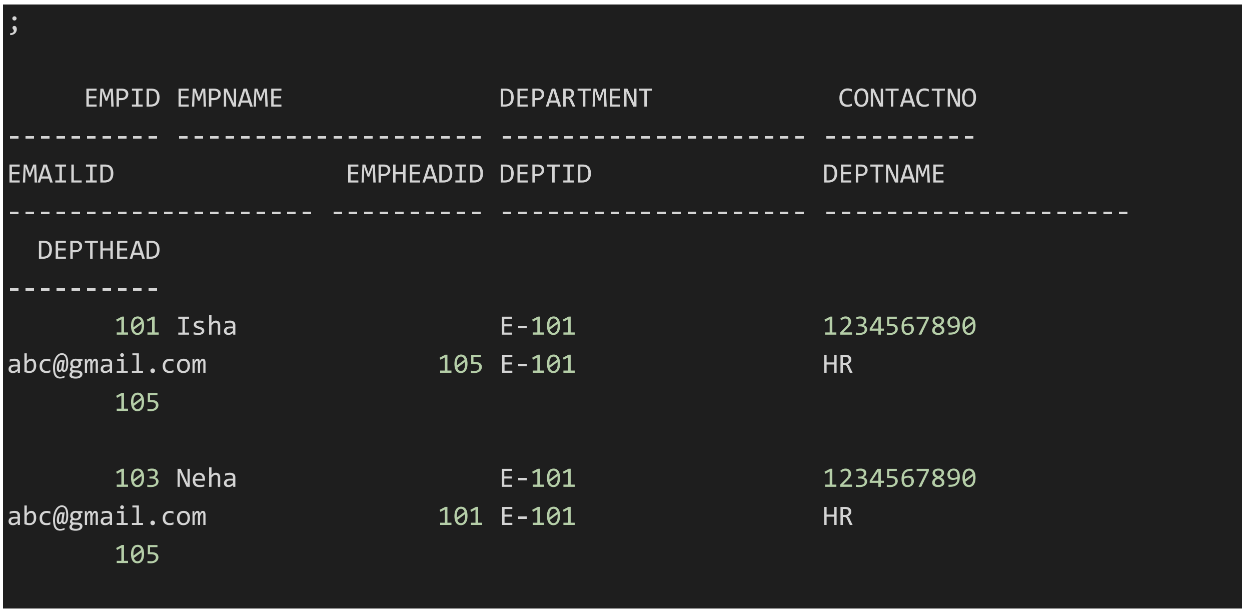
```
       105 Abhishek             E-101                1234567890
abc@gmail.com               102 E-103                House Keeping

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID              EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------


       105 Abhishek             E-101                1234567890
abc@gmail.com               102 E-104                Sales
       104

       105 Abhishek             E-101                1234567890

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID              EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
abc@gmail.com               102 E-105                Purchase
       104


20 rows selected.
```

v. Use Equi Join, to join employee and EmpDept tables.

CODE:



```
SQL> SELECT * FROM Employee, EmpDept WHERE Employee.Department = EmpDept.DeptId
```



```
;

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID              EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
       101 Isha                 E-101                1234567890
abc@gmail.com               105 E-101                HR
       105

       103 Neha                 E-101                1234567890
abc@gmail.com               101 E-101                HR
       105
     EMPID EMPNAME              DEPARTMENT           CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------

       105 Abhishek             E-101                1234567890
abc@gmail.com               102 E-101                HR
       105

       104 Rahul                E-102                1234567890
abc@gmail.com               105 E-102                Development

     EMPID EMPNAME              DEPARTMENT           CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID DEPTID               DEPTNAME
-------------------- ---------- -------------------- --------------------
  DEPTHEAD
----------
       101

       102 Priya                E-104                1234567890
abc@gmail.com               103 E-104                Sales
       104
```

2. For the above given Relational Schema, Perform the following Nested Sub Query Operations:

i. Display the department details of a company which is assigned to the employee with employee id above 103.

CODE:

```
SQL> SELECT * FROM EmpDept WHERE DeptId IN (SELECT Department FROM Employee WHE
RE EmpId>103 );

DEPTID               DEPTNAME               DEPTHEAD
-------------------- -------------------- ----------
E-101                HR                          105
E-102                Development                 101
```

ii. Display the details of Employee who is working under ‘Priya’.

CODE:

```
SQL> SELECT * FROM Employee WHERE EmpHeadId IN (SELECT EmpId FROM Employee WHER
E EmpName = 'Priya');
```

```
     EMPID EMPNAME              DEPARTMENT           CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID              EMPHEADID
-------------------- ----------
       105 Abhishek             E-101                1234567890
abc@gmail.com              102
```

iii. Display the details of Employee who is the department head of HR. iv. Display the detail of employee who is working in ‘development’ department and they are permanent.

CODE:

```
SQL> SELECT * FROM Employee WHERE EmpId IN (SELECT DeptHead FROM EmpDept WHERE
DeptName = 'HR');

     EMPID EMPNAME              DEPARTMENT           CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID              EMPHEADID
-------------------- ----------
       105 Abhishek             E-101                1234567890
abc@gmail.com              102
```

iv. Display the detail of employee who is working in ‘development’ department and they are permanent.

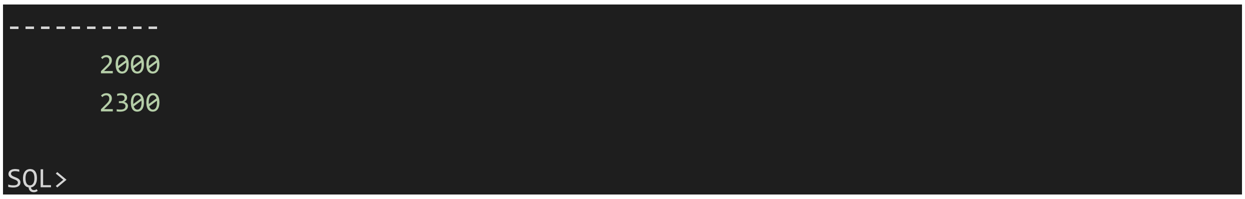
CODE:

```
SQL> SELECT * FROM Employee WHERE EmpId IN (SELECT EmpId FROM EmpSalary WHERE I
sPermanent = 'Yes') AND Department IN (SELECT DeptId FROM EmpDept WHERE DeptNam
e = 'Development');

     EMPID EMPNAME              DEPARTMENT           CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID              EMPHEADID
-------------------- ----------
       104 Rahul                E-102                1234567890
abc@gmail.com              105
```

v. Display the salary of the employee who is currently working in the HR Department and is a permanent employee.

CODE:

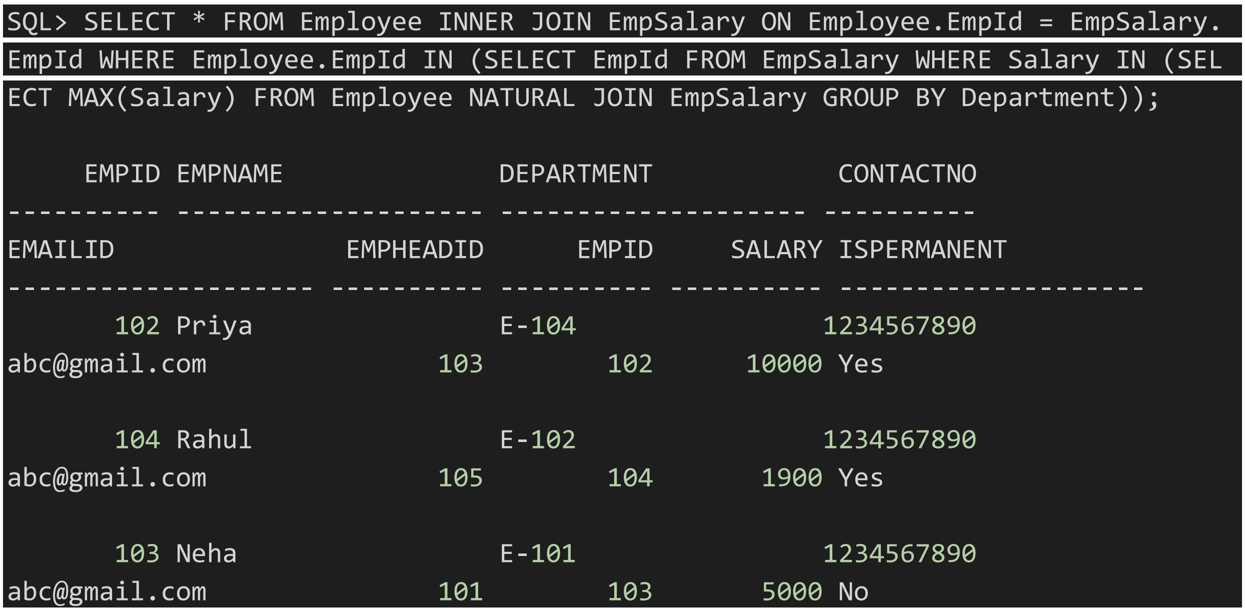
```
SQL> SELECT Salary FROM EmpSalary WHERE IsPermanent = 'Yes' AND EmpId IN (SELEC
T EmpId FROM Employee WHERE Department IN (SELECT DeptId FROM EmpDept WHERE Dep
tName = 'HR'));

    SALARY
```



```
----------
      2000
      2300

SQL>
```

vi. Display the maximum salary of an employee with its details from each department.

CODE:

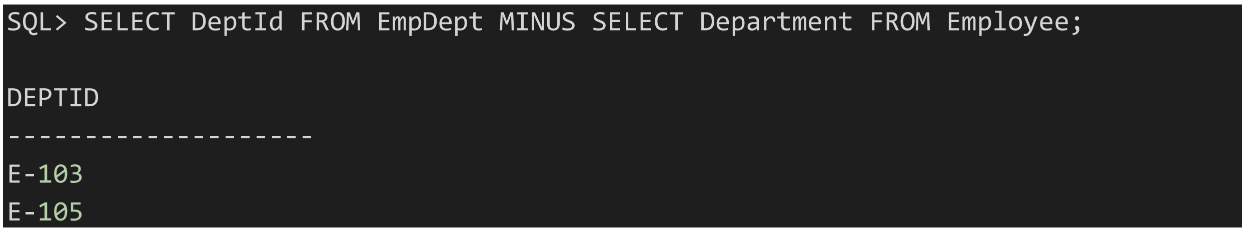


```
SQL> SELECT * FROM Employee INNER JOIN EmpSalary ON Employee.EmpId = EmpSalary.
EmpId WHERE Employee.EmpId IN (SELECT EmpId FROM EmpSalary WHERE Salary IN (SEL
ECT MAX(Salary) FROM Employee NATURAL JOIN EmpSalary GROUP BY Department));

     EMPID EMPNAME              DEPARTMENT           CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID              EMPHEADID      EMPID     SALARY ISPERMANENT
-------------------- ---------- ---------- ---------- --------------------
       102 Priya                E-104                1234567890
abc@gmail.com               103        102      10000 Yes

       104 Rahul                E-102                1234567890
abc@gmail.com               105        104       1900 Yes

       103 Neha                 E-101                1234567890
abc@gmail.com               101        103       5000 No
```

3. For the above given Relational Schema, Perform the following Set Operator Operations:

i. Display the department which is not yet being assigned to any employee up till now.

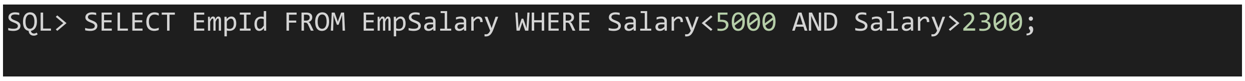
CODE:



```
SQL> SELECT DeptId FROM EmpDept MINUS SELECT Department FROM Employee;

DEPTID
--------------------
E-103
E-105
```

ii. Find Id of employee for salary less than 5000 and greater than 2300.

CODE:



```
SQL> SELECT EmpId FROM EmpSalary WHERE Salary<5000 AND Salary>2300;
```

```
no rows selected
```

iii. Find Id of employee for salary less than 2000.

CODE:

```
SQL> SELECT EmpId From EmpSalary WHERE SALARY<2000;

     EMPID
----------
       104
```

iv. Find Employee Names starting from A, P and N.

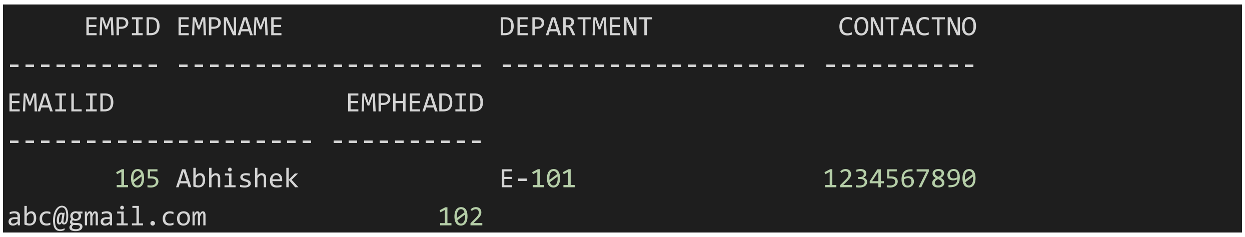
CODE:

```
SQL> SELECT EmpName FROM Employee WHERE EmpName LIKE 'A%' OR EmpName LIKE 'P%'
OR EmpName LIKE 'N%';

EMPNAME
--------------------
Priya
Neha
Abhishek
```

v. Find employee details other than employee having salary less than 2000.

CODE:

```
SQL> SELECT * FROM Employee WHERE EmpId IN (SELECT EmpId FROM Employee MINUS SE
LECT EmpId FROM EmpSalary WHERE Salary<2000);

     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID
-------------------- ----------
       101 Isha                 E-101                1234567890
abc@gmail.com               105

       102 Priya                E-104                1234567890
abc@gmail.com               103

       103 Neha                 E-101                1234567890
abc@gmail.com               101
```



```
     EMPID EMPNAME              DEPARTMENT            CONTACTNO
---------- -------------------- -------------------- ----------
EMAILID               EMPHEADID
-------------------- ----------
       105 Abhishek             E-101                1234567890
abc@gmail.com               102
```

Conclusion:

1. The various Join operations have been learnt and practically implemented on complex queries for the employee table.
2. It can be concluded that the join clause is used to combine rows from two or more tables, based on a related column.
3. The set comparison operators are used to perform nested queries in SQL.
4. Thus, the queries based on SQL join operators have been performed and the obtained results have been recorded.