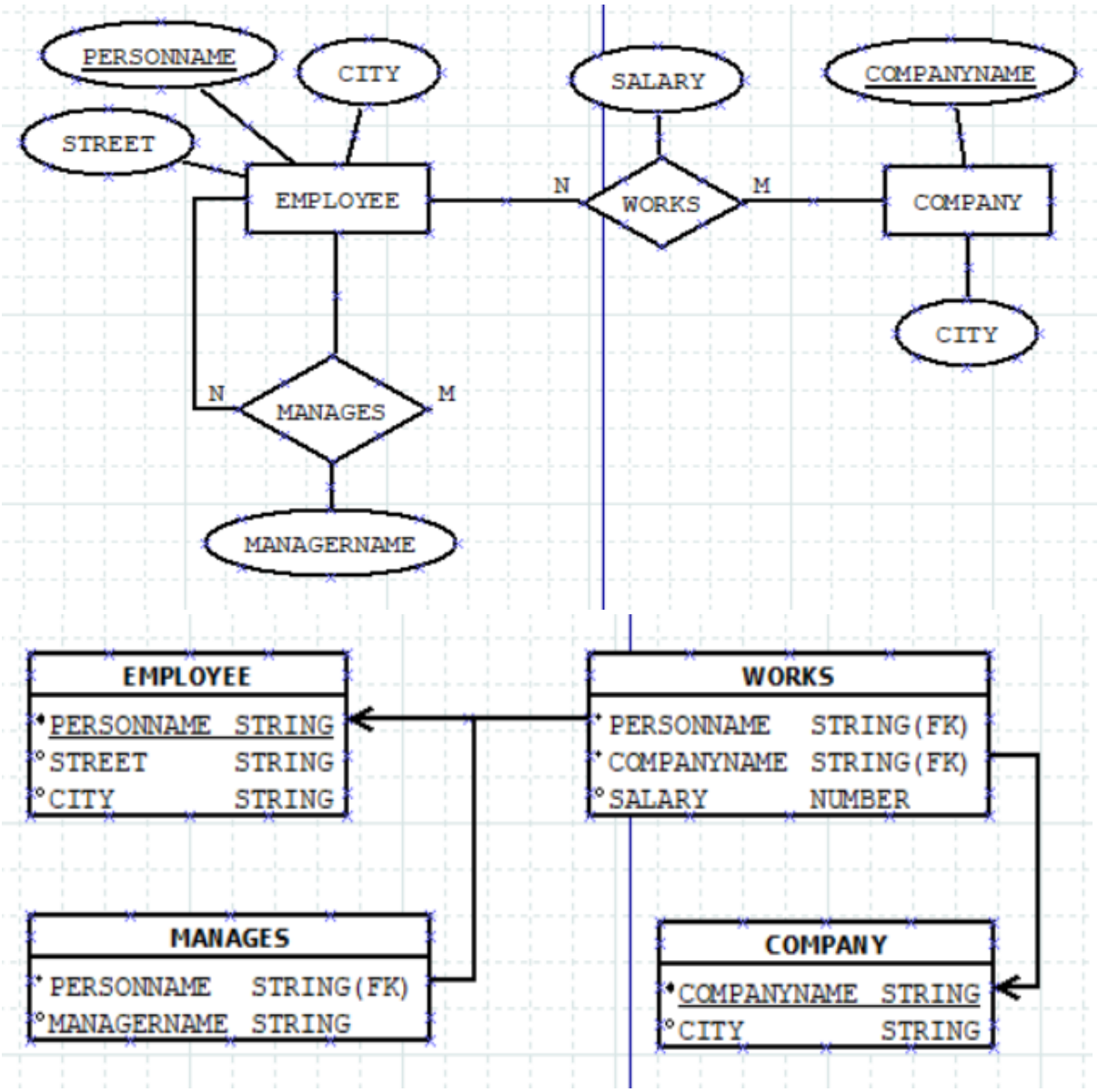
ASSIGNMENT 9

Consider the following relations and Draw the ER, EER Diagram, Relational Model and write the SQL statement for the following queries:



Create the tables and insert 5 sets of records into each.
employee (personname, street, city)
works (personname, companyname, salary)
company (companyname, city)
manages (personname, managername)

```
CREATE TABLE EMPLOYEE(
        PERSONNAME VARCHAR2(20) PRIMARY KEY,
        STREET VARCHAR2(20),
        CITY VARCHAR2(20)
```

);

```
SQL> CREATE TABLE EMPLOYEE(
  2     PERSONNAME VARCHAR2(20) PRIMARY KEY,
  3     STREET VARCHAR2(20),
  4     CITY VARCHAR2(20)
  5  );

Table created.

SQL> DESC EMPLOYEE;
 Name                                                                                    Null?    Type
 --------------------------------------------------------------------------------------- -------- ----------------
 PERSONNAME                                                                              NOT NULL VARCHAR2(20)
 STREET                                                                                           VARCHAR2(20)
 CITY                                                                                             VARCHAR2(20)

SQL>
```

CREATE TABLE WORKS(
PERSONNAME VARCHAR2(20),
COMPANYNAME VARCHAR2(20),
SALARY NUMBER,
CONSTRAINT WFK1 FOREIGN KEY (PERSONNAME) REFERENCES EMPLOYEE(PERSONNAME) ON DELETE CASCADE,
CONSTRAINT WFK2 FOREIGN KEY (COMPANYNAME) REFERENCES COMPANY(COMPANYNAME) ON DELETE CASCADE);

```
SQL> CREATE TABLE WORKS(
  2     PERSONNAME VARCHAR2(20),
  3     COMPANYNAME VARCHAR2(20),
  4     SALARY NUMBER,
  5     CONSTRAINT WFK1 FOREIGN KEY (PERSONNAME) REFERENCES EMPLOYEE(PERSONNAME),
  6     CONSTRAINT WFK2 FOREIGN KEY (COMPANYNAME) REFERENCES COMPANY(COMPANYNAME)
  7  );

Table created.

SQL> DESC WORKS;
 Name                                                                                    Null?    Type
 --------------------------------------------------------------------------------------- -------- ----------------
 PERSONNAME                                                                                       VARCHAR2(20)
 COMPANYNAME                                                                                      VARCHAR2(20)
 SALARY                                                                                           NUMBER

SQL>
```

CREATE TABLE COMPANY(
COMPANYNAME VARCHAR2(20) PRIMARY KEY,
CITY VARCHAR2(20));

```
SQL> CREATE TABLE COMPANY(
  2     COMPANYNAME VARCHAR2(20) PRIMARY KEY,
  3     CITY VARCHAR2(20)
  4  );

Table created.

SQL> DESC COMPANY;
 Name                                                                                    Null?    Type
 --------------------------------------------------------------------------------------- -------- ----------------
 COMPANYNAME                                                                             NOT NULL VARCHAR2(20)
 CITY                                                                                             VARCHAR2(20)

SQL>
```

CREATE TABLE MANAGES(
PERSONNAME VARCHAR2(20),
MANAGERNAME VARCHAR2(20),

CONSTRAINT MFK1 FOREIGN KEY (PERSONNAME) REFERENCES EMPLOYEE(PERSONNAME) ON DELETE CASCADE);

```
SQL> CREATE TABLE MANAGES(
  2     PERSONNAME VARCHAR2(20),
  3     MANAGERNAME VARCHAR2(20),
  4     CONSTRAINT MFK1 FOREIGN KEY (PERSONNAME) REFERENCES EMPLOYEE(PERSONNAME)
  5  );

Table created.

SQL> DESC MANAGES;
 Name                                                                                    Null?    Type
 --------------------------------------------------------------------------------------- -------- ------------------
 PERSONNAME                                                                                       VARCHAR2(20)
 MANAGERNAME                                                                                      VARCHAR2(20)

SQL>
```

INSERT ALL
INTO EMPLOYEE VALUES ('ARKA', '123 Main St', 'New York')
INTO EMPLOYEE VALUES ('JOHN', '456 Elm St', 'Los Angeles')
INTO EMPLOYEE VALUES ('MOHIT', '789 Oak St', 'Chicago')
INTO EMPLOYEE VALUES ('ABC', '999 Maple St', 'Houston')
INTO EMPLOYEE VALUES ('XYZ', '111 Pine St', 'San Francisco')
SELECT * FROM DUAL;

```
SQL> INSERT ALL
  2      INTO EMPLOYEE VALUES ('ARKA', '123 Main St', 'New York')
  3      INTO EMPLOYEE VALUES ('JOHN', '456 Elm St', 'Los Angeles')
  4      INTO EMPLOYEE VALUES ('MOHIT', '789 Oak St', 'Chicago')
  5      INTO EMPLOYEE VALUES ('ABC', '999 Maple St', 'Houston')
  6      INTO EMPLOYEE VALUES ('XYZ', '111 Pine St', 'San Francisco')
  7  SELECT * FROM DUAL;

5 rows created.

SQL> SELECT * FROM EMPLOYEE;

PERSONNAME           STREET               CITY
-------------------- -------------------- --------------------
ARKA                 123 Main St          New York
JOHN                 456 Elm St           Los Angeles
MOHIT                789 Oak St           Chicago
ABC                  999 Maple St         Houston
XYZ                  111 Pine St          San Francisco

SQL>
```

INSERT ALL
INTO WORKS VALUES ('ARKA', 'Google', 100000)
INTO WORKS VALUES ('JOHN', 'Microsoft', 150000)
INTO WORKS VALUES ('MOHIT', 'Amazon', 250000)
INTO WORKS VALUES ('XYZ', 'Axis Bank', 200000)
INTO WORKS VALUES ('ABC', 'Axis Bank', 280000)
SELECT * FROM DUAL;

```
SQL> INSERT ALL
  2      INTO WORKS VALUES ('ARKA', 'Google', 100000)
  3      INTO WORKS VALUES ('JOHN', 'Microsoft', 150000)
  4      INTO WORKS VALUES ('MOHIT', 'Amazon', 250000)
  5      INTO WORKS VALUES ('XYZ', 'Axis Bank', 200000)
  6      INTO WORKS VALUES ('XYZ', 'Axis Bank', 280000)
  7  SELECT * FROM DUAL;

5 rows created.

SQL> SELECT * FROM WORKS;

PERSONNAME           COMPANYNAME              SALARY
-------------------- -------------------- ----------
ARKA                 Google                   100000
JOHN                 Microsoft                150000
MOHIT                Amazon                   250000
XYZ                  Axis Bank                200000
XYZ                  Axis Bank                280000

SQL>
```

```
INSERT ALL
   INTO COMPANY VALUES ('Google', 'Mountain View')
   INTO COMPANY VALUES ('Microsoft', 'Redmond')
   INTO COMPANY VALUES ('Amazon', 'Seattle')
   INTO COMPANY VALUES ('Axis Bank', 'Mumbai')
   INTO COMPANY VALUES ('Walmart', 'Bentonville')
SELECT * FROM DUAL;
```

```
SQL> INSERT ALL
  2      INTO COMPANY VALUES ('Google', 'Mountain View')
  3      INTO COMPANY VALUES ('Microsoft', 'Redmond')
  4      INTO COMPANY VALUES ('Amazon', 'Seattle')
  5      INTO COMPANY VALUES ('Axis Bank', 'Mumbai')
  6      INTO COMPANY VALUES ('Walmart', 'Bentonville')
  7  SELECT * FROM DUAL;

5 rows created.

SQL> SELECT * FROM COMPANY;

COMPANYNAME          CITY
-------------------- --------------------
Google               Mountain View
Microsoft            Redmond
Amazon               Seattle
Axis Bank            Mumbai
Walmart              Bentonville

SQL>
```

INSERT ALL

```
   INTO MANAGES VALUES ('JOHN', 'ARKA')
   INTO MANAGES VALUES ('MOHIT', 'ARKA')
   INTO MANAGES VALUES ('ABC', 'MOHIT')
   INTO MANAGES VALUES ('XYZ', 'JOHN')
   INTO MANAGES VALUES ('ABC', 'JOHN')
SELECT * FROM DUAL;
```

```
SQL> INSERT ALL
  2       INTO MANAGES VALUES ('JOHN', 'ARKA')
  3       INTO MANAGES VALUES ('MOHIT', 'ARKA')
  4       INTO MANAGES VALUES ('ABC', 'MOHIT')
  5       INTO MANAGES VALUES ('XYZ', 'JOHN')
  6       INTO MANAGES VALUES ('XYZ', 'JOHN')
  7  SELECT * FROM DUAL;

5 rows created.

SQL> SELECT * FROM MANAGES;

PERSONNAME           MANAGERNAME
-------------------- --------------------
JOHN                 ARKA
MOHIT                ARKA
ABC                  MOHIT
XYZ                  JOHN
XYZ                  JOHN

SQL>
```

a)Find the names of all employees who work for Axis Bank.

SELECT PERSONNAME FROM WORKS WHERE COMPANYNAME = 'AXIS BANK';

```
SQL> SELECT PERSONNAME FROM WORKS WHERE COMPANYNAME = 'Axis Bank';

PERSONNAME
--------------------
XYZ
ABC

SQL>
```

b)Find the names and cities of residence of all employees who work for Axis Bank.

SELECT E.PERSONNAME , E.CITY FROM EMPLOYEE E JOIN WORKS W ON W.PERSONNAME = E.PERSONNAME WHERE W.COMPANYNAME = 'Axis Bank';

```
SQL> SELECT E.PERSONNAME , E.CITY
  2  FROM EMPLOYEE E
  3  JOIN WORKS W ON W.PERSONNAME = E.PERSONNAME
  4  WHERE W.COMPANYNAME = 'Axis Bank';

PERSONNAME           CITY
-------------------- --------------------
ABC                  Houston
XYZ                  San Francisco

SQL>
```

c)Find the names, street addresses, and cities of residence of all employees who work for Axis Bank and earn more than Rs.30000 per annum.

SELECT E.PERSONNAME , E.STREET , E.CITY FROM EMPLOYEE E JOIN WORKS W ON W.PERSONNAME = E.PERSONNAME WHERE W.COMPANYNAME = 'Axis Bank' AND W.SALARY > 30000;

```
SQL> SELECT E.PERSONNAME , E.STREET , E.CITY
  2  FROM EMPLOYEE E
  3  JOIN WORKS W ON W.PERSONNAME = E.PERSONNAME
  4  WHERE W.COMPANYNAME = 'Axis Bank' AND W.SALARY > 30000;

PERSONNAME           STREET               CITY
-------------------- -------------------- --------------------
ABC                  999 Maple St         Houston
XYZ                  111 Pine St          San Francisco

SQL>
```

d)Find all employees who live in the same city as the company for which they work is located.

SELECT E.PERSONNAME FROM EMPLOYEE E JOIN WORKS W ON W.PERSONNAME = E.PERSONNAME JOIN COMPANY C ON W.COMPANYNAME = C.COMPANYNAME WHERE C.CITY = E.CITY;

```
SQL> SELECT E.PERSONNAME
  2  FROM EMPLOYEE E
  3  JOIN WORKS W ON W.PERSONNAME = E.PERSONNAME
  4  JOIN COMPANY C ON W.COMPANYNAME = C.COMPANYNAME
  5  WHERE C.CITY = E.CITY;

no rows selected

SQL>
```

e)Find all employees who live in the same city and on the same street as their managers.

SELECT E.PERSONNAME FROM EMPLOYEE E
WHERE E.CITY IN (SELECT CITY FROM EMPLOYEE WHERE PERSONNAME IN (SELECT DISTINCT MANAGERNAME FROM MANAGES))
AND E.STREET IN (SELECT STREET FROM EMPLOYEE WHERE PERSONNAME IN (SELECT DISTINCT MANAGERNAME FROM MANAGES))
AND E.PERSONNAME NOT IN (SELECT DISTINCT MANAGERNAME FROM MANAGES);

```
SQL> SELECT E.PERSONNAME FROM EMPLOYEE E
  2  WHERE E.CITY IN (SELECT CITY FROM EMPLOYEE WHERE PERSONNAME IN (SELECT DISTINCT MANAGERNAME FROM MANAGES))
  3  AND E.STREET IN (SELECT STREET FROM EMPLOYEE WHERE PERSONNAME IN (SELECT DISTINCT MANAGERNAME FROM MANAGES))
  4  AND E.PERSONNAME NOT IN (SELECT DISTINCT MANAGERNAME FROM MANAGES);

no rows selected

SQL>
```

f)Find all employees in the database who do not work for Axis Bank.

SELECT E.PERSONNAME
FROM EMPLOYEE E
JOIN WORKS W ON E.PERSONNAME = W.PERSONNAME
WHERE W.COMPANYNAME <> 'Axis Bank';

```
SQL> SELECT E.PERSONNAME
  2  FROM EMPLOYEE E
  3  JOIN WORKS W ON E.PERSONNAME = W.PERSONNAME
  4  WHERE W.COMPANYNAME <> 'Axis Bank';

PERSONNAME
--------------------
ARKA
JOHN
MOHIT

SQL>
```

g)Find all employees who earn more than every employee of Axis Bank.

SELECT PERSONNAME FROM WORKS WHERE SALARY > (SELECT MAX(SALARY) FROM WORKS WHERE COMPANYNAME = 'Axis Bank');

```
SQL> SELECT PERSONNAME FROM WORKS WHERE SALARY > (SELECT MAX(SALARY) FROM WORKS WHERE COMPANYNAME = 'Axis Bank');

no rows selected

SQL>
```

h)Assume that the companies may be located in several cities. Find all companies located in every city iin which Axis Bank is located.

SELECT DISTINCT COMPANYNAME FROM COMPANY WHERE CITY IN (SELECT CITY FROM COMPANY WHERE COMPANYNAME = 'Axis Bank') AND COMPANYNAME <> 'Axis Bank';

```
SQL> SELECT DISTINCT COMPANYNAME FROM COMPANY WHERE CITY IN (SELECT CITY FROM COMPANY WHERE COMPANYNAME = 'Axis Bank') AND COMPANYNAME <> 'Axis Bank';

no rows selected

SQL>
```

i)Find all employees who earn more than the average salary of all employees of their company.

CREATE TABLE TMPSAL AS SELECT AVG(SALARY) AS AVGSAL , COMPANYNAME FROM WORKS GROUP BY COMPANYNAME;
SELECT W.PERSONNAME , W.COMPANYNAME , W.SALARY
FROM WORKS W
JOIN TMPSAL T ON W.COMPANYNAME = T.COMPANYNAME
WHERE W.SALARY > T.AVGSAL;

```
SQL> CREATE TABLE TMPSAL AS SELECT AVG(SALARY) AS AVGSAL , COMPANYNAME FROM WORKS GROUP BY COMPANYNAME;

Table created.

SQL> SELECT * FROM TMPSAL;

    AVGSAL COMPANYNAME
---------- --------------------
    240000 Axis Bank
    100000 Google
    250000 Amazon
    150000 Microsoft

SQL> SELECT W.PERSONNAME , W.COMPANYNAME , W.SALARY
  2  FROM WORKS W
  3  JOIN TMPSAL T ON W.COMPANYNAME = T.COMPANYNAME
  4  WHERE W.SALARY > T.AVGSAL;

PERSONNAME           COMPANYNAME              SALARY
-------------------- -------------------- ----------
ABC                  Axis Bank                280000
```

j)Find the company that has the most employees.

SELECT COMPANYNAME FROM (SELECT COUNT(PERSONNAME) AS TOT, COMPANYNAME FROM WORKS GROUP BY COMPANYNAME ORDER BY TOT DESC) WHERE ROWNUM = 1;

```
SQL> SELECT COMPANYNAME FROM (SELECT COUNT(PERSONNAME) AS TOT, COMPANYNAME FROM WORKS GROUP BY COMPANYNAME ORDER BY TOT DESC) WHERE ROWNUM = 1;

COMPANYNAME
--------------------
Axis Bank

SQL>
```

k)Find the company that has the smallest payroll.

SELECT COMPANYNAME FROM (SELECT SUM(SALARY) AS PAYROLL , COMPANYNAME FROM WORKS GROUP BY COMPANYNAME ORDER BY PAYROLL ASC) WHERE ROWNUM = 1;

```
SQL> SELECT COMPANYNAME FROM (SELECT SUM(SALARY) AS PAYROLL , COMPANYNAME FROM WORKS GROUP BY COMPANYNAME ORDER BY PAYROLL ASC) WHERE ROWNUM = 1;

COMPANYNAME
--------------------
Google

SQL>
```

l)Find those companies whose employees earn a higher salary, on average, than the average salary at Axis Bank.

SELECT COMPANYNAME FROM TMPSAL WHERE AVGSAL > (SELECT AVGSAL FROM TMPSAL WHERE COMPANYNAME = 'Axis Bank');

```
SQL> SELECT COMPANYNAME FROM TMPSAL WHERE AVGSAL > (SELECT AVGSAL FROM TMPSAL WHERE COMPANYNAME = 'Axis Bank');

COMPANYNAME
--------------------
Amazon
```

m)Modify the database so that ABC now lives in Kolkata.

UPDATE EMPLOYEE SET CITY = 'Kolkata' WHERE PERSONNAME = 'ABC';

```
SQL> UPDATE EMPLOYEE SET CITY = 'Kolkata' WHERE PERSONNAME = 'ABC';

1 row updated.

SQL> SELECT * FROM EMPLOYEE;

PERSONNAME           STREET               CITY
-------------------- -------------------- --------------------
ARKA                 123 Main St          New York
JOHN                 456 Elm St           Los Angeles
MOHIT                789 Oak St           Chicago
ABC                  999 Maple St         Kolkata
XYZ                  111 Pine St          San Francisco

SQL>
```

n)Give all employees of Axis Bank a 10 percent raise.

UPDATE WORKS SET SALARY = SALARY * 1.10 WHERE COMPANYNAME = 'Axis Bank';

```
SQL> UPDATE WORKS SET SALARY = SALARY * 1.10 WHERE COMPANYNAME = 'Axis Bank';

2 rows updated.

SQL> SELECT * FROM WORKS;

PERSONNAME           COMPANYNAME              SALARY
-------------------- -------------------- ----------
ARKA                 Google                   100000
JOHN                 Microsoft                150000
MOHIT                Amazon                   250000
XYZ                  Axis Bank                220000
ABC                  Axis Bank                308000

SQL>
```

o)Give all managers in the database a 10 percent raise.

UPDATE WORKS SET SALARY = SALARY * 1.1 WHERE PERSONNAME IN (SELECT DISTINCT MANAGERNAME FROM MANAGES);

```
SQL> SELECT DISTINCT MANAGERNAME FROM MANAGES;

MANAGERNAME
--------------------
ARKA
MOHIT
JOHN

SQL> SELECT * FROM WORKS;

PERSONNAME           COMPANYNAME              SALARY
-------------------- -------------------- ----------
ARKA                 Google                   100000
JOHN                 Microsoft                150000
MOHIT                Amazon                   250000
XYZ                  Axis Bank                220000
ABC                  Axis Bank                308000

SQL> UPDATE WORKS SET SALARY = SALARY * 1.1 WHERE PERSONNAME IN (SELECT DISTINCT MANAGERNAME FROM MANAGES);

3 rows updated.

SQL> SELECT * FROM WORKS;

PERSONNAME           COMPANYNAME              SALARY
-------------------- -------------------- ----------
ARKA                 Google                   110000
JOHN                 Microsoft                165000
MOHIT                Amazon                   275000
XYZ                  Axis Bank                220000
ABC                  Axis Bank                308000

SQL>
```

p) Give all managers in the database a 10 percent raise, unless the salary would be greater than Rs.300000.In such cases, give only a 3 percent raise.

UPDATE WORKS SET SALARY =
CASE
    WHEN SALARY*1.1 <= 300000 THEN SALARY*1.1
    ELSE SALARY*1.03
END
WHERE PERSONNAME IN (SELECT DISTINCT MANAGERNAME FROM MANAGES);

```
SQL> SELECT PERSONNAME , SALARY FROM WORKS WHERE PERSONNAME IN (SELECT DISTINCT MANAGERNAME FROM MANAGES);

PERSONNAME           SALARY
-------------------- ----------
ARKA                 110000
MOHIT                275000
JOHN                 165000

SQL> UPDATE WORKS SET SALARY =
  2  CASE
  3     WHEN SALARY*1.1 <= 300000 THEN SALARY*1.1
  4     ELSE SALARY*1.03
  5  END
  6  WHERE PERSONNAME IN (SELECT DISTINCT MANAGERNAME FROM MANAGES);

3 rows updated.

SQL> SELECT PERSONNAME , SALARY FROM WORKS WHERE PERSONNAME IN (SELECT DISTINCT MANAGERNAME FROM MANAGES);

PERSONNAME           SALARY
-------------------- ----------
ARKA                 121000
MOHIT                283250
JOHN                 181500

SQL>
```

q) Delete all tuples in the works relation for employees of Axis Bank.

DELETE FROM WORKS WHERE COMPANYNAME = 'Axis Bank';

```
SQL> SELECT * FROM WORKS;

PERSONNAME           COMPANYNAME          SALARY
-------------------- -------------------- ----------
ARKA                 Google               121000
JOHN                 Microsoft            181500
MOHIT                Amazon               283250
XYZ                  Axis Bank            220000
ABC                  Axis Bank            308000

SQL> DELETE FROM WORKS WHERE COMPANYNAME = 'Axis Bank';

2 rows deleted.

SQL> SELECT * FROM WORKS;

PERSONNAME           COMPANYNAME          SALARY
-------------------- -------------------- ----------
ARKA                 Google               121000
JOHN                 Microsoft            181500
MOHIT                Amazon               283250

SQL>
```