Program - 3

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 'Hegde', 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 'AI' 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 5 (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 earning more than Rs.6,00,000 per month.

Solution Queries:

Query to create tables:

- Department Table –

```
CREATE TABLE DEPARTMENT (
   DNo INT PRIMARY KEY,
   DName VARCHAR(50),
   MgrSSN CHAR(9),
   MgrStartDate DATE
);
```

- Employee Table –

```
CREATE TABLE EMPLOYEE (
   SSN CHAR(9) PRIMARY KEY,
   Name VARCHAR(50),
   Address VARCHAR(100),
   Sex CHAR(1),
   Salary DECIMAL(10, 2),
   SuperSSN CHAR(9),
   DNo INT,
   FOREIGN KEY (SuperSSN) REFERENCES EMPLOYEE(SSN),
   FOREIGN KEY (DNo) REFERENCES DEPARTMENT(DNo)
);
```

- Dlocation Table –

```
CREATE TABLE DLOCATION (
   DNo INT,
   DLoc VARCHAR(50),
   PRIMARY KEY (DNo, DLoc),
   FOREIGN KEY (DNo) REFERENCES DEPARTMENT(DNo)
);
```

- Project Table –

```
CREATE TABLE PROJECT (
   PNo INT PRIMARY KEY,
   PName VARCHAR(50),
   PLocation VARCHAR(50),
   DNo INT,
   FOREIGN KEY (DNo) REFERENCES DEPARTMENT(DNo)
);
```

- Works_on Table –

```
CREATE TABLE WORKS_ON (
   SSN CHAR(9),
   PNo INT,
   Hours DECIMAL(5, 2),
   PRIMARY KEY (SSN, PNo),
   FOREIGN KEY (SSN) REFERENCES EMPLOYEE(SSN),
   FOREIGN KEY (PNo) REFERENCES PROJECT(PNo)
);
```

Query to insert values into the table:

- Department Table –

INSERT INTO DEPARTMENT VALUES (1, 'HR', '123456789', '01-JAN-2020');
INSERT INTO DEPARTMENT VALUES (2, 'Engineering', '987654321', '15-MAR-2019');
INSERT INTO DEPARTMENT VALUES (3, 'Marketing', '456789123', '10-JUN-2021');
INSERT INTO DEPARTMENT VALUES (4, 'Sales', '789123456', '23-NOV-2018');
INSERT INTO DEPARTMENT VALUES (5, 'Accounts', '321654987', '01-AUG-2017');

DNO	DNAME	MGRSSN	MGRSTARTDATE
1	HR	123456789	01-JAN-20
2	Engineering	987654321	15-MAR-19
3	Marketing	456789123	10-JUN-21
4	Sales	789123456	23-NOV-18
5	Accounts	321654987	01-AUG-17

- Employee Table –

INSERT INTO EMPLOYEE VALUES ('123456789', 'John Doe', '123 Elm St', 'M', 50000, NULL, 1);
INSERT INTO EMPLOYEE VALUES ('987654321', 'Jane Smith', '456 Oak St', 'F', 60000, '123456789', 2);
INSERT INTO EMPLOYEE VALUES ('456789123', 'Robert Hegde', '789 Pine St', 'M', 55000, '987654321', 3);
INSERT INTO EMPLOYEE VALUES ('789123456', 'Maria Johnson', '101 Maple St', 'F', 45000, '456789123', 4);
INSERT INTO EMPLOYEE VALUES ('321654987', 'Michael Hegde', '202 Birch St', 'M', 70000, '789123456', 5);

SSN	NAME	ADDRESS	SEX	SALARY	SUPERSSN	DNO
123456789	John Doe	123 Elm St	M	50000	-	1
987654321	Jane Smith	456 Oak St	F	60000	123456789	2
456789123	Robert Hegde	789 Pine St	M	55000	987654321	3
789123456	Maria Johnson	101 Maple St	F	45000	456789123	4
321654987	Michael Hegde	202 Birch St	M	70000	789123456	5

- Dlocation Table –

INSERT INTO DLOCATION VALUES (1, 'New York');
INSERT INTO DLOCATION VALUES (2, 'San Francisco');
INSERT INTO DLOCATION VALUES (3, 'Los Angeles');

INSERT INTO DLOCATION VALUES (4, 'Chicago');
INSERT INTO DLOCATION VALUES (5, 'Houston');

DNO	DLOC
1	New York
2	San Francisco
3	Los Angeles
4	Chicago
5	Houston

- Project Table –

INSERT INTO PROJECT VALUES (101, 'Project A', 'New York', 1);
INSERT INTO PROJECT VALUES (102, 'Project B', 'San Francisco', 2);
INSERT INTO PROJECT VALUES (103, 'AI', 'Los Angeles', 3);
INSERT INTO PROJECT VALUES (104, 'Project D', 'Chicago', 4);
INSERT INTO PROJECT VALUES (105, 'Project E', 'Houston', 5);

PNO	PNAME	PLOCATION	DNO
101	Project A	New York	1
102	Project B	San Francisco	2
103	AI	Los Angeles	3
104	Project D	Chicago	4
105	Project E	Houston	5

- Works_on Table –

INSERT INTO WORKS_ON VALUES ('123456789', 101, 20);
INSERT INTO WORKS_ON VALUES ('987654321', 102, 25);
INSERT INTO WORKS_ON VALUES ('456789123', 103, 30);
INSERT INTO WORKS_ON VALUES ('789123456', 104, 35);
INSERT INTO WORKS_ON VALUES ('321654987', 105, 40);
INSERT INTO WORKS_ON VALUES ('123456789', 103, 15);
INSERT INTO WORKS_ON VALUES ('456789123', 105, 10);

SSN	PNO	HOURS
123456789	101	20
987654321	102	25
456789123	103	30
789123456	104	35
321654987	105	40
123456789	103	15
456789123	105	10

Query for given questions:

1) SELECT DISTINCT P.PNo
   FROM PROJECT P
   LEFT JOIN WORKS_ON W ON P.PNo = W.PNo
   LEFT JOIN EMPLOYEE E1 ON W.SSN = E1.SSN
   LEFT JOIN DEPARTMENT D ON P.DNo = D.DNo
   LEFT JOIN EMPLOYEE E2 ON D.MgrSSN = E2.SSN
   WHERE E1.Name LIKE '%Hegde%' OR E2.Name LIKE '%Hegde%';

PNO
105
103

2) SELECT E.SSN, E.Name, E.Salary * 1.10 AS NewSalary
   FROM EMPLOYEE E
   JOIN WORKS_ON W ON E.SSN = W.SSN
   JOIN PROJECT P ON W.PNo = P.PNo
   WHERE P.PName = 'AI';

SSN	NAME	NEWSALARY
123456789	John Doe	55000
456789123	Robert Hegde	60500

3) SELECT SUM(E.Salary) AS TotalSalary,
      MAX(E.Salary) AS MaxSalary,
      MIN(E.Salary) AS MinSalary,
      AVG(E.Salary) AS AvgSalary
   FROM EMPLOYEE E
   JOIN DEPARTMENT D ON E.DNo = D.DNo
   WHERE D.DName = 'Accounts';

TOTALSALARY	MAXSALARY	MINSALARY	AVGSALARY
70000	70000	70000	70000

4) SELECT E.Name
   FROM EMPLOYEE E
   WHERE NOT EXISTS (
      SELECT P.PNo
      FROM PROJECT P
      WHERE P.DNo = 5
      AND NOT EXISTS (

```
        SELECT W.SSN
        FROM WORKS_ON W
        WHERE W.PNo = P.PNo AND W.SSN = E.SSN
    )
);
```

NAME
Robert Hegde
Michael Hegde

5)
```
SELECT D.DNo, COUNT(E.SSN) AS NumEmployees
FROM DEPARTMENT D
JOIN EMPLOYEE E ON D.DNo = E.DNo
WHERE E.Salary > 60000
GROUP BY D.DNo
HAVING COUNT(E.SSN) >= 1;
```

DNO	NUMEMPLOYEES
5	1