Practical 1 – ER Diagram and Schema Design

Create the tables designed in ER diagram and schema and insert the valid values in the table

```
CREATE DATABASE COMPANY_DATABASE;

USE COMPANY_DATABASE;

CREATE TABLE EMPLOYEE(
        FNAME VARCHAR(15) NOT NULL,
         MINIT CHAR,
        LNAME VARCHAR(15) NOT NULL,
         SSN CHAR(9) NOT NULL,
         BDATE DATE,
        ADDRESS VARCHAR(30),
         SEX CHAR,        SALARY DECIMAL(10,2),  SUPER_SSN CHAR(9),
        DNO INT NOT NULL,
        PRIMARY KEY(SSN)
);

CREATE TABLE DEPARTMENT(
        DNAME VARCHAR(15) NOT NULL,
        DNUMBER INT NOT NULL,
        MGR_SSN CHAR(9) NOT NULL,
        MGR_START_DATE DATE,
       PRIMARY KEY(DNUMBER),
        UNIQUE(DNAME),
         FOREIGN KEY(MGR_SSN) REFERENCES EMPLOYEE(SSN)
);

CREATE TABLE DEPT_LOCATIONS(            DLOCATION VARCHAR(15) NOT NULL,       DNUMBER INT
NOT NULL,         PRIMARY KEY(DNUMBER, DLOCATION),    FOREIGN KEY(DNUMBER) REFERENCES
DEPARTMENT(DNUMBER)  );

CREATE TABLE PROJECT(
        PNAME VARCHAR(15) NOT NULL,
         PNUMBER INT NOT NULL,            PLOCATION VARCHAR(15),
        DNUM INT NOT NULL,
       PRIMARY KEY(PNUMBER),
        UNIQUE(PNAME),
     FOREIGN KEY(DNUM) REFERENCES DEPARTMENT(DNUMBER)
);

CREATE TABLE WORKS_ON(
         ESSN CHAR(9) NOT NULL,
         PNO INT NOT NULL,
        HOURS DECIMAL(3,1) NOT NULL,
         PRIMARY KEY(ESSN, PNO),
       FOREIGN KEY(ESSN) REFERENCES EMPLOYEE(SSN),
```

```
        FOREIGN KEY(PNO) REFERENCES PROJECT(PNUMBER)
);

CREATE TABLE DEPENDENT(
            ESSN CHAR(9) NOT NULL,
             DEPENDENT_NAME VARCHAR(15) NOT NULL,        SEX CHAR,         BDATE DATE,
             RELATIONSHIP VARCHAR(8),        PRIMARY KEY(ESSN, DEPENDENT_NAME),
          FOREIGN KEY(ESSN) REFERENCES EMPLOYEE(SSN)
);
```

(Contd.) Insertion of valid values in the tables:

```
USE COMPANY_DATABASE;

INSERT INTO EMPLOYEE VALUES
('John','B','Smith','123456789','1965-01-09','731 Fondren, Housten, TX','M',30000,'333445555',5),
('Franklin','T','Wong','333445555','1955-12-08','638 Voss, Housten,
TX','M',40000,'888665555',5),
('Alicia','J','Zolaya','999887777','1968-01-19','3321 Castlo, Spring,
TX','F',25000,'987654321',4),
('Jennifer','S','Wallace','987654321','1941-06-20','291 Berry, Beilaire,
TX','F',43000,'888665555',4),
('Ramesh','K','Narayan','666884444','1962-09-15','975 Fire Oak, Humble,
TX','M',38000,'333445555',5),
('Joyce','A','English','453453453','1972-07-31','5631 Rice, Housten, TX','F',25000,'333445555',5),
('Ahmad','V','Jabbar','987987987','1969-03-29','980 Dallas, Housten,
TX','M',25000,'987654321',4),
('James','E','Borg','888665555','1937-11-10','450 Stone, Housten,
TX','M',55000,NULL,1);

INSERT INTO DEPARTMENT VALUES
('Research',5,'333445555','1988-05-22'),
('Administration',4,'987654321','1995-01-01'),
('Headquaters',1,'888665555','1981-06-19');

INSERT INTO DEPT_LOCATIONS VALUES
('Houston',1),
('Stafford',4),
('Bellaire',5),
('Sugarland',5),
('Houston',5);

INSERT INTO PROJECT VALUES
('ProductX',1,'Bellaire',5),
('ProductY',2,'Sugarland',5),
('ProductZ',3,'Houston',5),
('Computerization',10,'Stafford',4),
('Reorganization',20,'Houston',1),
('Newbenefits',30,'Stafford',4);
```

```
INSERT INTO WORKS_ON VALUES
('123456789',1,32.5),
('123456789',2,7.5),
('666884444',3,40),
('453453453',1,20), ('453453453',2,20),
('333445555',2,10),
('333445555',3,10),
('333445555',10,10),
('333445555',20,10),
('999887777',30,30),
('999887777',10,10),
('987987987',10,35), ('987987987',30,5),
('987654321',30,20),
('987654321',20,15),
('888665555',20,0);

INSERT INTO DEPENDENT VALUES
('333445555','Alice','F','1986-04-05','Daughter'),
('333445555','Theodore','M','1983-10-25','Son'), ('333445555','Joy','F','1958-05-03','Spouse'),
('987654321','Abner','M','1942-02-28','Spouse'),
('123456789','Michael','M','1988-01-04','Son'),
('123456789','Alice','F','1988-12-30','Daughter'),
('123456789','Elizabeth','F','1967-05-05','Spouse');
```

EMPLOYEE

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno

DEPARTMENT

Dname	Dnumber	Mgr_ssn	Mgr_start_date

DEPT_LOCATIONS

Dnumber	Dlocation

PROJECT

Pname	Pnumber	Plocation	Dnum

WORKS_ON

Essn	Pno	Hours

DEPENDENT

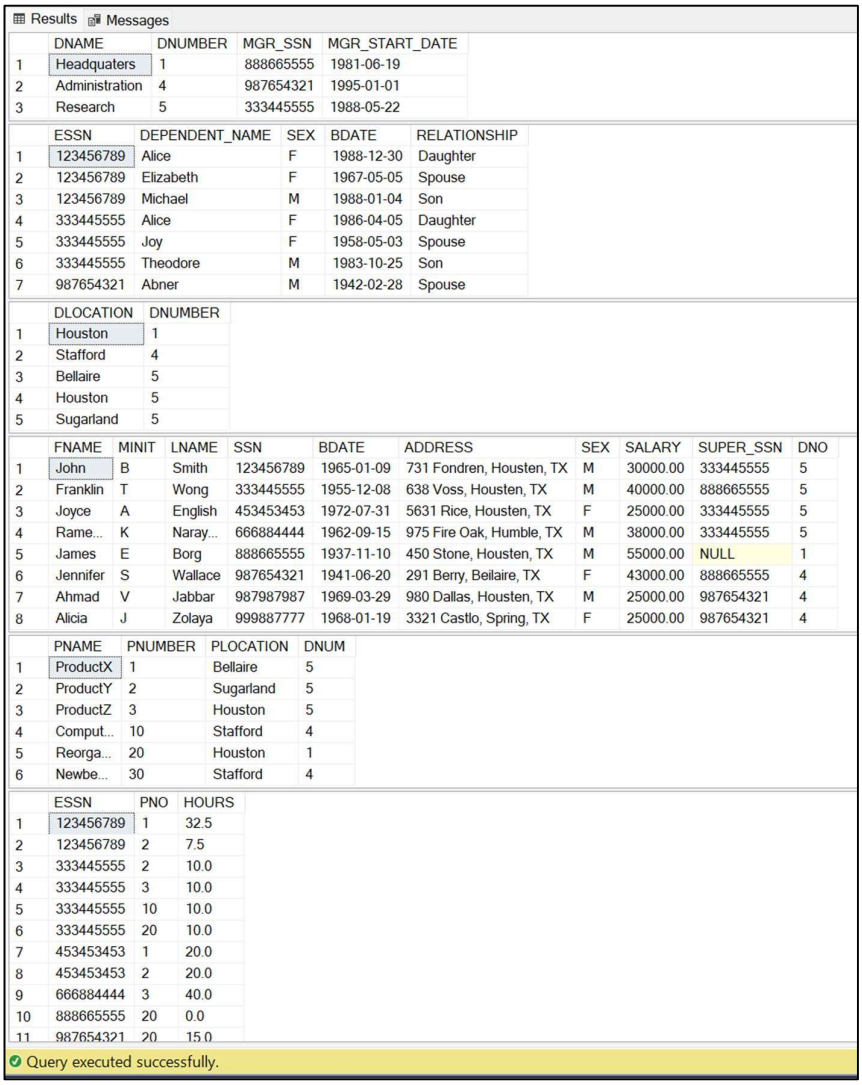
Essn	Dependent_name	Sex	Bdate	Relationship

Practical 2 - Selection and projection-based queries **2**

1. Display all the tables created in the database.

```
SELECT * FROM DEPARTMENT
SELECT * FROM DEPENDENT
SELECT * FROM DEPT_LOCATIONS SELECT * FROM EMPLOYEE
SELECT * FROM PROJECT
```

```
SELECT * FROM WORKS_ON
```



Results Messages

	DNAME	DNUMBER	MGR_SSN	MGR_START_DATE
1	Headquaters	1	888665555	1981-06-19
2	Administration	4	987654321	1995-01-01
3	Research	5	333445555	1988-05-22

	ESSN	DEPENDENT_NAME	SEX	BDATE	RELATIONSHIP
1	123456789	Alice	F	1988-12-30	Daughter
2	123456789	Elizabeth	F	1967-05-05	Spouse
3	123456789	Michael	M	1988-01-04	Son
4	333445555	Alice	F	1986-04-05	Daughter
5	333445555	Joy	F	1958-05-03	Spouse
6	333445555	Theodore	M	1983-10-25	Son
7	987654321	Abner	M	1942-02-28	Spouse

	DLOCATION	DNUMBER
1	Houston	1
2	Stafford	4
3	Bellaire	5
4	Houston	5
5	Sugarland	5

	FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPER_SSN	DNO
1	John	B	Smith	123456789	1965-01-09	731 Fondren, Housten, TX	M	30000.00	333445555	5
2	Franklin	T	Wong	333445555	1955-12-08	638 Voss, Housten, TX	M	40000.00	888665555	5
3	Joyce	A	English	453453453	1972-07-31	5631 Rice, Housten, TX	F	25000.00	333445555	5
4	Rame...	K	Naray...	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5
5	James	E	Borg	888665555	1937-11-10	450 Stone, Housten, TX	M	55000.00	NULL	1
6	Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Beilaire, TX	F	43000.00	888665555	4
7	Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Housten, TX	M	25000.00	987654321	4
8	Alicia	J	Zolaya	999887777	1968-01-19	3321 Castlo, Spring, TX	F	25000.00	987654321	4

	PNAME	PNUMBER	PLOCATION	DNUM
1	ProductX	1	Bellaire	5
2	ProductY	2	Sugarland	5
3	ProductZ	3	Houston	5
4	Comput...	10	Stafford	4
5	Reorga...	20	Houston	1
6	Newbe...	30	Stafford	4

	ESSN	PNO	HOURS
1	123456789	1	32.5
2	123456789	2	7.5
3	333445555	2	10.0
4	333445555	3	10.0
5	333445555	10	10.0
6	333445555	20	10.0
7	453453453	1	20.0
8	453453453	2	20.0
9	666884444	3	40.0
10	888665555	20	0.0
11	987654321	20	15.0

Query executed successfully.

2. Display all Employee's SSNs

```
SELECT SSN FROM EMPLOYEE;
```

3. Display Employee Name, Employee Number working in department number 5.

```
SELECT FNAME, LNAME, SSN FROM EMPLOYEE WHERE DNO = 5;
```

4. Retrieve the birth date and address of the employee(s) whose name is 'John B. Smith'.

```
SELECT BDATE, ADDRESS FROM EMPLOYEE WHERE FNAME = 'John' AND MINIT = 'B' AND LNAME = 'Smith';
```

5. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birth date.

```
SELECT P.PNUMBER, P.DNUM, E.LNAME, E.ADDRESS, E.BDATE  FROM PROJECT P, DEPARTMENT D,
EMPLOYEE E WHERE P.PLOCATION = 'Stafford' AND P.DNUM = D.DNUMBER AND D.MGR_SSN = E.SSN;
```

6. Display all the data from the Employee Table. Separate each Column by a comma and name the said column as THE_OUTPUT.

```
SELECT CONCAT(FNAME, ', ', MINIT, ',', LNAME, ', ', SSN, ',' ,BDATE, ',' , ADDRESS, ',' , SEX, ',' , SALARY, ','
, SALARY, ',' , SUPER_SSN, ',' , DNO) AS THE_OUTPUT FROM EMPLOYEE;
```

Results Messages

	SSN
1	123456789
2	333445555
3	453453453
4	666884444
5	888665555
6	987654321
7	987987987
8	999887777

	FNAME	LNAME	SSN
1	John	Smith	123456789
2	Franklin	Wong	333445555
3	Joyce	English	453453453
4	Ramesh	Narayan	666884444

	BDATE	ADDRESS
1	1965-01-09	731 Fondren, Housten, TX

	PNUMBER	DNUM	LNAME	ADDRESS	BDATE
1	10	4	Wallace	291 Berry, Beilaire, TX	1941-06-20
2	30	4	Wallace	291 Berry, Beilaire, TX	1941-06-20

	THE_OUTPUT
1	John, B,Smith, 123456789,1965-01-09,731 Fondren, ...
2	Franklin, T,Wong, 333445555,1955-12-08,638 Voss, ...
3	Joyce, A,English, 453453453,1972-07-31,5631 Rice, ...
4	Ramesh, K,Narayan, 666884444,1962-09-15,975 Fire ...
5	James, E,Borg, 888665555,1937-11-10,450 Stone, H...
6	Jennifer, S,Wallace, 987654321,1941-06-20,291 Berry...
7	Ahmad, V,Jabbar, 987987987,1969-03-29,980 Dallas,...
8	Alicia, J,Zolaya, 999887777,1968-01-19,3321 Castlo, ...

7. For each employee, retrieve the employee's first and last name and the first and last name of his or her immediate supervisor.

```
SELECT E.FNAME, E.LNAME, S.FNAME, S.LNAME FROM EMPLOYEE as E, EMPLOYEE as S WHERE
E.SUPER_SSN=S.SSN;
```

8. Display Name of all the employees where the third letter of their name is 'A'.

```
SELECT FNAME FROM EMPLOYEE WHERE FNAME LIKE '__A%';
```

9. Display Name of all employees either have two R's or have two A's in their name and are either in Dept No = 7 or their Manger's Employee No = '123456789'.

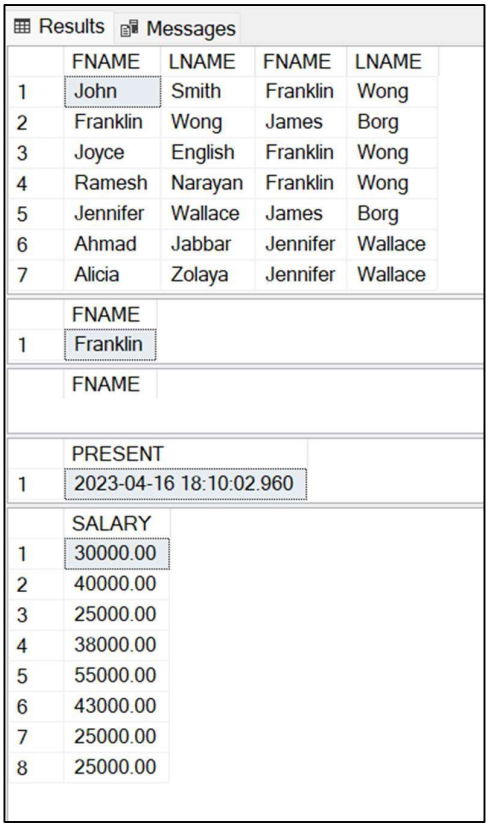
```
SELECT FNAME FROM EMPLOYEE WHERE (FNAME LIKE '%A%A%' OR FNAME LIKE '%R%R%') AND
(DNO = 5 OR SUPER_SSN = 123456789);
```

10. Display the Current Date.

```
SELECT GETDATE();
```

11. Retrieve the salary of every employee

```
SELECT SALARY from EMPLOYEE;
```



Results Messages

	FNAME	LNAME	FNAME	LNAME
1	John	Smith	Franklin	Wong
2	Franklin	Wong	James	Borg
3	Joyce	English	Franklin	Wong
4	Ramesh	Narayan	Franklin	Wong
5	Jennifer	Wallace	James	Borg
6	Ahmad	Jabbar	Jennifer	Wallace
7	Alicia	Zolaya	Jennifer	Wallace

	FNAME
1	Franklin

	FNAME

	PRESENT
1	2023-04-16 18:10:02.960

	SALARY
1	30000.00
2	40000.00
3	25000.00
4	38000.00
5	55000.00
6	43000.00
7	25000.00
8	25000.00

Practical 3 - Selection and projection-based queries

1. Display Name with the 1st letter capitalized and all other letter lower case and length of their name of all the employees whose name starts with ‘J‘, ‘A‘ and ‘M‘.

```
SELECT CONCAT(UPPER(SUBSTRING(FNAME,1,1)),LOWER(SUBSTRING(FNAME,2,14))) AS NAME, LEN(FNAME) FROM EMPLOYEE  WHERE (FNAME LIKE 'J%' OR FNAME LIKE 'A%' OR FNAME LIKE 'M%');
```

12. Display all valid combinations of Employee’s Ssn and Department name in the database.

```
SELECT E.SSN, D.DNAME FROM EMPLOYEE AS E, DEPARTMENT AS D WHERE E.DNO = D.DNUMBER;
```

13. Display the Employee Name and Salary of all the employees earning more than 25000.

```
SELECT FNAME, LNAME, SALARY FROM EMPLOYEE WHERE SALARY > 25000;
```

14. Retrieve the name and address of all employees who work for the ‘Research’ department.

```
SELECT E.FNAME, E.LNAME, E.ADDRESS FROM EMPLOYEE AS E, DEPARTMENT AS D WHERE E.DNO = D.DNUMBER AND D.DNAME = 'Research';
```

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

```
(SELECT DISTINCT PNUMBER FROM PROJECT, DEPARTMENT, EMPLOYEE WHERE DNUM = DNUMBER AND MGR_SSN = SSN AND LNAME = 'Smith')
UNION
```

```
(SELECT DISTINCT PNUMBER FROM PROJECT, WORKS_ON, EMPLOYEE WHERE PNUMBER = PNO
AND ESSN = SSN AND LNAME = 'Smith');
```

Results Messages

	NAME	NAME_LENGTH
1	John	4
2	Joyce	5
3	James	5
4	Jennifer	8
5	Ahmad	5
6	Alicia	6

	SSN	DNAME
1	123456789	Research
2	333445555	Research
3	453453453	Research
4	666884444	Research
5	888665555	Headquaters
6	987654321	Administration
7	987987987	Administration
8	999887777	Administration

	FNAME	LNAME	SALARY
1	John	Smith	30000.00
2	Franklin	Wong	40000.00
3	Ramesh	Narayan	38000.00
4	James	Borg	55000.00
5	Jennifer	Wallace	43000.00

	FNAME	LNAME	ADDRESS
1	John	Smith	731 Fondren, Housten, TX
2	Franklin	Wong	638 Voss, Housten, TX
3	Joyce	English	5631 Rice, Housten, TX
4	Rame...	Naray...	975 Fire Oak, Humble, TX

	PNUMBER
1	1
2	2

17. Retrieve all employees whose address is in Houston, Texas

```
SELECT * FROM EMPLOYEE WHERE ADDRESS LIKE '%Housten, TX%';
```

18. Find all employees who were born during the 1950s.

```
SELECT * FROM EMPLOYEE WHERE BDATE >= '1950-01-01' AND BDATE < '1960-01-01';
```

19. Show the resulting salaries if every employee working on the ‘ProductX’ project is given a 10% raise.

```
SELECT E.SALARY*1.1 AS PRODUCTX_10 FROM EMPLOYEE AS E, PROJECT AS P, WORKS_ON AS W
WHERE P.PNAME = 'ProductX' AND W.PNO = P.PNUMBER AND W.ESSN = E.SSN;
```

20. Retrieve all employees in department 5 whose salary is between $30,000 and $40,000.

```
SELECT * FROM EMPLOYEE WHERE DNO = 5 AND SALARY >= 30000 AND SALARY <= 40000;
```

21. Find the names of all employees who are directly supervised by ‘Franklin Wong’.

```
SELECT E1.FNAME, E1.LNAME FROM EMPLOYEE AS E1, EMPLOYEE AS E2 WHERE E1.SUPER_SSN =
E2.SSN AND E2.FNAME = 'Franklin' AND E2.LNAME = 'Wong';
```

Results Messages

	FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPER_SSN	DNO
1	John	B	Smith	123456789	1965-01-09	731 Fondren, Housten, TX	M	30000.00	333445555	5
2	Franklin	T	Wong	333445555	1955-12-08	638 Voss, Housten, TX	M	40000.00	888665555	5
3	Joyce	A	English	453453453	1972-07-31	5631 Rice, Housten, TX	F	25000.00	333445555	5
4	James	E	Borg	888665555	1937-11-10	450 Stone, Housten, TX	M	55000.00	NULL	1
5	Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Housten, TX	M	25000.00	987654321	4

	FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPER_SSN	DNO
1	Franklin	T	Wong	333445555	1955-12-08	638 Voss, Housten, TX	M	40000.00	888665555	5

	PRODUCTX_10
1	33000.000
2	27500.000

	FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPER_SSN	DNO
1	John	B	Smith	123456789	1965-01-09	731 Fondren, Housten, TX	M	30000.00	333445555	5
2	Franklin	T	Wong	333445555	1955-12-08	638 Voss, Housten, TX	M	40000.00	888665555	5
3	Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5

	FNAME	LNAME
1	John	Smith
2	Joyce	English
3	Ramesh	Narayan

Practical 4 – Some Complex queries

22. Retrieve a list of employees and the projects they are working on, ordered by department and, within each department, ordered alphabetically by last name, then first name.

```
SELECT D.DNAME, E.LNAME, E.FNAME, P.PNAME FROM DEPARTMENT AS D, EMPLOYEE AS E,
WORKS_ON AS W, PROJECT AS P WHERE D.DNUMBER = E.DNO AND E.SSN = W.ESSN AND W.PNO =
P.PNUMBER ORDER BY D.DNAME, E.LNAME, E.FNAME;
```

23. Retrieve the names of all employees in department 5 who work more than 10 hours per week on the ProductX project.

```
SELECT FNAME, LNAME FROM EMPLOYEE WHERE DNO = 5 AND  SSN IN (SELECT W.ESSN FROM
WORKS_ON AS W WHERE W.HOURS > 10 AND  W.PNO = (SELECT P.PNUMBER FROM PROJECT AS P
WHERE P.PNAME = 'ProductX'));
```

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

```
SELECT E.FNAME, E.LNAME FROM EMPLOYEE AS E WHERE E.SSN IN (SELECT ESSN FROM
DEPENDENT WHERE E.FNAME = DEPENDENT_NAME);
```

25. Create a table EMPLOYEE_BACKUP to back up the EMPLOYEE table

```
SELECT * INTO EMPLOYEE_BACKUP FROM EMPLOYEE;
```

26. Retrieve the names of all employees who do not have supervisors.

```
SELECT * FROM EMPLOYEE WHERE SUPER_SSN IS NULL;
```

27. Retrieve the name of each employee who has a dependent with the same first name and is the same sex as the employee.

```
SELECT E.FNAME, E.LNAME FROM EMPLOYEE AS E WHERE E.SSN IN (SELECT ESSN FROM
DEPENDENT WHERE E.FNAME = DEPENDENT_NAME AND E.SEX = SEX);
```

Results Messages

	DNAME	LNAME	FNAME	PNAME
1	Administration	Jabbar	Ahmad	Computerization
2	Administration	Jabbar	Ahmad	Newbenefits
3	Administration	Wallace	Jennifer	Reorganization
4	Administration	Wallace	Jennifer	Newbenefits
5	Administration	Zolaya	Alicia	Computerization
6	Administration	Zolaya	Alicia	Newbenefits
7	Headquaters	Borg	James	Reorganization
8	Research	English	Joyce	ProductX
9	Research	English	Joyce	ProductY
10	Research	Narayan	Ramesh	ProductZ
11	Research	Smith	John	ProductX
12	Research	Smith	John	ProductY
13	Research	Wong	Franklin	ProductY
14	Research	Wong	Franklin	ProductZ
15	Research	Wong	Franklin	Computerization
16	Research	Wong	Franklin	Reorganization

	FNAME	LNAME
1	John	Smith
2	Joyce	English

	FNAME	LNAME

	FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPER_SSN	DNO
1	James	E	Borg	888665555	1937-11-10	450 Stone, Housten, TX	M	55000.00	NULL	1

	FNAME	LNAME

28. For each project, retrieve the project number, the project name, and the number of employees from department 5 who work on the project.

```
SELECT PNUMBER, PNAME, COUNT(*) AS NO_OF_EMPLOYEE  FROM PROJECT, WORKS_ON WHERE
PNUMBER = PNO AND ESSN IN (SELECT E.SSN FROM EMPLOYEE AS E WHERE E.DNO = 5) GROUP BY
PNUMBER, PNAME;
```

29. For each department that has more than five employees, retrieve the department number and the number of its employees who are making more than $40,000.

```
SELECT DNAME, COUNT(*) AS NO_OF_EMPLOYEE FROM DEPARTMENT, EMPLOYEE  WHERE
DNUMBER = DNO AND SALARY>40000 AND  DNO IN (SELECT DNO FROM EMPLOYEE GROUP BY DNO
HAVING COUNT(*)>5)  GROUP BY DNAME;
```

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

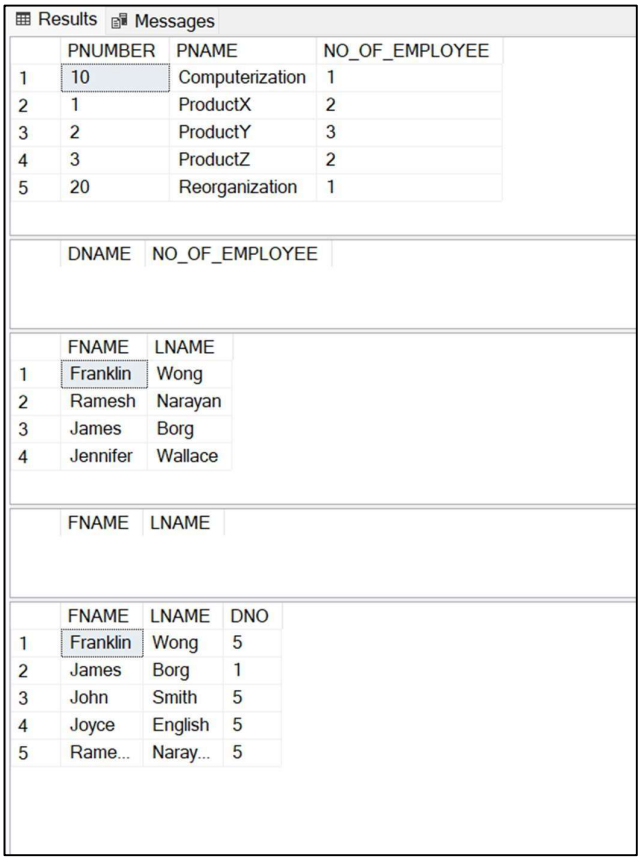
```
SELECT FNAME, LNAME FROM EMPLOYEE WHERE SALARY >= (SELECT MIN(SALARY) FROM
EMPLOYEE)+10000;
```

31. Display Employee Name and Department Number for the Employee No= 7900.

```
SELECT FNAME, LNAME FROM EMPLOYEE WHERE SSN='%7900%';
```

32. Display Employee Name and Department No. of all the employees in Dept 5 and Dept 1 in the alphabetical order by name.

```
SELECT FNAME, LNAME, DNO FROM EMPLOYEE WHERE DNO=5 OR DNO=1 ORDER BY FNAME;
```



Results Messages

	PNUMBER	PNAME	NO_OF_EMPLOYEE
1	10	Computerization	1
2	1	ProductX	2
3	2	ProductY	3
4	3	ProductZ	2
5	20	Reorganization	1

	DNAME	NO_OF_EMPLOYEE

	FNAME	LNAME
1	Franklin	Wong
2	Ramesh	Narayan
3	James	Borg
4	Jennifer	Wallace

	FNAME	LNAME

	FNAME	LNAME	DNO
1	Franklin	Wong	5
2	James	Borg	1
3	John	Smith	5
4	Joyce	English	5
5	Rame...	Naray...	5

Practical 5 – Aggregation function-based queries

33. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary.

```
SELECT SUM(SALARY) AS SUM_SALARY, MIN(SALARY) AS MIN_SALARY, MAX(SALARY) AS
MAX_SALARY, AVG(SALARY) AS AVG_SALARY FROM EMPLOYEE;
```

34. Find the sum of the salaries of all employees of the 'Research' department, as well as the maximum salary, the minimum salary, and the average salary in this department.

```
SELECT SUM(SALARY) AS SUM_SALARY, MIN(SALARY) AS MIN_SALARY, MAX(SALARY) AS MAX_SALARY, AVG(SALARY) AS AVG_SALARY  FROM EMPLOYEE WHERE DNO = (SELECT DNUMBER FROM DEPARTMENT WHERE DNAME = 'Research');
```

35. Retrieve the total number of employees in the company

```
SELECT COUNT(*) AS NO_OF_EMPLOYEE FROM EMPLOYEE;
```

36. Retrieve the number of employees in the 'Research' department.

```
SELECT COUNT(*) AS RESEARCH_EMPLOYEE FROM EMPLOYEE WHERE DNO = (SELECT DNUMBER FROM DEPARTMENT WHERE DNAME = 'Research');
```

37. Count the number of distinct salary values in the database

```
SELECT COUNT(DISTINCT SALARY) AS DISTINCT_SALARY FROM EMPLOYEE;
```

Results Messages

	SUM_SALARY	MIN_SALARY	MAX_SALARY	AVG_SALARY
1	281000.00	25000.00	55000.00	35125.000000

	SUM_SALARY	MIN_SALARY	MAX_SALARY	AVG_SALARY
1	133000.00	25000.00	40000.00	33250.000000

	NO_OF_EMPLOYEE
1	8

	RESEARCH_EMPLOYEE
1	4

	DISTINCT_SALARY
1	6

38. Retrieve the names of all employees who have two or more dependents

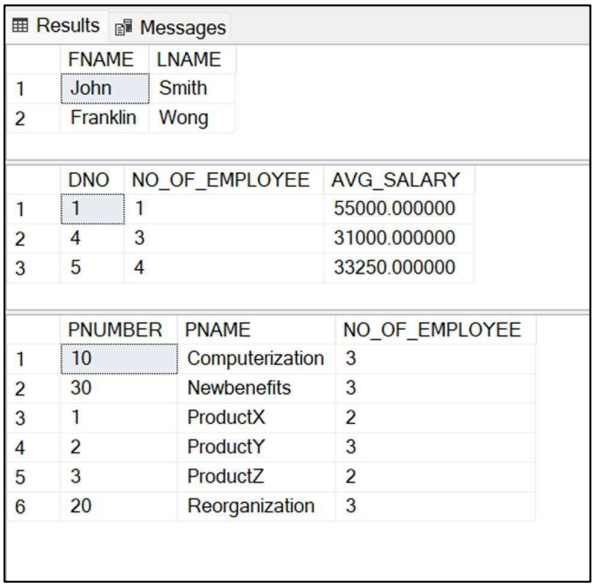
```
SELECT FNAME, LNAME FROM EMPLOYEE WHERE(SELECT COUNT(*) FROM DEPENDENT WHERE SSN=ESSN)>=2;
```

39. For each department, retrieve the department number, the number of employees in the department, and their average salary.

```
SELECT DNO, COUNT(*) AS NO_OF_EMPLOYEE, AVG(SALARY) AS AVG_SALARY FROM EMPLOYEE GROUP BY DNO;
```

40. For each project, retrieve the project number, the project name, and the number of employees who work on that project.

```
SELECT PNUMBER, PNAME, COUNT(*) AS NO_OF_EMPLOYEE FROM PROJECT, WORKS_ON WHERE PNUMBER = PNO GROUP BY PNUMBER, PNAME;
```



Results Messages

	FNAME	LNAME
1	John	Smith
2	Franklin	Wong

	DNO	NO_OF_EMPLOYEE	AVG_SALARY
1	1	1	55000.000000
2	4	3	31000.000000
3	5	4	33250.000000

	PNUMBER	PNAME	NO_OF_EMPLOYEE
1	10	Computerization	3
2	30	Newbenefits	3
3	1	ProductX	2
4	2	ProductY	3
5	3	ProductZ	2
6	20	Reorganization	3

41. For each project on which more than two employees work, retrieve the project number, the project name, and the number of employees who work on the project.

```
SELECT P.PNUMBER, P.PNAME, COUNT(W.PNO) AS NO_OF_EMPLOYEE  FROM PROJECT AS P, WORKS_ON AS W WHERE P.PNUMBER = W.PNO GROUP BY P.PNUMBER, P.PNAME, W.PNO HAVING COUNT(W.PNO)>2;
```

42. List the names of managers who have at least one dependent.

```
SELECT FNAME, LNAME FROM EMPLOYEE, DEPARTMENT WHERE SSN = MGR_SSN AND (SELECT COUNT(*) FROM DEPENDENT WHERE SSN=ESSN)>=1;
```

43. Retrieve all distinct salary values in COMPANY.

```
SELECT DISTINCT SALARY FROM EMPLOYEE;
```

44. Display Name and Salaries represented by asterisks, where each asterisk (*) signifies $100.

```
SELECT FNAME, REPLICATE('*',SALARY/100) AS STAR_REPRESENTATION FROM EMPLOYEE;
```

45. Display the no. of managers in the COMPANY.

```
SELECT COUNT(DISTINCT MGR_SSN) FROM DEPARTMENT;
```

46. Display the Department Name, Location Name, No. of Employees and the average salary in that department.

```
SELECT D.DNAME, LOC.DLOCATION, COUNT(E.DNO) AS NO_OF_EMPLOYEE, AVG(E.SALARY) AS AVG_SALARY FROM DEPARTMENT AS D, EMPLOYEE AS E, DEPT_LOCATIONS AS LOC  WHERE D.DNUMBER = E.DNO AND D.DNUMBER = LOC.DNUMBER GROUP BY D.DNAME, LOC.DLOCATION, E.DNO;
```

47. Display the Employee No. And Name for all employees who earn more than the average salary.

```
SELECT SSN, FNAME, LNAME FROM EMPLOYEE WHERE SALARY > (SELECT AVG(SALARY) FROM
EMPLOYEE);
```

Results Messages

	PNUMBER	PNAME	NO_OF_EMPLOYEE
1	10	Computerization	3
2	30	Newbenefits	3
3	2	ProductY	3
4	20	Reorganization	3

	FNAME	LNAME
1	Jennifer	Wallace
2	Franklin	Wong

	SALARY
1	25000.00
2	30000.00
3	38000.00
4	40000.00
5	43000.00
6	55000.00

	FNAME	STAR_REPRESENTATION
1	John	**********
2	Franklin	**********
3	Joyce	**********
4	Ramesh	**********
5	James	**********
6	Jennifer	**********
7	Ahmad	**********
8	Alicia	**********

	NO_OF_MANAGERS
1	3

	DNAME	DLOCATION	NO_OF_EMPLOYEE	AVG_SALARY
1	Administration	Stafford	3	31000.000000
2	Headquaters	Houston	1	55000.000000
3	Research	Bellaire	4	33250.000000
4	Research	Houston	4	33250.000000
5	Research	Sugarland	4	33250.000000

	SSN	FNAME	LNAME
1	333445555	Franklin	Wong
2	666884444	Ramesh	Narayan
3	888665555	James	Borg
4	987654321	Jennifer	Wallace

Practical 6– Update/Delete-based queries

48. Increment the salary of managers in the COMPANY by 50%.

```
SELECT * FROM EMPLOYEE; UPDATE EMPLOYEE SET SALARY = SALARY*1.5 WHERE SSN IN
(SELECT MGR_SSN FROM DEPARTMENT); SELECT * FROM EMPLOYEE;
```

Results Messages

	FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPER_SSN	DNO
1	John	B	Smith	123456789	1965-01-09	731 Fondren, Housten, TX	M	30000.00	333445555	5
2	Franklin	T	Wong	333445555	1955-12-08	638 Voss, Housten, TX	M	40000.00	888665555	5
3	Joyce	A	English	453453453	1972-07-31	5631 Rice, Housten, TX	F	25000.00	333445555	5
4	Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5
5	James	E	Borg	888665555	1937-11-10	450 Stone, Housten, TX	M	55000.00	NULL	1
6	Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Beilaire, TX	F	43000.00	888665555	4
7	Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Housten, TX	M	25000.00	987654321	4
8	Alicia	J	Zolaya	999887777	1968-01-19	3321 Castlo, Spring, TX	F	25000.00	987654321	4

	FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPER_SSN	DNO
1	John	B	Smith	123456789	1965-01-09	731 Fondren, Housten, TX	M	30000.00	333445555	5
2	Franklin	T	Wong	333445555	1955-12-08	638 Voss, Housten, TX	M	60000.00	888665555	5
3	Joyce	A	English	453453453	1972-07-31	5631 Rice, Housten, TX	F	25000.00	333445555	5
4	Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5
5	James	E	Borg	888665555	1937-11-10	450 Stone, Housten, TX	M	82500.00	NULL	1
6	Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Beilaire, TX	F	64500.00	888665555	4
7	Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Housten, TX	M	25000.00	987654321	4
8	Alicia	J	Zolaya	999887777	1968-01-19	3321 Castlo, Spring, TX	F	25000.00	987654321	4

49. Decrement the salary of manager of project number 10 by 10%.

```
SELECT * FROM EMPLOYEE; UPDATE EMPLOYEE SET SALARY = SALARY*0.9 WHERE SSN IN
(SELECT MGR_SSN FROM DEPARTMENT WHERE DNUMBER = (SELECT DNUM FROM PROJECT
WHERE PNUMBER = 10));
SELECT  *  FROM  EMPLOYEE;
```

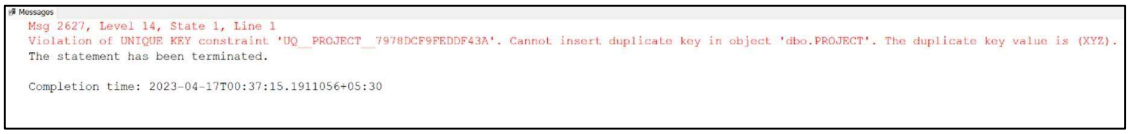
Results Messages

	FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPER_SSN	DNO
1	John	B	Smith	123456789	1965-01-09	731 Fondren, Housten, TX	M	30000.00	333445555	5
2	Franklin	T	Wong	333445555	1955-12-08	638 Voss, Housten, TX	M	40000.00	888665555	5
3	Joyce	A	English	453453453	1972-07-31	5631 Rice, Housten, TX	F	25000.00	333445555	5
4	Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5
5	James	E	Borg	888665555	1937-11-10	450 Stone, Housten, TX	M	55000.00	NULL	1
6	Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Beilaire, TX	F	43000.00	888665555	4
7	Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Housten, TX	M	25000.00	987654321	4
8	Alicia	J	Zolaya	999887777	1968-01-19	3321 Castlo, Spring, TX	F	25000.00	987654321	4

	FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPER_SSN	DNO
1	John	B	Smith	123456789	1965-01-09	731 Fondren, Housten, TX	M	30000.00	333445555	5
2	Franklin	T	Wong	333445555	1955-12-08	638 Voss, Housten, TX	M	40000.00	888665555	5
3	Joyce	A	English	453453453	1972-07-31	5631 Rice, Housten, TX	F	25000.00	333445555	5
4	Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5
5	James	E	Borg	888665555	1937-11-10	450 Stone, Housten, TX	M	55000.00	NULL	1
6	Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Beilaire, TX	F	38700.00	888665555	4
7	Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Housten, TX	M	25000.00	987654321	4
8	Alicia	J	Zolaya	999887777	1968-01-19	3321 Castlo, Spring, TX	F	25000.00	987654321	4

50. Update the name of project to ‘XYZ’ lead in department no 5.

```
UPDATE PROJECT SET PNAME = 'XYZ' WHERE DNUM = 5;
```



```
Messages
  Msg 2627, Level 14, State 1, Line 1
  Violation of UNIQUE KEY constraint 'UQ__PROJECT__7978DCF9FEDDF43A'. Cannot insert duplicate key in object 'dbo.PROJECT'. The duplicate key value is (XYZ).
  The statement has been terminated.

  Completion time: 2023-04-17T00:37:15.1911056+05:30
```

51. Remove the dependents of employee with SNN = ‘123456789’

```
SELECT * FROM DEPENDENT;
DELETE FROM DEPENDENT WHERE ESSN = 123456789;
SELECT * FROM DEPENDENT;
```

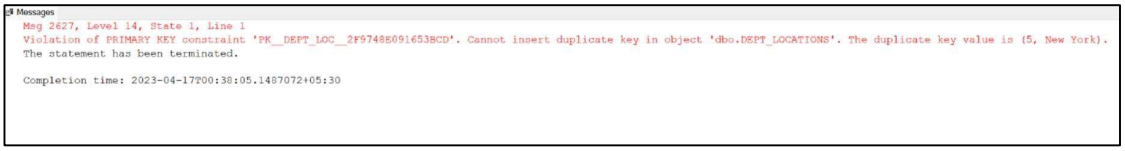
Results Messages

	ESSN	DEPENDENT_NAME	SEX	BDATE	RELATIONSHIP
1	123456789	Alice	F	1988-12-30	Daughter
2	123456789	Elizabeth	F	1967-05-05	Spouse
3	123456789	Michael	M	1988-01-04	Son
4	333445555	Alice	F	1986-04-05	Daughter
5	333445555	Joy	F	1958-05-03	Spouse
6	333445555	Theodore	M	1983-10-25	Son
7	987654321	Abner	M	1942-02-28	Spouse

	ESSN	DEPENDENT_NAME	SEX	BDATE	RELATIONSHIP
1	333445555	Alice	F	1986-04-05	Daughter
2	333445555	Joy	F	1958-05-03	Spouse
3	333445555	Theodore	M	1983-10-25	Son
4	987654321	Abner	M	1942-02-28	Spouse

52. Change the location of research department to ‘New York’.

```
UPDATE DEPT_LOCATIONS SET DLOCATION = 'New York'  WHERE DNUMBER = (SELECT D.DNUMBER
FROM DEPARTMENT D WHERE D.DNAME = 'Research');
```



```
Messages
  Msg 2627, Level 14, State 1, Line 1
  Violation of PRIMARY KEY constraint 'PK__DEPT_LOC__2F9748E091653BCD'. Cannot insert duplicate key in object 'dbo.DEPT_LOCATIONS'. The duplicate key value is (5, New York).
  The statement has been terminated.

  Completion time: 2023-04-17T00:38:05.1487072+05:30
```

53. Increment the salary of all the employees working on ‘ProductX’.

```
SELECT * FROM EMPLOYEE; UPDATE EMPLOYEE SET SALARY = 2*SALARY  WHERE SSN IN (SELECT
ESSN FROM WORKS_ON WHERE PNO = (SELECT PNUMBER FROM PROJECT WHERE PNAME =
'ProductX'));
SELECT  *  FROM  EMPLOYEE;
```

Results Messages

	FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPER_SSN	DNO
1	John	B	Smith	123456789	1965-01-09	731 Fondren, Housten, TX	M	30000.00	333445555	5
2	Franklin	T	Wong	333445555	1955-12-08	638 Voss, Housten, TX	M	40000.00	888665555	5
3	Joyce	A	English	453453453	1972-07-31	5631 Rice, Housten, TX	F	25000.00	333445555	5
4	Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5
5	James	E	Borg	888665555	1937-11-10	450 Stone, Housten, TX	M	55000.00	NULL	1
6	Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Beilaire, TX	F	43000.00	888665555	4
7	Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Housten, TX	M	25000.00	987654321	4
8	Alicia	J	Zolaya	999887777	1968-01-19	3321 Castlo, Spring, TX	F	25000.00	987654321	4

	FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPER_SSN	DNO
1	John	B	Smith	123456789	1965-01-09	731 Fondren, Housten, TX	M	60000.00	333445555	5
2	Franklin	T	Wong	333445555	1955-12-08	638 Voss, Housten, TX	M	40000.00	888665555	5
3	Joyce	A	English	453453453	1972-07-31	5631 Rice, Housten, TX	F	50000.00	333445555	5
4	Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5
5	James	E	Borg	888665555	1937-11-10	450 Stone, Housten, TX	M	55000.00	NULL	1
6	Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Beilaire, TX	F	43000.00	888665555	4
7	Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Housten, TX	M	25000.00	987654321	4
8	Alicia	J	Zolaya	999887777	1968-01-19	3321 Castlo, Spring, TX	F	25000.00	987654321	4

54. Assign all the employees working under manager 333445555 to manager 987654321.

```
SELECT * FROM EMPLOYEE; UPDATE EMPLOYEE SET SUPER_SSN = 987654321 WHERE SUPER_SSN =
333445555; SELECT * FROM EMPLOYEE;
```

Results Messages

	FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPER_SSN	DNO
1	John	B	Smith	123456789	1965-01-09	731 Fondren, Housten, TX	M	30000.00	333445555	5
2	Franklin	T	Wong	333445555	1955-12-08	638 Voss, Housten, TX	M	40000.00	888665555	5
3	Joyce	A	English	453453453	1972-07-31	5631 Rice, Housten, TX	F	25000.00	333445555	5
4	Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5
5	James	E	Borg	888665555	1937-11-10	450 Stone, Housten, TX	M	55000.00	NULL	1
6	Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Beilaire, TX	F	43000.00	888665555	4
7	Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Housten, TX	M	25000.00	987654321	4
8	Alicia	J	Zolaya	999887777	1968-01-19	3321 Castlo, Spring, TX	F	25000.00	987654321	4

	FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPER_SSN	DNO
1	John	B	Smith	123456789	1965-01-09	731 Fondren, Housten, TX	M	30000.00	987654321	5
2	Franklin	T	Wong	333445555	1955-12-08	638 Voss, Housten, TX	M	40000.00	888665555	5
3	Joyce	A	English	453453453	1972-07-31	5631 Rice, Housten, TX	F	25000.00	987654321	5
4	Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	987654321	5
5	James	E	Borg	888665555	1937-11-10	450 Stone, Housten, TX	M	55000.00	NULL	1
6	Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Beilaire, TX	F	43000.00	888665555	4
7	Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Housten, TX	M	25000.00	987654321	4
8	Alicia	J	Zolaya	999887777	1968-01-19	3321 Castlo, Spring, TX	F	25000.00	987654321	4

55. Delete all the employees having age greater than 65.

```
DELETE FROM EMPLOYEE WHERE (SELECT DATEDIFF(YEAR,BDATE,GETDATE()) + 0)>65;
```

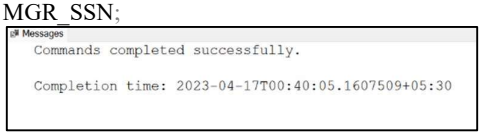
Messages

```
Msg 547, Level 16, State 0, Line 1
The DELETE statement conflicted with the REFERENCE constraint "FK__DEPARTMEN__MGR_S__3A81B327". The conflict occurred in database "COMPANY_DATABASE", table "dbo.DEPARTMENT", column 'MGR_SSN'.
The statement has been terminated.

Completion time: 2023-04-17T00:39:38.1867620+05:30
```

56. Make ‘333445555’ as the default manager for any department.

```
ALTER TABLE DEPARTMENT ADD DEFAULT 333445555 FOR
MGR_SSN;
```



Practical 7 – Some more Update/Delete-based, View-based and Alter-based queries

57. Create the virtual tables(views) for the schemas given below.

WORKS_ON1

Fname	Lname	Pname	Hours

DEPT_INFO

Dept_name	No_of_emps	Total_sal

```
CREATE VIEW WORKS_ON1 AS
```

```
SELECT E.FNAME AS FNAME, E.LNAME AS LNAME, P.PNAME AS PNAME, W.HOURS AS HOURS FROM
EMPLOYEE E, PROJECT P, WORKS_ON W WHERE E.SSN = W.ESSN AND P.PNUMBER = W.PNO;
```

Results Messages

	FNAME	LNAME	PNAME	HOURS
1	John	Smith	ProductX	32.5
2	John	Smith	ProductY	7.5
3	Franklin	Wong	ProductY	10.0
4	Franklin	Wong	ProductZ	10.0
5	Franklin	Wong	Computerization	10.0
6	Franklin	Wong	Reorganization	10.0
7	Joyce	English	ProductX	20.0
8	Joyce	English	ProductY	20.0
9	Ramesh	Narayan	ProductZ	40.0
10	James	Borg	Reorganization	0.0
11	Jennifer	Wallace	Reorganization	15.0
12	Jennifer	Wallace	Newbenefits	20.0
13	Ahmad	Jabbar	Computerization	35.0
14	Ahmad	Jabbar	Newbenefits	5.0
15	Alicia	Zolaya	Computerization	10.0
16	Alicia	Zolaya	Newbenefits	30.0

```
CREATE VIEW DEPT_INFO AS
SELECT DNAME, COUNT(*) EMP_COUNT, SUM(SALARY) AS SALARY  FROM DEPARTMENT,
EMPLOYEE WHERE DNO = DNUMBER GROUP BY DNAME;
```

Results Messages

	DNAME	EMP_COUNT	SALARY
1	Administration	3	93000.00
2	Headquaters	1	55000.00
3	Research	4	133000.00

58. Consider the WORKS_ON1 view, and issue the command to update the PNAME attribute of ‘John Smith’ from ‘ProductX’ to ‘ProductY’.

```
UPDATE WORKS_ON1 SET PNAME = 'ProductY' WHERE FNAME = 'John' AND PNAME = 'ProductX';
```

```
Results Messages

(16 rows affected)
Msg 2627, Level 14, State 1, Line 2
Violation of UNIQUE KEY constraint 'UQ__PROJECT__7978DCF9FEDDF43A'. Cannot insert duplicate key in object 'dbo.PROJECT'. The duplicate key value is (ProductY).
The statement has been terminated.

(16 rows affected)

Completion time: 2023-04-17T23:36:03.9567642+05:30
```

59. Get rid of the view WORKS_ON1.

```
DROP VIEW WORKS_ON1;
```

```
Messages
Commands completed successfully.

Completion time: 2023-04-17T23:36:42.4461908+05:30
```

60. Create a view that has the department name, manager name, and manager salary for every department.

```
CREATE VIEW DEPT AS
SELECT D.DNAME AS DNAME, E.FNAME AS FNAME, E.LNAME AS LNAME, E.SALARY AS SALARY
FROM EMPLOYEE E, DEPARTMENT D
WHERE E.SSN = D.MGR_SSN;
```

Results Messages

	DNAME	FNAME	LNAME	SALARY
1	Headquaters	James	Borg	55000.00
2	Administration	Jennifer	Wallace	43000.00
3	Research	Franklin	Wong	40000.00

61. Create a view that has the employee name, supervisor name, and employee salary for each employee who works in the 'Research' department.

```
CREATE VIEW RESEARCH AS
SELECT E1.FNAME AS FNAME, E2.FNAME AS SFNAME, E1.SALARY AS SALARY FROM EMPLOYEE
E1,EMPLOYEE E2, DEPARTMENT D
WHERE E1.SUPER_SSN = E2.SSN AND E1.DNO = (SELECT D.DNUMBER WHERE DNAME = 'Research');
```

Results Messages

	FNAME	SFNAME	SALARY
1	John	Franklin	30000.00
2	Franklin	James	40000.00
3	Joyce	Franklin	25000.00
4	Ramesh	Franklin	38000.00

62. Create a view that has the project name, controlling department name, number of employees, and total hours worked per week on the project for each project.

```
CREATE VIEW PROJ AS
SELECT PNAME AS PROJECT, DNAME AS DEPT, (SELECT COUNT(*) FROM WORKS_ON W WHERE
W.PNO = P.PNUMBER) AS EMPLOYEES, (SELECT SUM(W.Hours) FROM WORKS_ON W WHERE W.PNO =
P.PNUMBER GROUP BY PNO) AS HOURS FROM PROJECT P, DEPARTMENT D WHERE P.DNUM =
D.DNUMBER;
```

Results Messages

	PROJECT	DEPT	EMPLOYEES	HOURS
1	ProductX	Research	2	52.5
2	ProductY	Research	3	37.5
3	ProductZ	Research	2	50.0
4	Computerization	Administration	3	55.0
5	Reorganization	Headquaters	3	25.0
6	Newbenefits	Administration	3	55.0

63. Create a view that has the project name, controlling department name, number of employees, and total hours worked per week on the project for each project with more than one employee working on it.

```
CREATE VIEW NEW_PROJ AS
```

```
SELECT PNAME AS PROJECT, DNAME AS DEPT, (SELECT COUNT(*) FROM WORKS_ON W WHERE
W.PNO = P.PNUMBER) AS EMPLOYEES, (SELECT SUM(W.Hours) FROM WORKS_ON W WHERE W.PNO =
P.PNUMBER GROUP BY PNO) AS HOURS FROM PROJECT P, DEPARTMENT D WHERE P.DNUM =
D.DNUMBER AND (SELECT COUNT(*) FROM WORKS_ON W WHERE W.PNO = P.PNUMBER GROUP BY
W.PNO)>1;
```

Results Messages

	PROJECT	DEPT	EMPLOYEES	HOURS
1	ProductX	Research	2	52.5
2	ProductY	Research	3	37.5
3	ProductZ	Research	2	50.0
4	Computerization	Administration	3	55.0
5	Reorganization	Headquaters	3	25.0
6	Newbenefits	Administration	3	55.0

64. Create a view for a certain user who is only allowed to see employee information for employees who work for department 5.

```
CREATE VIEW DEPT5 AS
SELECT * FROM EMPLOYEE WHERE DNO = 5;
```

Results Messages

	FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPER_SSN	DNO
1	John	B	Smith	123456789	1965-01-09	731 Fondren, Housten, TX	M	30000.00	333445555	5
2	Franklin	T	Wong	333445555	1955-12-08	638 Voss, Housten, TX	M	40000.00	888665555	5
3	Joyce	A	English	453453453	1972-07-31	5631 Rice, Housten, TX	F	25000.00	333445555	5
4	Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5

65. Remove the attribute Address from the EMPLOYEE base table.

```
SELECT * FROM EMPLOYEE;
ALTER TABLE EMPLOYEE
DROP COLUMN ADDRESS;
SELECT * FROM EMPLOYEE;
```

Results Messages

	FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPER_SSN	DNO
1	John	B	Smith	123456789	1965-01-09	731 Fondren, Housten, TX	M	30000.00	333445555	5
2	Franklin	T	Wong	333445555	1955-12-08	638 Voss, Housten, TX	M	40000.00	888665555	5
3	Joyce	A	English	453453453	1972-07-31	5631 Rice, Housten, TX	F	25000.00	333445555	5
4	Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5
5	James	E	Borg	888665555	1937-11-10	450 Stone, Housten, TX	M	55000.00	NULL	1
6	Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Beilaire, TX	F	43000.00	888665555	4
7	Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Housten, TX	M	25000.00	987654321	4
8	Alicia	J	Zolaya	999887777	1968-01-19	3321 Castlo, Spring, TX	F	25000.00	987654321	4

	FNAME	MINIT	LNAME	SSN	BDATE	SEX	SALARY	SUPER_SSN	DNO
1	John	B	Smith	123456789	1965-01-09	M	30000.00	333445555	5
2	Franklin	T	Wong	333445555	1955-12-08	M	40000.00	888665555	5
3	Joyce	A	English	453453453	1972-07-31	F	25000.00	333445555	5
4	Ramesh	K	Narayan	666884444	1962-09-15	M	38000.00	333445555	5
5	James	E	Borg	888665555	1937-11-10	M	55000.00	NULL	1
6	Jennifer	S	Wallace	987654321	1941-06-20	F	43000.00	888665555	4
7	Ahmad	V	Jabbar	987987987	1969-03-29	M	25000.00	987654321	4
8	Alicia	J	Zolaya	999887777	1968-01-19	F	25000.00	987654321	4

Practical 8 – Some more Nested Queries and complex subqueries

66. Retrieve the names of employees who have no dependents.

```
SELECT * FROM EMPLOYEE WHERE SSN NOT IN (SELECT ESSN FROM DEPENDENT);
```

Results Messages

	FNAME	MINIT	LNAME	SSN	BDATE	ADDRESS	SEX	SALARY	SUPER_SSN	DNO
1	Joyce	A	English	453453453	1972-07-31	5631 Rice, Housten, TX	F	25000.00	333445555	5
2	Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5
3	James	E	Borg	888665555	1937-11-10	450 Stone, Housten, TX	M	55000.00	NULL	1
4	Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Housten, TX	M	25000.00	987654321	4
5	Alicia	J	Zolaya	999887777	1968-01-19	3321 Castlo, Spring, TX	F	25000.00	987654321	4

67. Retrieve all supervisees of a supervisory employee e at all levels—that is, all employees e′ directly supervised by e, all employees e′’ directly supervised by each employee e′, all employees e‴ directly supervised by each employee e″, and so on.

```
WITH RECURSIVE SUP_EMP(SUPER_SSN, SSN) AS( SELECT SUPER_SSN, SSN FROM EMPLOYEE
UNION
SELECT E.SSN, S.SUPER_SSN FROM EMPLOYEE AS E , SUP_EMP AS S WHERE E.SUPER_SSN = S.SSN)
SELECT  *  FROM  SUP_EMP ;
```

	SUPER_SSN	SSN
▶	333445555	123456789
	888665555	333445555
	333445555	453453453
	333445555	666884444
	NULL	888665555
	888665555	987654321
	987654321	987987987
	987654321	999887777
	123456789	888665555
	333445555	NULL
	453453453	888665555
	666884444	888665555
	987654321	NULL
	987987987	888665555
	999887777	888665555
	333445555	999887777
	333445555	987987987
	987654321	666884444
	987654321	453453453
	987654321	123456789

68. For every project located in ‘Stafford’, list the project number, the controlling department number, and the department manager’s last name, address, and birth date.

```
SELECT P.PNUMBER, P.DNUM, E.LNAME, E.ADDRESS, E.BDATE FROM PROJECT AS P, DEPARTMENT AS
D, EMPLOYEE AS E  WHERE P.PLOCATION = 'Stafford' AND P.DNUM = D.DNUMBER AND D.MGR_SSN =
E.SSN;
```

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

```
(SELECT W.PNO FROM WORKS_ON AS W, EMPLOYEE AS E WHERE E.LNAME = 'Smith' AND E.SSN =
W.ESSN)
UNION
```

```
(SELECT W.PNO FROM WORKS_ON AS W, PROJECT AS P, EMPLOYEE AS E, DEPARTMENT AS D  WHERE
E.LNAME = 'Smith' AND W.PNO = P.PNUMBER AND P.DNUM = D.DNUMBER AND D.MGR_SSN = E.SSN);
```

Results Messages

	PNUMBER	DNUM	LNAME	ADDRESS	BDATE
1	10	4	Wallace	291 Berry, Beilaire, TX	1941-06-20
2	30	4	Wallace	291 Berry, Beilaire, TX	1941-06-20

	PNO
1	1
2	2

70. Retrieve the names of all employees in department 5 who work more than 10 hours per week on the ProductX project.

```
SELECT DISTINCT(E.FNAME) FROM EMPLOYEE AS E, WORKS_ON AS W, PROJECT AS P  WHERE
P.PNAME = 'ProductX' AND P.PNUMBER = W.PNO AND W.HOURS > 10 AND W.ESSN = E.SSN AND E.DNO =
5;
```

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

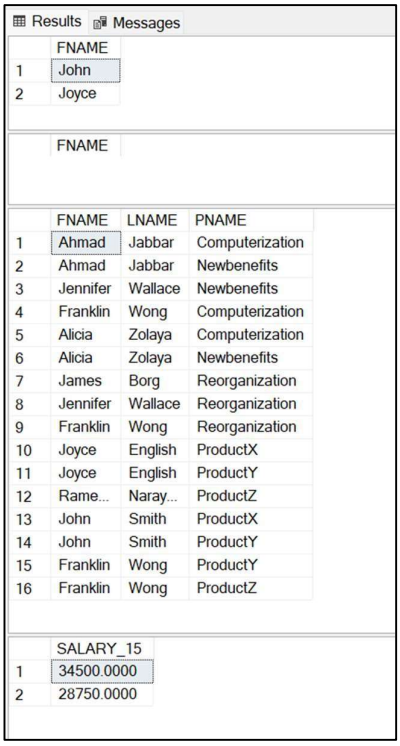
```
SELECT E.FNAME FROM EMPLOYEE AS E, DEPENDENT AS D WHERE E.FNAME =
D.DEPENDENT_NAME AND E.SSN = D.ESSN;
```

72. Retrieve a list of employees and the projects they are working on, ordered by department and, within each department, ordered alphabetically by last name, then first name.

```
SELECT E.FNAME, E.LNAME, P.PNAME FROM EMPLOYEE AS E, DEPARTMENT AS D, WORKS_ON AS W,
PROJECT AS P
WHERE W.ESSN = E.SSN AND W.PNO = P.PNUMBER AND P.DNUM = D.DNUMBER ORDER BY D.DNAME,
E.LNAME, E.FNAME;
```

73. Show the resulting salaries if every employee working on the ‘ProductX’ project is given a 15 percent raise.

```
SELECT E.SALARY*1.15 AS SALARY_15 FROM PROJECT AS P, WORKS_ON AS W, EMPLOYEE AS E
WHERE P.PNAME = 'ProductX' AND P.PNUMBER = W.PNO and W.ESSN = E.SSN;
```



Results Messages

	FNAME
1	John
2	Joyce

	FNAME

	FNAME	LNAME	PNAME
1	Ahmad	Jabbar	Computerization
2	Ahmad	Jabbar	Newbenefits
3	Jennifer	Wallace	Newbenefits
4	Franklin	Wong	Computerization
5	Alicia	Zolaya	Computerization
6	Alicia	Zolaya	Newbenefits
7	James	Borg	Reorganization
8	Jennifer	Wallace	Reorganization
9	Franklin	Wong	Reorganization
10	Joyce	English	ProductX
11	Joyce	English	ProductY
12	Rame...	Naray...	ProductZ
13	John	Smith	ProductX
14	John	Smith	ProductY
15	Franklin	Wong	ProductY
16	Franklin	Wong	ProductZ

	SALARY_15
1	34500.0000
2	28750.0000

Practical 9 – Some more Nested Queries and complex subqueries

74. 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 DNAME, COUNT(*) Emp_Count FROM DEPARTMENT, EMPLOYEE WHERE DNO = DNUMBER
GROUP BY DNAME HAVING AVG(SALARY)>30000;
```

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

```
SELECT FNAME FROM EMPLOYEE WHERE DNO = (SELECT DNO FROM EMPLOYEE WHERE SALARY =
(SELECT Max(SALARY) FROM EMPLOYEE));
```

76. Retrieve the names of all employees whose supervisor's supervisor has '888665555' for Ssn.

```
SELECT E1.FNAME FROM EMPLOYEE AS E1, EMPLOYEE AS E2 WHERE E1.SUPER_SSN = E2.SSN AND
E2.SUPER_SSN = 888665555;
```

77. Display Name of all employees who don't have Manager.

```
SELECT FNAME FROM EMPLOYEE WHERE SUPER_SSN IS NULL;
```

78. Display Employee full name, Age, Department Name and Department No for all the employees.

```
SELECT E.FNAME, E.LNAME, (SELECT DATEDIFF(YEAR,E.BDATE,GETDATE()) + 0) AS AGE, D.DNAME,
D.DNUMBER  FROM EMPLOYEE AS E, DEPARTMENT AS D WHERE D.DNUMBER = E.DNO;
```

Results | Messages

	DNAME	NO_OF_EMPLOYEE
1	Administration	3
2	Headquaters	1
3	Research	4

	FNAME
1	James

	FNAME
1	John
2	Joyce
3	Ramesh
4	Ahmad
5	Alicia

	FNAME
1	James

	FNAME	LNAME	AGE	DNAME	DNUMBER
1	John	Smith	58	Research	5
2	Franklin	Wong	68	Research	5
3	Joyce	English	51	Research	5
4	Ramesh	Narayan	61	Research	5
5	James	Borg	86	Headqu...	1
6	Jennifer	Wallace	82	Adminis...	4
7	Ahmad	Jabbar	54	Adminis...	4
8	Alicia	Zolaya	55	Adminis...	4

79. Display Name and Employee no. Along with their Manger‘s Name and the Manager‘s employee no; along with the Employees‘ Name who do not have a Manager.

```
SELECT E1.FNAME AS ENAME, E1.SSN AS ESSN, E2.FNAME AS MNAME, E2.SSN AS MSSN
FROM EMPLOYEE AS E1 LEFT OUTER JOIN EMPLOYEE AS E2 ON E1.SUPER_SSN = E2.SSN;
```

80. Display the following for each employee <FName> earns < Salary> monthly but wants < 3 * Current Salary >. Practicalel the Column as Dream Salary.

```
SELECT CONCAT(FNAME,' earns ',SALARY,' monthly but wants ',3*SALARY) AS DREAM_SALARY FROM
EMPLOYEE;
```

Results Messages

	ENAME	ESSN	MNAME	MSSN
1	John	123456789	Franklin	333445555
2	Franklin	333445555	James	888665555
3	Joyce	453453453	Franklin	333445555
4	Ramesh	666884444	Franklin	333445555
5	James	888665555	NULL	NULL
6	Jennifer	987654321	James	888665555
7	Ahmad	987987987	Jennifer	987654321
8	Alicia	999887777	Jennifer	987654321

	DREAM_SALARY
1	John earns 30000.00 monthly but wants 90000.00
2	Franklin earns 40000.00 monthly but wants 120000.00
3	Joyce earns 25000.00 monthly but wants 75000.00
4	Ramesh earns 38000.00 monthly but wants 114000.00
5	James earns 55000.00 monthly but wants 165000.00
6	Jennifer earns 43000.00 monthly but wants 129000.00
7	Ahmad earns 25000.00 monthly but wants 75000.00
8	Alicia earns 25000.00 monthly but wants 75000.00