FAIZAN CHOUDHARY

20BCS021

DBMS LAB

31st January 2022

Creation:

- mysql> create database 20bcs021_faizan;
- mysql> use 20bcs021_faizan;
- mysql> create table Employee
    ```
    -> (
    -> f_name varchar(15) not null,
    -> m_init char,
    -> l_name varchar(15) not null,
    -> ssn char(10) not null,
    -> dob date,
    -> address varchar(30),
    -> gender char,
    -> salary decimal(10,2),
    -> super_ssn char(10),
    -> d_no int not null,
    -> primary key(ssn)
    -> );
    ```
- mysql> insert into Employee
    ```
    -> values ('John', 'B', 'Smith', '123456789', '1965-01-09', '731 Fondren, Houston, TX', 'M', 30000, '333445555', 5),
    -> ('Franklin', 'T', 'Wong', '333445555', '1955-12-08', '638 Voss, Houston, TX', 'M', 40000, '888665555', 5),
    -> ('Alicia', 'J', 'Zelaya', '999887777', '1968-01-19', '3321 Castle, Spring, TX', 'F', 25000, '987654321', 4),
    -> ('Jennifer', 'S', 'Wallace', '987654321', '1941-06-20', '291 Berry, Bellaire, 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, Houston, TX', 'F', 25000, '333445555', 5),
    -> ('Ahmad', 'V', 'Jabbar', '987987987', '1969-03-29', '980 Dallas, Houston, TX', 'M', 25000, '987654321', 4),
    -> ('James', 'E', 'Borg', '888665555', '1937-11-10', '450 Stone, Houston, TX', 'M', 55000, NULL, 1);
    ```

- mysql> select * from Employee;

```
mysql> select * from Employee;
+-----------+--------+---------+-----------+------------+------------------------+--------+----------+-----------+------+
| f_name    | m_init | l_name  | ssn       | dob        | address                | gender | salary   | super_ssn | d_no |
+-----------+--------+---------+-----------+------------+------------------------+--------+----------+-----------+------+
| John      | B      | Smith   | 123456789 | 1965-01-09 | 731 Fondren, Houston, TX | M    | 30000.00 | 333445555 |    5 |
| Franklin  | T      | Wong    | 333445555 | 1955-12-08 | 638 Voss, Houston, TX  | M      | 40000.00 | 888665555 |    5 |
| Joyce     | A      | English | 453453453 | 1972-07-31 | 5631 Rice, Houston, TX | F      | 25000.00 | 333445555 |    5 |
| Ramesh    | K      | Narayan | 666884444 | 1962-09-15 | 975 Fire Oak, Humble, TX | M    | 38000.00 | 333445555 |    5 |
| James     | E      | Borg    | 888665555 | 1937-11-10 | 450 Stone, Houston, TX | M      | 55000.00 | NULL      |    1 |
| Jennifer  | S      | Wallace | 987654321 | 1941-06-20 | 291 Berry, Bellaire, TX | F     | 43000.00 | 888665555 |    4 |
| Ahmad     | V      | Jabbar  | 987987987 | 1969-03-29 | 980 Dallas, Houston, TX | M     | 25000.00 | 987654321 |    4 |
| Alicia    | J      | Zelaya  | 999887777 | 1968-01-19 | 3321 Castle, Spring, TX | F     | 25000.00 | 987654321 |    4 |
+-----------+--------+---------+-----------+------------+------------------------+--------+----------+-----------+------+
8 rows in set (0.00 sec)
```

- mysql> create table Department
    ```
    -> (
    -> d_name varchar(15) not null,
    -> d_number int not null,
    -> mgr_ssn char(10) not null,
    -> mgr_start_date date,
    -> primary key(d_number),
    -> unique(d_name),
    -> foreign key (mgr_ssn) references employee(ssn)
    -> );
    ```
- mysql> insert into Department values
    ```
    -> ('Research', 5, '333445555', '1988-05-22'),
    -> ('Administration', 4, '987654321', '1995-01-01'),
    -> ('Headquarters', 1, '888665555', '1981-06-19');
    ```
- mysql> select * from Department;

```
mysql> select * from Department;
+----------------+----------+-----------+----------------+
| d_name         | d_number | mgr_ssn   | mgr_start_date |
+----------------+----------+-----------+----------------+
| Headquarters   |        1 | 888665555 | 1981-06-19     |
| Administration |        4 | 987654321 | 1995-01-01     |
| Research       |        5 | 333445555 | 1988-05-22     |
+----------------+----------+-----------+----------------+
3 rows in set (0.00 sec)
```

- mysql> create table Project
    ```
    -> (
    -> p_name varchar(15) not null,
    -> p_number int not null,
    -> p_location varchar(15),
    -> d_num int not null,
    -> primary key (p_number),
    -> unique (p_name),
    -> foreign key (d_num) references Department (d_number)
    -> );
    ```

- mysql> insert into Project values
    ```
    -> ('ProductX', 1, 'Bellaire', 5),
    -> ('ProductY', 2, 'Sugarland', 5),
    ```

```
                    -> ('ProductZ', 3, 'Houston', 5),
                    -> ('Computerization', 10, 'Strafford', 4),
                    -> ('Reorganization', 20, 'Houston', 1),
                    -> ('Newbenefits', 30, 'Strafford', 4);
```
- mysql> select * from Project;

```
mysql> select * from Project;
+-----------------+----------+------------+--------+
| p_name          | p_number | p_location | d_num  |
+-----------------+----------+------------+--------+
| ProductX        |        1 | Bellaire   |      5 |
| ProductY        |        2 | Sugarland  |      5 |
| ProductZ        |        3 | Houston    |      5 |
| Computerization |       10 | Strafford  |      4 |
| Reorganization  |       20 | Houston    |      1 |
| Newbenefits     |       30 | Strafford  |      4 |
+-----------------+----------+------------+--------+
6 rows in set (0.00 sec)
```

Queries:

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

```
mysql> select dob, address
    -> from Employee
    -> where f_name = 'John' and m_init = 'B' and l_name = 'Smith';
```

OUTPUT:
```
+------------+------------------------+
| dob        | address                |
+------------+------------------------+
| 1965-01-09 | 731 Fondren, Houston, TX |
+------------+------------------------+
1 row in set (0.01 sec)
```

2.   Retrieve the name and address of all employees who work for the 'Research' department.
```
mysql> select f_name, l_name, address
    -> from Employee, Department
    -> where d_name = 'Research' and d_number = d_no;
```

OUTPUT:

```
+------------+-----------+----------------------------+
| f_name     | l_name    | address                    |
+------------+-----------+----------------------------+
| John       | Smith     | 731 Fondren, Houston, TX   |
| Franklin   | Wong      | 638 Voss, Houston, TX      |
| Joyce      | English   | 5631 Rice, Houston, TX     |
| Ramesh     | Narayan   | 975 Fire Oak, Humble, TX   |
+------------+-----------+----------------------------+
4 rows in set (0.00 sec)
```

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

```
mysql> select p_number, d_num, l_name, address, dob
    -> from Project, Department, Employee
    -> where d_num = d_number and mgr_ssn = ssn and p_location =
'Strafford';
```

OUTPUT:

```
+----------+-------+---------+------------------------+------------+
| p_number | d_num | l_name  | address                | dob        |
+----------+-------+---------+------------------------+------------+
|       10 |     4 | Wallace | 291 Berry, Bellaire, TX | 1941-06-20 |
|       30 |     4 | Wallace | 291 Berry, Bellaire, TX | 1941-06-20 |
+----------+-------+---------+------------------------+------------+
2 rows in set (0.01 sec)
```

4.   Retrieve the names and addresses of the employees working in the 'Research' Department.

```
mysql> select Employee.f_name, Employee.l_name, Employee.address
    -> from Employee, Department
    -> where Department.d_name = 'Research' and d_no = d_number;
```

OUTPUT:

```
+------------+-----------+----------------------------+
| f_name     | l_name    | address                    |
+------------+-----------+----------------------------+
| John       | Smith     | 731 Fondren, Houston, TX   |
| Franklin   | Wong      | 638 Voss, Houston, TX      |
| Joyce      | English   | 5631 Rice, Houston, TX     |
| Ramesh     | Narayan   | 975 Fire Oak, Humble, TX   |
+------------+-----------+----------------------------+
4 rows in set (0.00 sec)
```

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

```
mysql> select E.f_name, E.l_name, S.f_name, S.l_name
    -> from Employee as E, Employee as S
    -> where E.super_ssn = S.ssn;
```

OUTPUT:

f_name	l_name	f_name	l_name
John	Smith	Franklin	Wong
Franklin	Wong	James	Borg
Joyce	English	Franklin	Wong
Ramesh	Narayan	Franklin	Wong
Jennifer	Wallace	James	Borg
Ahmad	Jabbar	Jennifer	Wallace
Alicia	Zelaya	Jennifer	Wallace

6.   Select all EMPLOYEE ssn's .

```
mysql> select ssn from Employee;
```

OUTPUT:

ssn
123456789
333445555
453453453
666884444
888665555
987654321
987987987
999887777

8 rows in set (0.00 sec)

7. Select all combinations of EMPLOYEE ssn and DEPARTMENT d_name in the database.

```
mysql> select ssn, d_name
    -> from Employee, Department;
```

OUTPUT:

```
+-----------+----------------+
| ssn       | d_name         |
+-----------+----------------+
| 123456789 | Research       |
| 123456789 | Headquarters   |
| 123456789 | Administration |
| 333445555 | Research       |
| 333445555 | Headquarters   |
| 333445555 | Administration |
| 453453453 | Research       |
| 453453453 | Headquarters   |
| 453453453 | Administration |
| 666884444 | Research       |
| 666884444 | Headquarters   |
| 666884444 | Administration |
| 888665555 | Research       |
| 888665555 | Headquarters   |
| 888665555 | Administration |
| 987654321 | Research       |
| 987654321 | Headquarters   |
| 987654321 | Administration |
| 987987987 | Research       |
| 987987987 | Headquarters   |
| 987987987 | Administration |
| 999887777 | Research       |
| 999887777 | Headquarters   |
| 999887777 | Administration |
+-----------+----------------+
24 rows in set (0.00 sec)
```

8. Retrieve all the attribute values of any EMPLOYEE who works in DEPARTMENT number 5.

```
mysql> select *
    -> from Employee
    -> where d_no = 5;
```

OUTPUT:

f_name	m_init	l_name	ssn	dob	address	gender	salary	super_ssn	d_no
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000.00	333445555	5
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000.00	888665555	5
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000.00	333445555	5
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5

```
4 rows in set (0.00 sec)
```

9. Retrieve all the attributes of an EMPLOYEE and the attributes of the DEPARTMENT in which he or she works for every employee of the 'Research' department.

```
mysql> select ssn, d_name
    -> from Employee, Department
    -> where d_name = 'Research' and d_no = d_number;
```

OUTPUT:

```
+-------------+-----------+
| ssn         | d_name    |
+-------------+-----------+
| 123456789   | Research  |
| 333445555   | Research  |
| 453453453   | Research  |
| 666884444   | Research  |
+-------------+-----------+
4 rows in set (0.00 sec)
```

10. Display the CROSS PRODUCT of the EMPLOYEE and DEPARTMENT relations.

```
mysql> select * from Employee, Department;
```

OUTPUT:

f_name	m_init	l_name	ssn	dob	address	gender	salary	super_ssn	d_no	d_name	d_number	mgr_ssn	mgr_start_date
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000.00	333445555	5	Research	5	333445555	1988-05-22
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000.00	333445555	5	Administration	4	987654321	1995-01-01
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000.00	333445555	5	Headquarters	1	888665555	1981-06-19
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000.00	888665555	5	Research	5	333445555	1988-05-22
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000.00	888665555	5	Administration	4	987654321	1995-01-01
Franklin	T	Wong	333445555	1955-12-08	638 Voss, Houston, TX	M	40000.00	888665555	5	Headquarters	1	888665555	1981-06-19
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000.00	333445555	5	Research	5	333445555	1988-05-22
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000.00	333445555	5	Administration	4	987654321	1995-01-01
Joyce	A	English	453453453	1972-07-31	5631 Rice, Houston, TX	F	25000.00	333445555	5	Headquarters	1	888665555	1981-06-19
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5	Research	5	333445555	1988-05-22
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5	Administration	4	987654321	1995-01-01
Ramesh	K	Narayan	666884444	1962-09-15	975 Fire Oak, Humble, TX	M	38000.00	333445555	5	Headquarters	1	888665555	1981-06-19
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000.00	NULL	1	Research	5	333445555	1988-05-22
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000.00	NULL	1	Administration	4	987654321	1995-01-01
James	E	Borg	888665555	1937-11-10	450 Stone, Houston, TX	M	55000.00	NULL	1	Headquarters	1	888665555	1981-06-19
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000.00	888665555	4	Research	5	333445555	1988-05-22
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000.00	888665555	4	Administration	4	987654321	1995-01-01
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry, Bellaire, TX	F	43000.00	888665555	4	Headquarters	1	888665555	1981-06-19
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000.00	987654321	4	Research	5	333445555	1988-05-22
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000.00	987654321	4	Administration	4	987654321	1995-01-01
Ahmad	V	Jabbar	987987987	1969-03-29	980 Dallas, Houston, TX	M	25000.00	987654321	4	Headquarters	1	888665555	1981-06-19
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000.00	987654321	4	Research	5	333445555	1988-05-22
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000.00	987654321	4	Administration	4	987654321	1995-01-01
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle, Spring, TX	F	25000.00	987654321	4	Headquarters	1	888665555	1981-06-19

24 rows in set (0.00 sec)