UPES

University of Petroleum

&

Energy Studies

SCHOOL OF COMPUTER SCIENCE

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BATCH: 1

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Semester: 3

Experiment 3: To understand DDL and DML Command

Objective: To understand the concept of designing issue related to the database with creating, populating the tables. To understand the concept of data constraints that is enforced on data being stored in the table. Focus on Primary Key and the Foreign Key.

1. Create the tables for Company database as per ER diagram of Exp 2.

- Creating and Using Database

```
mysql> CREATE DATABASE IF NOT EXISTS Company;
Query OK, 1 row affected (0.14 sec)

mysql> USE Company;
Database changed
```

- TABLE 1: DEPARTMENT

```
mysql> 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)
    -> );
Query OK, 0 rows affected (0.14 sec)
```

- TABLE 2: EMPLOYEE

```
mysql> CREATE TABLE EMPLOYEE (
    ->      Fname VARCHAR(15) NOT NULL,
    ->      Minit CHAR(1),
    ->      Lname VARCHAR(15) NOT NULL,
    ->      Ssn CHAR(9) NOT NULL,
    ->      Bdate DATE,
    ->      Address VARCHAR(30),
    ->      Sex CHAR(1),
    ->      Salary DECIMAL(10,2),
    ->      Super_ssn CHAR(9),
    ->      Dno INT NOT NULL,
    ->      PRIMARY KEY (Ssn),
    ->      FOREIGN KEY (Super_ssn) REFERENCES EMPLOYEE(Ssn),
    ->      FOREIGN KEY (Dno) REFERENCES DEPARTMENT(Dnumber)
    -> );
Query OK, 0 rows affected (0.20 sec)
```

- TABLE 3: Dept_Locations

```
mysql> CREATE TABLE DEPT_LOCATIONS (
    ->     Dnumber INT NOT NULL,
    ->     Dlocation VARCHAR(15) NOT NULL,
    ->     PRIMARY KEY (Dnumber, Dlocation),
    ->     FOREIGN KEY (Dnumber) REFERENCES DEPARTMENT(Dnumber)
    -> );
Query OK, 0 rows affected (0.17 sec)
```

- TABLE 4: PROJECT

```
mysql> 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)
    -> );
Query OK, 0 rows affected (0.16 sec)
```

- TABLE 5: WORKS_ON

```
mysql> 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)
    -> );
Query OK, 0 rows affected (0.20 sec)
```

- TABLE 6: DEPENDENT

```
mysql> CREATE TABLE DEPENDENT (
    ->     Essn CHAR(9) NOT NULL,
    ->     Dependent_name VARCHAR(15) NOT NULL,
    ->     Sex CHAR(1),
    ->     Bdate DATE,
    ->     Relationship VARCHAR(8),
    ->     PRIMARY KEY (Essn, Dependent_name),
    ->     FOREIGN KEY (Essn) REFERENCES EMPLOYEE(Ssn)
    -> );
Query OK, 0 rows affected (0.18 sec)
```

- ALL TABLES:

```
mysql> SHOW TABLES
    -> FROM Company;
+--------------------+
| Tables_in_company  |
+--------------------+
| department         |
| dependent          |
| dept_locations     |
| employee           |
| project            |
| works_on           |
+--------------------+
6 rows in set (0.13 sec)
```

2. Insert the following data into their respective tables of Company database.

- Department

```
mysql> INSERT INTO DEPARTMENT (Dname, Dnumber, Mgr_ssn, Mgr_start_date)
    -> VALUES
    ->     ('Research', 5, '333445555', '1988-05-22'),
    ->     ('Administration', 4, '987654321', '1995-01-01'),
    ->     ('Headquarters', 1, '888665555', '1981-06-19');
Query OK, 3 rows affected (0.14 sec)
Records: 3  Duplicates: 0  Warnings: 0
```

- Employee

```
mysql> INSERT INTO EMPLOYEE (Fname, Lname, Ssn, Bdate, Address, Sex, Salary, Super_ssn, Dno)
    -> VALUES
    ->     ('James', 'Borg', '888665555', '1937-11-10', '450 Stone, Houston TX', 'M', 55000, NULL, 1),
    ->     ('Jennifer', 'Wallace', '987654321', '1941-06-20', '291 Berry, Bellaire TX', 'F', 43000, '888665555', 4),
    ->     ('Franklin', 'Wong', '333445555', '1965-12-08', '638 Voss, Houston TX', 'M', 40000, '888665555', 5);
Query OK, 3 rows affected (0.14 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> INSERT INTO EMPLOYEE (Fname, Lname, Ssn, Bdate, Address, Sex, Salary, Super_ssn, Dno)
    -> VALUES
    ->     ('John', 'Smith', '123456789', '1965-01-09', '731 Fondren, Houston TX', 'M', 30000, '333445555', 5),
    ->     ('Alicia', 'Zelaya', '999887777', '1968-01-19', '3321 Castle, Spring TX', 'F', 25000, '987654321', 4),
    ->     ('Ramesh', 'Narayan', '666884444', '1962-09-15', '975 Fire Oak, Humble TX', 'M', 38000, '333445555', 5),
    ->     ('Joyce', 'English', '453453453', '1972-07-31', '5631 Rice, Houston TX', 'F', 25000, '333445555', 5),
    ->     ('Ahmad', 'Jabbar', '987987987', '1969-03-29', '980 Dallas, Houston TX', 'M', 25000, '987654321', 4);
Query OK, 5 rows affected (0.14 sec)
Records: 5  Duplicates: 0  Warnings: 0
```

- Project

```
mysql> INSERT INTO PROJECT (Pname, Pnumber, Plocation, Dnum)
    -> 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);
Query OK, 6 rows affected (0.14 sec)
Records: 6  Duplicates: 0  Warnings: 0
```

- Works_on

```
mysql> INSERT INTO WORKS_ON (Essn, Pno, Hours)
    -> VALUES ('888665555', 20, NULL);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO WORKS_ON (Essn, Pno, Hours)
    -> VALUES
    ->      ('123456789', 1, 32.5),
    ->      ('123456789', 2, 7.5),
    ->      ('666884444', 3, 40.0),
    ->      ('453453453', 1, 20.0),
    ->      ('453453453', 2, 20.0),
    ->      ('333445555', 2, 10.0),
    ->      ('333445555', 3, 10.0),
    ->      ('333445555', 10, 10.0),
    ->      ('333445555', 20, 10.0),
    ->      ('999887777', 30, 30.0),
    ->      ('999887777', 10, 10.0),
    ->      ('987987987', 10, 35.0),
    ->      ('987987987', 30, 5.0),
    ->      ('987654321', 30, 20.0),
    ->      ('987654321', 20, 15.0);
Query OK, 15 rows affected (0.14 sec)
Records: 15  Duplicates: 0  Warnings: 0
```

- Dependent

```
mysql> INSERT INTO DEPENDENT (Essn, Dependent_name, Sex, Bdate, Relationship)
    -> VALUES
    ->      ('333445555', 'Alice', 'F', '1986-04-04', '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');
Query OK, 7 rows affected (0.12 sec)
Records: 7  Duplicates: 0  Warnings: 0
```

- Dept_Location

```
mysql> INSERT INTO DEPT_LOCATIONS (Dnumber, Dlocation)
    -> VALUES
    ->      (1, 'Houston'),
    ->      (4, 'Stafford'),
    ->      (5, 'Bellaire'),
    ->      (5, 'Houston');
Query OK, 4 rows affected (0.07 sec)
Records: 4  Duplicates: 0  Warnings: 0
```
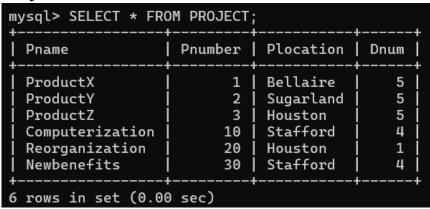
3. Display Tables

- Department

```
mysql> SELECT * FROM DEPARTMENT;
+----------------+---------+-----------+----------------+
| Dname          | Dnumber | 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)
```

- Employee

```
mysql> SELECT * FROM EMPLOYEE;
+----------+-------+---------+-----------+------------+-----------------------+-----+----------+-----------+-----+
| Fname    | Minit | Lname   | Ssn       | Bdate      | Address               | Sex | Salary   | Super_ssn | Dno |
+----------+-------+---------+-----------+------------+-----------------------+-----+----------+-----------+-----+
| John     | NULL  | Smith   | 123456789 | 1965-01-09 | 731 Fondren, Houston TX | M   | 30000.00 | 333445555 |   5 |
| Franklin | NULL  | Wong    | 333445555 | 1965-12-08 | 638 Voss, Houston TX  | M   | 40000.00 | 888665555 |   5 |
| Joyce    | NULL  | English | 453453453 | 1972-07-31 | 5631 Rice, Houston TX | F   | 25000.00 | 333445555 |   5 |
| Ramesh   | NULL  | Narayan | 666884444 | 1962-09-15 | 975 Fire Oak, Humble TX | M | 38000.00 | 333445555 |   5 |
| James    | NULL  | Borg    | 888665555 | 1937-11-10 | 450 Stone, Houston TX | M   | 55000.00 | NULL      |   1 |
| Jennifer | NULL  | Wallace | 987654321 | 1941-06-20 | 291 Berry, Bellaire TX | F  | 43000.00 | 888665555 |   4 |
| Ahmad    | NULL  | Jabbar  | 987987987 | 1969-03-29 | 980 Dallas, Houston TX | M  | 25000.00 | 987654321 |   4 |
| Alicia   | NULL  | Zelaya  | 999887777 | 1968-01-19 | 3321 Castle, Spring TX | F  | 25000.00 | 987654321 |   4 |
+----------+-------+---------+-----------+------------+-----------------------+-----+----------+-----------+-----+
8 rows in set (0.00 sec)
```

- Project

```
mysql> SELECT * FROM PROJECT;
+-----------------+---------+-----------+------+
| Pname           | Pnumber | Plocation | Dnum |
+-----------------+---------+-----------+------+
| ProductX        |       1 | Bellaire  |    5 |
| ProductY        |       2 | Sugarland |    5 |
| ProductZ        |       3 | Houston   |    5 |
| Computerization |      10 | Stafford  |    4 |
| Reorganization  |      20 | Houston   |    1 |
| Newbenefits     |      30 | Stafford  |    4 |
+-----------------+---------+-----------+------+
6 rows in set (0.00 sec)
```

- WORKS_ON

```
mysql> SELECT * FROM WORKS_ON;
+-----------+-----+-------+
| Essn      | Pno | Hours |
+-----------+-----+-------+
| 123456789 |   1 |  32.5 |
| 123456789 |   2 |   7.5 |
| 333445555 |   2 |  10.0 |
| 333445555 |   3 |  10.0 |
| 333445555 |  10 |  10.0 |
| 333445555 |  20 |  10.0 |
| 453453453 |   1 |  20.0 |
| 453453453 |   2 |  20.0 |
| 666884444 |   3 |  40.0 |
| 888665555 |  20 |  NULL |
| 987654321 |  20 |  15.0 |
| 987654321 |  30 |  20.0 |
| 987987987 |  10 |  35.0 |
| 987987987 |  30 |   5.0 |
| 999887777 |  10 |  10.0 |
| 999887777 |  30 |  30.0 |
+-----------+-----+-------+
16 rows in set (0.00 sec)
```

- DEPENDENT

```
mysql> SELECT * FROM DEPENDENT;
+-----------+----------------+-----+------------+--------------+
| Essn      | Dependent_name | Sex | Bdate      | Relationship |
+-----------+----------------+-----+------------+--------------+
| 123456789 | Alice          | F   | 1988-12-30 | Daughter     |
| 123456789 | Elizabeth      | F   | 1967-05-05 | Spouse       |
| 123456789 | Michael        | M   | 1988-01-04 | Son          |
| 333445555 | Alice          | F   | 1986-04-04 | Daughter     |
| 333445555 | Joy            | F   | 1958-05-03 | Spouse       |
| 333445555 | Theodore       | M   | 1983-10-25 | Son          |
| 987654321 | Abner          | M   | 1942-02-28 | Spouse       |
+-----------+----------------+-----+------------+--------------+
7 rows in set (0.00 sec)
```

- DEPT_LOCATIONS

```
mysql> SELECT * FROM DEPT_LOCATIONS;
+---------+-----------+
| Dnumber | Dlocation |
+---------+-----------+
|       1 | Houston   |
|       4 | Stafford  |
|       5 | Bellaire  |
|       5 | Houston   |
|       5 | Sugarland |
+---------+-----------+
5 rows in set (0.00 sec)
```