

# EXPERIMENT 3

## Title: 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

- Create the tables for Company database as per ER diagram of Exp 2
- Insert the following data into their respective tables of Company database

The screenshot shows a database query editor with the following content:

```

Query 1 x
-- Abhinav Singla
-- 500120278
CREATE DATABASE CompanyDB;

USE CompanyDB;

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
);

INSERT INTO EMPLOYEE (Fname, Minit, Lname, Ssn, Bdate, Address, Sex, Salary, Super_ssn, Dno) VALUES
('John', 'B', 'Smith', '123456789', '1965-01-09', '731 Fondren, Houston TX', 'M', 30000, '333445555', 5),
('Franklin', 'T', 'Wong', '333445555', '1965-12-08', '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);
    
```

The Action Output table shows the execution of the commands:

| # | Time     | Action                    |
|---|----------|---------------------------|
| 1 | 11:03:08 | show databases            |
| 2 | 11:03:08 | CREATE DATABASE CompanyDB |

The bottom part of the screenshot shows the continuation of the SQL commands, including the INSERT statement with 8 rows of data.

32

33 • CREATE TABLE DEPARTMENT (

34 Dname VARCHAR(15) NOT NULL,

35 Dnumber INT NOT NULL,

36 Mgr\_ssn CHAR(9) NOT NULL,

37 Mgr\_start\_date DATE,

38 PRIMARY KEY (Dnumber),

39 UNIQUE (Dname),

40 FOREIGN KEY (Mgr\_ssn) REFERENCES EMPLOYEE(Ssn)

41 );

42

43 • INSERT INTO DEPARTMENT (Dname, Dnumber, Mgr\_ssn, Mgr\_start\_date) VALUES

---

Output

Action Output

| # | Time     | Action  | Message           |
|---|----------|---|-------------------|
| 1 | 10:37:54 | 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)) | 0 row(s) affected |

42

43 • INSERT INTO DEPARTMENT (Dname, Dnumber, Mgr\_ssn, Mgr\_start\_date) VALUES

44 ('Research', 5, '333445555', '1988-05-22'),

45 ('Administration', 4, '987654321', '1995-01-01'),

46 ('Headquarters', 1, '888665555', '1981-06-19');

47

48 • CREATE TABLE DEPT\_LOCATIONS (

49 Dnumber INT NOT NULL,

50 Dlocation VARCHAR(15) NOT NULL,

51 PRIMARY KEY (Dnumber, Dlocation),

52 FOREIGN KEY (Dnumber) REFERENCES DEPARTMENT(Dnumber)

53 );

54

55 • INSERT INTO DEPT\_LOCATIONS (DNUMBER, DLOCATION) VALUES

---

Output

Action Output

| # | Time     | Action   | Message           |
|---|----------|--|-------------------|
| 1 | 10:37:54 | 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))    | 0 row(s) affected |
| 2 | 10:38:21 | 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') | 3 row(s) affected |

47

48 • CREATE TABLE DEPT\_LOCATIONS (

49 Dnumber INT NOT NULL,

50 Dlocation VARCHAR(15) NOT NULL,

51 PRIMARY KEY (Dnumber, Dlocation),

52 FOREIGN KEY (Dnumber) REFERENCES DEPARTMENT(Dnumber)

53 );

54

55 • INSERT INTO DEPT\_LOCATIONS (DNUMBER, DLOCATION) VALUES

---

Output

Action Output

| # | Time     | Action   | Message           |
|---|----------|--|-------------------|
| 1 | 10:37:54 | 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))    | 0 row(s) affected |
| 2 | 10:38:21 | 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') | 3 row(s) affected |
| 3 | 10:38:23 | INSERT INTO DEPT_LOCATIONS (DNUMBER, DLOCATION) VALUES (5, 'New York'), (5, 'San Francisco'), (4, 'Chicago'), (4, 'London'), (1, 'Tokyo'), (1, 'Sydney')   | 6 row(s) affected |
| 4 | 10:38:42 | CREATE TABLE DEPT_LOCATIONS ( Dnumber INT NOT NULL, Dlocation VARCHAR(15) NOT NULL, PRIMARY KEY (Dnumber, Dlocation), FOREIGN KEY (Dnumber) REFERENCES DEPARTMENT(Dnumber))  | 0 row(s) affected |

```

53 );
54
55 • INSERT INTO DEPT_LOCATIONS (DNUMBER, DLOCATION) VALUES
56 (1, 'Houston'),
57 (4, 'Stafford'),
58 (5, 'Bellaire'),
59 (5, 'Houston'),
60 (5, 'Sugarland');
61

```

Output

| # | Time     | Action   | Message  |
|---|----------|--|----------|
| 1 | 10:37:54 | CREATE TABLE DEPARTMENT ( Dname VARCHAR(15) NOT NULL, Dnumber INT NOT NULL, Mgr_ssn CHAR(9) NOT NULL, Mgr_start_dat...                             | 0 row(s) |
| 2 | 10:38:21 | INSERT INTO DEPARTMENT (Dname, Dnumber, Mgr_ssn, Mgr_start_date) VALUES ('Research', 5, '333445555', '1988-05-22'), ('Administration', 4, '9876... | 3 row(s) |
| 3 | 10:38:23 | INSERT INTO DEPARTMENT (Dname, Dnumber, Mgr_ssn, Mgr_start_date) VALUES ('Research', 5, '333445555', '1988-05-22'), ('Administration', 4, '9876... | Error C  |
| 4 | 10:38:42 | CREATE TABLE DEPT_LOCATIONS ( Dnumber INT NOT NULL, Dlocation VARCHAR(15) NOT NULL, PRIMARY KEY (Dnumber, Dlocation), ...                          | 0 row(s) |
| 5 | 10:39:04 | INSERT INTO DEPT_LOCATIONS (DNUMBER, DLOCATION) VALUES (1, 'Houston'), (4, 'Stafford'), (5, 'Bellaire'), (5, 'Houston'), (5, 'Sugarland')          | 5 row(s) |

```

62 • CREATE TABLE PROJECT (
63     Pname VARCHAR(15) NOT NULL,
64     Pnumber INT NOT NULL,
65     Plocation VARCHAR(15),
66     Dnum INT NOT NULL
67 );

```

Output

| # | Time     | Action  | Message           |
|---|----------|---|-------------------|
| 1 | 10:39:25 | CREATE TABLE PROJECT ( Pname VARCHAR(15) NOT NULL, Pnumber INT NOT NULL, Plocation VARCHAR(15), Dnum INT NOT NULL ) | 0 row(s) affected |

```

8
9 • INSERT INTO PROJECT (Pname, Pnumber, Plocation, Dnum) VALUES
10 ('ProductX', 1, 'Bellaire', 5),
11 ('ProductY', 2, 'Sugarland', 5),
12 ('ProductZ', 3, 'Houston', 5),
13 ('Computerization', 10, 'Stafford', 4),
14 ('Reorganization', 20, 'Houston', 1),
15 ('Newbenefits', 30, 'Stafford', 4);
16
17 • CREATE TABLE WORKS_ON (
18     Essn CHAR(9) NOT NULL,

```

Output

| # | Time     | Action   | Message               |
|---|----------|--|-----------------------|
| 1 | 10:39:25 | CREATE TABLE PROJECT ( Pname VARCHAR(15) NOT NULL, Pnumber INT NOT NULL, Plocation VARCHAR(15), Dnum INT NOT NULL )  | 0 row(s) affected     |
| 2 | 10:39:47 | INSERT INTO PROJECT (Pname, Pnumber, Plocation, Dnum) VALUES ('ProductX', 1, 'Bellaire', 5), ('ProductY', 2, 'Sugarland', 5), ('ProductZ', 3, 'Houston', ... | 6 row(s) affected Rec |

```

77 CREATE TABLE WORKS_ON (
78     Essn CHAR(9) NOT NULL,
79     Pno INT NOT NULL,
80     Hours DECIMAL(3,1) NOT NULL
81 );

```

Output

| # | Time     | Action  | Message  |
|---|----------|---|--|
| 1 | 10:39:25 | CREATE TABLE PROJECT ( Pname VARCHAR(15) NOT NULL, Pnumber INT NOT NULL, Plocation VARCHAR(15), Dnum INT NOT NULL )   | 0 row(s) affected                                    |
| 2 | 10:39:47 | INSERT INTO PROJECT (Pname, Pnumber, Plocation, Dnum) VALUES ('ProductX', 1, 'Bellaire', 5), ('ProductY', 2, 'Sugarland', 5), ('ProductZ', 3, 'Houston', 5) | 6 row(s) affected Rows: 6, Duplicates: 0, Ignored: 0 |
| 3 | 10:40:03 | CREATE TABLE WORKS_ON ( Essn CHAR(9) NOT NULL, Pno INT NOT NULL, Hours DECIMAL(3,1) NOT NULL )  | 0 row(s) affected                                    |

Query 1 x

Limit to 1000 rows

```

57 );
58 INSERT INTO WORKS_ON (Essn, Pno, Hours) VALUES
59 ('123456789', 1, 32.5),
60 ('123456789', 2, 7.5),
61 ('666884444', 3, 40.0),
62 ('453453453', 1, 20.0),
63 (453453453, 2, 20.0),
64 (333445555, 2, 10.0 ),
65 (333445555, 3, 10.0 ),
66 (333445555, 10, 10.0 ),
67 (333445555, 20, 10.0 ),
68 (999887777, 30, 30.0 ),
69 (999887777, 10, 10.0 ),
70 (987987987, 10, 35.0 ),
71 (987987987, 30, 5.0 ),
72 (987654321, 30, 20.0 ),
73 (987654321, 20, 15.0 ),
74 (888665555, 20, null) ;
75
76

```

```

98  ( '987654321', '20', '1970' );
99
100 CREATE TABLE DEPENDENT (
101     Essn CHAR(9) NOT NULL,
102     Dependent_name VARCHAR(15) NOT NULL,
103     Sex CHAR,
104     Bdate DATE,
105     Relationship VARCHAR(8),
106     PRIMARY KEY (Essn, Dependent_name),
107     FOREIGN KEY (Essn) REFERENCES EMPLOYEE(Ssn)
108 );
109
110 INSERT INTO DEPENDENT (ESSN, DEPENDENT_NAME, SEX, BDATE, RELATIONSHIP) VALUES
111 ('333445555', 'Alice', 'F', '1986-04-04', 'Daughter'),
112 ('333445555', 'Theodore', 'M', '1983-10-25', 'Son'),
113 ('333445555', 'Joy', 'F', '1958-05-03', 'Spouse'),
114 ...

```

Output:

| # | Time     | Action  | Message                       |
|---|----------|---|-------------------------------|
| 1 | 10:41:42 | INSERT INTO WORKS_ON (Essn, Pno, Hours) VALUES (123456789, 1, 32.5), (123456789, 2, 7.5), (666884444, 3, 40.0), (453453453, 1, 20.0), (453... | 15 row(s) affected Records: 1 |
| 2 | 10:42:17 | CREATE TABLE DEPENDENT ( Essn CHAR(9) NOT NULL, Dependent_name VARCHAR(15) NOT NULL, Sex CHAR, Bdate DATE, Relatio...                         | 0 row(s) affected             |

```

100 -- }
109
110 INSERT INTO DEPENDENT (ESSN, DEPENDENT_NAME, SEX, BDATE, RELATIONSHIP) VALUES
111 ('333445555', 'Alice', 'F', '1986-04-04', 'Daughter'),
112 ('333445555', 'Theodore', 'M', '1983-10-25', 'Son'),
113 ('333445555', 'Joy', 'F', '1958-05-03', 'Spouse'),
114 ('987654321', 'Abner', 'M', '1942-02-28', 'Spouse'),
115 ('123456789', 'Michael', 'M', '1988-01-04', 'Son'),
116 ('123456789', 'Alice', 'F', '1988-12-30', 'Daughter'),
117 ('123456789', 'Elizabeth', 'F', '1967-05-05', 'Spouse');
118
119

```

Output:

| # | Time     | Action  | Message  |
|---|----------|---|--|
| 1 | 10:41:42 | INSERT INTO WORKS_ON (Essn, Pno, Hours) VALUES (123456789, 1, 32.5), (123456789, 2, 7.5), (666884444, 3, 40.0), (453453453, 1, 20.0), (453... | 15 row(s) affected Records: 15 Duplicates: 0 Warnings: 0 |
| 2 | 10:42:17 | CREATE TABLE DEPENDENT ( Essn CHAR(9) NOT NULL, Dependent_name VARCHAR(15) NOT NULL, Sex CHAR, Bdate DATE, Relatio...                         | 0 row(s) affected  |
| 3 | 10:42:36 | INSERT INTO DEPENDENT (ESSN, DEPENDENT_NAME, SEX, BDATE, RELATIONSHIP) VALUES (333445555, 'Alice', 'F', '1986-04-04', 'Daughter), (...        | 7 row(s) affected Records: 7 Duplicates: 0 Warnings: 0   |