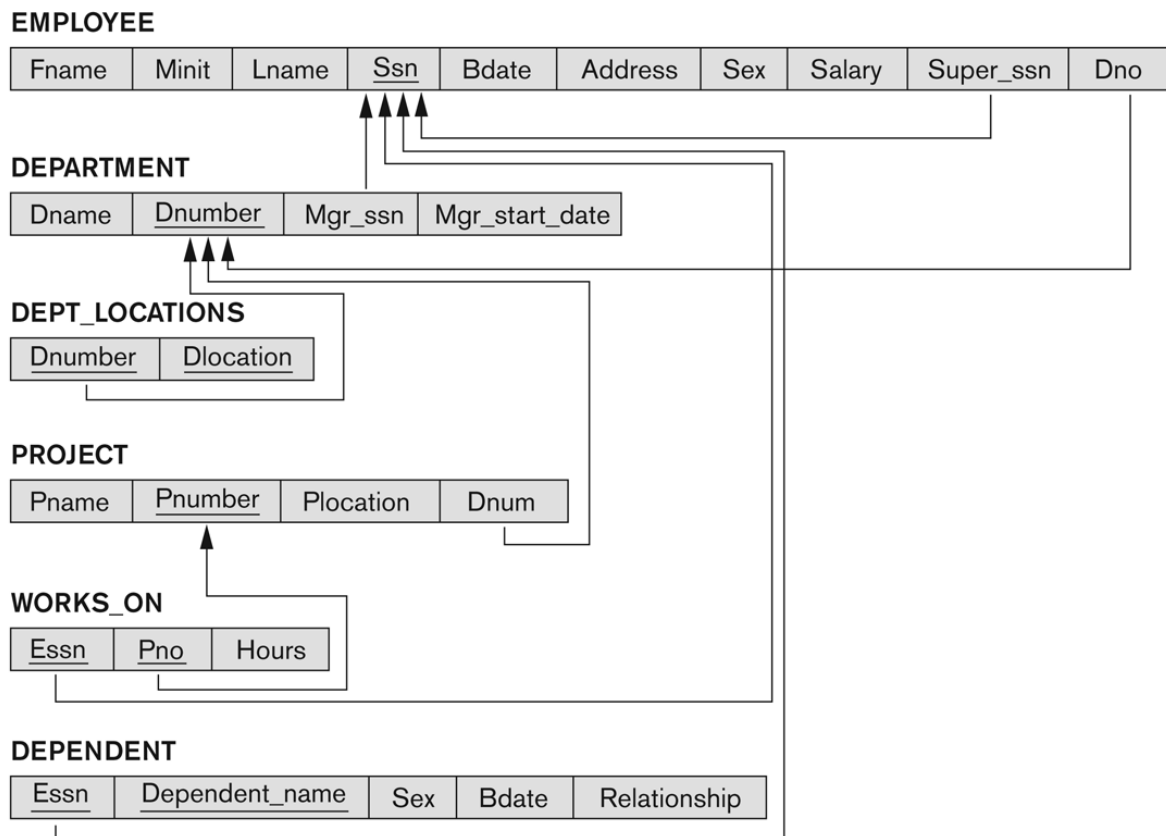


# 1. Creating a Relational Database Schema from ER Diagram, Populating the Database and Querying over the database with SQL

**Figure 5.7**

Referential integrity constraints displayed on the COMPANY relational database schema.



## CREATE TABLE EMPLOYEE

```
( Fname      VARCHAR(10) NOT NULL,
  Minit      CHAR,
  Lname      VARCHAR(20)  NOT NULL,
  Ssn        CHAR(9)     NOT NULL,
  Bdate      DATE,
  Address    VARCHAR(30),
  Sex        CHAR(1),
  Salary     DECIMAL(5),
  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  
( Dnumber      INT          NOT NULL,  
  Dlocation     VARCHAR(15)  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) );
```

## Insertion

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

```
INSERT INTO EMPLOYEE VALUES ('John','B','Smith',123456789,'1965-01-09','731 Fondren, Houston  
TX','M',30000,333445555,5);
```

```

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

```

```

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

```

```

INSERT INTO WORKS_ON VALUES (123456789,1,32.5);
INSERT INTO WORKS_ON VALUES (123456789,2,7.5);
INSERT INTO WORKS_ON VALUES (666884444,3,40.0);
INSERT INTO WORKS_ON VALUES (453453453,1,20.0);
INSERT INTO WORKS_ON VALUES (453453453,2,20.0);
INSERT INTO WORKS_ON VALUES (333445555,2,10.0);
INSERT INTO WORKS_ON VALUES (333445555,3,10.0);
INSERT INTO WORKS_ON VALUES (333445555,10,10.0);
INSERT INTO WORKS_ON VALUES (333445555,20,10.0);
INSERT INTO WORKS_ON VALUES (999887777,30,30.0);
INSERT INTO WORKS_ON VALUES (999887777,10,10.0);
INSERT INTO WORKS_ON VALUES (987987987,10,35.0);
INSERT INTO WORKS_ON VALUES (987987987,30,5.0);
INSERT INTO WORKS_ON VALUES (987654321,30,20.0);
INSERT INTO WORKS_ON VALUES (987654321,20,15.0);
INSERT INTO WORKS_ON VALUES (888665555,20,null);

```

```

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

```

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

#### **4. Update the following new changes into the database:**

- 1) Joyce English with Ssn = 453453453 got married with John.
- 2) Jenifer Wallace with Ssn = 987654321 just had a new daughter named Erica.
- 3) Jenifer Wallace with Ssn = 987654321 is just assigned to a new project number '10' to work on.