

Relational Database Design – Company Schema

1. Design the Company Schema given in the text book named “Fundamentals of Database Systems” authored by Ramez Elmasri and Shamkant B. Navathe. The e-copy of the text book is uploaded in the moodle.

```
mysql> use deepak;  
Database changed
```

```
mysql> create table employee( Fname char(50),Minit char(50),Lname char(50),Ssn INT primary key,  
Bdate date, Address varchar(50),Sex char(10),Salary INT,Super_ssn INT,Dno INT);  
Query OK, 0 rows affected (0.06 sec)
```

```
mysql> show tables;  
+-----+  
| Tables_in_deepak |  
+-----+  
| employee          |  
+-----+  
1 row in set (0.00 sec)
```

```
mysql> create table Department(Dname char(50),Dnumber INT primary key,Mgr_ssn  
INT,Mgr_start_date date);  
Query OK, 0 rows affected (0.05 sec)  
mysql> show tables;
```

```
+-----+  
| Tables_in_dev |  
+-----+  
| Department    |  
| employee      |  
+-----+  
2 rows in set (0.00 sec)
```

```
mysql> create table DEPT_LOCATIONS(Dnumber INT,Dlocation char(50),primary  
key(Dnumber,Dlocation));  
Query OK, 0 rows affected (0.03 sec)
```

```
mysql> create table WORKS_ON(Essn INT,Pno INT,Hours decimal(3,1),primary key(Essn,Pno));  
'Query OK, 0 rows affected (0.05 sec)
```

```
mysql> show tables;  
+-----+  
| Tables_in_deepak |  
+-----+  
| DEPT_LOCATIONS |  
| Department      |  
| WORKS_ON        |
```

```
| employee      |
+-----+
4 rows in set (0.00 sec)
```

```
mysql> create table project(Pname char(50),Pnumber int primary key,Plocation char(50),Dnum int);
Query OK, 0 rows affected (0.02 sec)
```

```
mysql> create table DEPENDENT(Essn INT,Dependent_name char(50),Sex char,Bdate
date,Relationship char(50),primary key(Essn,Dependent_name));
Query OK, 0 rows affected (0.05 sec)
```

```
mysql> show tables;
+-----+
| Tables_in_deepak |
+-----+
| DEPENDENT         |
| DEPT_LOCATIONS    |
| Department        |
| WORKS_ON          |
| employee          |
| project           |
+-----+
6 rows in set (0.01 sec)
```

```
mysql> select*from employee;
Empty set (0.00 sec)
```

```
mysql> describe employee;
+-----+-----+-----+-----+-----+-----+
| Field | Type   | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Fname  | char(50) | YES  |     | NULL    |       |
| Minit  | char(50) | YES  |     | NULL    |       |
| Lname  | char(50) | YES  |     | NULL    |       |
| Ssn    | int      | NO   | PRI | NULL    |       |
| Bdate  | date     | YES  |     | NULL    |       |
| Address | varchar(50) | YES  |     | NULL    |       |
| Sex    | char(10) | YES  |     | NULL    |       |
| Salary | int      | YES  |     | NULL    |       |
| Super_ssn | int      | YES  |     | NULL    |       |
| Dno    | int      | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
10 rows in set (0.00 sec)
```

2. Execute basic queries (Chapter 5) in Company Schema involving only two tables: Employee and Department to simulate the following keywords: CREATE, DELETE, UPDATE (or MODIFY), INSERT, ALTER, Entity Integrity Constraints and Referential Integrity Constraints.

```
mysql> insert into employee(Fname,Minit,Lname,Ssn,Bdate,Address,Sex,Salary,Super_ssn,Dno)
values('John','B','Smith',123456789,'1965-01-09','731 Fondren','M',30000,333445555,5);
Query OK, 1 row affected (0.01 sec)
```

```
mysql> select* from employee
-> ;
```

```
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Fname | Minit | Lname | Ssn    | Bdate   | Address   | Sex | Salary | Super_ssn | Dno |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| John  | B     | Smith | 123456789 | 1965-01-09 | 731 Fondren | M   | 30000 | 333445555 | 5 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)
```

```
mysql> insert into employee(Fname,Minit,Lname,Ssn,Bdate,Address,Sex,Salary,Super_ssn,Dno)
values('Franklin','T','Wong',333445555,'1955-12-08','638 Voss Houston TX','M',40000,888665555,5);
Query OK, 1 row affected (0.01 sec)
```

```
mysql> insert into employee(Fname,Minit,Lname,Ssn,Bdate,Address,Sex,Salary,Super_ssn,Dno)
values('Alicia','J','Zelaya',999887777,'1968-01-19','3321 Castle Spring TX','F',25000,987654321,4);
Query OK, 1 row affected (0.03 sec)
```

```
mysql> insert into employee(Fname,Minit,Lname,Ssn,Bdate,Address,Sex,Salary,Super_ssn,Dno)
values('Jennifer','S','Wallace',987654321,'1941-06-20','291 Berry Bellaire TX','F',43000,888665555,4);
Query OK, 1 row affected (0.03 sec)
```

```
mysql> select * from employee;
```

```
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Fname | Minit | Lname | Ssn    | Bdate   | Address           | Sex | Salary | Super_ssn | Dno |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| John  | B     | Smith | 123456789 | 1965-01-09 | 731 Fondren       | M   | 30000 | 333445555 | 5 |
|
| Franklin | T     | Wong  | 333445555 | 1955-12-08 | 638 Voss Houston TX | M   | 40000 | 888665555 | 5 |
| Jennifer | S     | Wallace | 987654321 | 1941-06-20 | 291 Berry Bellaire TX | F   | 43000 | 888665555 | 4 |
| Alicia | J     | Zelaya | 999887777 | 1968-01-19 | 3321 Castle Spring TX | F   | 25000 | 987654321 | 4 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

```
mysql> show tables;
```

```
+-----+
| Tables_in_deepak |
+-----+
| DEPENDENT         |
| DEPT_LOCATIONS    |
| Department        |
| WORKS_ON          |
| employee          |
```

```
| project      |
+-----+
6 rows in set (0.00 sec)
```

```
mysql> describe Department;
+-----+-----+-----+-----+-----+-----+
| Field      | Type   | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Dname       | char(50) | YES  |     | NULL    |      |
| Dnumber     | int      | NO   | PRI | NULL    |      |
| Mgr_ssn     | int      | YES  |     | NULL    |      |
| Mgr_start_date | date    | YES  |     | NULL    |      |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

```
mysql> insert into Department(Dname,Dnumber,Mgr_ssn,Mgr_start_date)
values('Research',5,333445555,'1988-05-22');
Query OK, 1 row affected (0.01 sec)
```

```
mysql> select * from Department;
+-----+-----+-----+-----+
| Dname   | Dnumber | Mgr_ssn | Mgr_start_date |
+-----+-----+-----+-----+
| Research | 5 | 333445555 | 1988-05-22 |
+-----+-----+-----+-----+
1 row in set (0.01 sec)
```

```
mysql> insert into Department(Dname,Dnumber,Mgr_ssn,Mgr_start_date)
values('Administration',4,987654321,'1995-01-01');
Query OK, 1 row affected (0.03 sec)
```

```
mysql> insert into Department(Dname,Dnumber,Mgr_ssn,Mgr_start_date)
values('Headquarters',1,888665555,'1981-06-19');
Query OK, 1 row affected (0.01 sec)
```

```
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 (0.01 sec)
```

```
mysql> select * from employee;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Fname  | Minit | Lname  | Ssn    | Bdate   | Address                | Sex | Salary | Super_ssn | Dno |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
```

```

+-----+-----+-----+-----+-----+-----+-----+-----+
| John   | B   | Smith | 123456789 | 1965-01-09 | 731 Fondren       | M   | 30000 | 333445555 | 5 |
|
| Franklin | T   | Wong  | 333445555 | 1955-12-08 | 638 Voss Houston TX | M   | 40000 | 888665555 | 5 |
888665555 | 5 |
| Jennifer | S   | Wallace | 987654321 | 1941-06-20 | 291 Berry Bellaire TX | F   | 43000 | 888665555 | 4 |
4 |
| Alicia  | J   | Zelaya | 999887777 | 1968-01-19 | 3321 Castle Spring TX | F   | 25000 | 987654321 | 4 |
4 |
+-----+-----+-----+-----+-----+-----+-----+-----+
4 rows in set (0.01 sec)

```

```
mysql> describe employee;
```

```

+-----+-----+-----+-----+-----+-----+
| Field   | Type      | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Fname   | char(50)  | YES  |     | NULL    |       |
| Minit   | char(50)  | YES  |     | NULL    |       |
| Lname   | char(50)  | YES  |     | NULL    |       |
| Ssn     | int       | NO   | PRI | NULL    |       |
| Bdate   | date      | YES  |     | NULL    |       |
| Address | varchar(50) | YES  |     | NULL    |       |
| Sex     | char(10)  | YES  |     | NULL    |       |
| Salary  | int       | YES  |     | NULL    |       |
| Super_ssn | int      | YES  |     | NULL    |       |
| Dno     | int       | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
10 rows in set (0.00 sec)

```

3. Execute all the example queries in Chapter 6 pertaining to the Company Schema you have created in Q. No. 1.

```
mysql> insert into Department(Dname,Dnumber,Mgr_ssn,Mgr_start_date)
values('Headquarter2',7,123456789,'1996-05-21');
Query OK, 1 row affected (0.01 sec)
```

```
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 |
| Headquarter2 | 7 | 123456789 | 1996-05-21 |
+-----+-----+-----+-----+
4 rows in set (0.01 sec)

```

```
mysql> delete from employee where Lname='Wong';
```

Query OK, 1 row affected (0.04 sec)

mysql> select *from employee;

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno
John	B	Smith	123456789	1965-01-09	731 Fondren	M	30000	333445555	5
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry Bellaire TX	F	43000	888665555	4
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle Spring TX	F	25000	987654321	4

3 rows in set (0.00 sec)

mysql> alter table employee add email varchar(50);

Query OK, 0 rows affected (0.05 sec)

Records: 0 Duplicates: 0 Warnings: 0

mysql> describe employee;

Field	Type	Null	Key	Default	Extra
Fname	char(50)	YES		NULL	
Minit	char(50)	YES		NULL	
Lname	char(50)	YES		NULL	
Ssn	int	NO	PRI	NULL	
Bdate	date	YES		NULL	
Address	varchar(50)	YES		NULL	
Sex	char(10)	YES		NULL	
Salary	int	YES		NULL	
Super_ssn	int	YES		NULL	
Dno	int	YES		NULL	
email	varchar(50)	YES		NULL	

11 rows in set (0.01 sec)

mysql> update employee set salary=70000 where Dno=4;

Query OK, 2 rows affected (0.03 sec)

Rows matched: 2 Changed: 2 Warnings: 0

mysql> select *from employee;

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno	email
-------	-------	-------	-----	-------	---------	-----	--------	-----------	-----	-------

John	B	Smith	123456789	1965-01-09	731 Fondren	M	30000	333445555	5
NULL									
Jennifer	S	Wallace	987654321	1941-06-20	291 Berry Bellaire TX	F	70000	888665555	
4	NULL								
Alicia	J	Zelaya	999887777	1968-01-19	3321 Castle Spring TX	F	70000	987654321	
4	NULL								

```
+-----+-----+-----+-----+-----+-----+-----+-----+
+-----+
```

3 rows in set (0.01 sec)

mysql> SELECT FName,LName,Address FROM employee;

+-----+-----+-----+
FName LName Address
+-----+-----+-----+
John Smith 731 Fondren
Jennifer Wallace 291 Berry Bellaire TX
Alicia Zelaya 3321 Castle Spring TX
+-----+-----+-----+

3 rows in set (0.01 sec)

mysql> show tables;

+-----+
Tables_in_deepak
+-----+
DEPENDENT
DEPT_LOCATIONS
Department
WORKS_ON
employee
project
+-----+

6 rows in set (0.00 sec)