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B.TECH. COMPUTER SCIENCE AND ENGINEERING – July - Dec, 2024
CSLR51 – Database Management Systems Laboratory

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 himanshu;  
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);
```

```
mysql> show tables;
```

```
+-----+  
| Tables_in_himanshu |  
+-----+  
| employee           |  
+-----+
```

```
mysql> create table Department(Dname char(50),Dnumber INT primary key,Mgr_ssn  
INT,Mgr_start_date date);
```

```
mysql> create table DEPT_LOCATIONS(Dnumber INT,Dlocation char(50),primary  
key(Dnumber,Dlocation));
```

```
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> 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));
```

```
mysql> show tables;
```

```
+-----+  
| Tables_in_himanshu |  
+-----+  
| DEPENDENT          |  
| DEPT_LOCATIONS     |  
| Department         |  
| WORKS_ON           |
```

```
| employee |
| project  |
+-----+
```

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    |       |
+-----+-----+-----+-----+-----+-----+
```

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   |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
```

```
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);
```

```
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);
```

```
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 |
+-----+-----+-----+-----+-----+-----+-----+-----+

```

mysql> show tables;

```

+-----+
| Tables_in_himanshu |
+-----+
| DEPENDENT          |
| DEPT_LOCATIONS    |
| Department         |
| WORKS_ON           |
| employee           |
| project            |
+-----+

```

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    |       |
+-----+-----+-----+-----+-----+-----+

```

mysql> insert into Department(Dname,Dnumber,Mgr_ssn,Mgr_start_date)
values('Research',5,333445555,'1988-05-22');

mysql> select * from Department;

```

+-----+-----+-----+-----+
| Dname  | Dnumber | Mgr_ssn | Mgr_start_date |
+-----+-----+-----+-----+
| Research | 5 | 333445555 | 1988-05-22 |
+-----+-----+-----+-----+

```

mysql> insert into Department(Dname,Dnumber,Mgr_ssn,Mgr_start_date)
values('Administration',4,987654321,'1995-01-01');

```
mysql> insert into Department(Dname,Dnumber,Mgr_ssn,Mgr_start_date)
values('Headquarters',1,888665555,'1981-06-19');
```

```
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

```
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

```
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	

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');
```

```
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 |
+-----+-----+-----+-----+

```

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

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   |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+

```

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    |       |
+-----+-----+-----+-----+-----+-----+

```

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

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 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
+-----+

```

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 |
+-----+-----+-----+

```

mysql> show tables;

```

+-----+
| Tables_in_himanshu |
+-----+
| DEPENDENT           |
| DEPT_LOCATIONS      |
| Department          |
| WORKS_ON            |
| employee            |
| project             |
+-----+

```