

# Assignment 1 – Basic SQL operations

## Exercise 1

Fetch the SQL script named *CreateCompanyDB.sql* from the materials folder of *Week 5* at the portal. Open the script file in *SQL Server Management Studio* and execute the script.

The *Company* database is now created with data.

The database content is as shown below:

One possible database state for the COMPANY relational database schema.

### EMPLOYEE

Fname	Minit	Lname	Ssn	Bdate	Address	Sex	Salary	Super_ssn	Dno
John	B	Smith	123456789	1965-01-09	731 Fondren, Houston, TX	M	30000	333445555	5
Franklin	T	Wong	333445555	1955-12-08	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

### DEPARTMENT

Dname	Dnumber	Mgr_ssn	Mgr_start_date
Research	5	333445555	1988-05-22
Administration	4	987654321	1995-01-01
Headquarters	1	888665555	1981-06-19

### DEPT\_LOCATIONS

Dnumber	Dlocation
1	Houston
4	Stafford
5	Bellaire
5	Sugarland
5	Houston

### WORKS\_ON

Essn	Pno	Hours
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
888665555	20	NULL

### 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

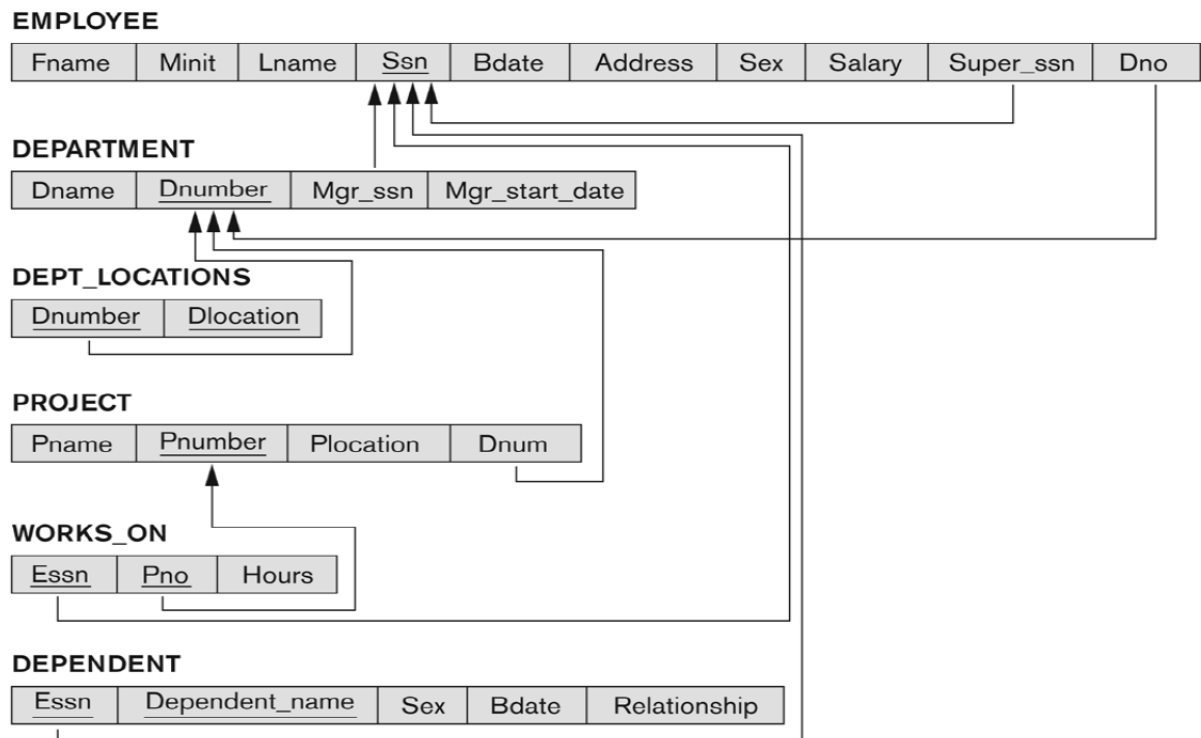
### DEPENDENT

Essn	Dependent_name	Sex	Bdate	Relationship
333445555	Alice	F	1986-04-05	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

## Exercise 2

For this exercise, use this relational database schema for the *Company* showing tables and foreign key relationships. The arrows show foreign key relationships. An arrow takes offset in the foreign key and point to the referenced primary key. Note the recursive relationship in the *Employee* relation, where the *Super\_ssn* attribute references the *Ssn* attribute of the same relation.

Referential integrity constraints displayed on the COMPANY relational database schema.



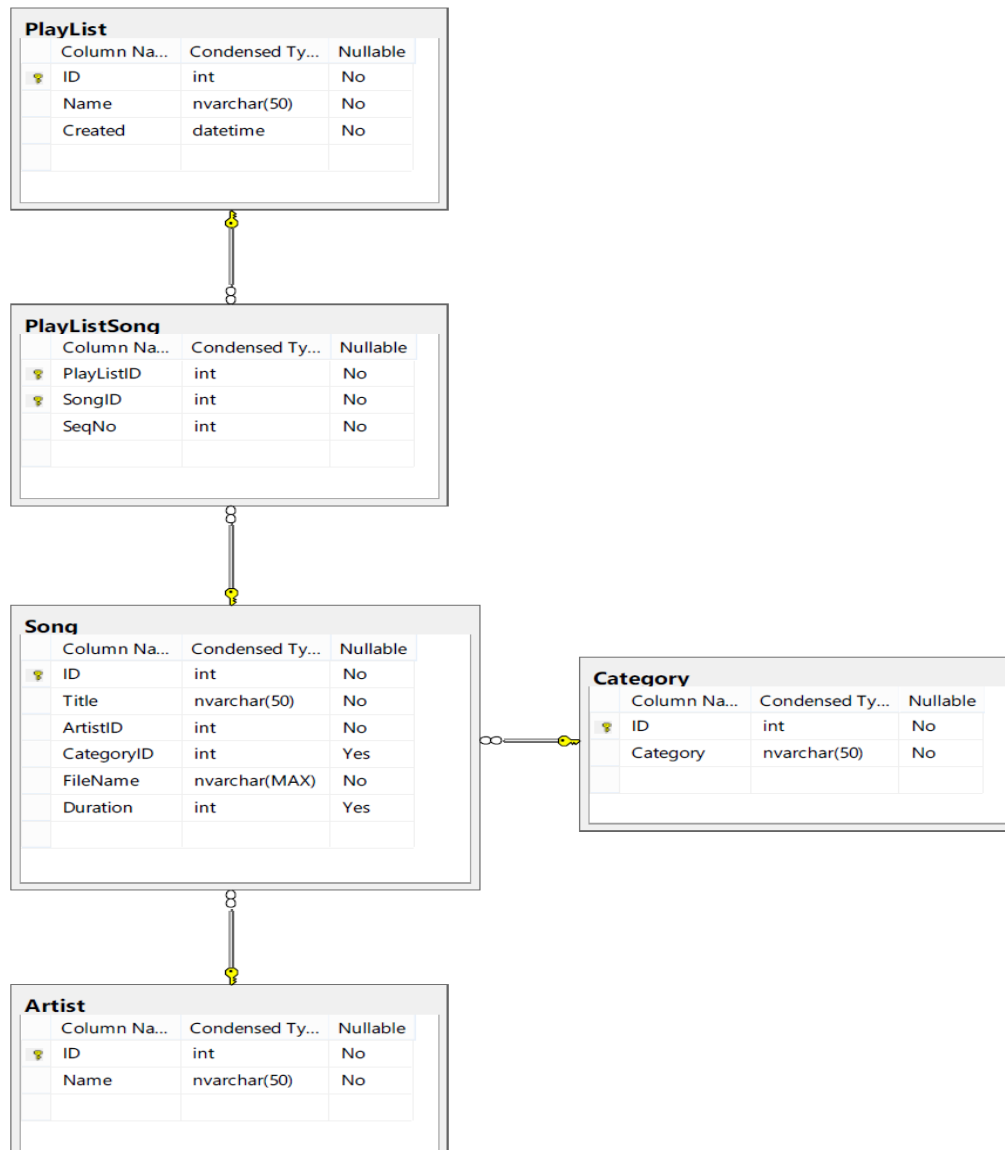
Now make sure the *Company* database is selected in the left panel of *SQL Server Management Studio*. Click the button named *New Query*. This opens up the query editor window.

Use the editor to specify the following queries for the *Company* database using *SQL SELECT statements*. Test each query by pressing the *Execute* button.

1. Read a list of ssn, fname, lname and salary for all employee.
2. Redo exercise 1, but this time show the list in decreasing order by salary.
3. Read a list of ssn, fname, lname and address for all employees from department 5.
4. Read a list of all employees working in the 'Administration' department.
5. Read a list of all projects (number, and name) controlled by the 'Research' department.
6. Read a list of all employees working on the 'ProductX' project.
7. Read a list of all employees living in Houston.

## Exercise 3 – Create database

Create a new database named *MyTunes* in SQL Server with the following design:



The primary key of the *Song*, *Category*, and the *Playlist* relations should be defined as auto-generated keys (also named Identity columns).

Hint 1: Right-click the primary key and select *Properties*. Select the property named *Identity Specification* and double-click it to turn on auto-generation of the primary key values.

Hint 2: To create a combined primary key (in the *PlaylistSong* relation) hold down the *CTRL*-key to enable multi-selection of attributes (click the left margin of the attributes). After selecting the attributes, right-click and *Set as Primary Key*.

## Exercise 4 – Data manipulation with SQL

Write SQL data manipulation statements for the MyTunes database:

1. Write 3 INSERT statements for each relation.
2. Write 3 UPDATE statements of your choice.
3. Write 3 DELETE statements of your choice.

## Exercise 5 – More joins

1. Read the song title and duration for all songs for a given artist name.
2. Read the song title, artist name, category name and duration for all songs ordered by song title.
3. Fetch a list of all artists having no songs.
4. Read the song title, artist name and duration for all songs from a given playlist.

## Exercise 6 – Scripting the database

Right-click the *MyTunes* database and select *Tasks -> Generate Scripts...*

Select to script the *entire database and all database objects*  
Click next.

In the next dialog, select to script to a *new editor window*. In the same dialog, press the *Advanced* button and set the property named *Types of data to script* to the value *Schema and Data*.

Finish the dialogs and inspect the created script. Try to explain each code section.

Save the script as *CreateMyTunesDB.sql*.