Any Issues Before Creating a Database Scheme and Initial Loading

If You Still Have Issues in using Your SQL Server to create a database:

Possible Causes:
1. If your user id is not part of Administrators of your system that is hosting your SQL server,
You have to add your user id into the admin group of your system in Control Panel ->Administration -> Computer management -> User management
If you are not the one install the SQL Server, ask the person who did in the Help desk office.

2. If the issue is not coming from Access Control, then it is coming from syntax of MS SQL.

In MS TSQL, Return key is not Submitting and get the query Executed. Query is executed by issuing GO in the next line or hit Execute button.

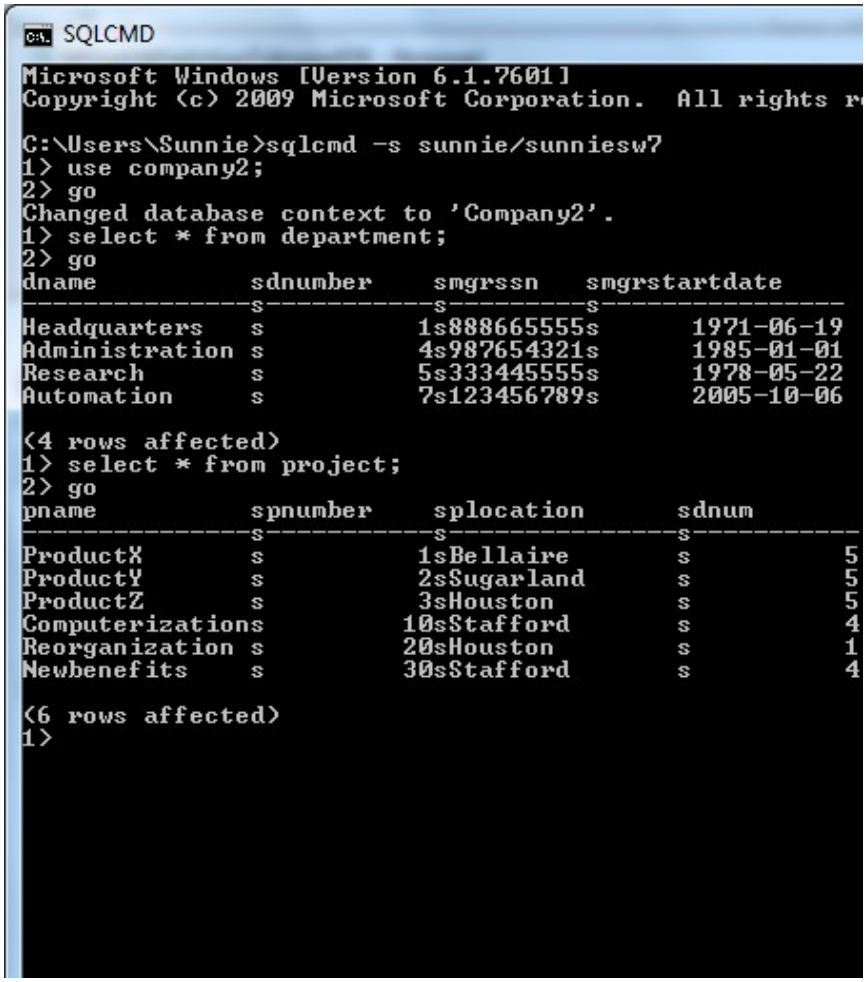
You have to change your current database to Company with Use Company; GO after creating the database in the master level.
Or setting in SQL management studio overwrites Use command in your query script, so set your current database to Company once you create it in the drop down list on the top corner of the Left side of Management Studio. By default, it is set to master when connect to the server first.

At master level, create a database first, which means you have to Execute it first (either by hitting Execute button or type Go in the next line in your script (script means the query editor where you can write multiple queries then execute them at once) then in a separate query, issue Use database-name you just create. Make sure you got MSG from your server that the database is created, then you can submit Use database command.

See the attached scripts help. Just to see how to use USE, GO, Create Database. Don't worry about the rest of the long list of option and alter stats there.

One more tip. If you have any installation issues, which usually come from version mismatch between the components, no point to try to fix. Most of time, not working. Remove all then freshly reinstall them. Note that you have to let the uninstalling program (by MS) or Remove Program by your system do all the uninstalling process. Never do it manually.

Naïve Command line MS SQL Client with Go Command as “Execute”:



Guidelines for Creating a Database Schema and Initial Loading

```
USE master;

IF DB_ID('COMPANY') IS NULL
	CREATE DATABASE COMPANY;
GO

USE COMPANY;

/*
	DROP TABLES, SO WE CAN RECREATE THEM
*/
IF OBJECT_ID('dbo.WORKS_ON') IS NOT NULL
	DROP TABLE dbo.WORKS_ON;

IF OBJECT_ID('dbo.DEPT_LOCATIONS') IS NOT NULL
	DROP TABLE dbo.DEPT_LOCATIONS;

IF OBJECT_ID('dbo.PROJECT') IS NOT NULL
	DROP TABLE dbo.PROJECT;
```

```
IF OBJECT_ID('dbo.DEPARTMENT') IS NOT NULL
	BEGIN
		ALTER TABLE dbo.EMPLOYEE DROP CONSTRAINT FK_EMPLOYEE_DNO;
		DROP TABLE dbo.DEPARTMENT;
	END

IF OBJECT_ID('dbo.DEPENDENT') IS NOT NULL
	DROP TABLE dbo.DEPENDENT;

IF OBJECT_ID('dbo.EMPLOYEE') IS NOT NULL
	DROP TABLE dbo.EMPLOYEE;

GO
```

Creating Database Scheme

Make sure you create all the tables using Create Table statements with all the columns and each PK declared first then add FK using Alter table. Do not mix the FK constraint names with PK, FK column names. To avoid confusion, do not use Constraint names in your DDL, just use Column names of PK, FK with the correct Keywords (clauses) to declare FK. Note that the sequence to create database objects matters here. You should not use any database object (for example, a table name) that you have not created in the database yet inside another table's DDL.

Don't mix the syntax specifying Constraints Name with the syntax without specifying Constraint Name. Use the very specific syntax either with specifying constraint name or without specifying constraint name, NOT a mixture of both syntax, it never going to work. Either one of the following two would be correct.

Alter Table Employee
Add Foreign Key (Super_ssn) References Employee (Ssn);

OR

ALTER TABLE EMPLOYEE
ADD CONSTRAINT FKCONSTR1
FOREIGN KEY (Super_ssn) REFERENCES EMPLOYEE(Ssn);

The typical SQL commands (DML) to populate a table and show the rows inserted into the table for this task are like the following example.

```
INSERT INTO EMPLOYEE VALUES('John','B','Smith','123456789','9-Jan-55','731 Fondren,
Houston, TX','M',30000,'987654321',5);

INSERT INTO EMPLOYEE VALUES ('James', 'E', 'Borg', 888665555, '10-Nov-27', '450
Stone, Houston, TX', 'M', 55000, NULL, 1);

…
Alter Table Employee

Add Foreign Key (Super_ssn) References Employee (Ssn);
```

Select * From Employee;

```
insert into DEPARTMENT values ('Headquarters', 1, 888665555, '19-Jun-71');

INSERT INTO DEPENDENT VALUES (123456789, 'Alice', 'F', '31-Dec-78', 'Daughter');

INSERT INTO PROJECT VALUES ('ProductX', 1, 'Bellaire', 5);

INSERT INTO WORKS_ON VALUES (123456789, 1, 32.5);
```

…

```
ALTER TABLE employee ADD

 foreign key (superssn) references employee(ssn),

 foreign key (dno) references department(dnumber);


ALTER TABLE department ADD Constraint FKMgrSsnPKSsn

 foreign key (mgrssn) references employee(ssn)
```

How to change an existing column:
Please drop the existing column and add a new column with the data type and Not Null constraint.

```
ALTER TABLE dbo.doc_exy ALTER COLUMN column_a DECIMAL (5, 2);
```

ALTER TABLE dbo.Employee
Add Address varchar(500) NOT NULL;

https://learn.microsoft.com/en-us/sql/relational-databases/tables/modify-columns-database-engine?view=sql-server-ver16

https://learn.microsoft.com/en-us/sql/t-sql/statements/alter-table-transact-sql?view=sql-server-ver16

…

Note that the sequence of creating each database object
and adding FK constraints matters here. Depends on the sequence you create them, sometimes you might want to populate Employee and Department tables first without adding FK to seed a database with PK before adding a specific FK constraint if the server complaints.

Depends on the sequence you create them, sometimes you might want to populate one table for example, Employee or Department table first to seed a database with PK before adding a specific FK constraint if the server complaints.

```
Msg 547, Level 16, State 0, Line 2

The INSERT statement conflicted with the FOREIGN KEY constraint "FK_Employee_Dno". The conflict
occurred in database "COMPANY", table "dbo.Department", column 'Dnumber'.

The statement has been terminated.
```

The error message is usually thrown out when you tried to insert invalid data into DNO column (which is FK of Employee table). Invalid data for FK Dno could be:

1. You tried to insert Non existing value of its corresponding PK column Dnumber of Department. So you tried to insert a value other than 1, 4, 5, 7 or Null in this Company example.

2. You tried to insert space " " instead of Null.

3. This error is also thrown out when you tried to insert into Dno of Employee table first even before you populate Department table, so PK Dnumber column of Department table has no value, yet you tried to insert a value into FK Dno of Employee table. As a result whatever you tried to insert into FK column is a non existing PK value because your PK Dnumber column is empty. Populate Department table first before inserting tuple Employee table.

Visualize a database ER diagram:

It is in the Object Explorer, Click on your Company database, then it will expand the database diagram and all the tables and columns you created under the database. Click database diagram -> ER diagram, then you will see the diagram in the window.

If you want to know more on this, check here.

http://msdn.microsoft.com/en-us/library/ms189279.aspx

One possible sequence for creating a database schema and initial loading:

```
Create all the Tables without FK constraints.

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

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),
)

…

Add ONLY the 5 Tables (Department, Dept_Locations, Project, Works_On, Dependent)
with FK, Unique;

Add the 2 FKs of Employee Table later once populate it first to avoid circular
reference or refer to other non-existing Table problem;


Alter Table Department
Add Foreign Key (Mgr_ssn) References Employee (Ssn)

…
```

2. Populating the COMPANY database using SQL (DML) statements.

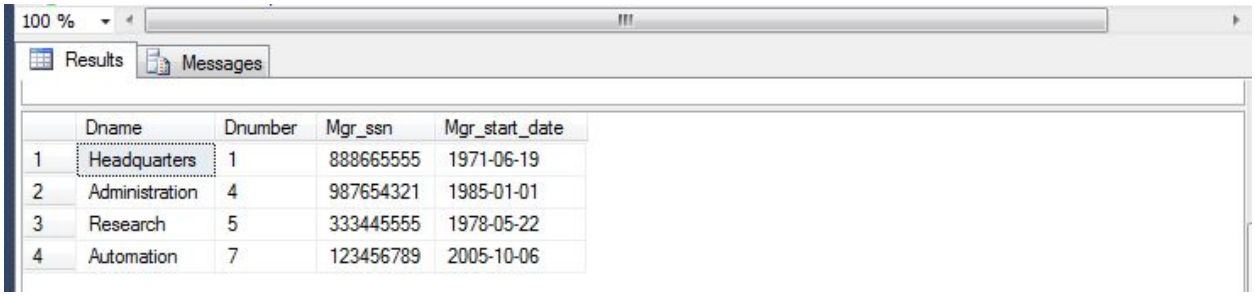
Comments //
1st, I populating the Table Employee,

```
Insert Into Employee Values ('John', 'B', 'Smith', '123456789','09-Jan-55',
'731 Fondren, Houston, TX', 'M','30000','987654321','5');

Insert Into Employee Values ('Franklin', 'T', 'Wong', '333445555','08-Dec-45',
'638 Voss, Houston, TX', 'M','40000','888665555','5');

…
```

2nd, then I populating the Table Department, now FK_Department_Mgr_ssn is valid to point to PK_Employee_Ssn;

```
Insert Into Department Values ('Headquarters','1','888665555','19-Jun-71');
Insert Into Department Values ('Administration','4','987654321','01-Jan-85');
Insert Into Department Values ('Research','5','333445555','22-May-78');
Insert Into Department Values ('Automation','7','123456789','06-Oct-05');
```

```
Select * From Department;
```



100 %

Results | Messages

	Dname	Dnumber	Mgr_ssn	Mgr_start_date
1	Headquarters	1	888665555	1971-06-19
2	Administration	4	987654321	1985-01-01
3	Research	5	333445555	1978-05-22
4	Automation	7	123456789	2005-10-06

3rd, then I specify the 2 FKs: Super_ssn & Dno of Employee table;

```
Alter Table Employee
Add Foreign Key (Super_ssn) References Employee (Ssn)

Alter Table Employee
Add Foreign Key (Dno) References Department (Dnumber)
```

4. Populate other tables in order of (Dept_Locations, Project, Works_On, Dependent)

Another Possible sequence

Another example of initial loading with data from an empty database scheme

```
-- Create EMPLOYEE table
CREATE TABLE EMPLOYEE
( Fname VARCHAR(15) NOT NULL,    -- Adding columns
Minit CHAR,
Lname VARCHAR(15) NOT NULL,       -- NOT NULL means the domain must have a value
Ssn CHAR(9) NOT NULL,            -- CHAR padded to 9 spaces
Bdate DATE,                      -- Date, YYYY-MM-DD
Address VARCHAR(30),             -- Variable length CHAR array (string)
Sex CHAR,                        -- Single character
Salary DECIMAL(10,2),            -- Decimal up to a precision of two decimal points
Super_ssn CHAR(9),
Dno INT NOT NULL,
PRIMARY KEY (Ssn)                -- Primary key constraint
);

-- Create DEPARTMENT table
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),    -- Unique value constraint - no Departments can have the same
name
FOREIGN KEY (Mgr_ssn) REFERENCES EMPLOYEE(Ssn) ); -- Foreign key constraint

-- Now that the DEPARTMENT table is defined, add the Foreign Key constraints
-- to the EMPLOYEE table.
-- Super_ssn references Ssn

ALTER TABLE EMPLOYEE
ADD CONSTRAINT FKCONSTR1
FOREIGN KEY (Super_ssn) REFERENCES EMPLOYEE(Ssn);

-- The Dno column is referenced in the Department table
ALTER TABLE EMPLOYEE
ADD CONSTRAINT FKCONSTR2
FOREIGN KEY (Dno) REFERENCES DEPARTMENT(Dnumber);

…

Add all the rest of FK constaints !

…

// Disable the first FK Constraint Temporary for the First FK to Populate the
first table in the database

ALTER TABLE COMPANYDB1.dbo.EMPLOYEE
NOCHECK CONSTRAINT FKCONSTR2;

INSERT INTO COMPANYDB1.dbo.EMPLOYEE values
('John', 'B', 'Smith', '123456789', '1955-01-09', '731 Fondren, Houston, TX', 'M',
30000, '987654321', 5),
('Franklin', 'T', 'Wong', '333445555', '1945-12-08', '638 Voss, Houston, TX', 'M',
40000, '888665555', 5),
('Joyce', 'A', 'English', '453453453', '1962-12-31', '5631 Rice, Houston, TX', 'F',
25000, '333445555', 5);
…

ALTER TABLE dbo.EMPLOYEE CHECK CONSTRAINT FK_EMPLOYEE_Dno

…

INSERT INTO COMPANYDB1.dbo.DEPARTMENT values
('Headquarters', 1, '888665555', '1971-06-19'),
('Administration', 4, '987654321', '1985-01-01'),
('Research', 5, '333445555', '1978-05-22'),
('Automation', 7, '123456789', '2006-10-05');


Populate all the rest of data.

…
```

Visualize a database ER diagram:

It is in the Object Explorer, Click on your Company database, then it will expand Database Diagram and all the tables and columns you created under the database. Click database diagram -> ER diagram, then you will see the diagram in the window.

It may be found with Right click on Database Diagram under your Company database in Object Explorer in the left pane of SQL Server Management Studio.

If you want to know more on this, check here.

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