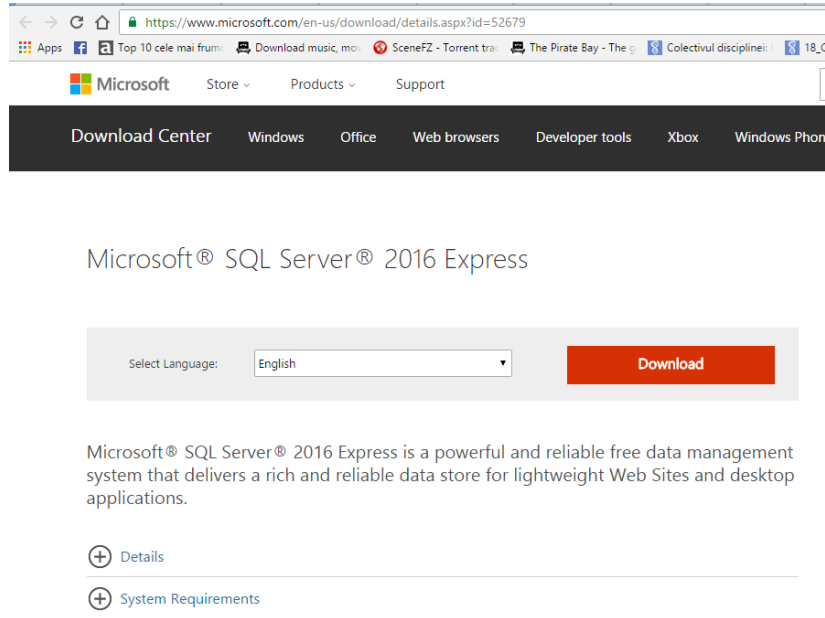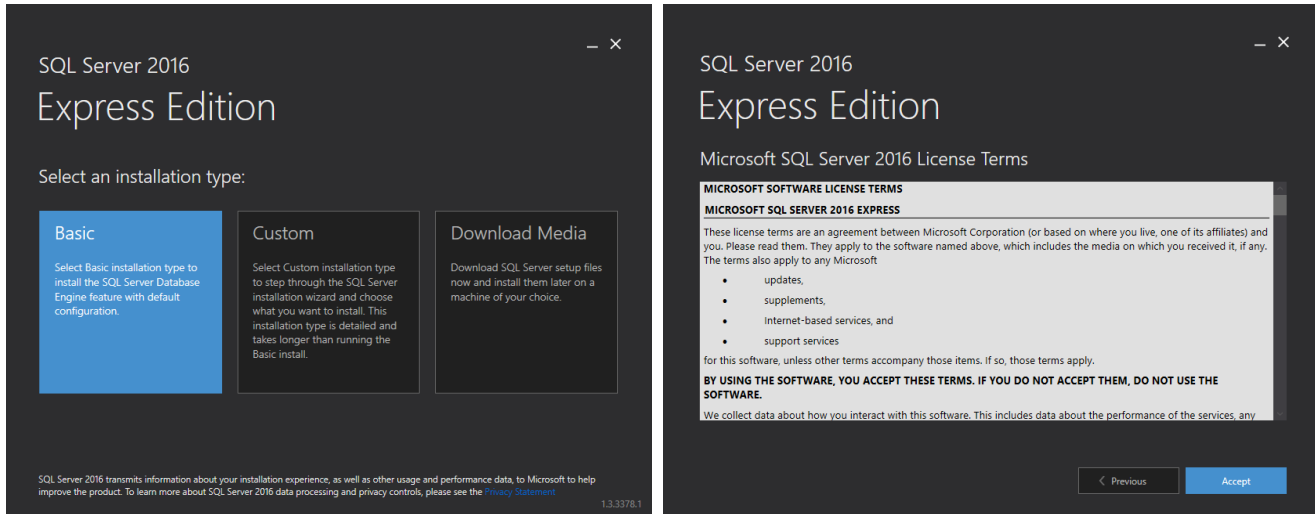# *Installation Microsoft SQL Server 2016*

Microsoft SQL Server 2016 is a relational database management system (RDBMS). It retrieve and manipulate data, create connections between pieces of data and uses the Transact-SQL version of the language.

It can be download from https://www.microsoft.com/en-us/download/details.aspx?id=54284
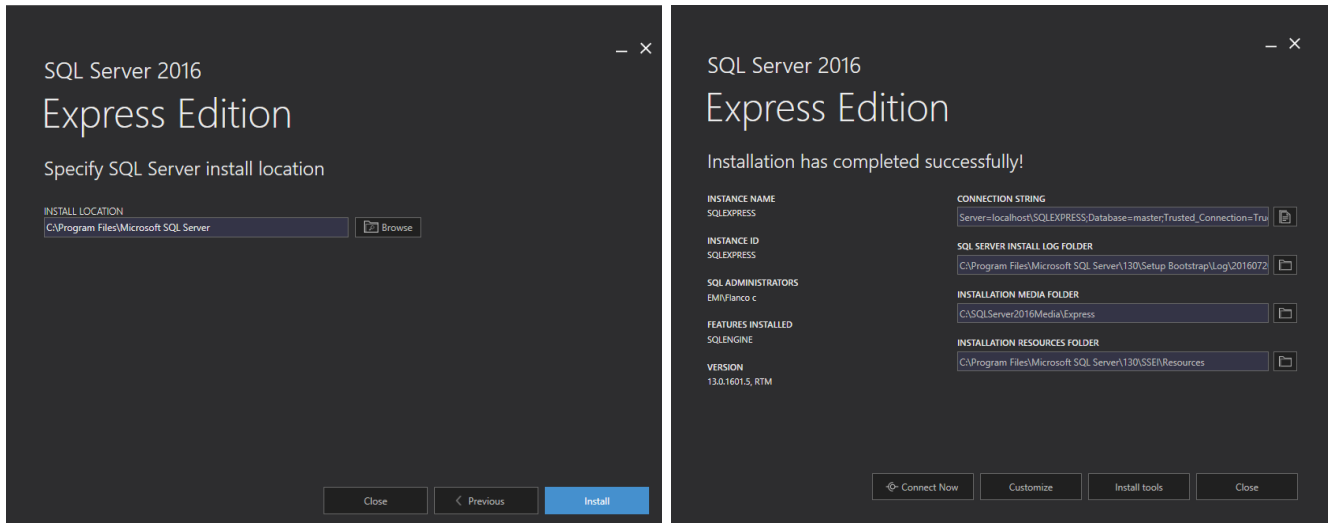
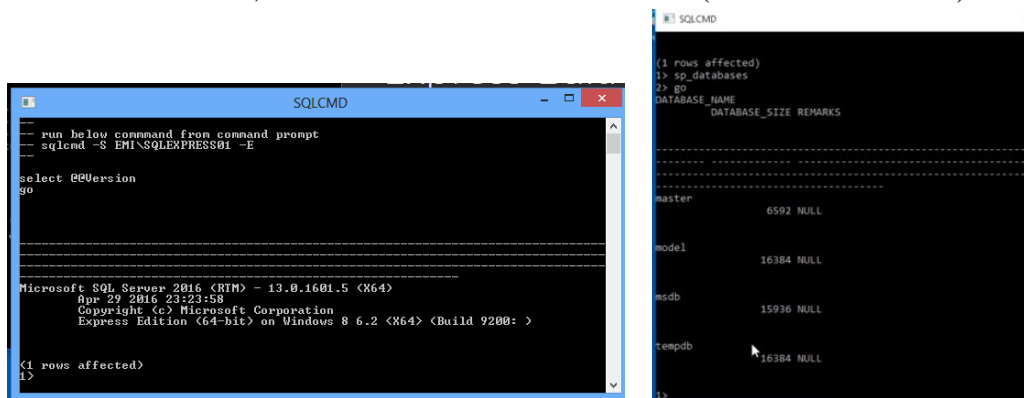The version Express will be installed (SQLServer2016-SSEI-Expr).

After downloading the SQL Server 2016 Express Edition, the Basic type will be installed. Multiple instances can be installed (if someone install it more than once).

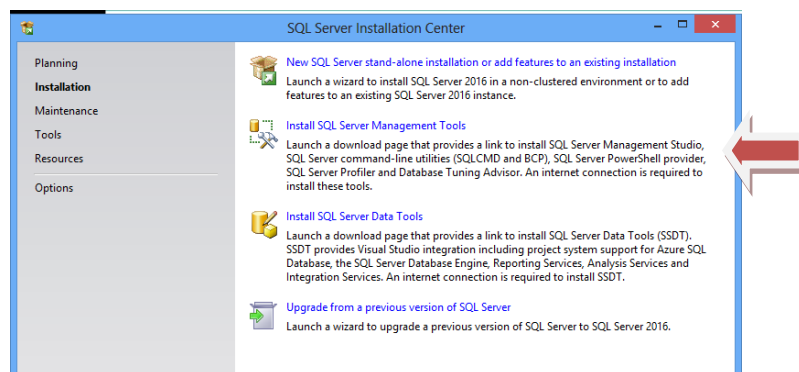

Accept the License -> Install

After the installation is finished, the connection has to be checked (from Connect Now).
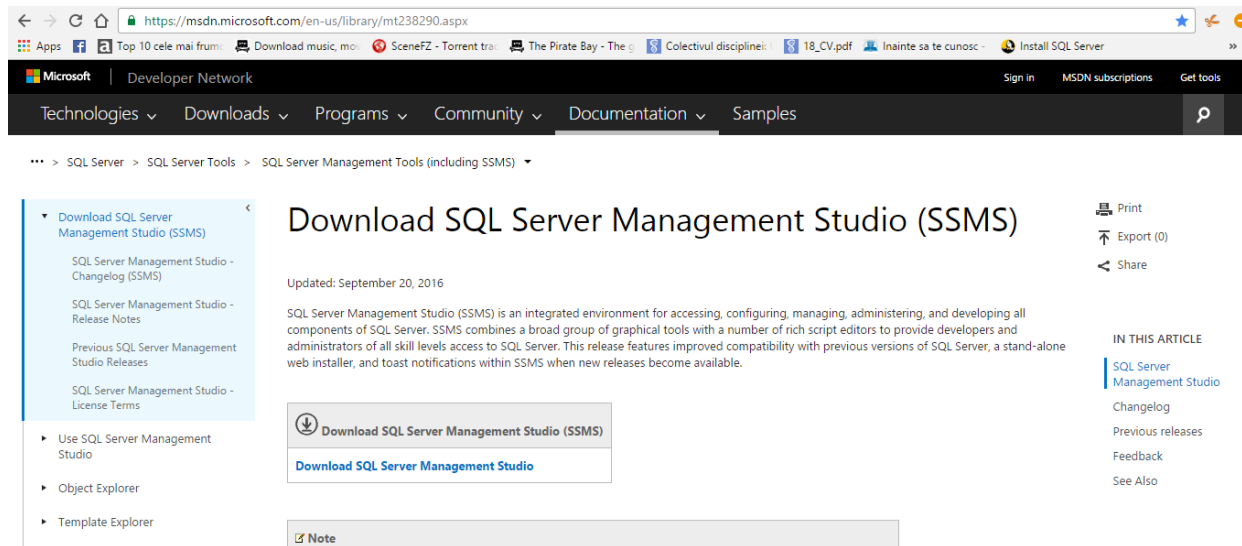

The commands that has to checked for the connection are: sp_databases -> go

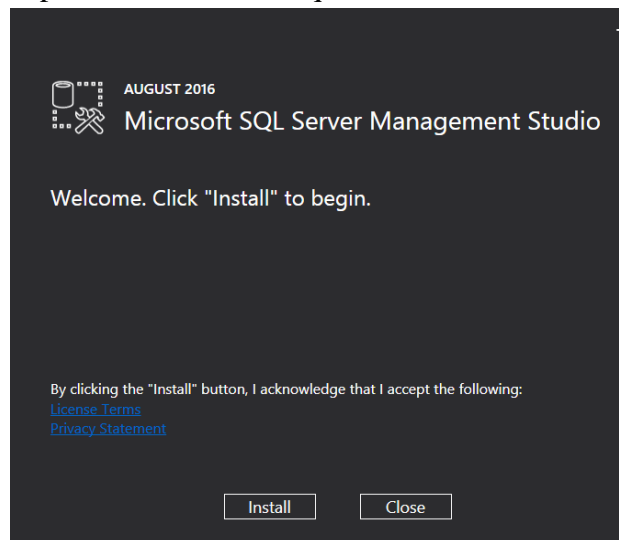From SQL Server 2016 Express Edition -> Customize / Install tools, the SQL Server Management Tools has to be install.

From the web page https://msdn.microsoft.com/en-us/library/mt238290.aspx, the SQL Server Management Studio (SSMS) will be downloaded (SSMS-Setup-ENU).
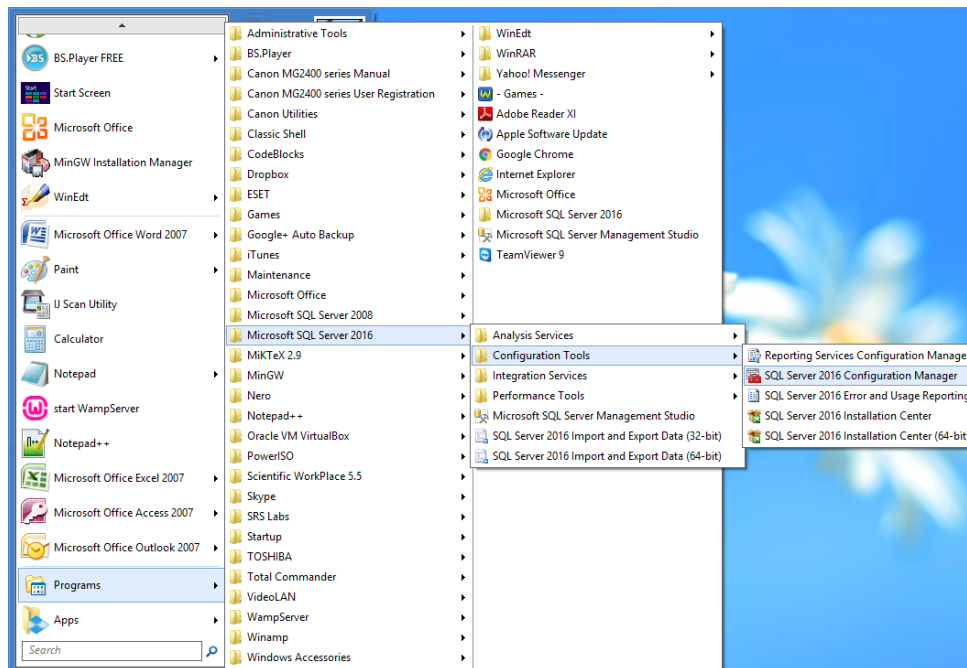
Now, the SQL Server 2016 Express Edition can be quit. The SSMS will be installed.

A restart of the computer is recommended after the installation.
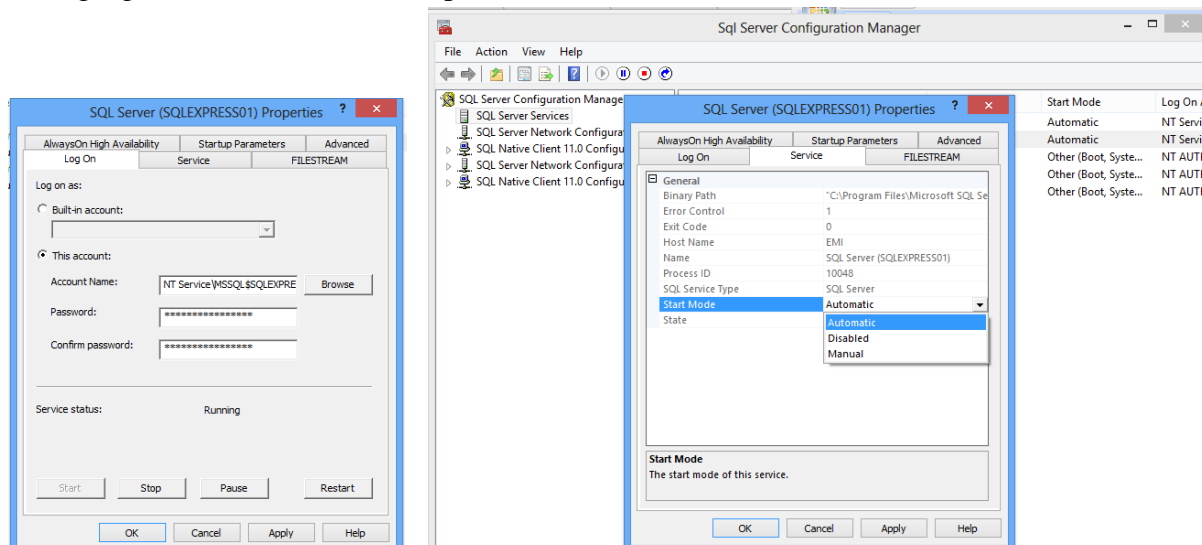- Microsoft SQL Server Management Studio (yellow icon)
- SQL Server 2016 Configuration Manager (red icon)

<u>SQL Server 2016 Configuration Manager</u> (red icon) – run into the background (not necessarily open). It is used for the service to be started or stopped.
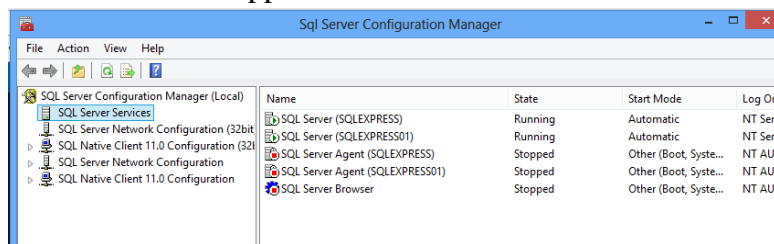

Usually, the SQL Server Services is running automatic. This property can be changed from Properties (by pressing right click on it): Start, Stop, Pause, Restart.


The automatic running (when the computer starts) can be changed from Properties -> Service -> Start Mode.

Microsoft SQL Server Management Studio (yellow icon)

The first connection present an authentication as Windows Authentication or can be changed to SQL Server Authentication.
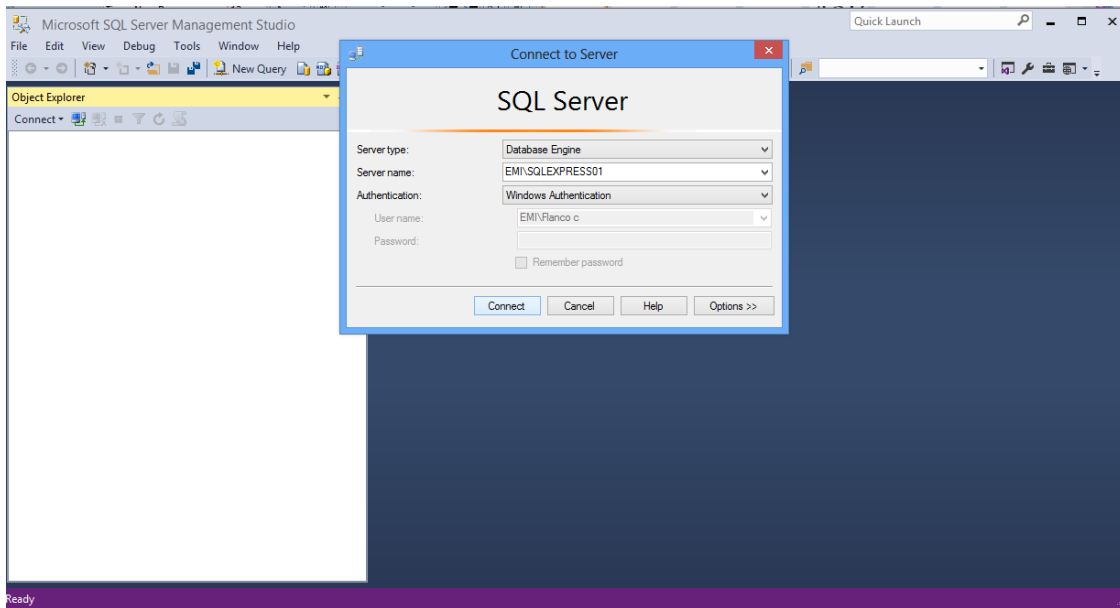

To configure the system administrator account (sa) – a default account, one has to go to Security -> Logins -> sa. If sa account is disabled (has a red point near the icon), it has to be enabled by click right -> Properties and from Status -> Enabled.
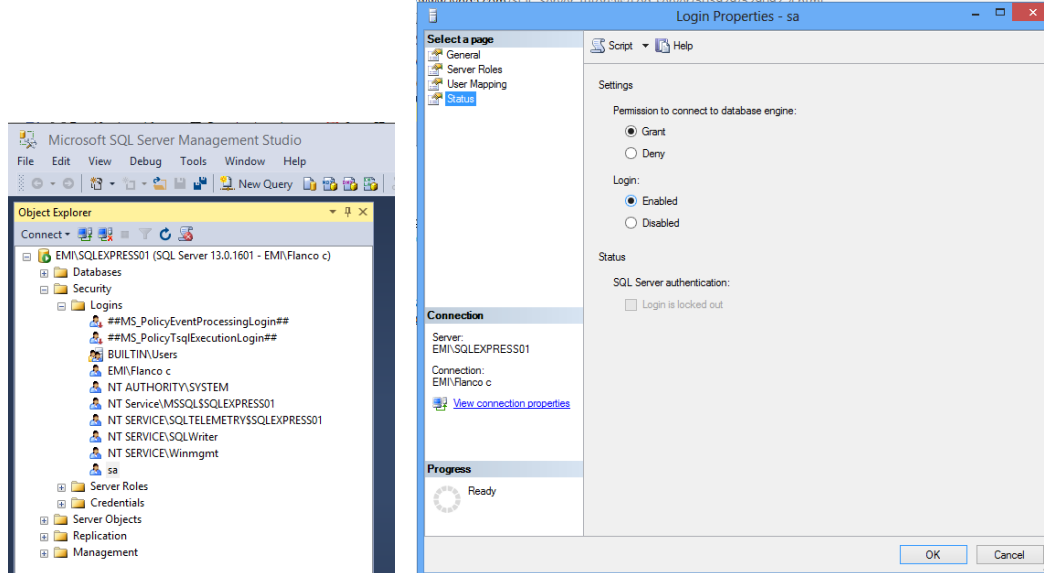

Also, for this account, from General menu, a password should be established (preferable a strong one) and then press Ok. Don't forget the password!

Then, by pressing right click on the Security->Logins a Refresh will be need (the red point from the sa icon will disappear).
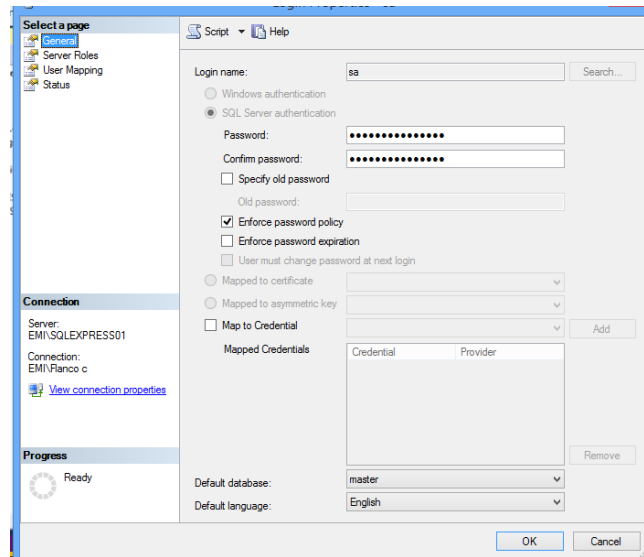
Next the SQL Server has to be enabled: a right click on the Server Name is required to access the Properties menu. From the Security menu, the bullet SQL Server and Windows Authentication mode has to be marked and then the ok button has to be pressed.
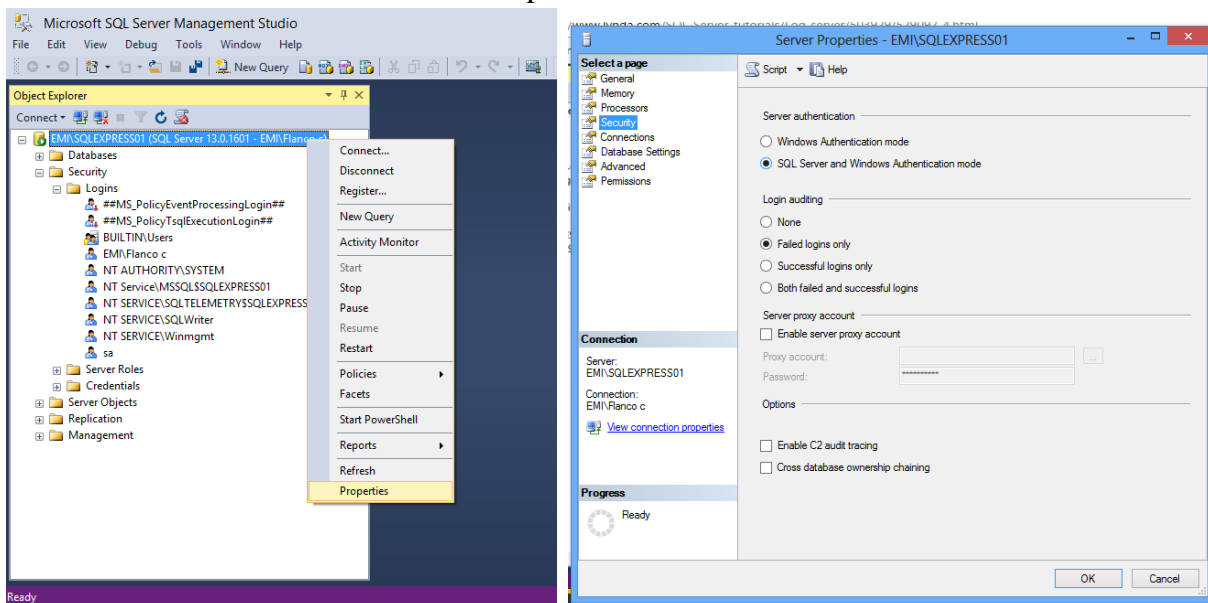

A message will be displayed and ask to restart the SQL Server (because otherwise the change will not take effect)
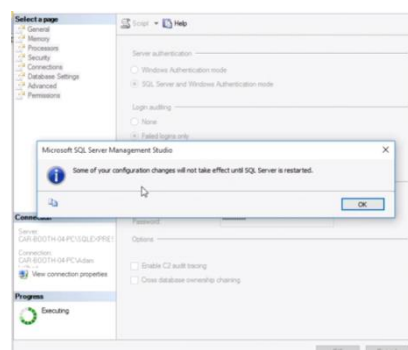
The Microsoft SQL Server Management Studio (yellow icon) has to be closed and the SQL Server 2016 Configuration Manager (red icon) started. On the SQL Server Services, the SQL Server (SQLEXPRESS) will be restarted by accessing the Properties menu (with right click) -> Log On menu -> Restart ->ok. After this change was done, the SQL Server 2016 Configuration Manager (red icon) can be closed.
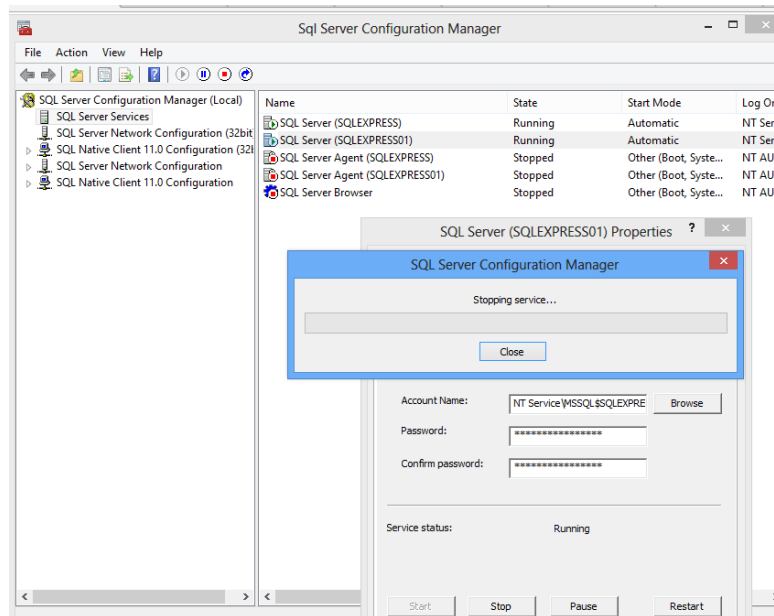
Now, the Microsoft SQL Server Management Studio (yellow icon) can be open and the authentication will be done by using as Authentication, the SQL Server Authentication with the Login sa and the password established previously. The Connect button can be pressed.
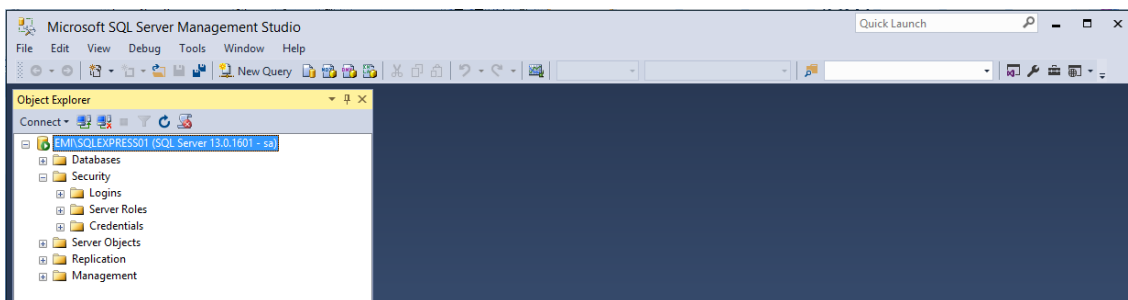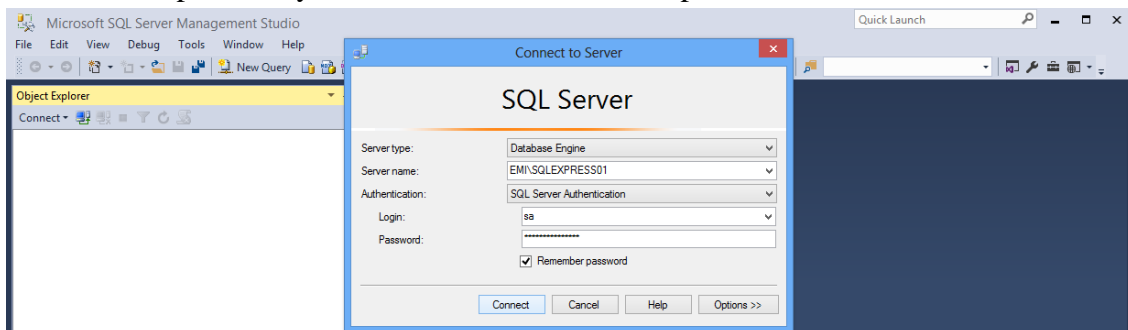
SQL Server Documentation

The documentation can be found on the web page https://technet.microsoft.com/en-us/.
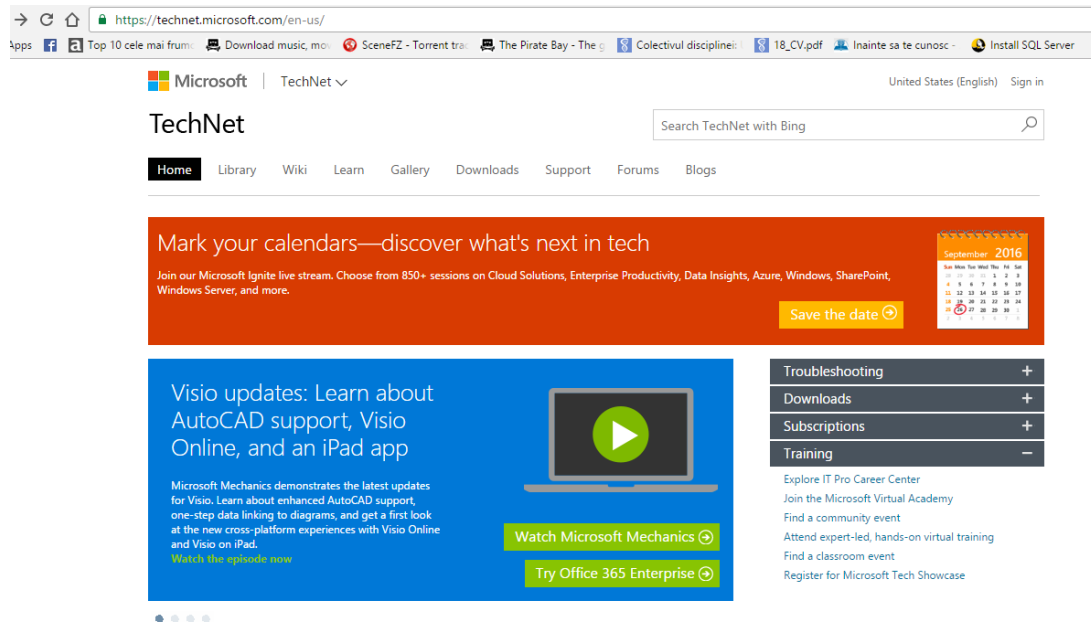
The Library menu was to be access, then SQL Server menu.
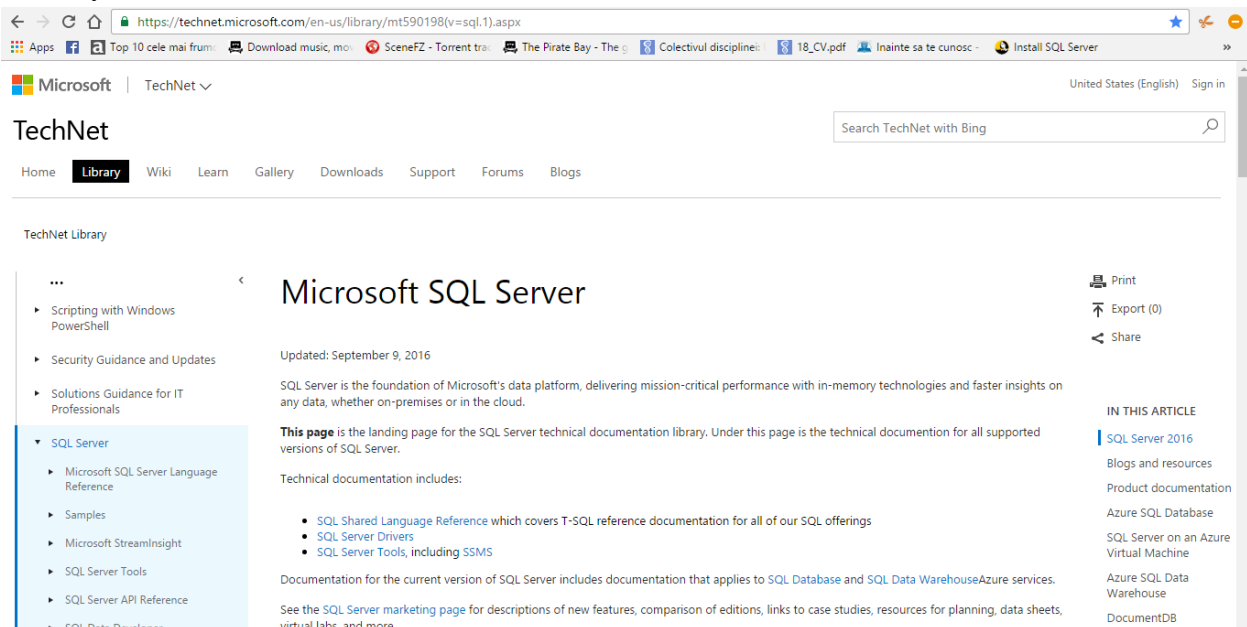
The documentation for SQL Server 2016 can be found there:

https://technet.microsoft.com/en-us/library/hh994726(v=sql.10).aspx

Inside of Microsoft SQL Server Management Studio (yellow icon), the documentation can be found in the Help menu at the section Add and Remove Help Content.
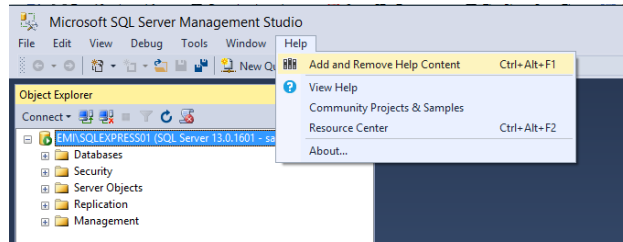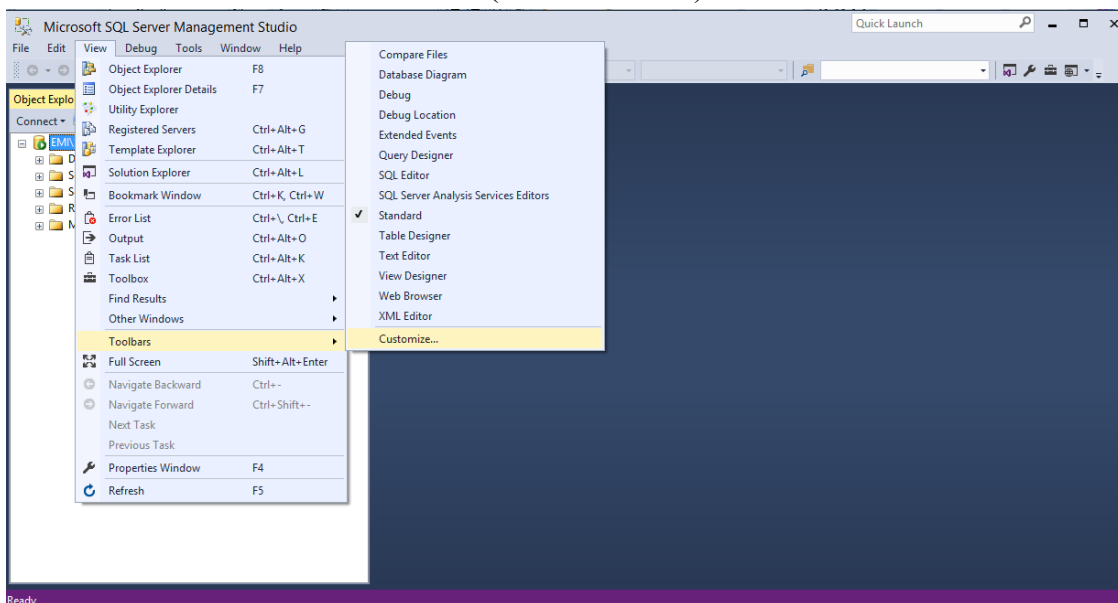
The SQL Server 2016 Technical Documentation, SQL Shared Language Reference and SQL Server 2016 Tutorials should be included by pressing Add and the Update.
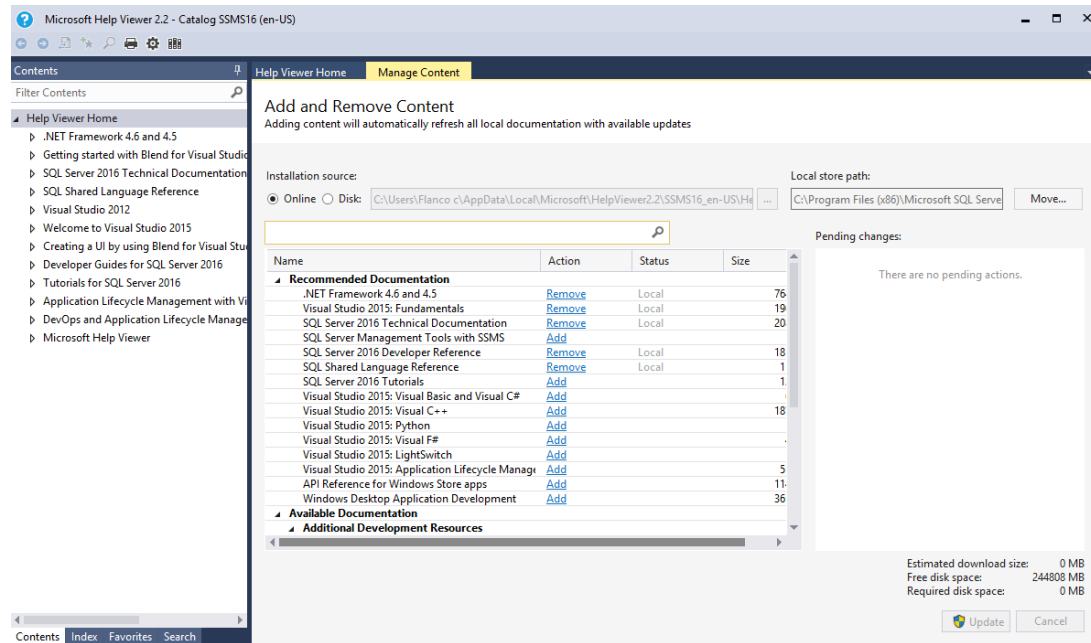
SQL Server Management Studio

Add new tools: View menu -> Toolbars -> … (one can choose)

New Query:
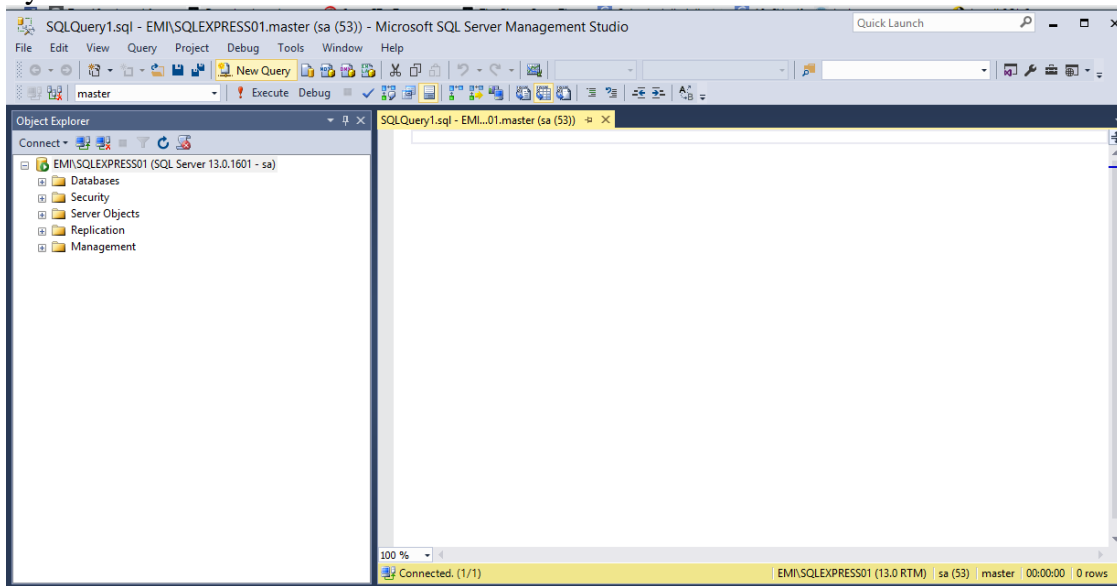
See the Properties:
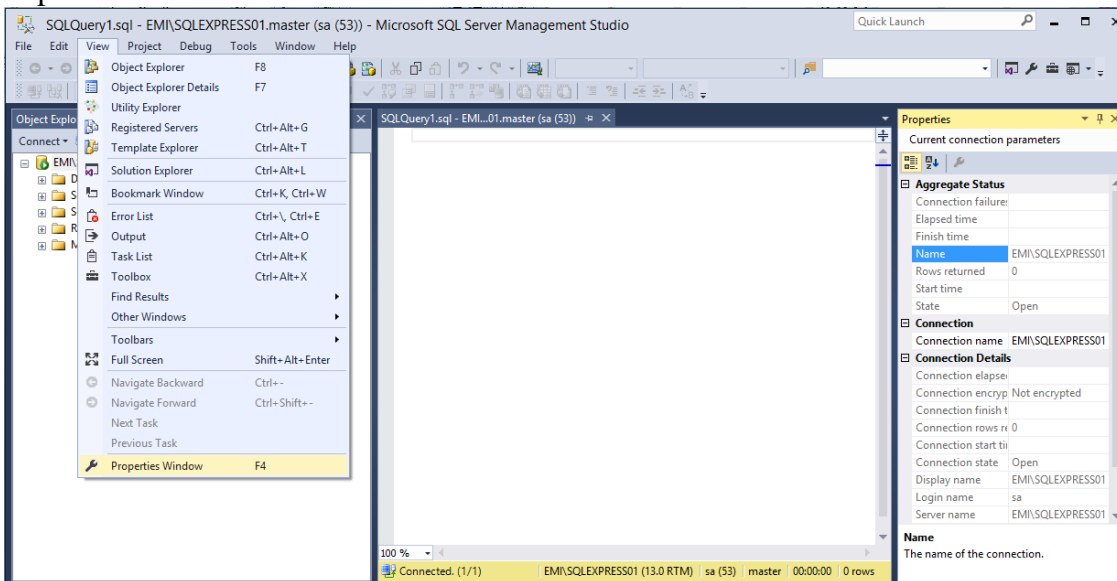
Choose the database
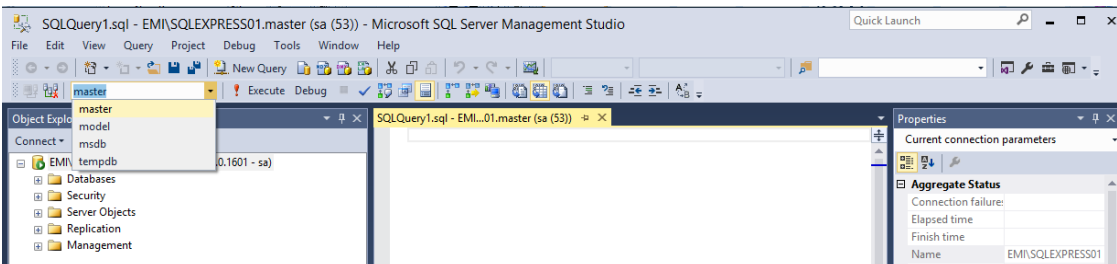
Install a Sample Database

http://msftdbprodsamples.codeplex.com/

Download database: Adventure Works 2014 Sample Database, Wide World Importers sample database.

The file WideWorldImporters-Full.bak will be downloaded from the link Wide World Importers sample database v1.0

The database (the backup file that had been downloaded) has to be placed in:
C:\Program Files -> Microsoft SQL Server -> MSSQL13.SQLEXPRESS -> MSSQL -> Backup -> .bak

The file WideWorldImporters-Standard.bak has to be downloaded.
Import the database into Microsoft SQL Server 2016 Management Studio: Database-> right click -> Restore databases
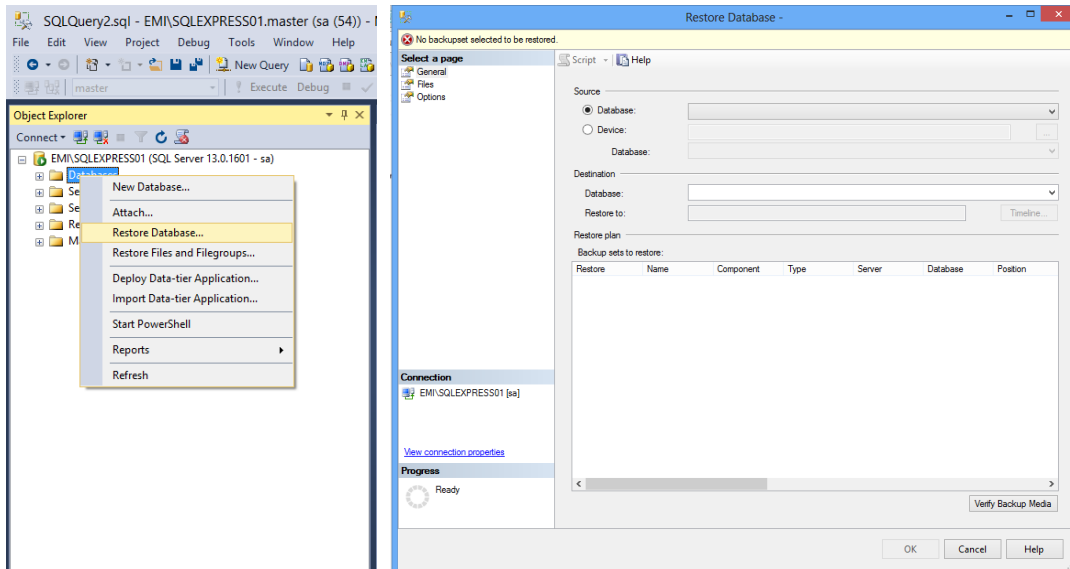
Now, the database can be restored in the program
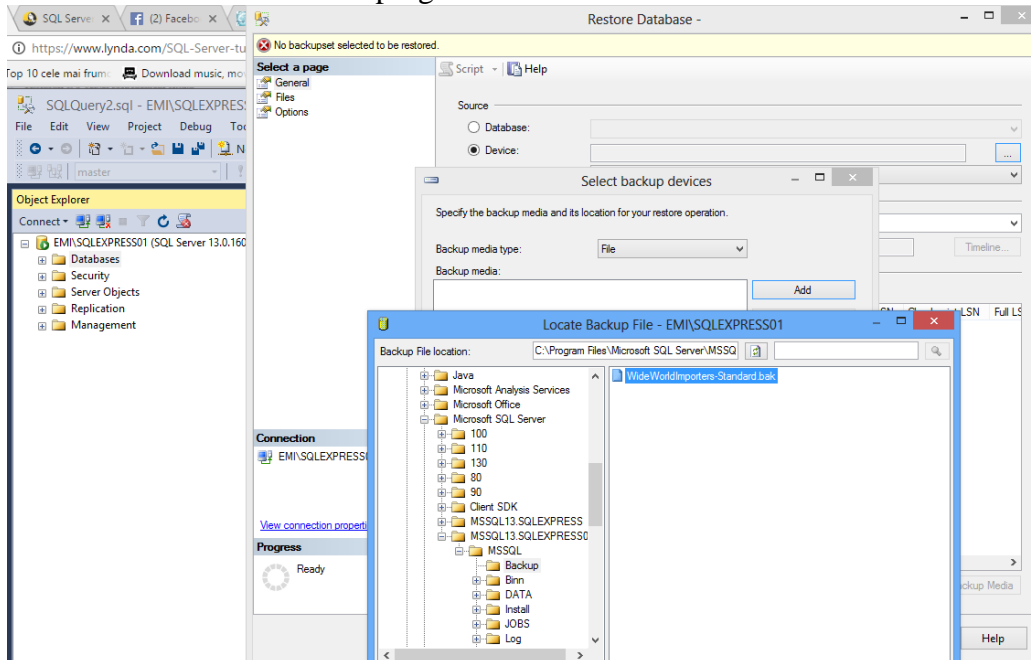
Check the database (Refresh = F5) and it appear
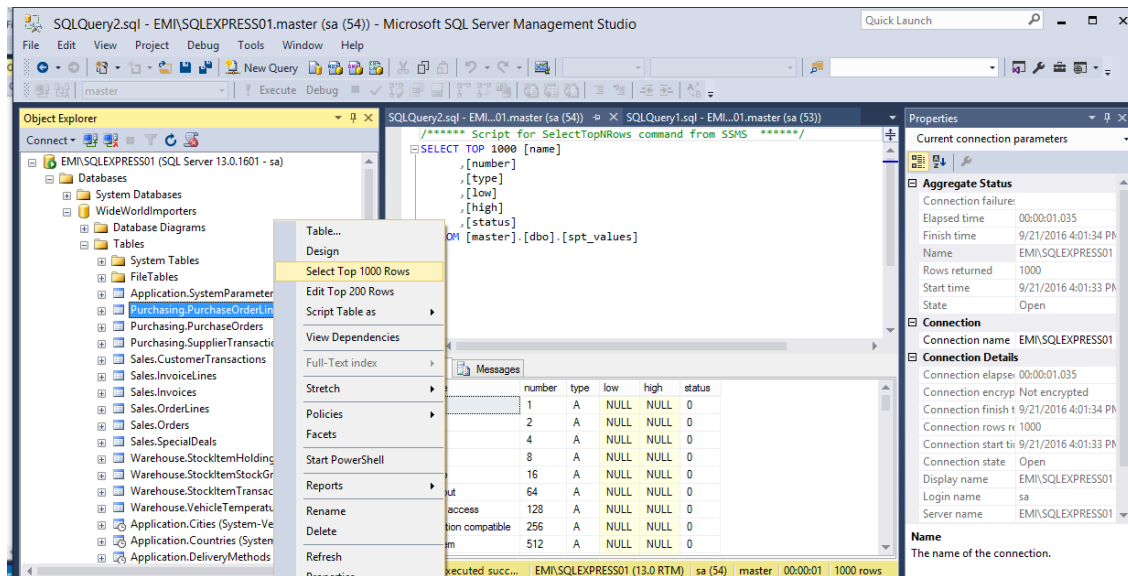
Create a new Database on the Server

Databases -> New Database (by right click)

Create a database: General menu -> name it

Change the space that the database will occupy

Path where the database will be saved

Then press ok. The database will appear in the Databases menu (eventually by right click -> Refresh)

Table Structure

- Horizontal rows – store information about a single item, are called "records"
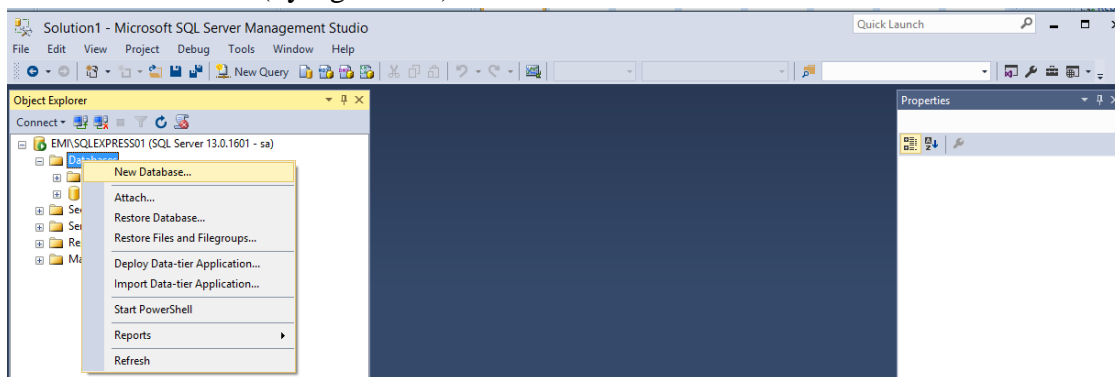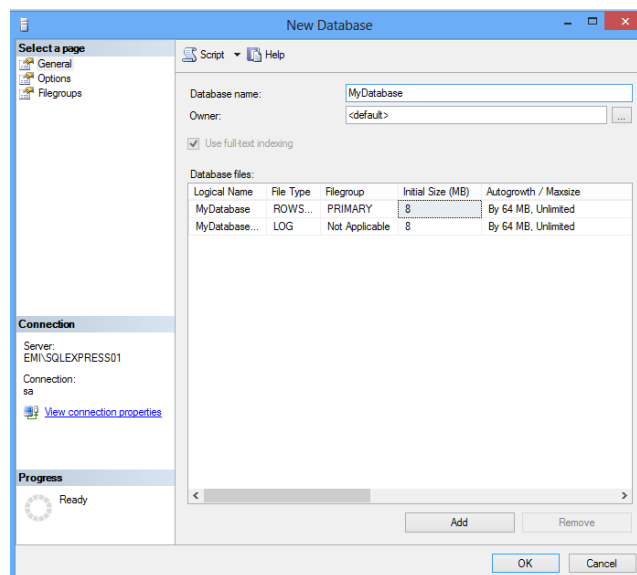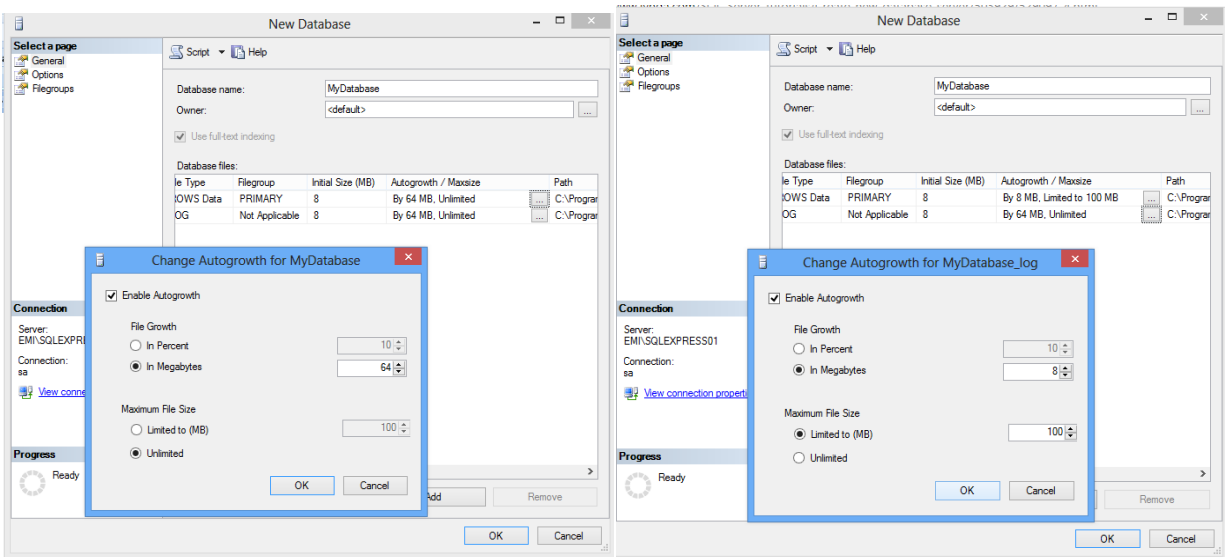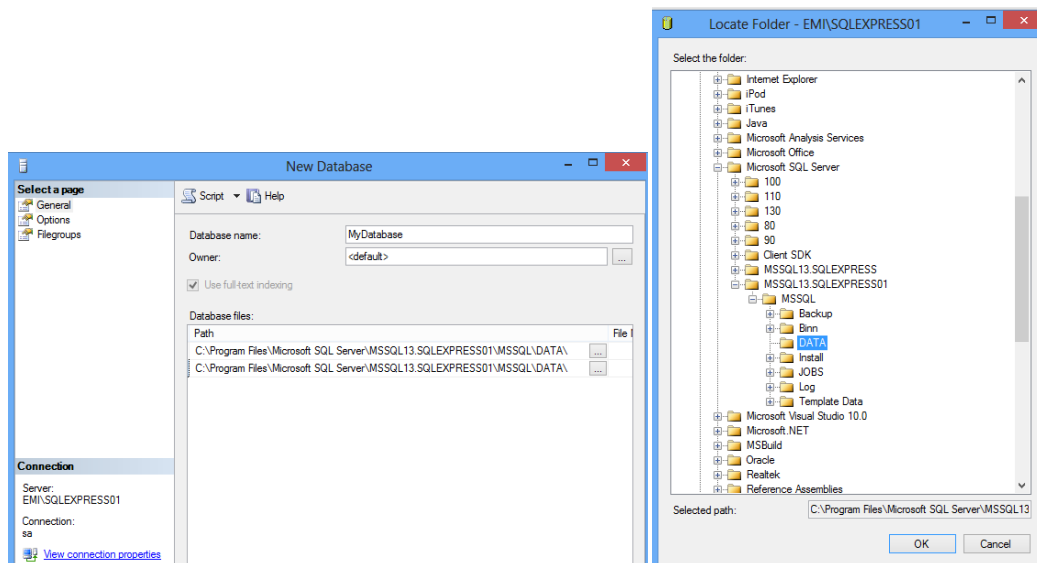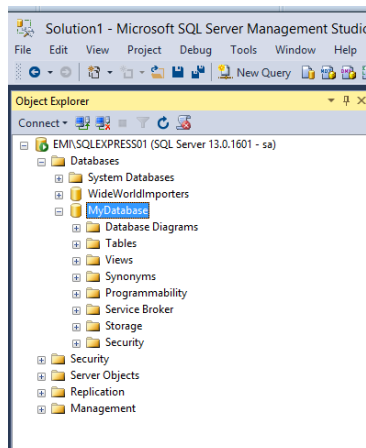- Vertical rows – attribute fields, descriptive component of each record
A table example:

Customers

	Name	Birthday	Favorite Color
1	Sean	5/23/1972	Blue
2	Tabitha	7/6/1984	Orange
3	Marcus	3/27/1996	Aqua

Data Type

Text Data Types:

Char(10) – text data of 10 characters

NChar(10) – Unicode text with 10 characters

VarChar(50) – Variable length text data up to 50 characters

NVarChar(50) – Variable length Unicode text data up to 50 characters

Numerical Data Types:

TinyInt – whole numbers between 0 and 255

Int – whole numbers between -2 billion and +2 billion

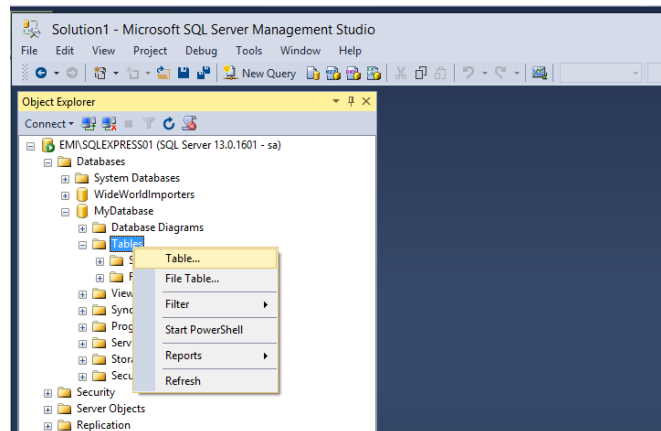**Decimal / Float** – fractional numeric with varying degrees of precision
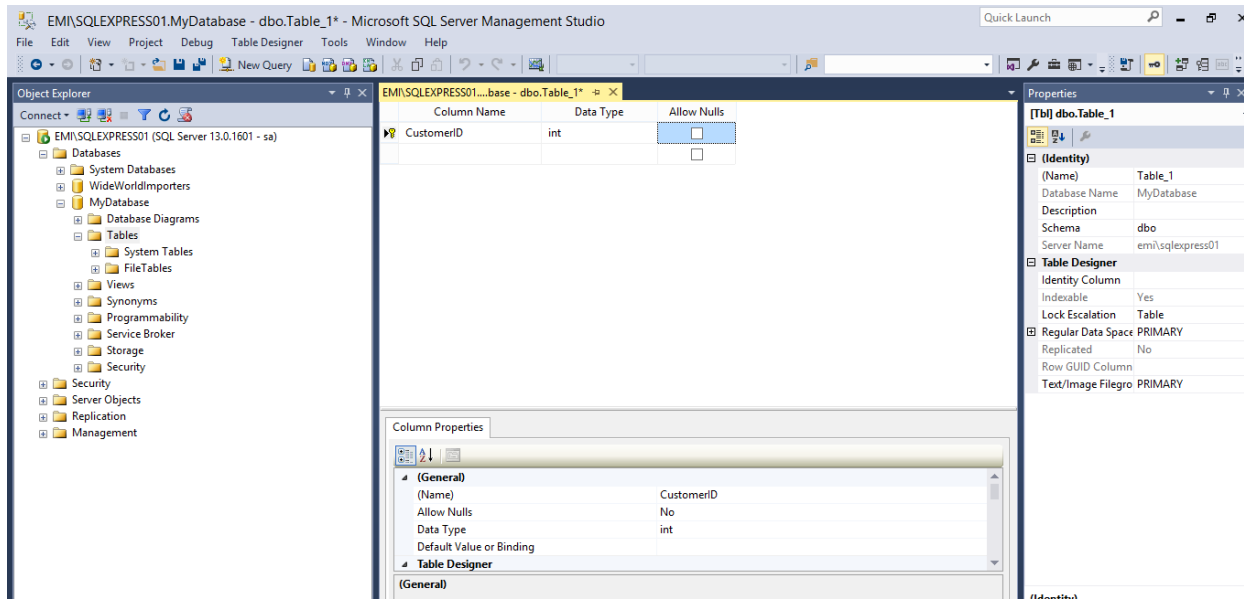
Specialty Data Types

Date

Currency

Geographic coordinates …
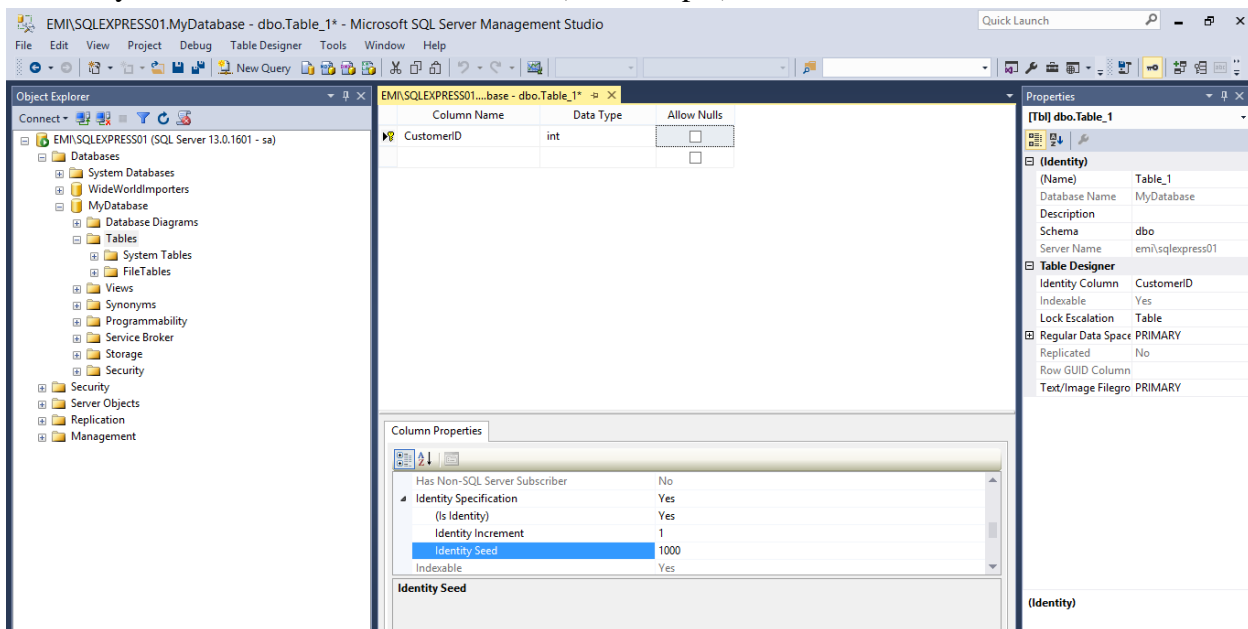
Create a table

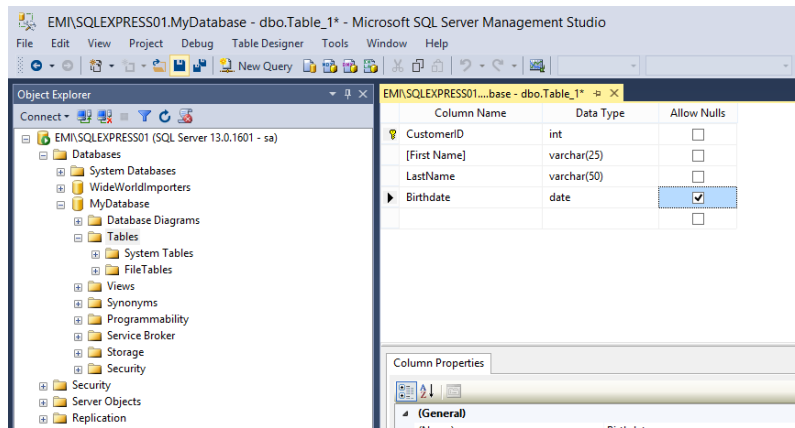Inside of the Database (MyDatabase) -> Table menu -> Table (by pressing right click)
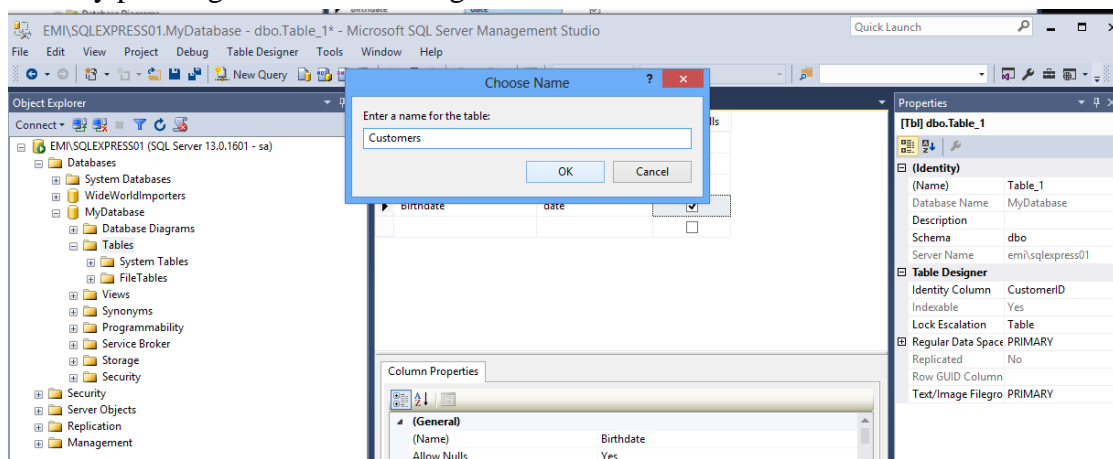

A column

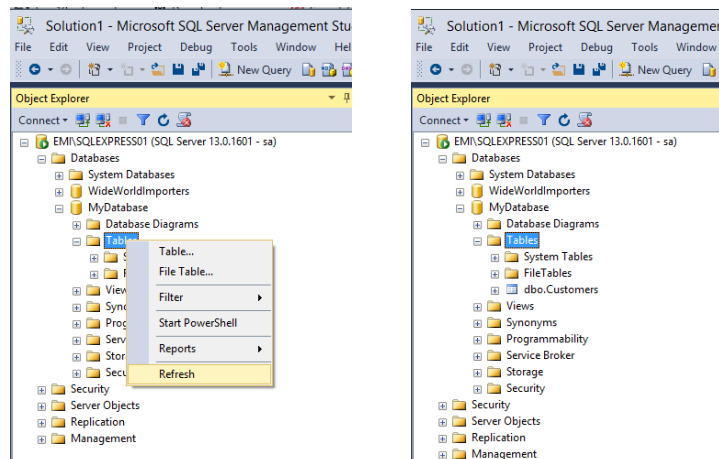A identity of the instances: Yes – 1 – 1000 (for example)

Introducing more fields (If another add will be required later than the save of the table: right click on table -> Design)

Save the table by pressing the disc or closing the window where we write.
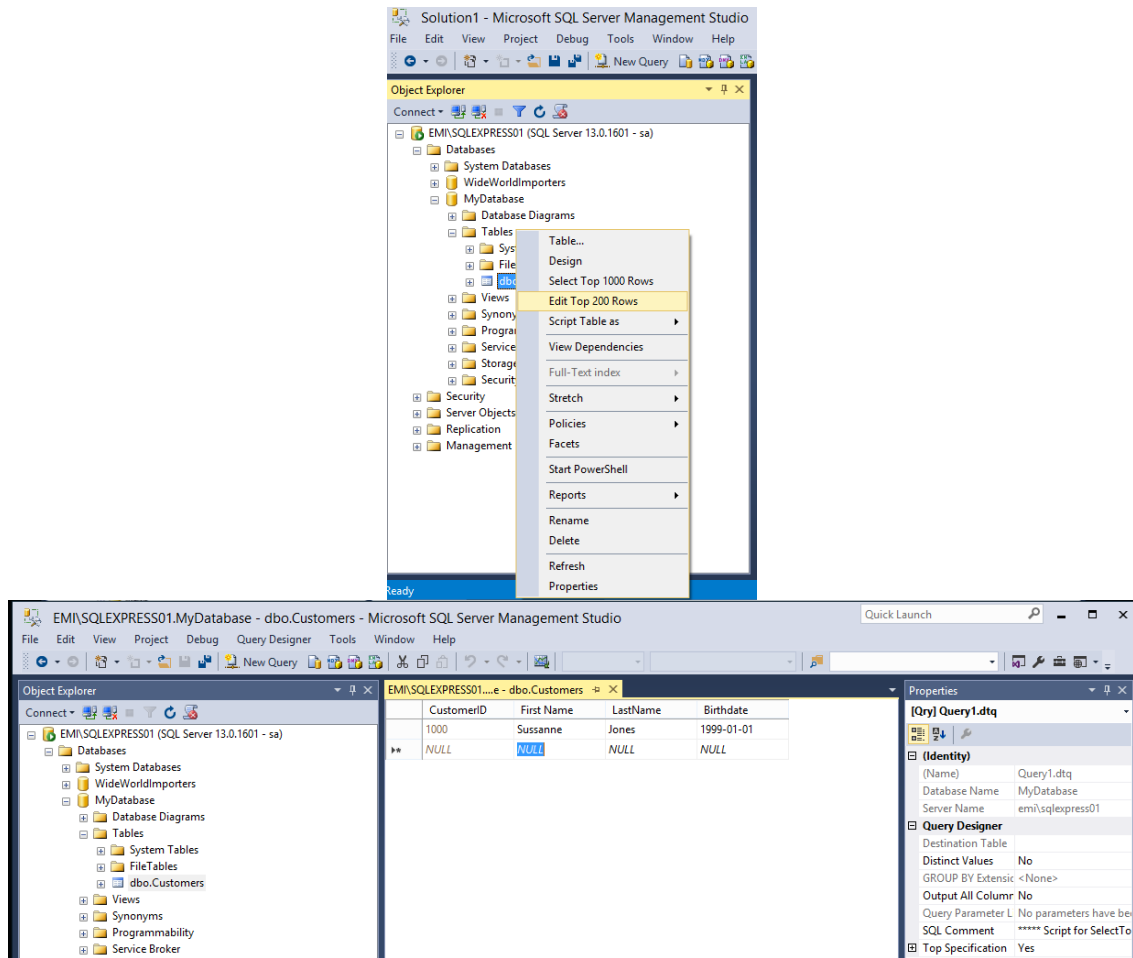

Refresh on Tables tab to see the table
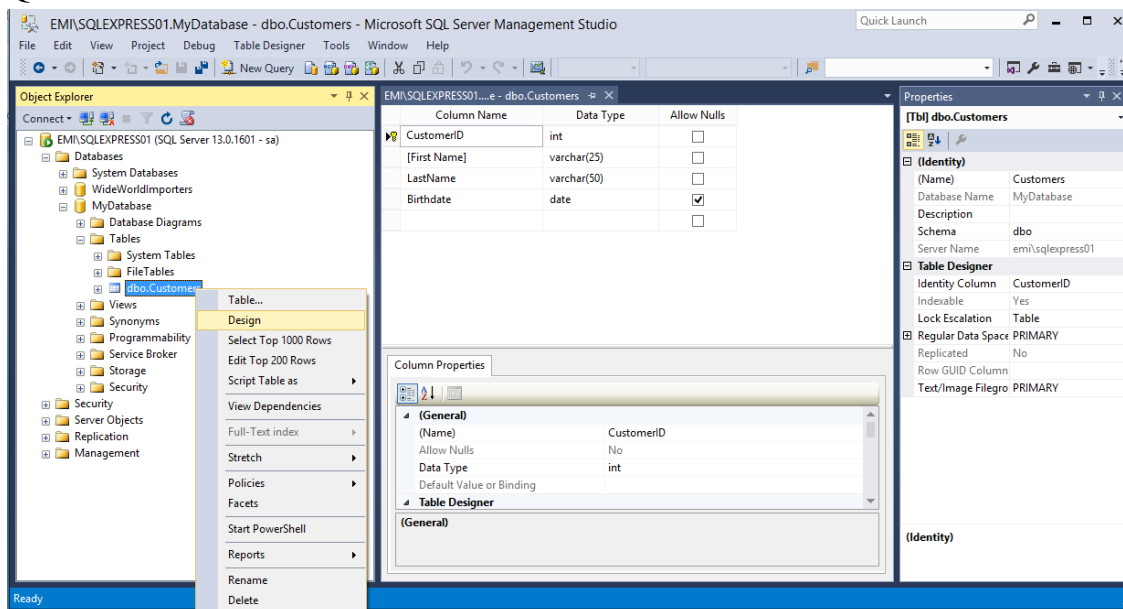

There is the dbo.Customers table.

Edit Top 200 rows (from right click on dbo.Customers) is used to introduce values.

Select Top 1000 rows is used to see the records from the table.

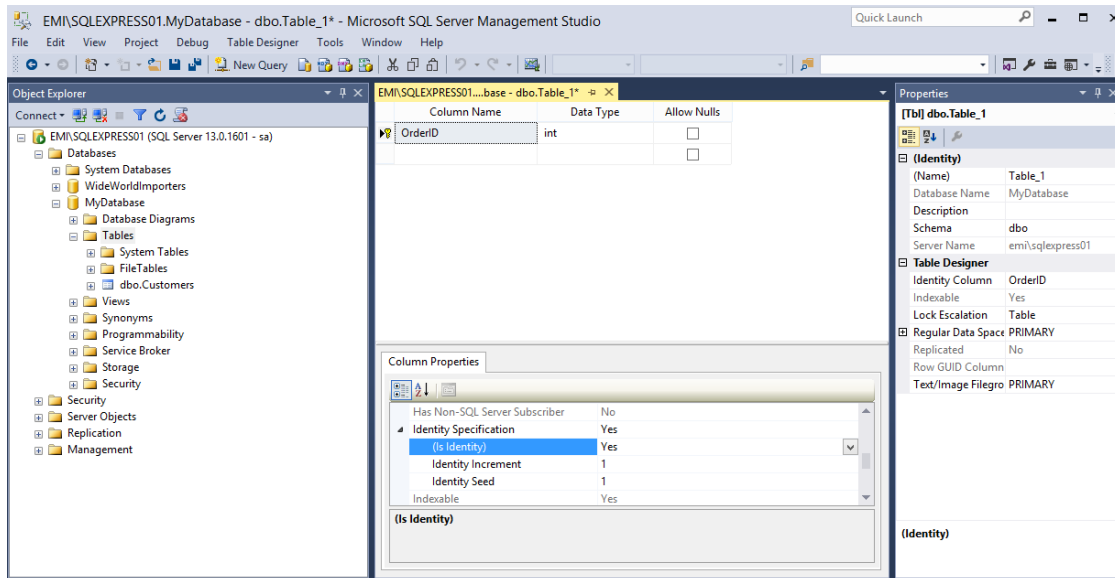The CustomerID (primary key) is not necessary to be introduced if it was set as Identity.

The UNIQUE IDENTIFIER in the table = PRIMARY KEY
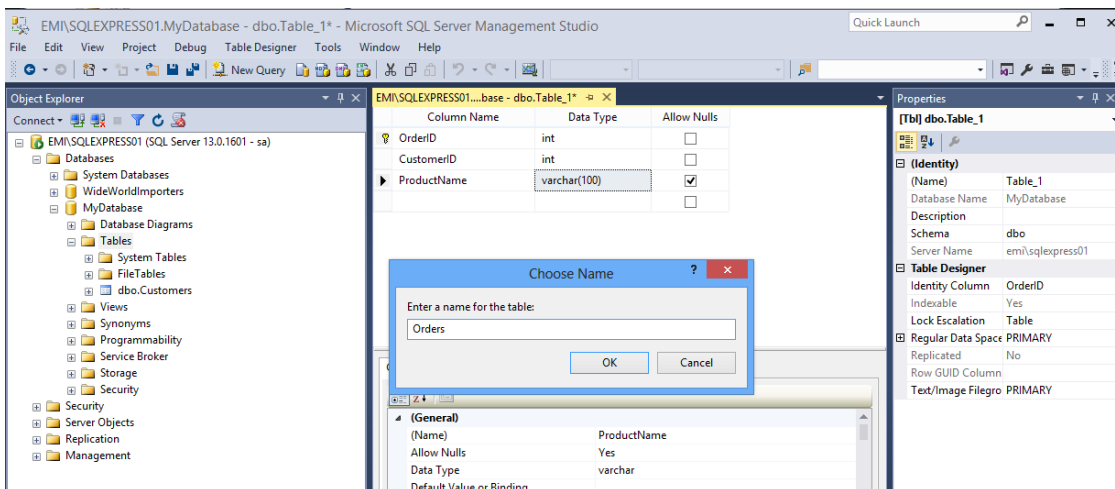
Join tables together with keys

Primary key from a table

- Allows null – NEVER
- Identity Specification – Yes – if someone wants to be autoincrement

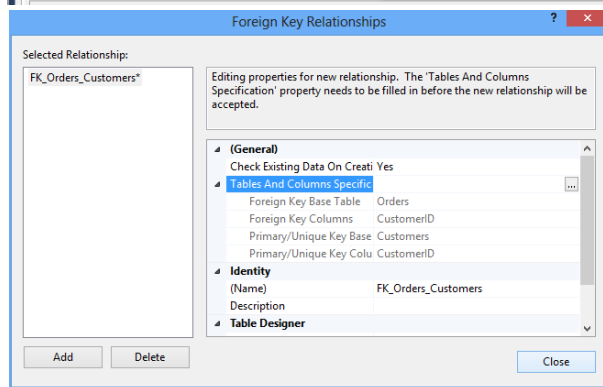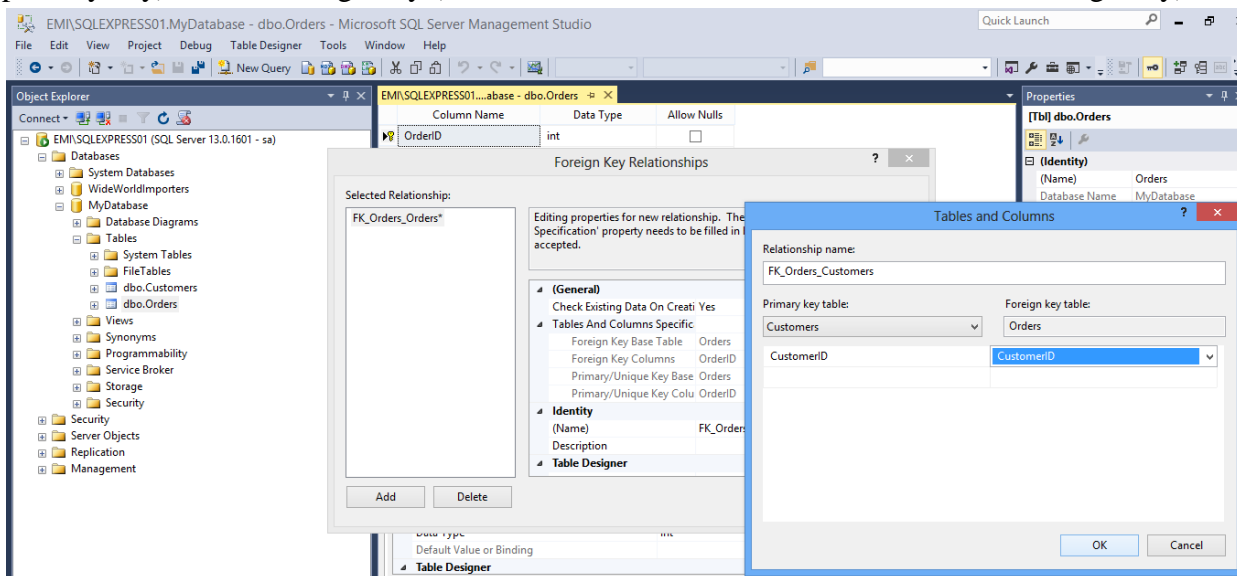Foreign key – CustomerID – from Customers table

– the same type like in that table where is primary key (int)
– the same values as where it is primary key, but not necessarily unique (a value can appear more than once)
– Allow Null – Never

Relationships – right click on the left part where the fields are -> Add a new relationship
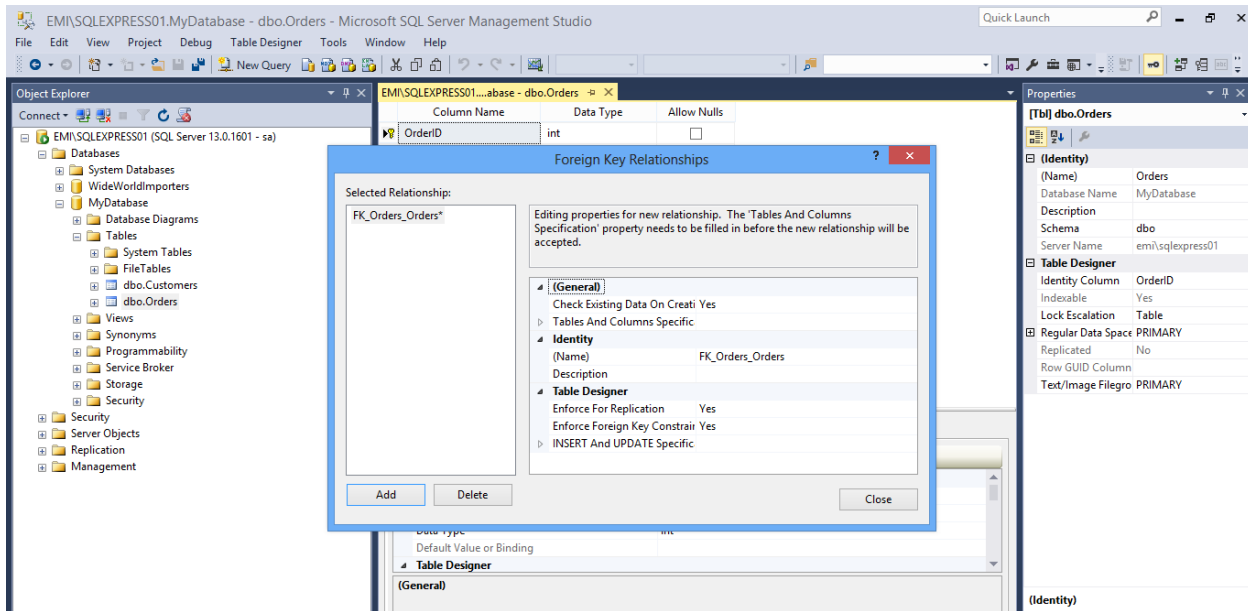
The Tables and Columns Specific -> has to be access from … -> complete the tables that are in the relationship and corresponding to those the primary key (the first table – Customers – the table with the primary key) and the foreign key (the second table – Orders – the table with the foreign key)
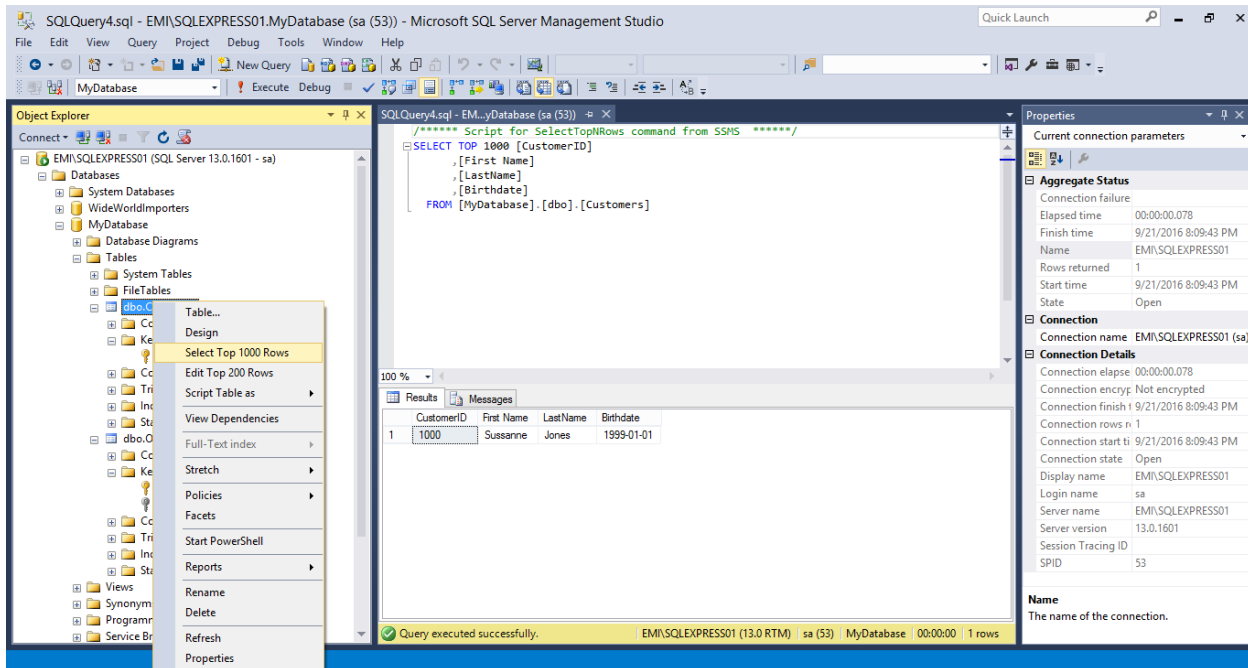
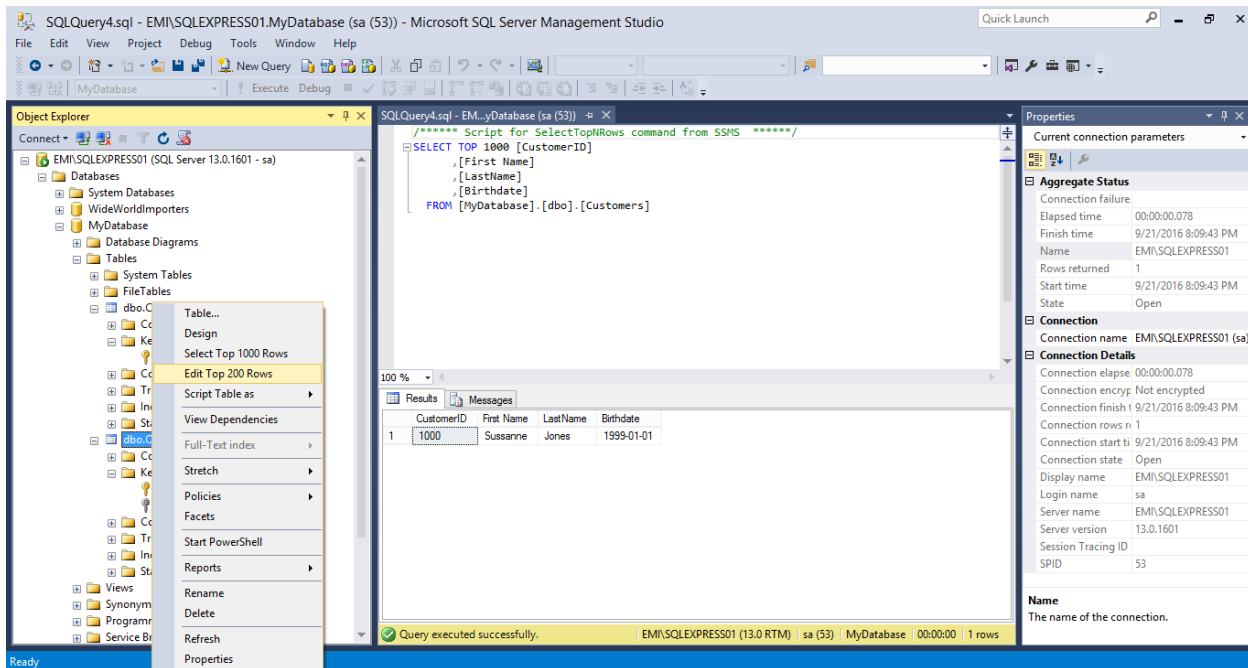SAVE after these changes and Yes to the message that follows.
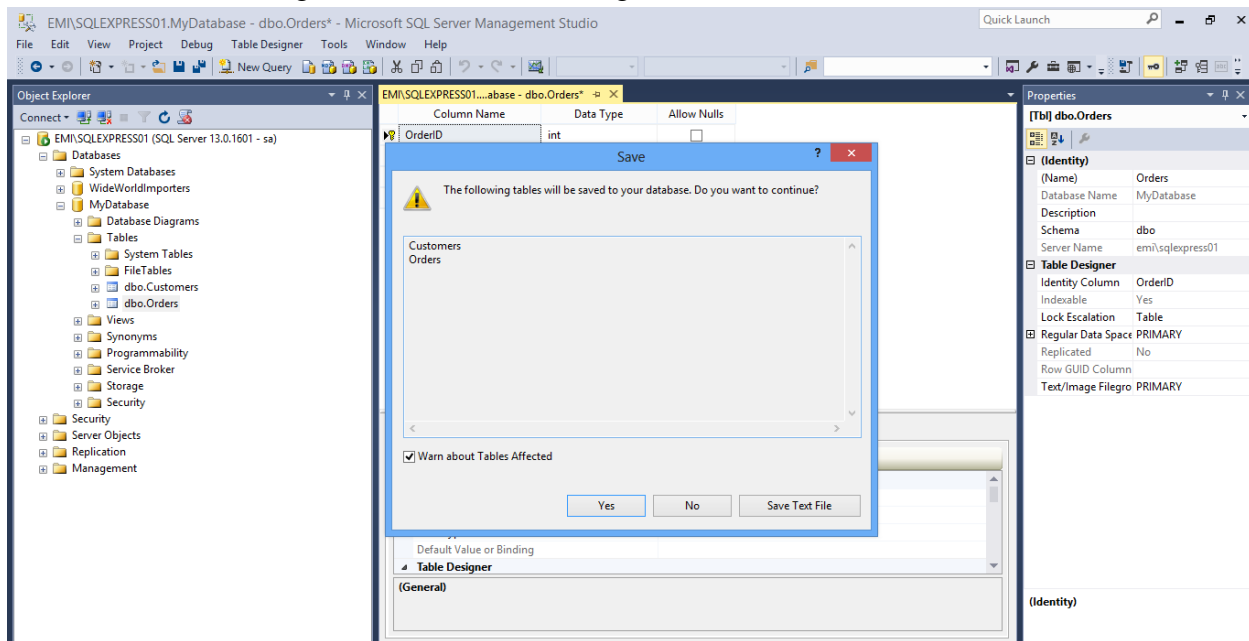
The primary keys and foreign key can be seen in the configuration part after a Refresh.
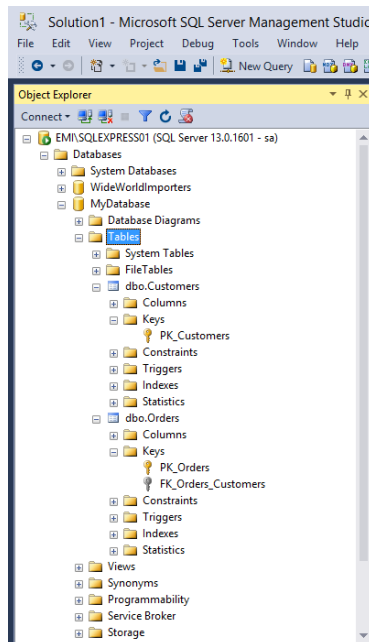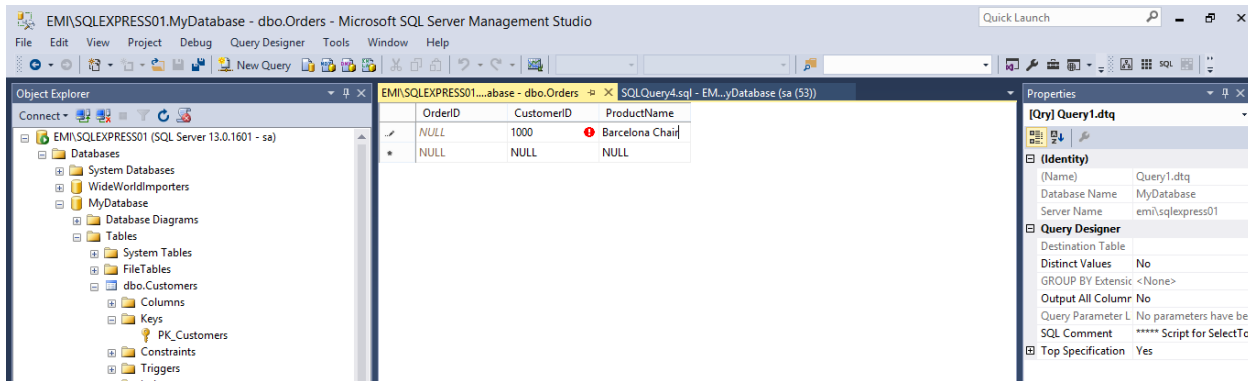

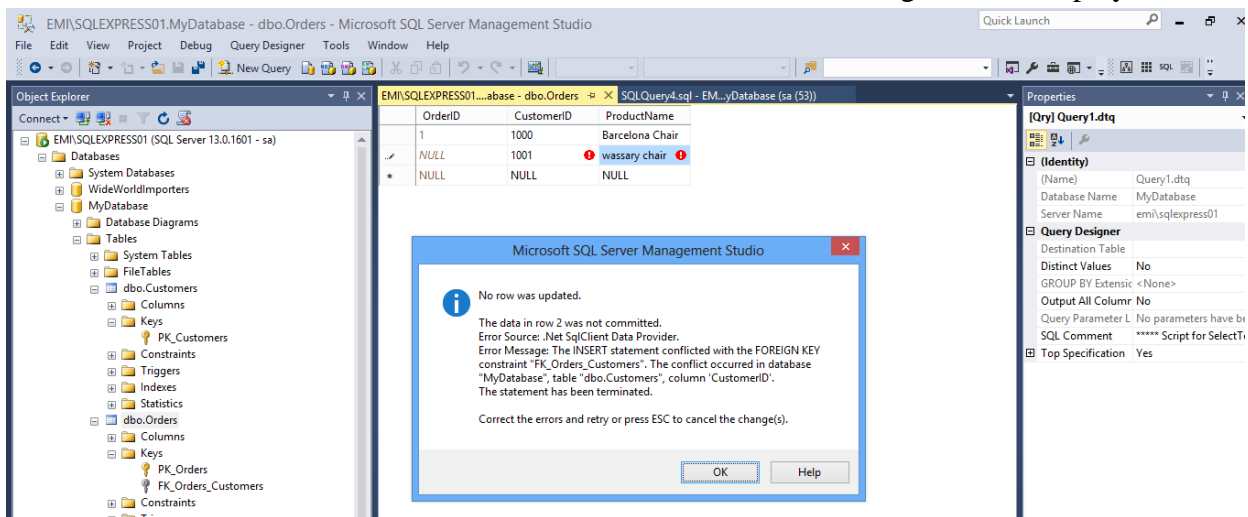See the records: right click on the table (Customers) -> Select 1000 top rows

Select right click on table 2 (Orders) -> Edit top 200 rows

THE SAME CustomerID

If a CustomerID that does not exist in Customer table a conflict message will be displayed.

ENTER to save the record introduced. ESC cu give up to the record.