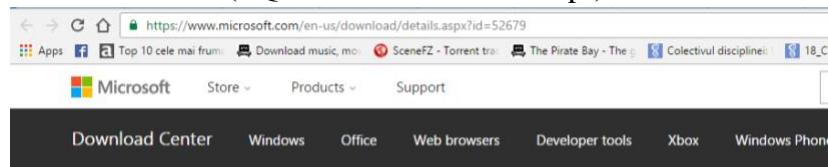


Installation Microsoft SQL Server 2016

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/sql-server/sql-server-downloads>

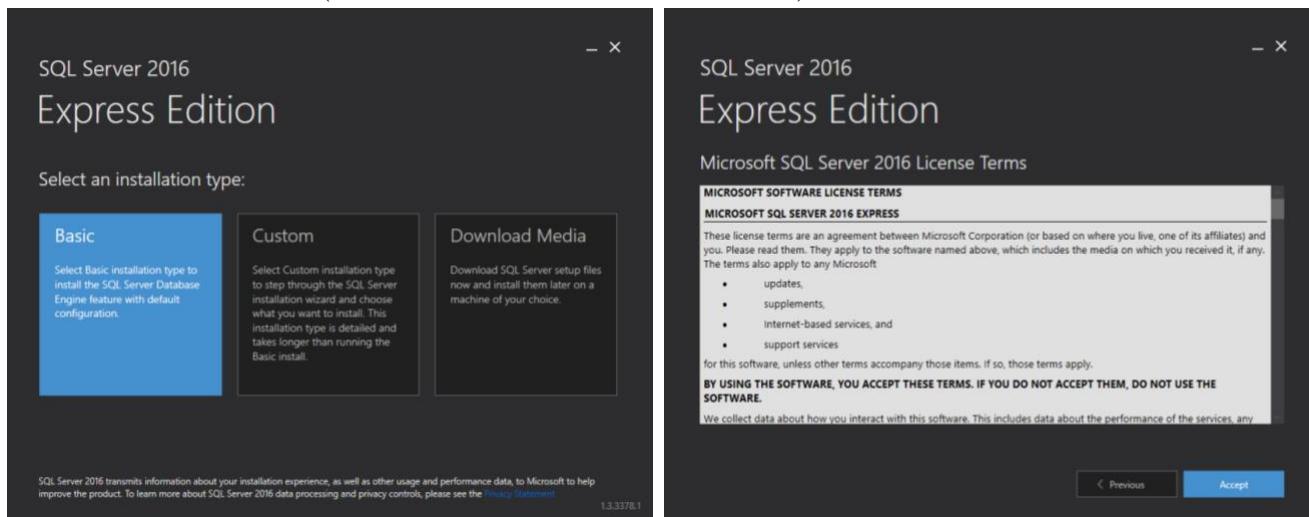
The version Express will be installed (SQLServer2016-SSEI-Expr).



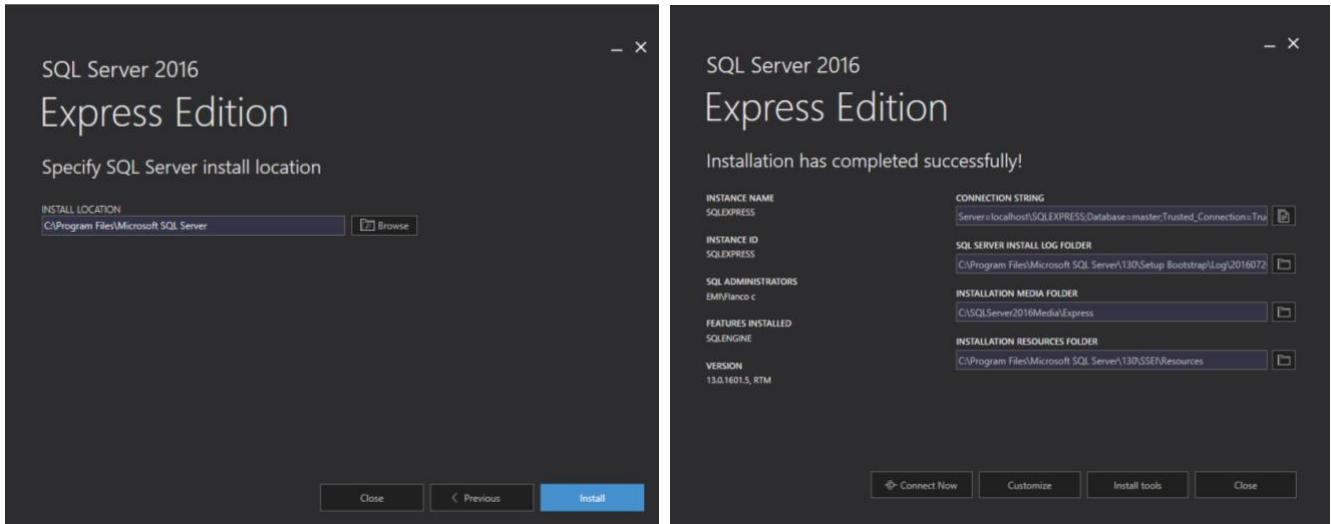
Microsoft® SQL Server® 2016 Express

A screenshot of the Microsoft SQL Server 2016 Express download page. It shows a summary of the product: "Microsoft® SQL Server® 2016 Express is a powerful and reliable free data management system that delivers a rich and reliable data store for lightweight Web Sites and desktop applications." Below this, there are two expandable sections: "Details" and "System Requirements".

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).

```

SQLCMD
run below command from command prompt
sqlcmd -S EMI\SQLEXPRESS01 -E
select @@Version
go

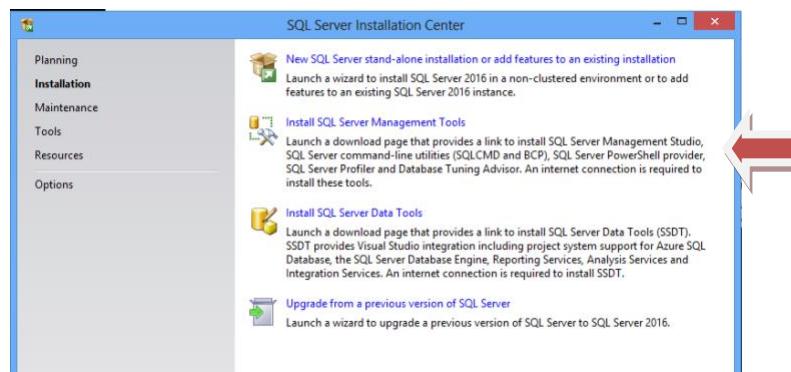
Microsoft SQL Server 2016 (RTM) - 13.0.1601.5 (X64)
Apr 29 2016 23:23:58
Copyright (c) Microsoft Corporation
Express Edition (64-bit) on Windows 8 6.2 (X64) <Build 9200>

(1 row affected)
1> sp_databases
2> go
DATABASE_NAME      DATABASE_SIZE  REMARKS
master              6592          NULL
model               16384         NULL
msdb                15936         NULL
Tempdb              16384         NULL
1>

```

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

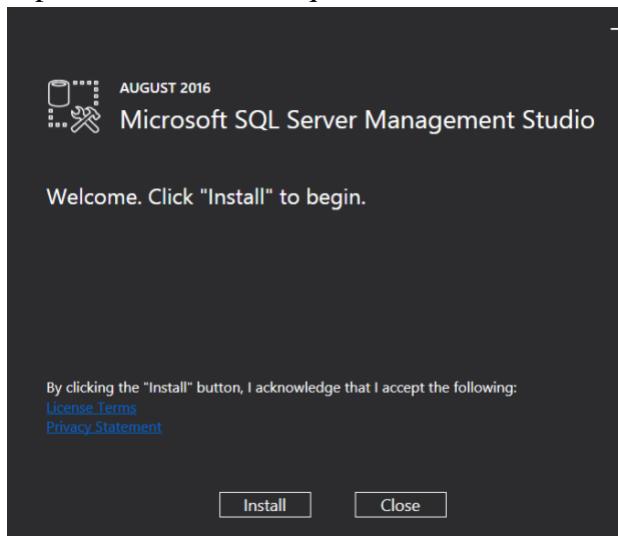
From SQL Server 2016 Express Edition -> Customize / Install tools, the SQL Server Management Tools has to be install.



From the web page <https://docs.microsoft.com/en-us/sql/ssms/download-sql-server-management-studio-ssms?view=sql-server-ver15>, the SQL Server Management Studio (SSMS) will be downloaded (SSMS-Setup-ENU).

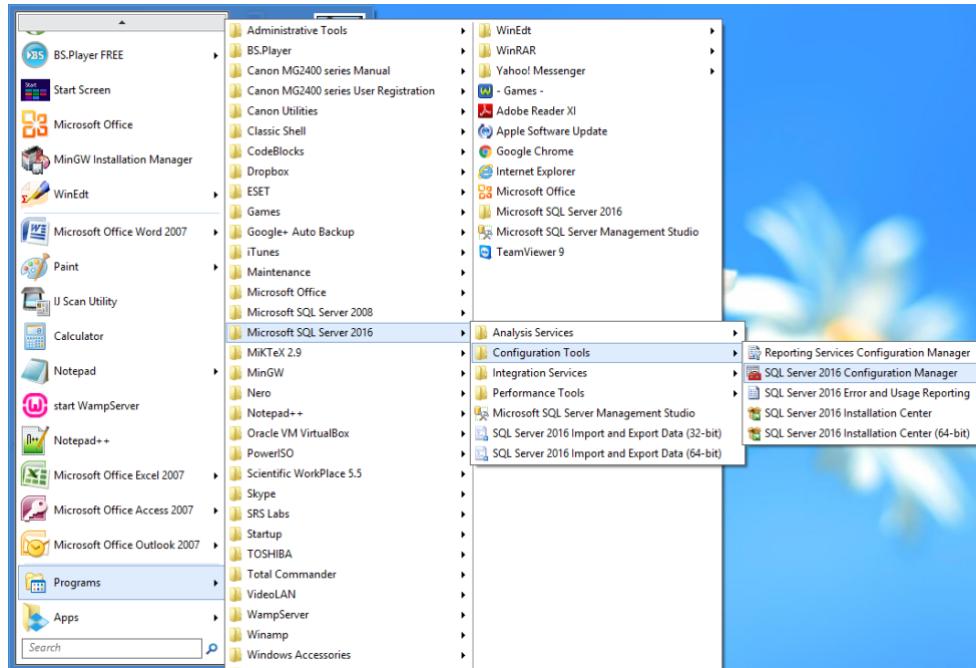
The screenshot shows a Microsoft MSDN webpage. At the top, there's a navigation bar with links like 'Technologies', 'Downloads', 'Programs', 'Community', 'Documentation', and 'Samples'. Below the navigation is a breadcrumb trail: '... > SQL Server > SQL Server Tools > SQL Server Management Tools (including SSMS)'. The main content area has a title 'Download SQL Server Management Studio (SSMS)' and a sub-header 'Updated: September 20, 2016'. It describes SSMS as an integrated environment for managing SQL Server. On the left, there's a sidebar with links for 'Download SQL Server Management Studio (SSMS)', 'Changelog (SSMS)', 'Release Notes', 'Previous SQL Server Management Studio Releases', and 'License Terms'. On the right, there are buttons for 'Print', 'Export (0)', and 'Share'. A sidebar titled 'IN THIS ARTICLE' lists 'SQL Server Management Studio Changelog', 'Previous releases', 'Feedback', and 'See Also'.

Now, the SQL Server 2016 Express Edition can be quit. The SSMS will be installed.

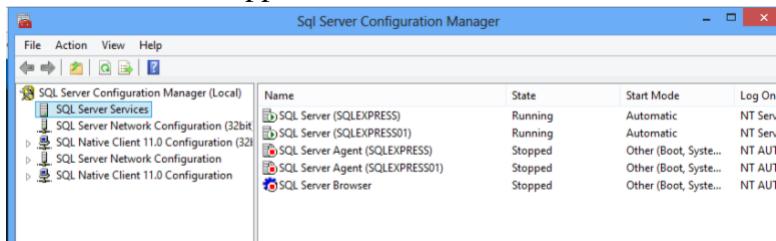


A restart of the computer is recommended after the installation.

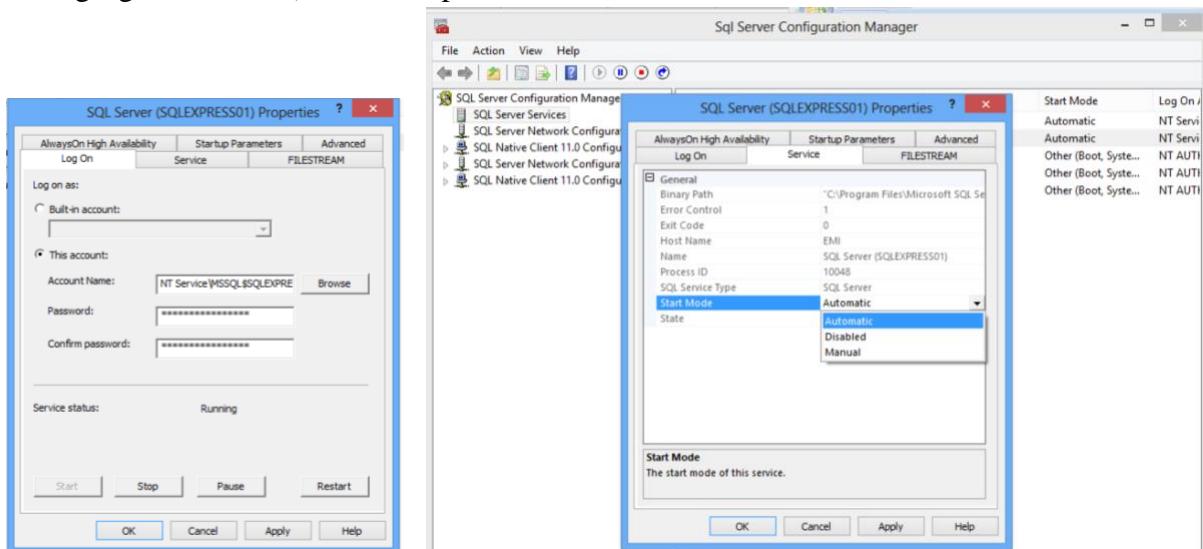
- Microsoft SQL Server Management Studio (yellow icon)
- SQL Server 2016 Configuration Manager (red icon)



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



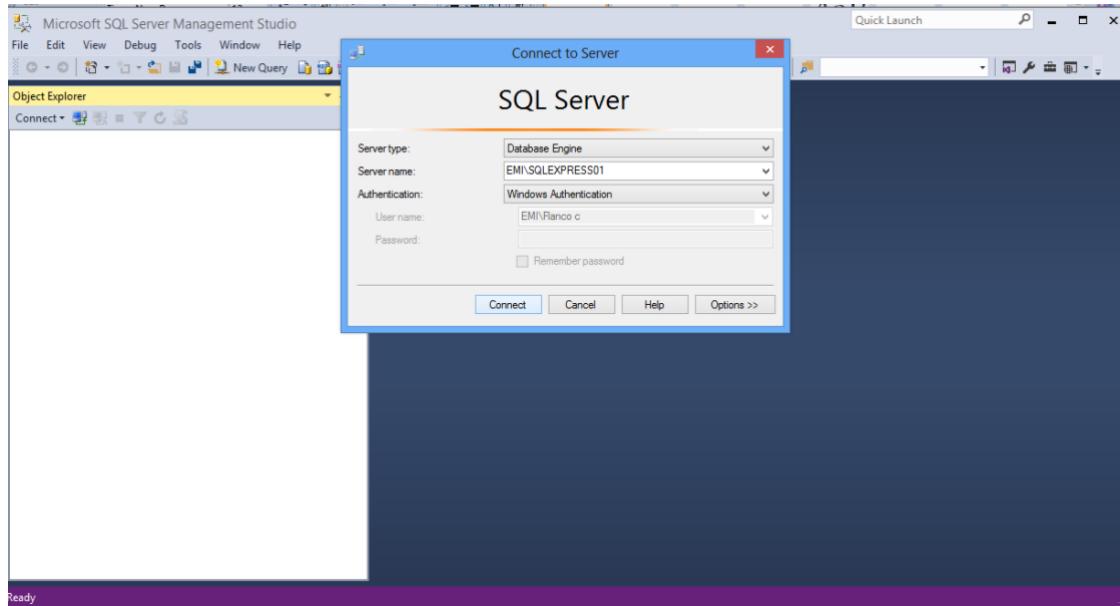
Usually, the SQL Server Services is running automatic. This property can be changed from Properties (by pressing right click on it): Start, Stop, Pause, Restart.



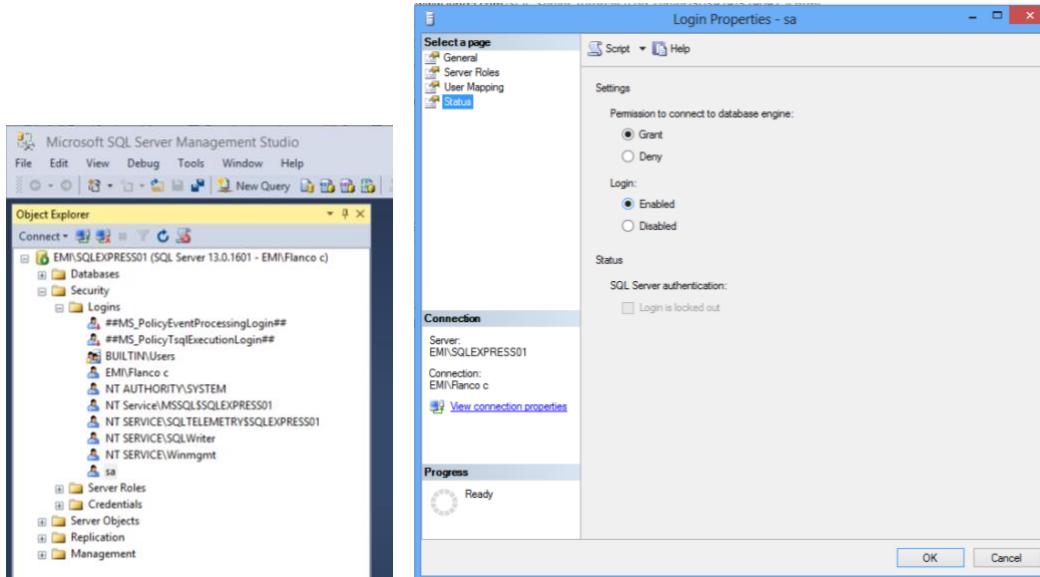
The automatic running (when the computer starts) can be changed from Properties -> Service -> Start Mode.

Microsoft SQL Server Management Studio (yellow icon)

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

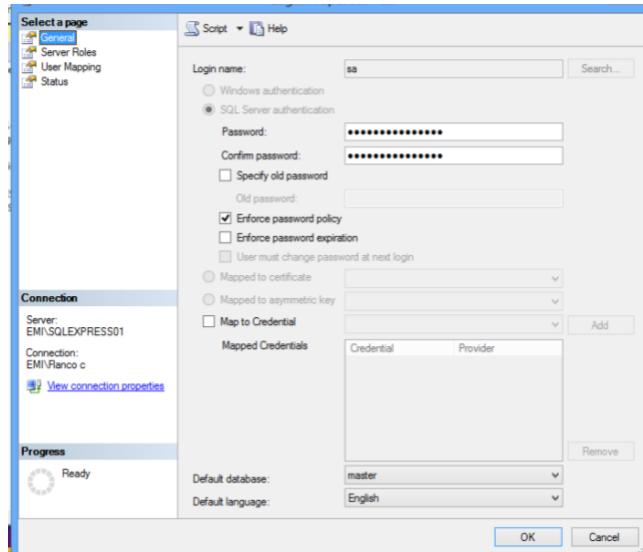


To configure the system administrator account (sa) – a default account, one has to go to Security -> Logins -> sa. If sa account is disabled (has a red point near the icon), it has to be enabled by click right -> Properties and from Status -> Enabled.

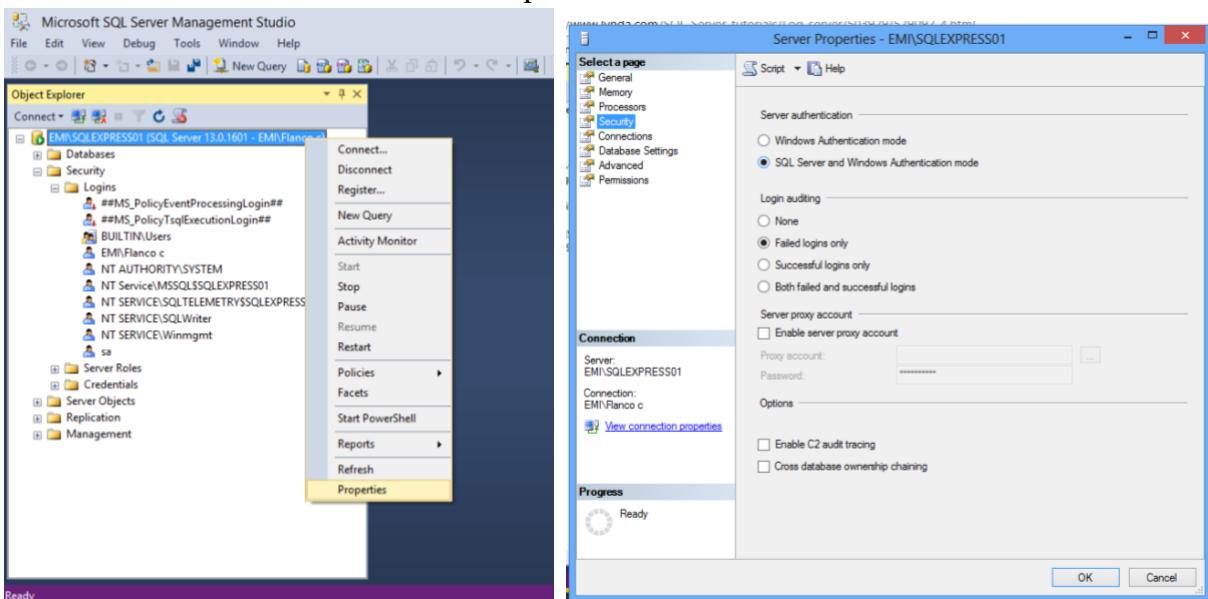


Also, for this account, from General menu, a password should be established (preferable a strong one) and then press Ok. Don't forget the password!

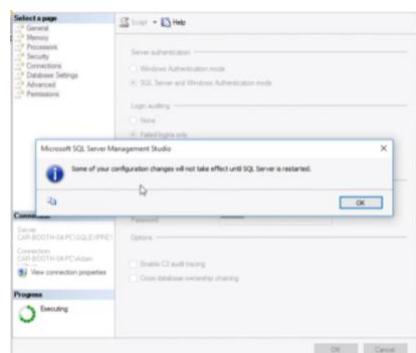
Then, by pressing right click on the Security->Logins a Refresh will be need (the red point from the sa icon will disappear).



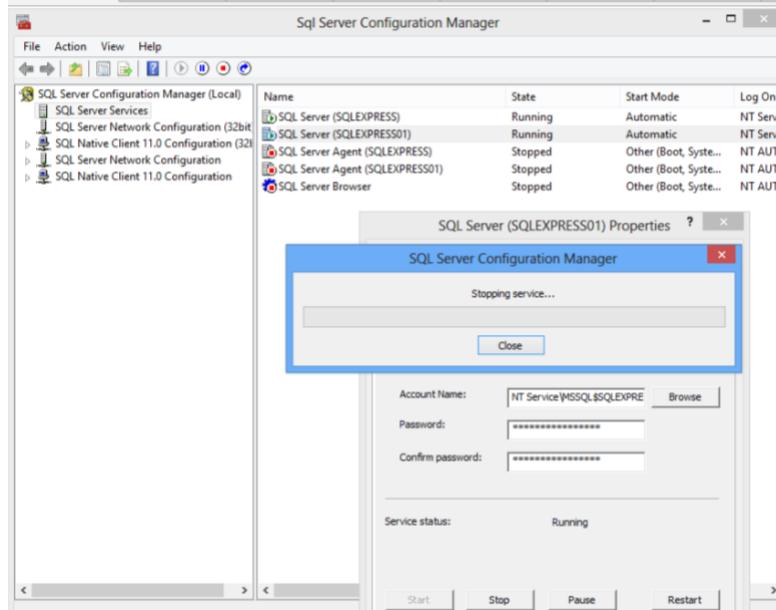
Next the SQL Server has to be enabled: a right click on the Server Name is required to access the Properties menu. From the Security menu, the bullet SQL Server and Windows Authentication mode has to be marked and then the ok button has to be pressed.



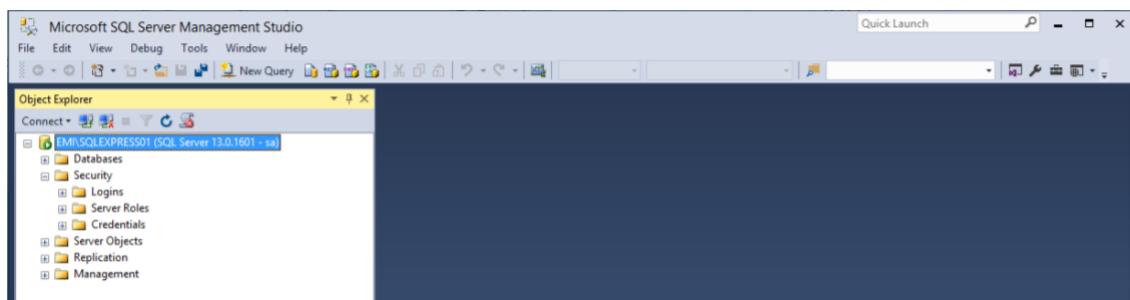
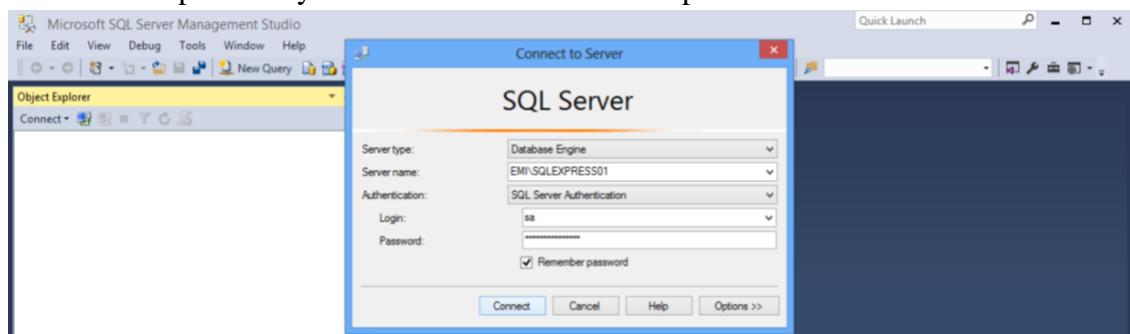
A message will be displayed and ask to restart the SQL Server (because otherwise the change will not take effect)



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 screenshot shows the TechNet homepage. At the top, there's a navigation bar with links to various Microsoft products like Apps, Facebook, and YouTube. Below it is the Microsoft logo and the "TechNet" dropdown menu. The main content area features a banner for "Microsoft Ignite" with a calendar for September 2016. Below the banner, there's a section about Visio updates and a video player. On the right side, there's a sidebar with sections for Troubleshooting, Downloads, Subscriptions, and Training, each with a plus sign to expand.

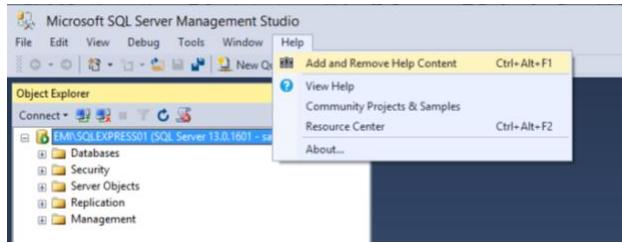
The Library menu was to be access, then SQL Server menu.

The screenshot shows the TechNet Library page for Microsoft SQL Server. The left sidebar is expanded to show the "Library" menu, with the "SQL Server" item selected. The main content area displays the "Microsoft SQL Server" landing page, which includes a brief description, a "Print" button, and a "Share" button. A sidebar on the right lists "IN THIS ARTICLE" topics such as SQL Server 2016, Blogs and resources, Product documentation, Azure SQL Database, SQL Server on an Azure Virtual Machine, Azure SQL Data Warehouse, and DocumentDB.

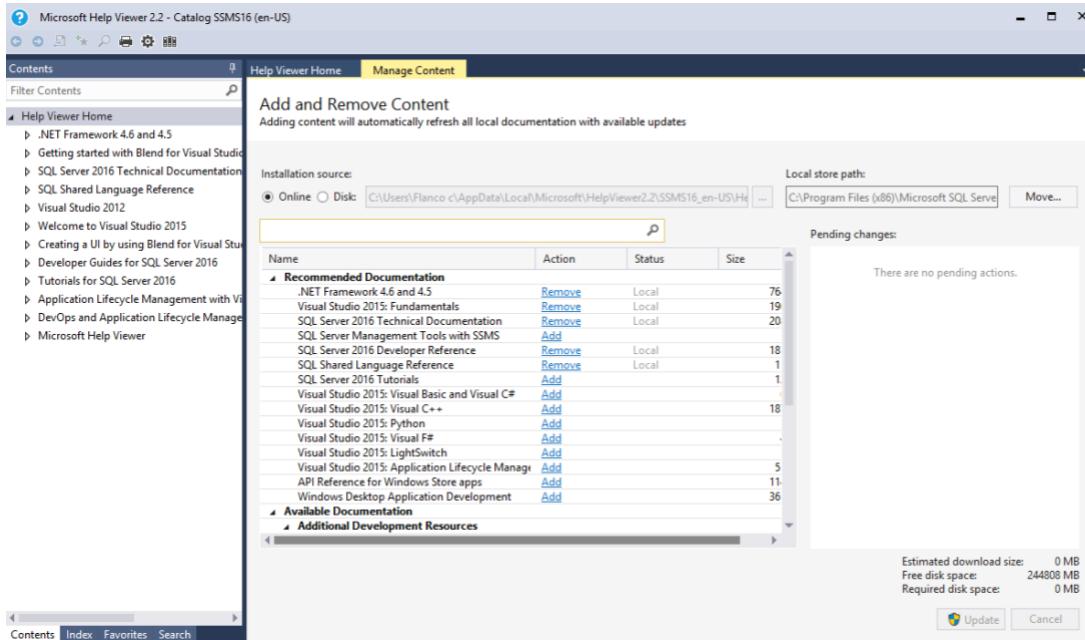
The documentation for SQL Server 2016 can be found there:

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

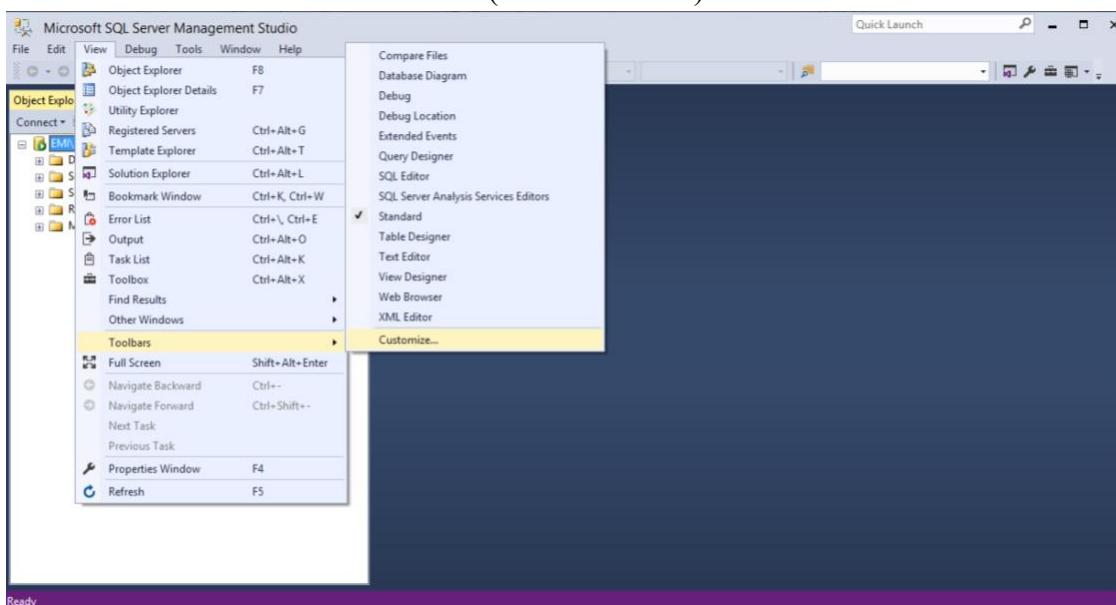


The SQL Server 2016 Technical Documentation, SQL Shared Language Reference and SQL Server 2016 Tutorials should be included by pressing Add and the Update.

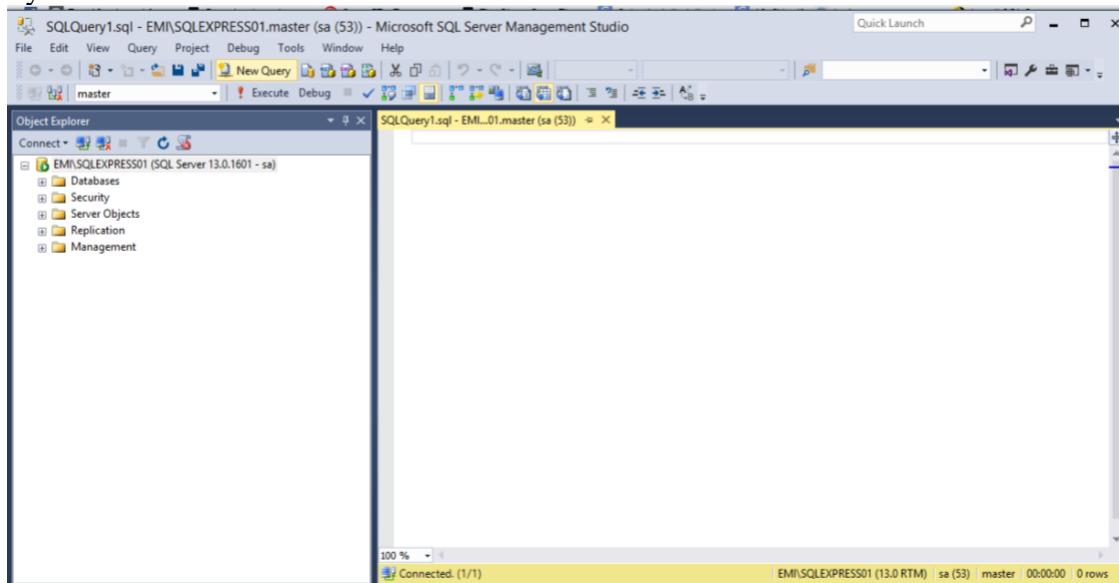


SQL Server Management Studio

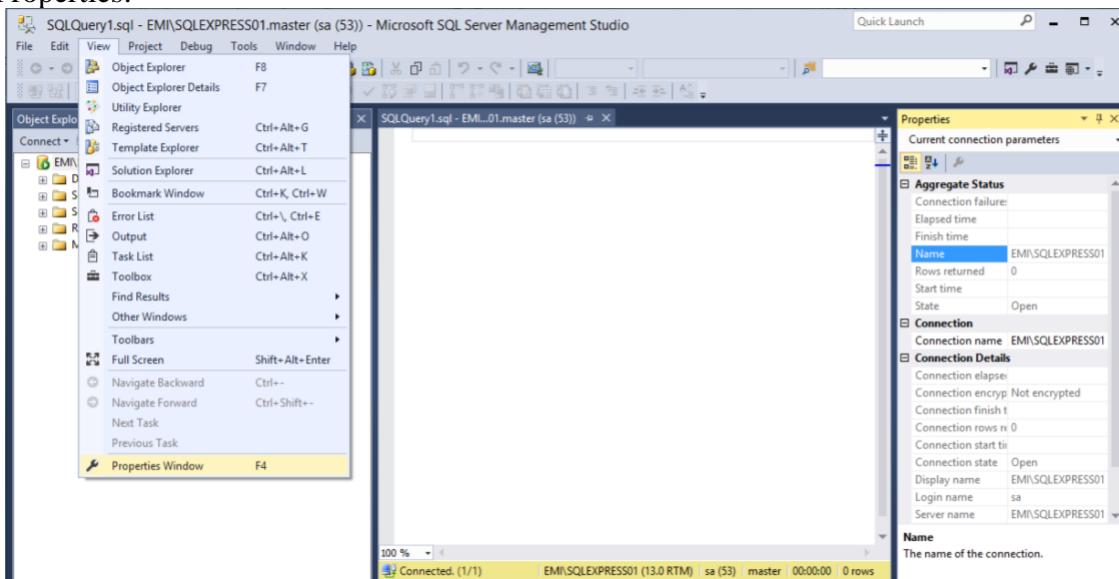
Add new tools: View menu -> Toolbars -> ... (one can choose)



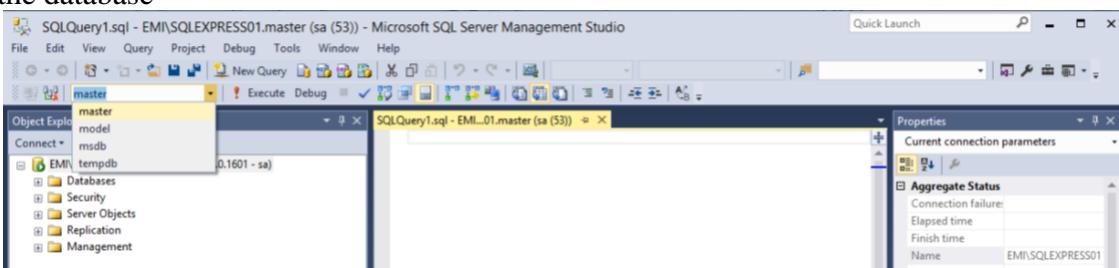
New Query:



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 screenshot shows the GitHub repository for Microsoft SQL Server Samples. The README.md file is displayed, showing various commit logs and file details. A context menu is open over the file list, with the 'Download ZIP' option highlighted.

The file **WideWorldImporters-Full.bak** will be downloaded from the link [Wide World Importers sample database v1.0](#)

The screenshot shows the release page for the Wide World Importers sample database v1.0. It details the contents of the release, including the WideWorldImporters-Full.bak file and other artifacts like WideWorldImportersDW-Full.bak and WideWorldImportersDW-Standard.bak.

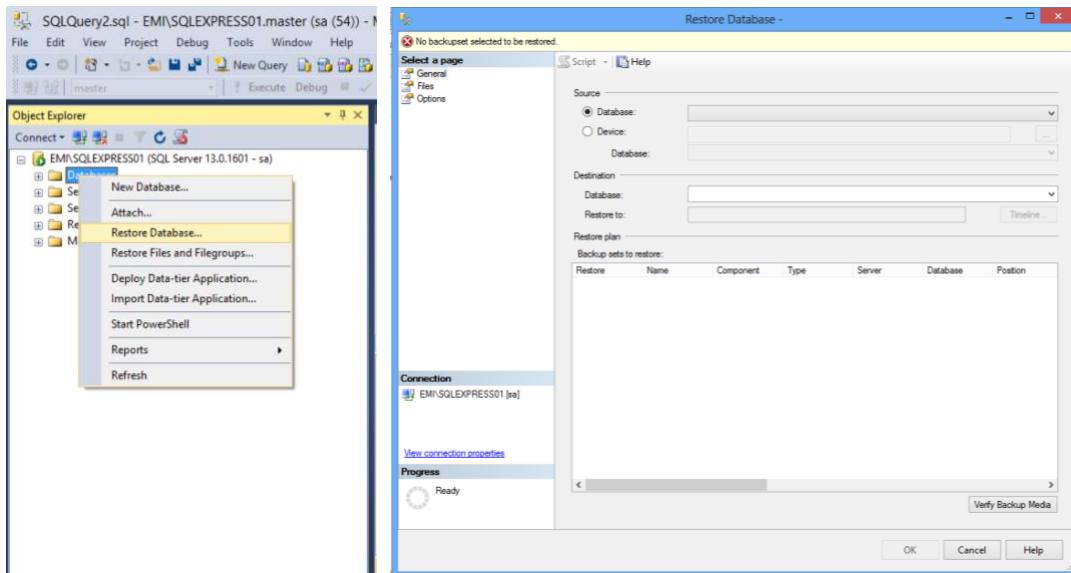
The database (the backup file that had been downloaded) has to be placed in:

C:\Program Files -> Microsoft SQL Server -> MSSQL13.SQLEXPRESS -> MSSQL -> Backup -> .bak

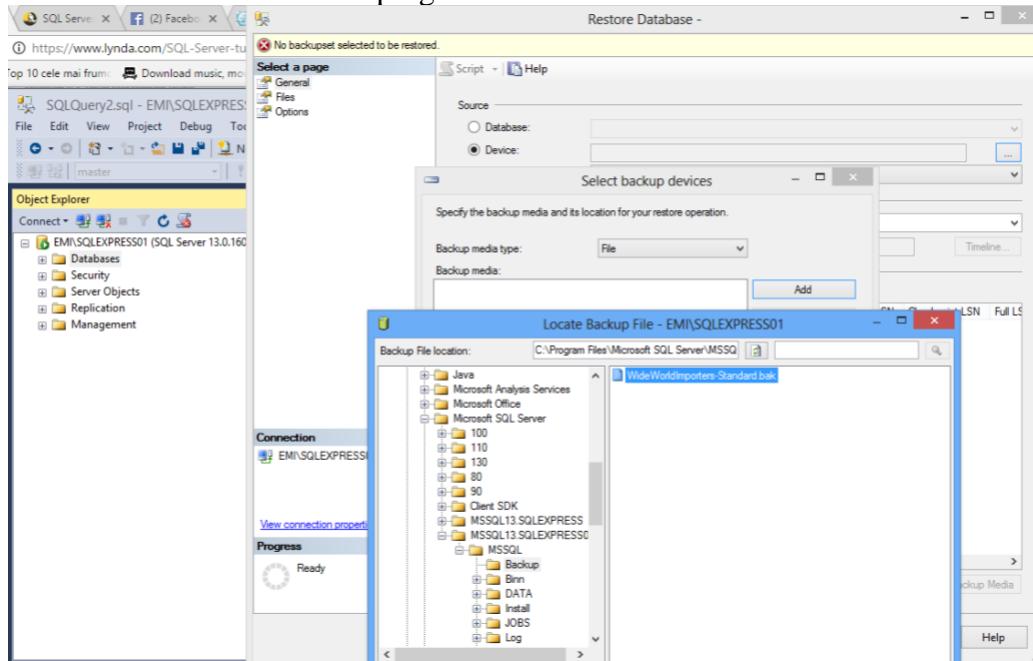
The screenshot shows the Windows File Explorer interface with the path C:\Program Files\Microsoft SQL Server\MSSQL13.SQLEXPRESS01\MSSQL\Backup. A file named 'WideWorldImporters-Standard.bak' is selected, indicating it is the file to be restored.

The file **WideWorldImporters-Standard.bak** has to be downloaded.

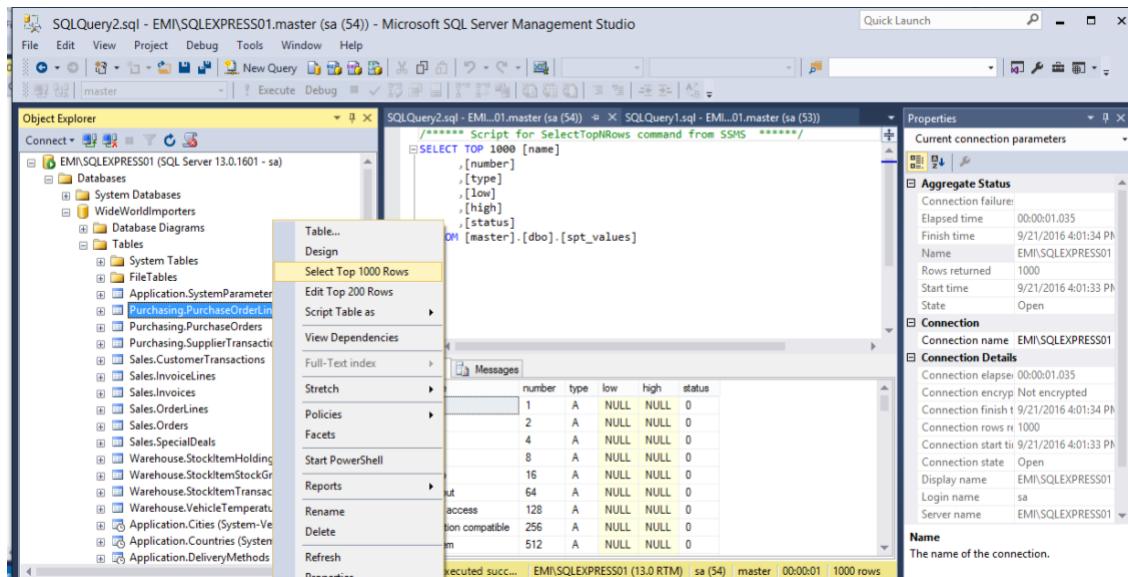
Import the database into Microsoft SQL Server 2016 Management Studio: Database-> right click -> Restore databases



Now, the database can be restored in the program

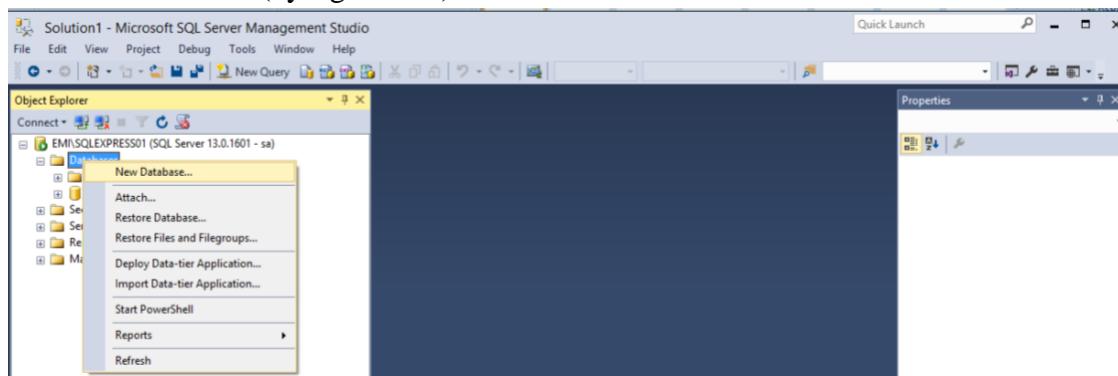


Check the database (Refresh = F5) and it appear

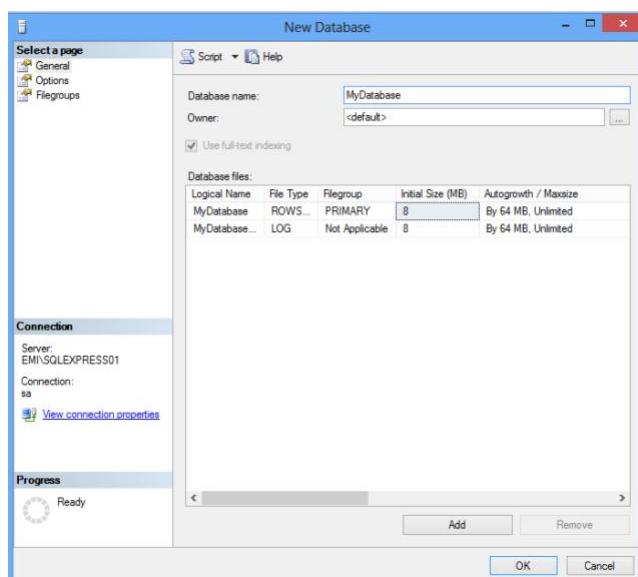


Create a new Database on the Server

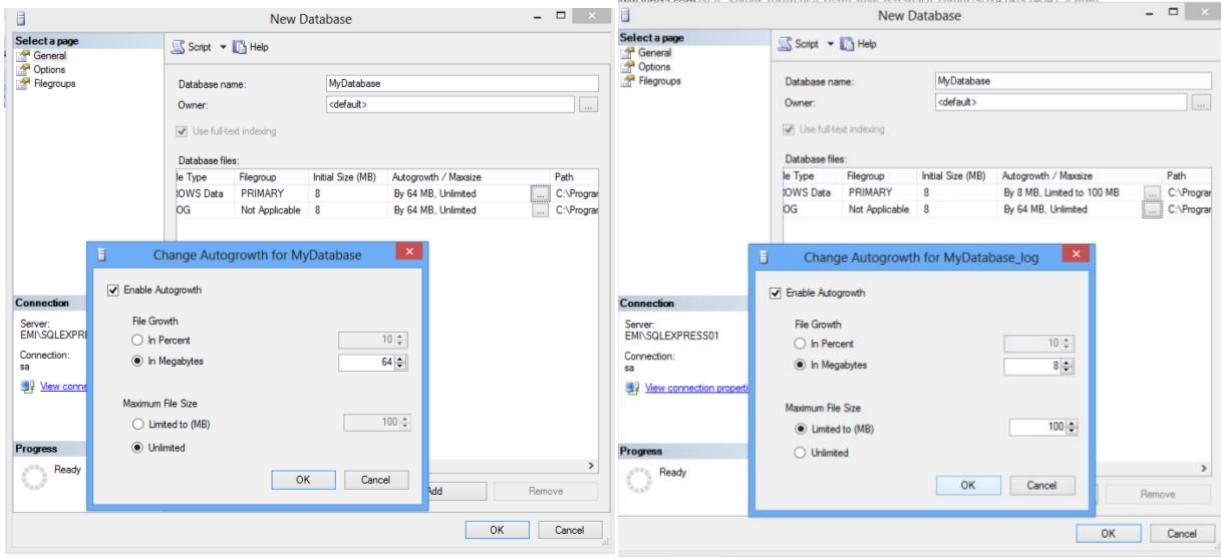
Databases -> New Database (by right click)



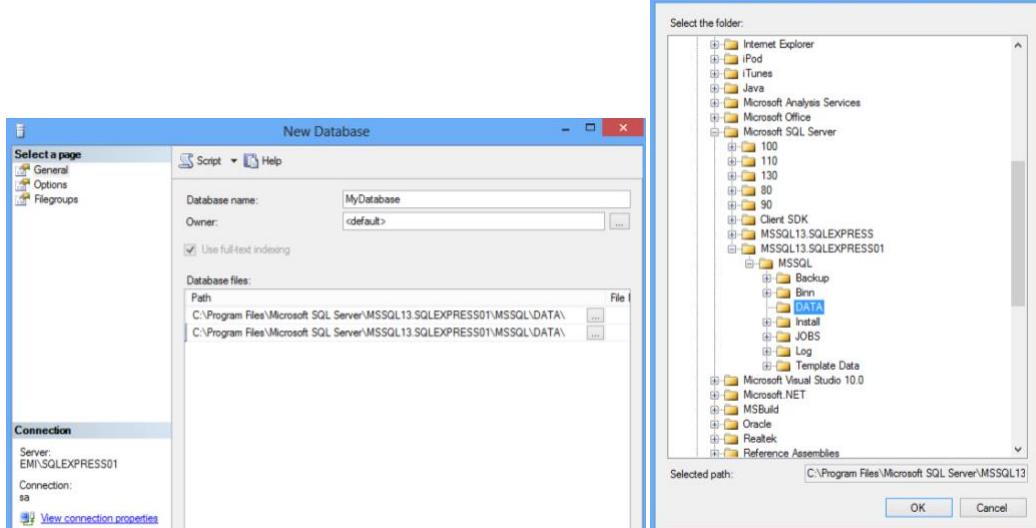
Create a database: General menu -> name it



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)

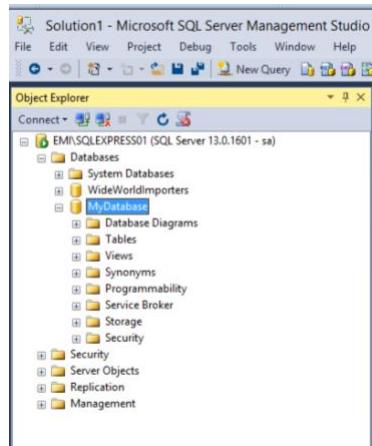


Table Structure

- 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

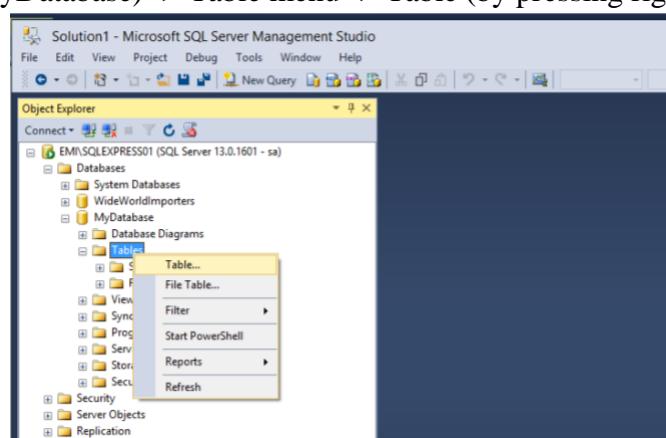
Date

Currency

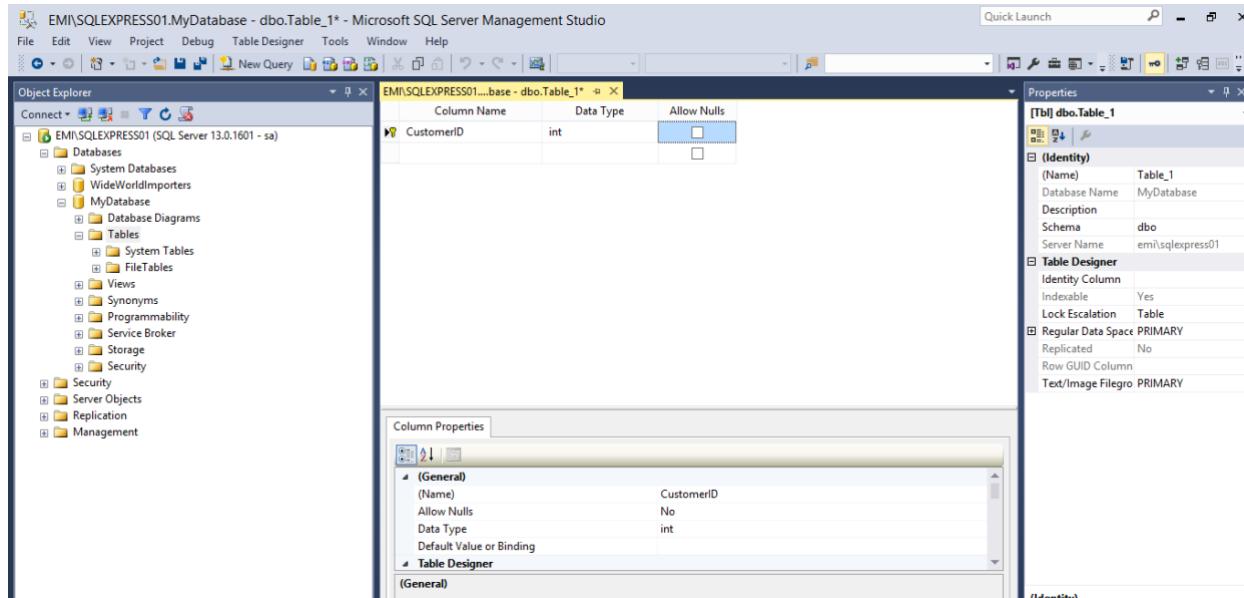
Geographic coordinates ...

Create a table

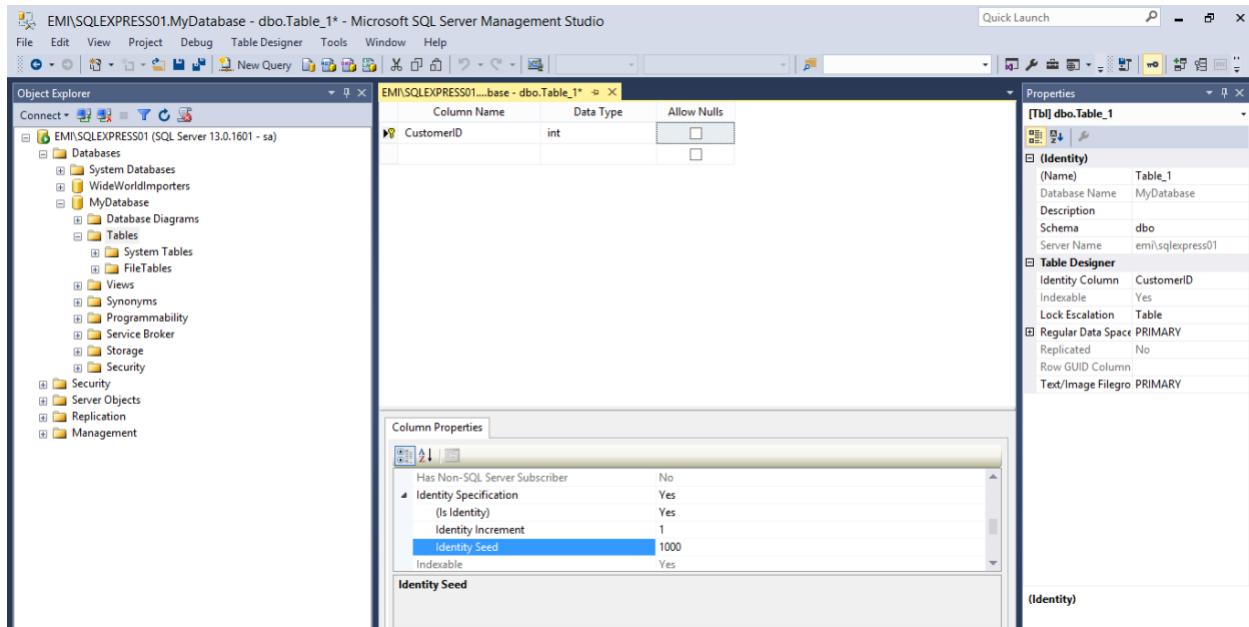
Inside of the Database (MyDatabase) -> Table menu -> Table (by pressing right click)



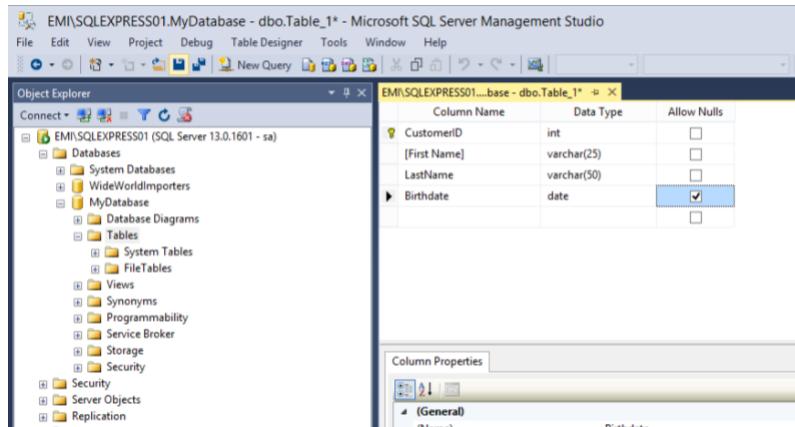
A column



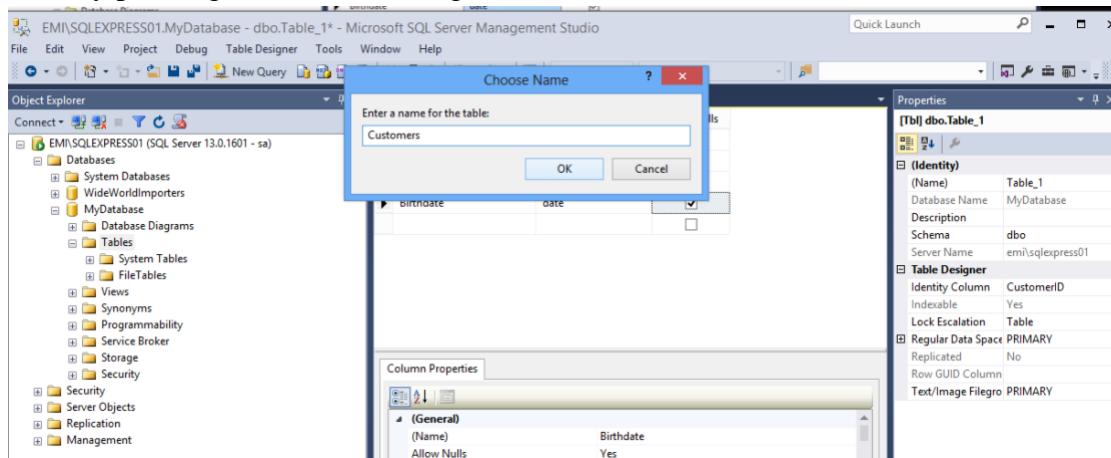
A identity of the instances: Yes – 1 – 1000 (for example)



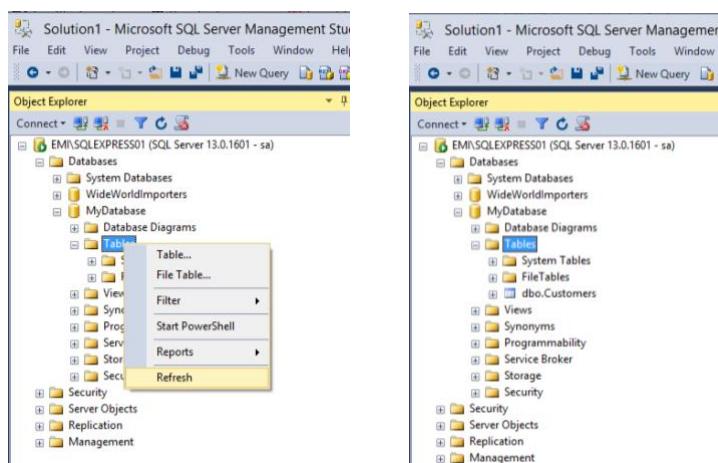
Introducing more fields (If another add will be required later than the save of the table: right click on table -> Design)



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



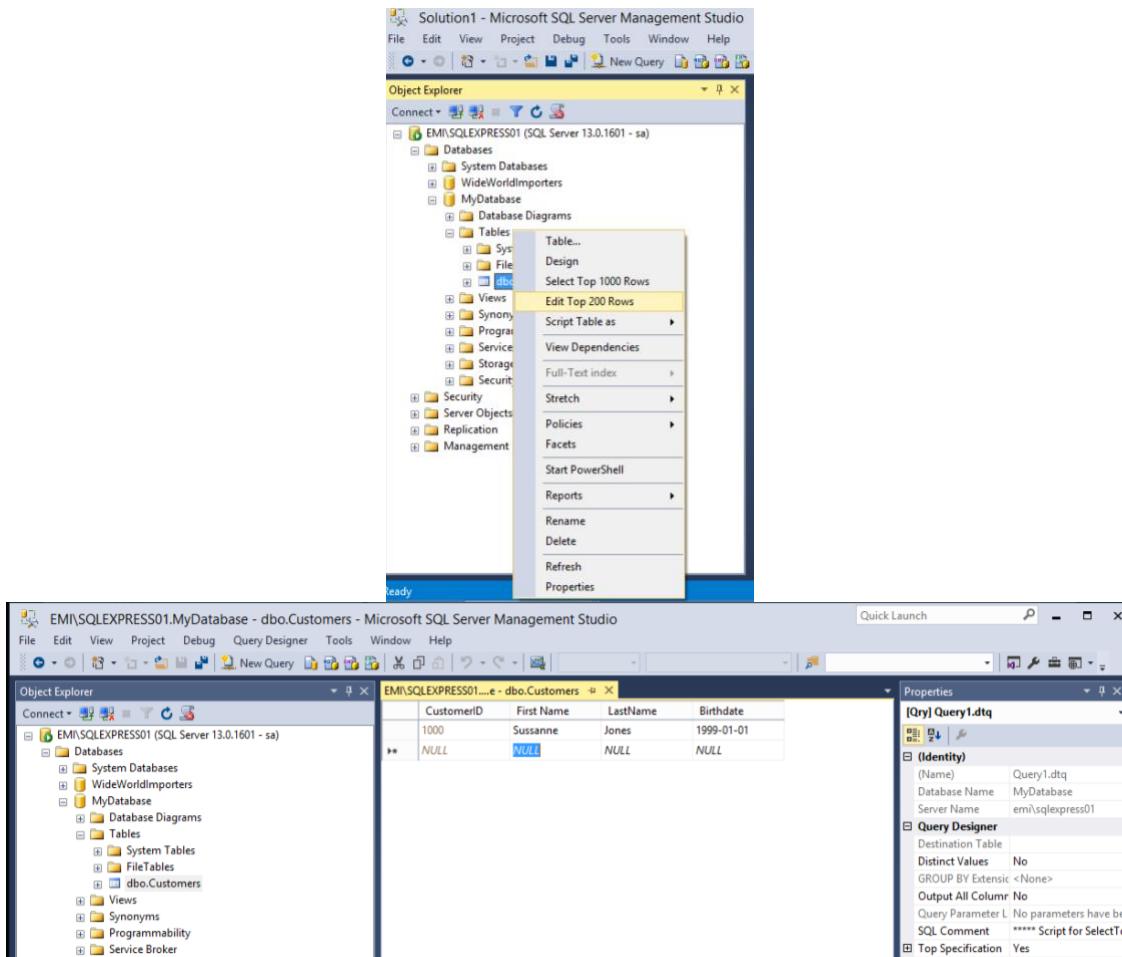
Refresh on Tables tab to see the table



There is the dbo.Customers table.

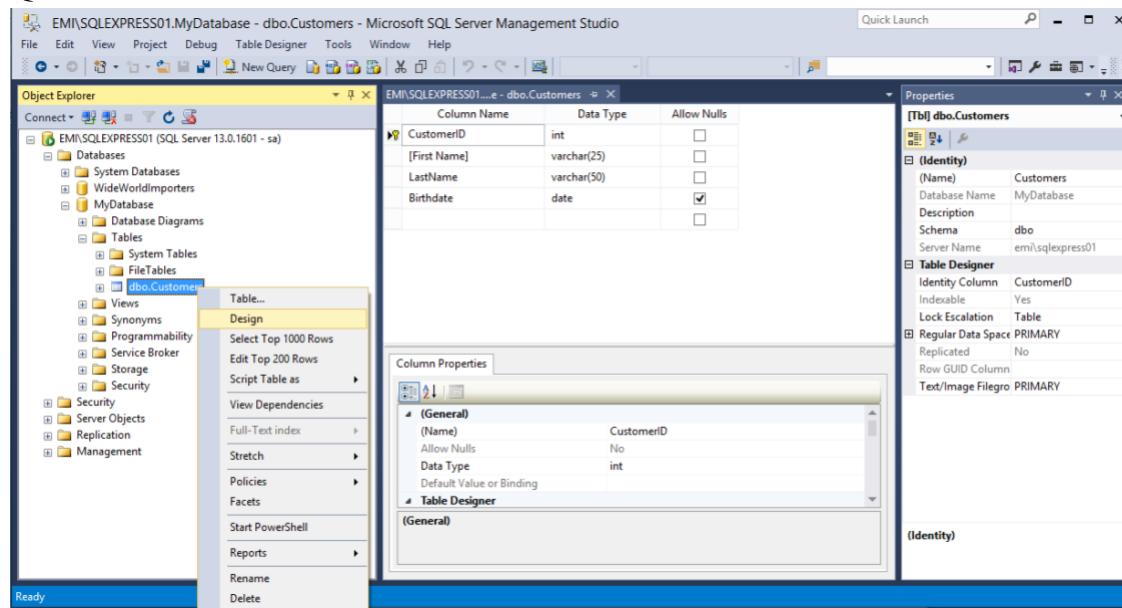
Edit Top 200 rows (from right click on dbo.Customers) is used to introduce values.

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.

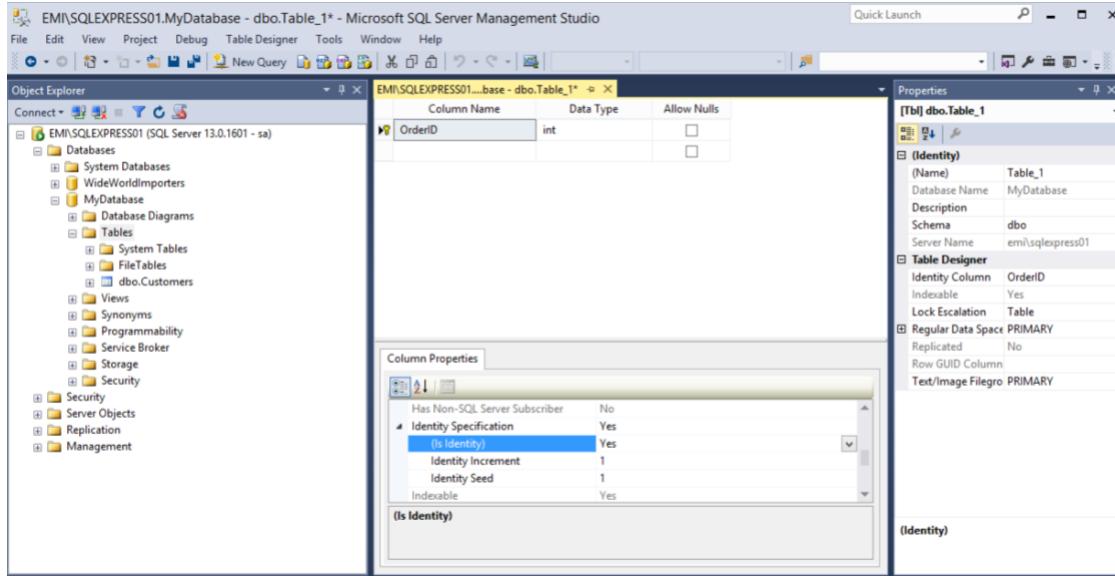
The UNIQUE IDENTIFIER in the table = PRIMARY KEY



Join tables together with keys

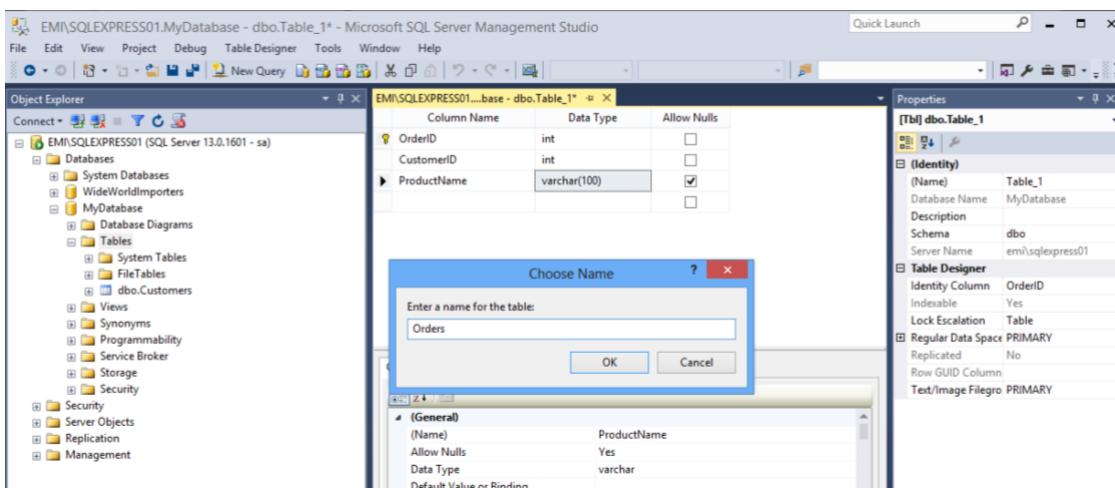
Primary key from a table

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

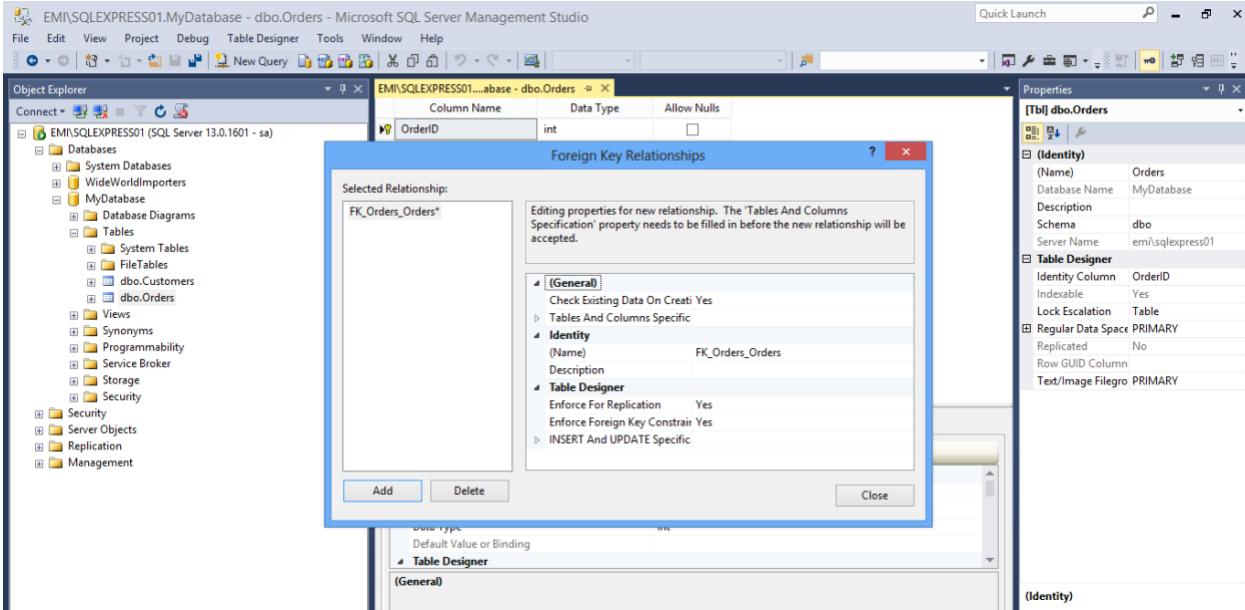


Foreign key – CustomerID – from Customers table

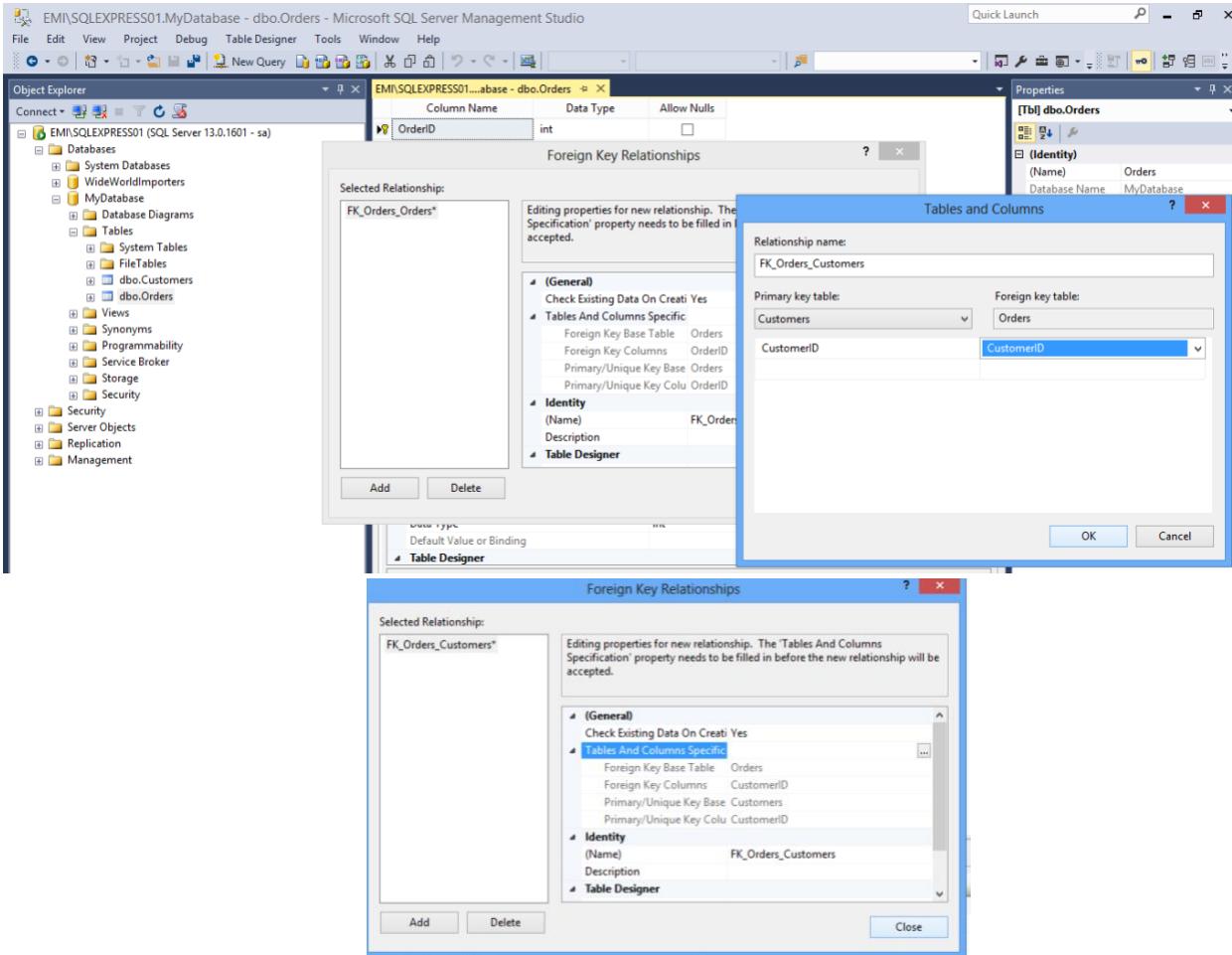
- the same type like in that table where is primary key (int)
- the same values as where it is primary key, but not necessarily unique (a value can appear more than once)
- Allow Null – Never



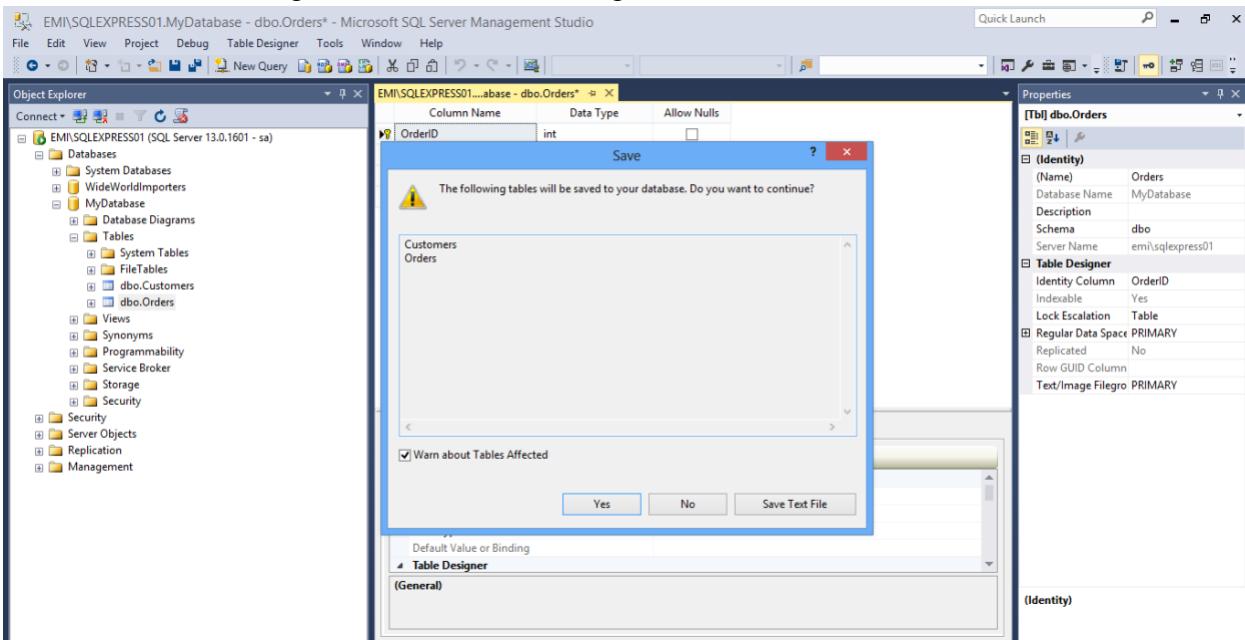
Relationships – right click on the left part where the fields are -> Add a new relationship



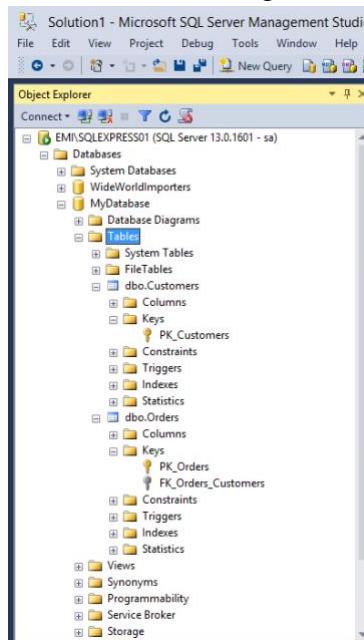
The Tables and Columns Specific -> has to be access from ... -> complete the tables that are in the relationship and corresponding to those the primary key (the first table – Customers – the table with the primary key) and the foreign key (the second table – Orders – the table with the foreign key)



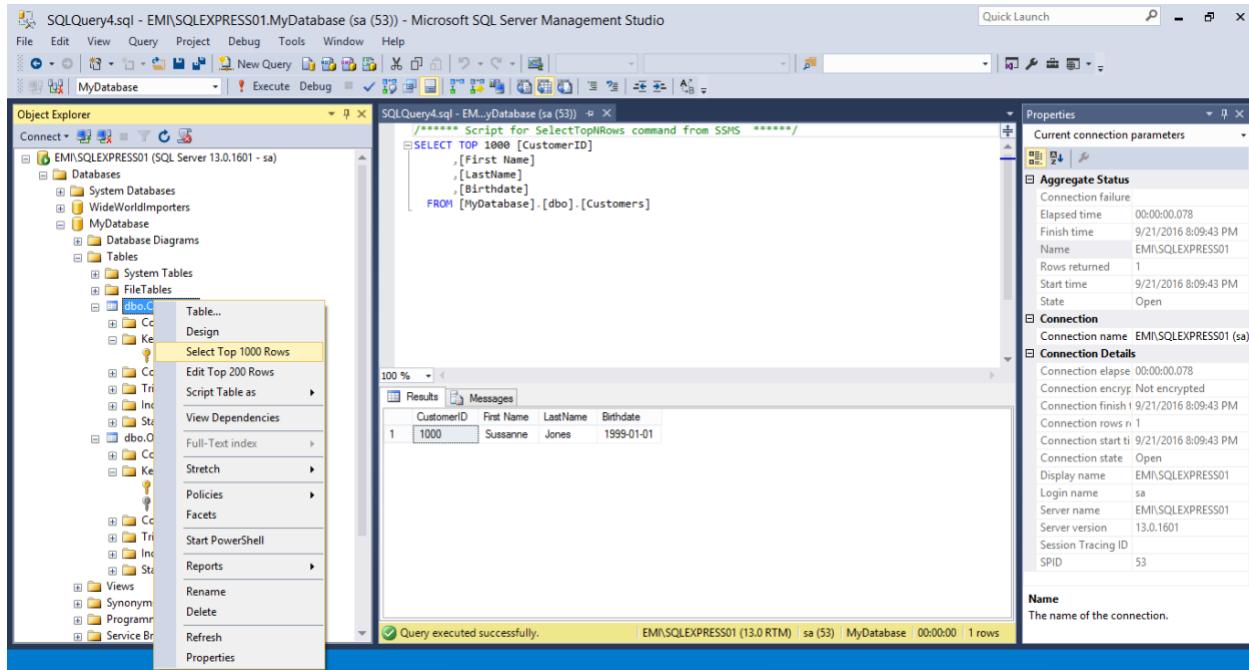
SAVE after these changes and Yes to the message that follows.



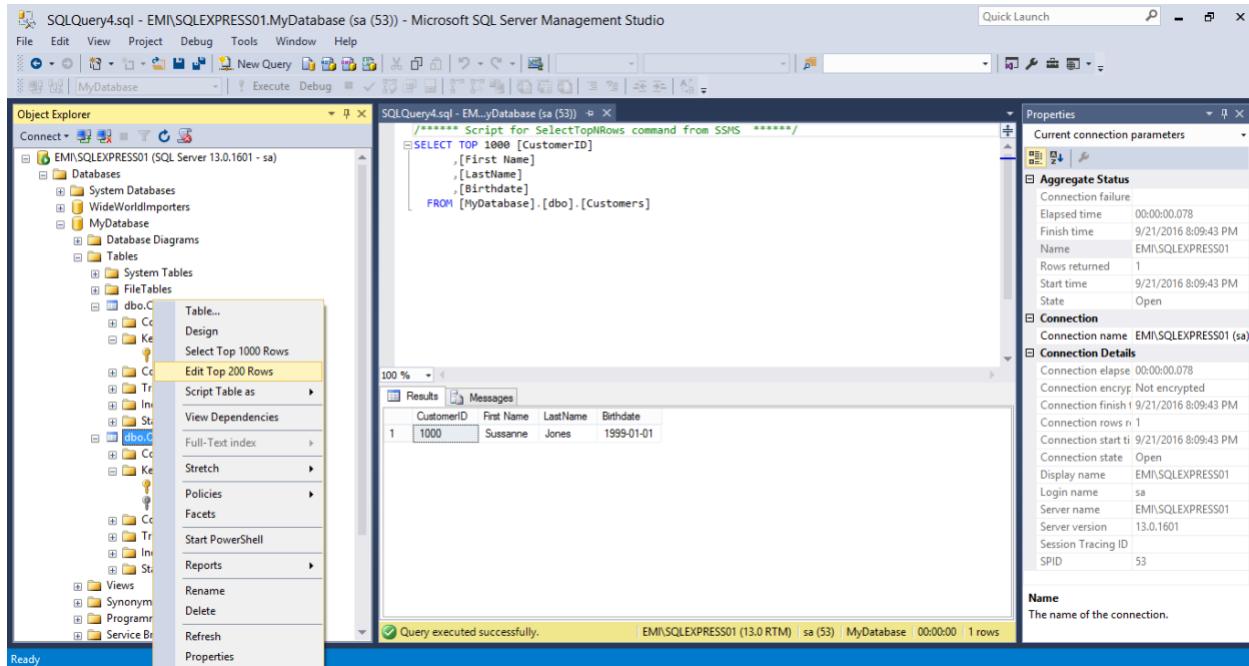
The primary keys and foreign key can be seen in the configuration part after a Refresh.



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

EMI\SQLEXPRESS01.MyDatabase - dbo.Orders - Microsoft SQL Server Management Studio

Object Explorer

EMI\SQLEXPRESS01 (SQL Server 13.0.1601 - sa)

Properties

[Query1.dtq]

(Identity)

(Name) Query1.dtq

Database Name MyDatabase

Server Name emi\sqlexpress01

Query Designer

Destination Table

Distinct Values No

GROUP BY Extencis <None>

Output All Column No

Query Parameter L No parameters have been defined.

SQL Comment ***** Script for SelectToText

Top Specification Yes

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

EMI\SQLEXPRESS01.MyDatabase - dbo.Orders - Microsoft SQL Server Management Studio

Object Explorer

EMI\SQLEXPRESS01 (SQL Server 13.0.1601 - sa)

Properties

[Query1.dtq]

(Identity)

(Name) Query1.dtq

Database Name MyDatabase

Server Name emi\sqlexpress01

Query Designer

Destination Table

Distinct Values No

GROUP BY Extencis <None>

Output All Column No

Query Parameter L No parameters have been defined.

SQL Comment ***** Script for SelectToText

Top Specification Yes

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