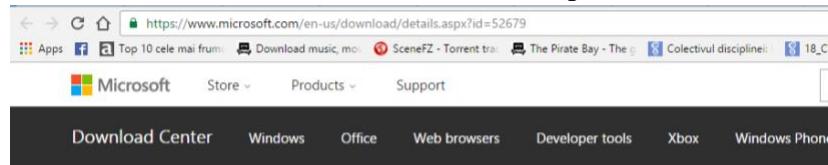


## Installation Microsoft SQL Server 2016

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>

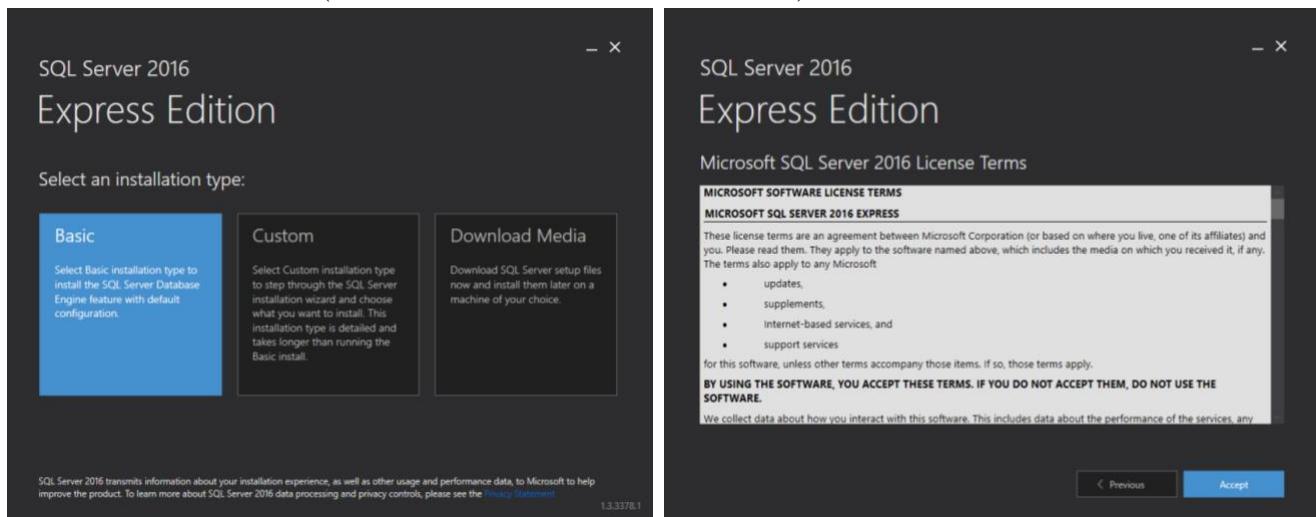
The version Express will be installed (SQLServer2016-SSEI-Expr).



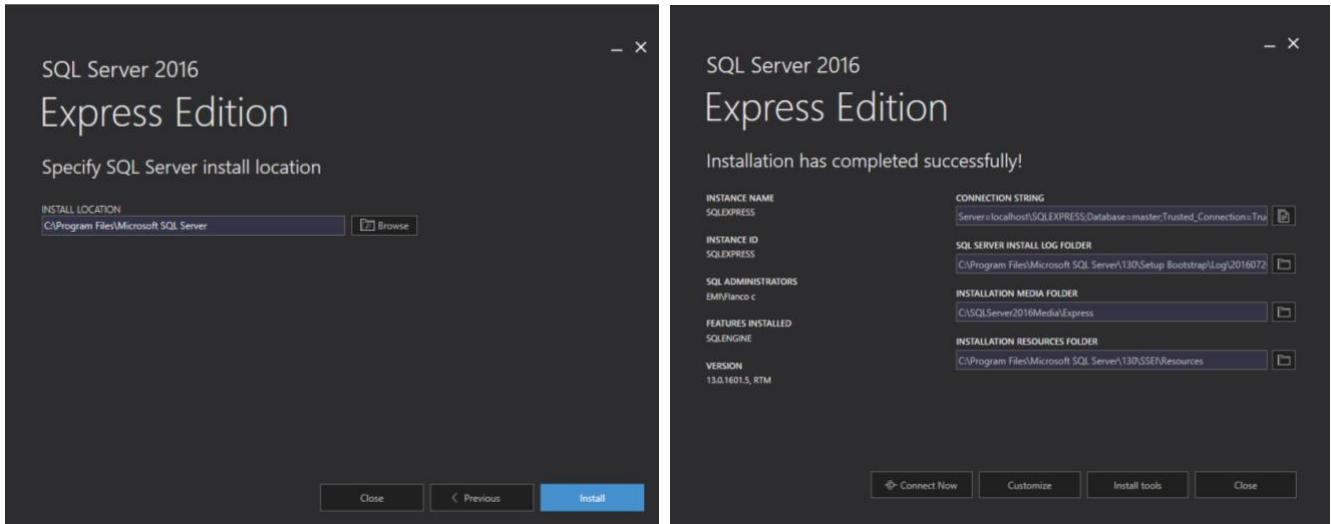
### Microsoft® SQL Server® 2016 Express

A screenshot of the Microsoft SQL Server 2016 Express download page. It includes a "Select Language" dropdown set to English and a large red "Download" button. Below the button, a brief description states: "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." 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

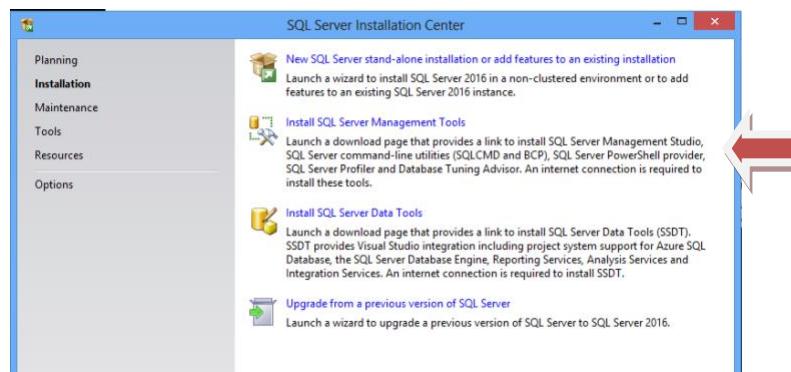
Microsoft SQL Server 2016 (RTM) - 13.0.1601.5 (X64)
Apr 29 2016 23:23:58
Copyright (c) Microsoft Corporation
Express Edition (64-bit) on Windows 8 6.2 (X64) <Build 9200>

(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

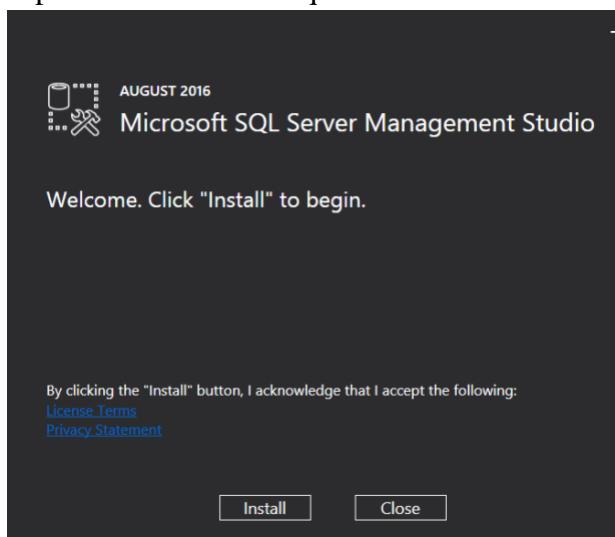
From SQL Server 2016 Express Edition -> Customize / Install tools, the SQL Server Management Tools has to be install.



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).

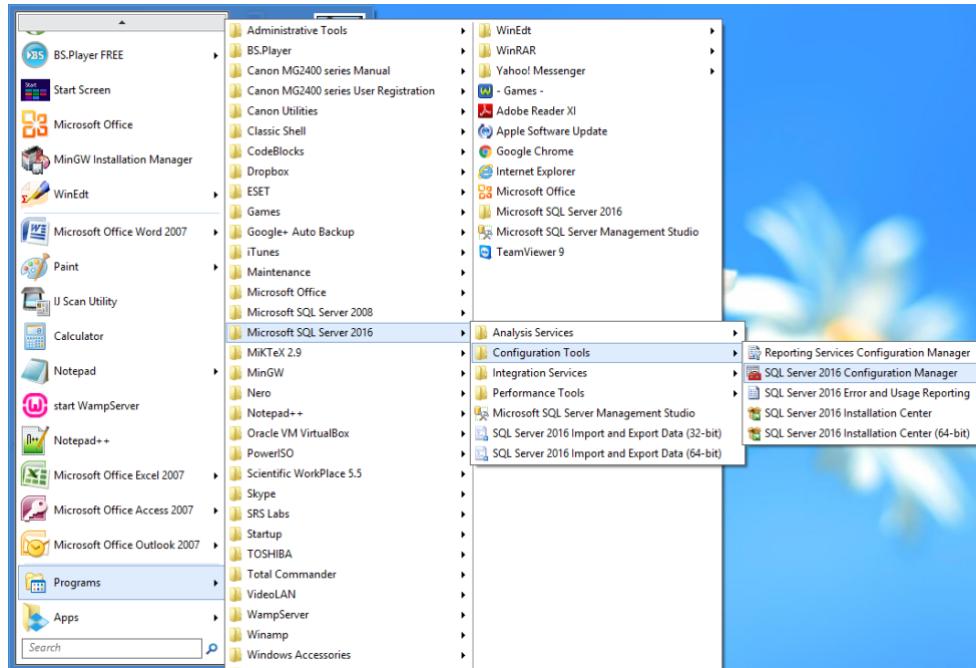
The screenshot shows a Microsoft MSDN webpage. At the top, there's a navigation bar with links for Apps, Facebook, Top 10 cele mai frumosi, Download music, SceneFZ - Torrent tra, The Pirate Bay - The, Collective discipline!, 18\_CV.pdf, Inainte sa te cunosc, Install SQL Server, Sign in, MSDN subscriptions, and Get tools. Below the bar, there's a main menu with categories like Technologies, Downloads, Programs, Community, Documentation, and Samples. Under the Documentation category, it says "SQL Server Tools > SQL Server Management Tools (including SSMS)". The main content area is titled "Download SQL Server Management Studio (SSMS)". It includes a sidebar with links for Download SQL Server Management Studio (SSMS), SQL Server Management Studio - Changelog (SSMS), SQL Server Management Studio - Release Notes, Previous SQL Server Management Studio Releases, and SQL Server Management Studio - License Terms. The main content area also has a "Note" section and a "IN THIS ARTICLE" sidebar with links for 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.

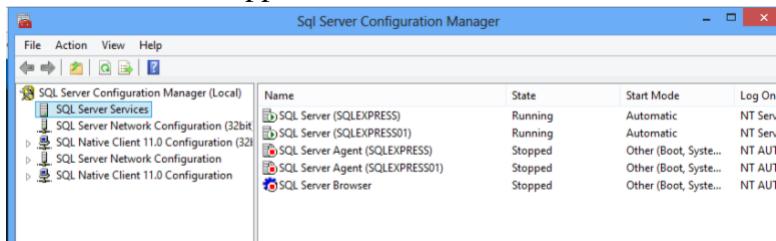


A restart of the computer is recommended after the installation.

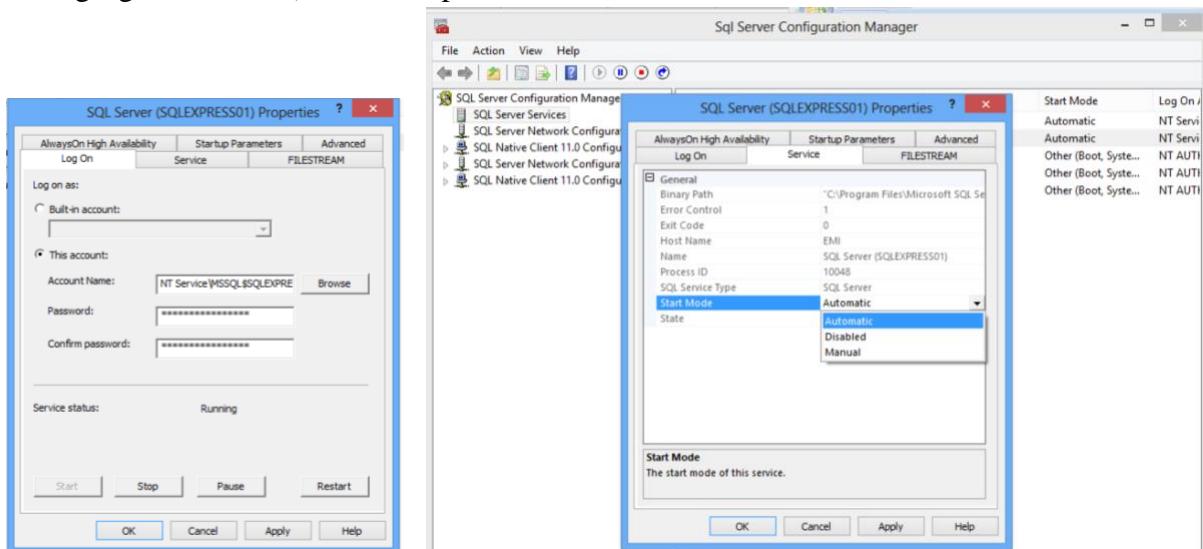
- Microsoft SQL Server Management Studio (yellow icon)
- SQL Server 2016 Configuration Manager (red icon)



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.



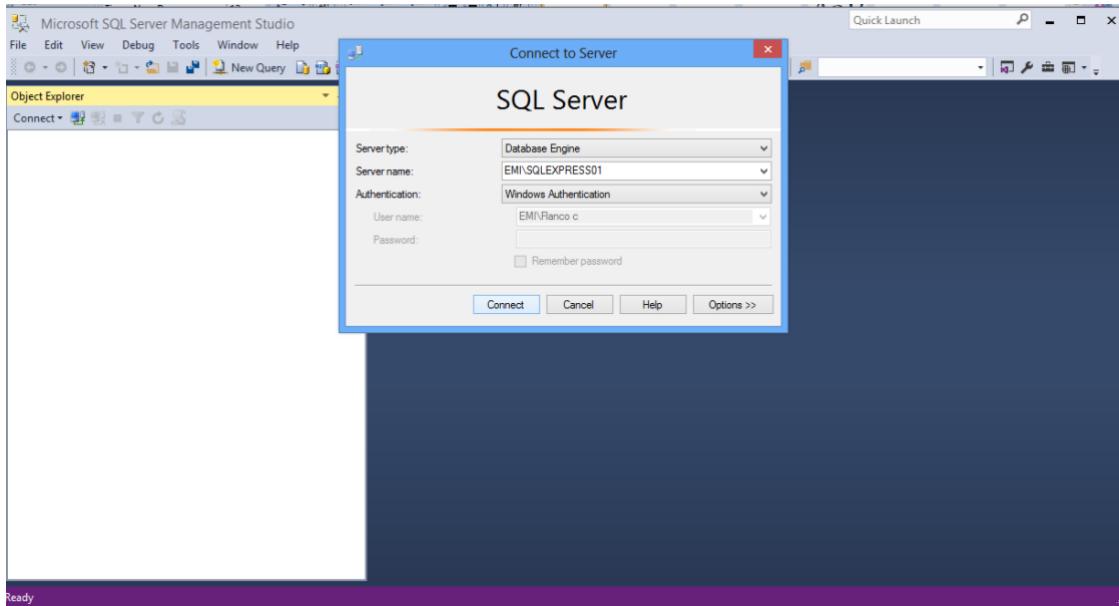
Usually, the SQL Server Services is running automatic. This property can be changed from Properties (by pressing right click on it): Start, Stop, Pause, Restart.



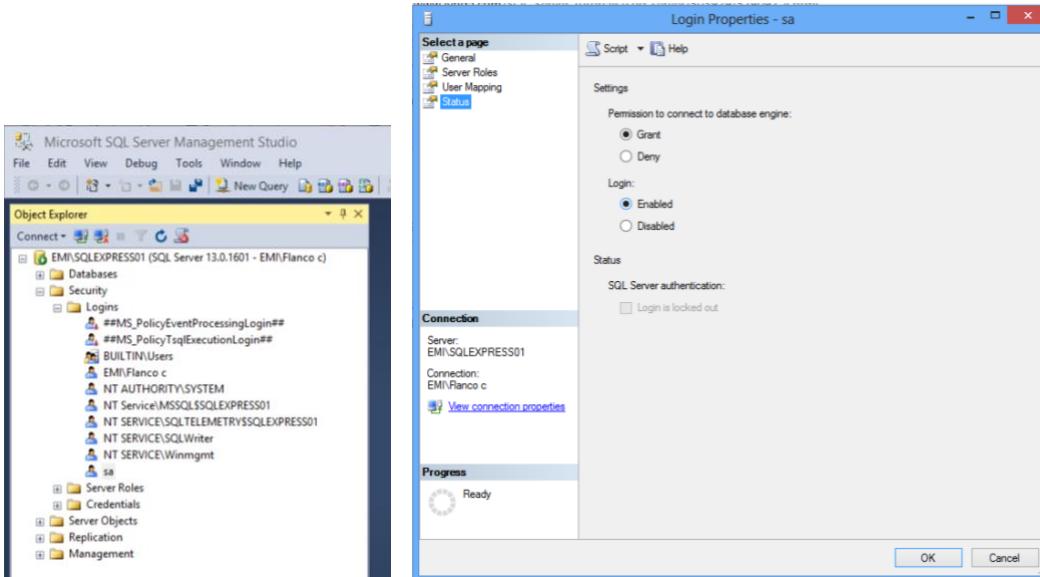
The automatic running (when the computer starts) can be changed from Properties -> Service -> Start Mode.

## Microsoft SQL Server Management Studio (yellow icon)

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

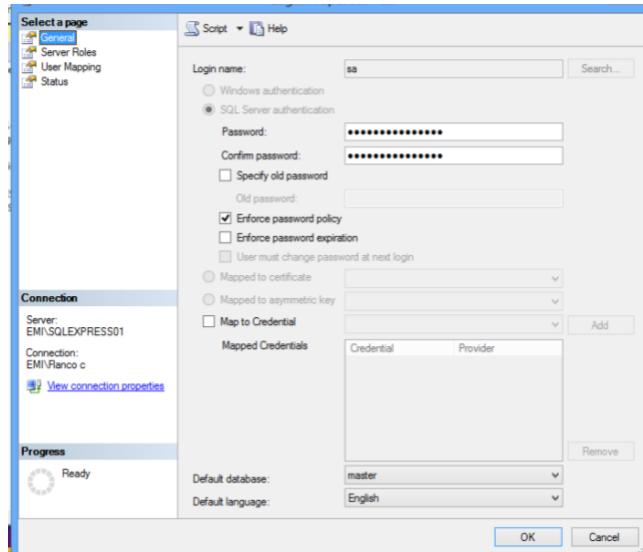


To configure the system administrator account (sa) – a default account, one has to go to Security -> Logins -> sa. If sa account is disabled (has a red point near the icon), it has to be enabled by click right -> Properties and from Status -> Enabled.

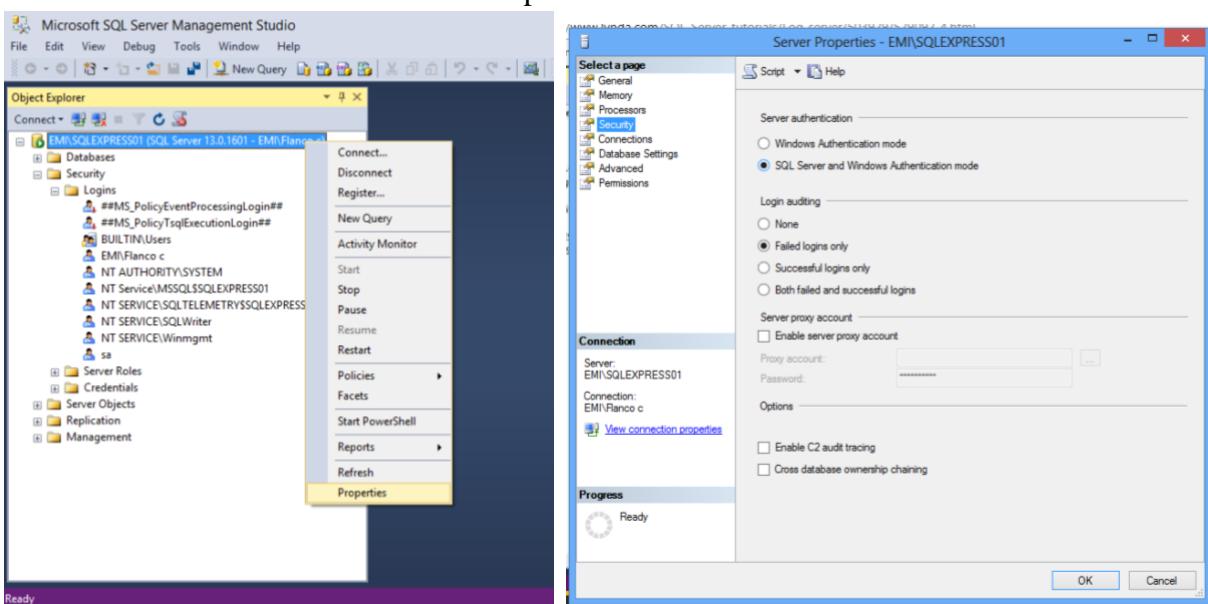


Also, for this account, from General menu, a password should be established (preferable a strong one) and then press Ok. Don't forget the password!

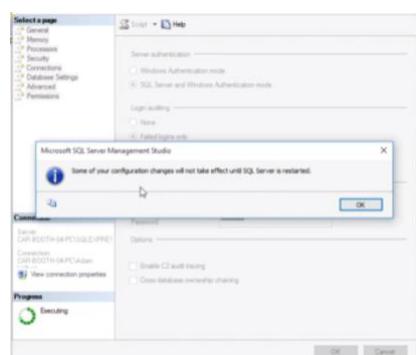
Then, by pressing right click on the Security->Logins a Refresh will be need (the red point from the sa icon will disappear).



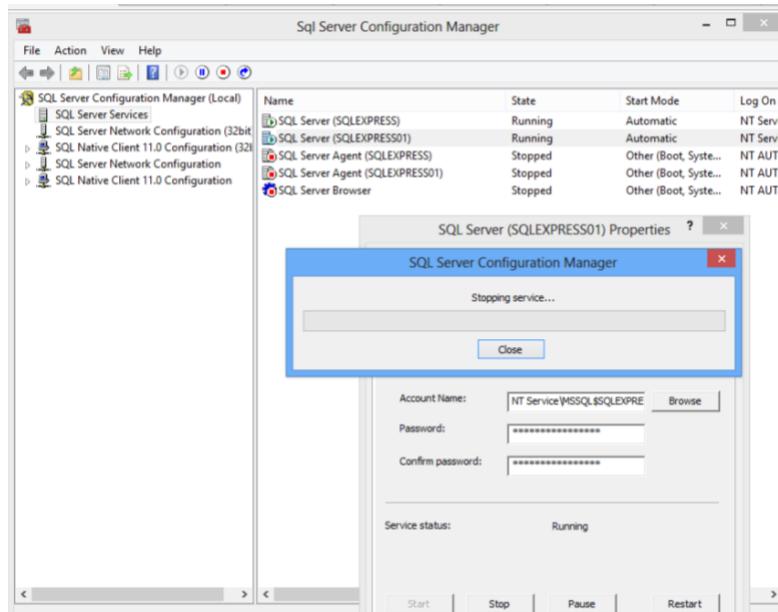
Next the SQL Server has to be enabled: a right click on the Server Name is required to access the Properties menu. From the Security menu, the bullet SQL Server and Windows Authentication mode has to be marked and then the ok button has to be pressed.



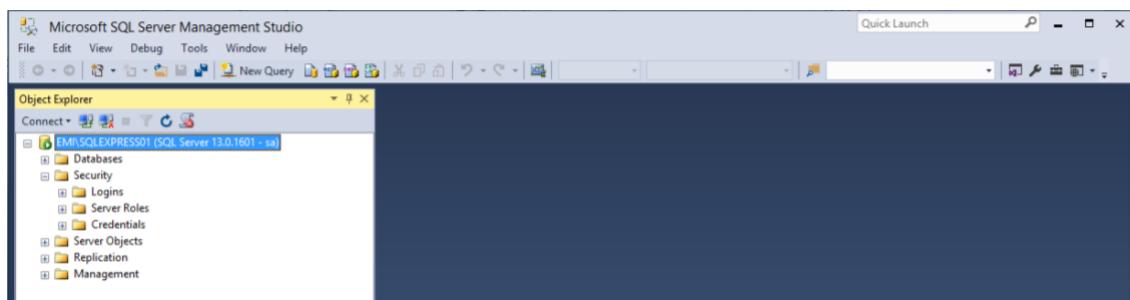
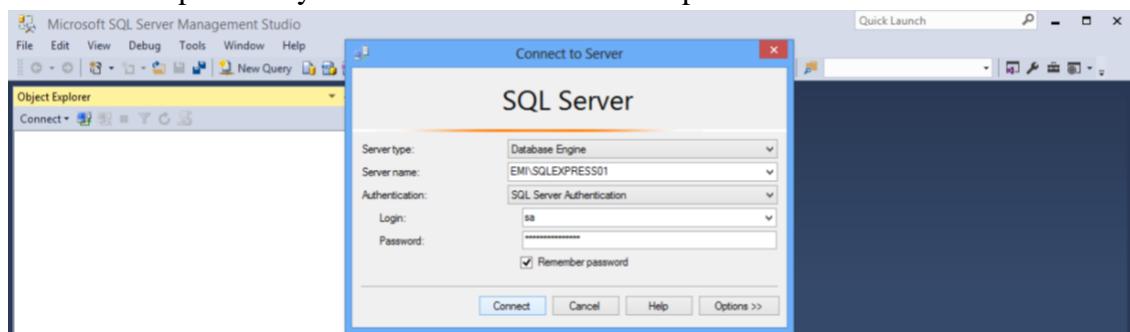
A message will be displayed and ask to restart the SQL Server (because otherwise the change will not take effect)



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 for Home, Library, Wiki, Learn, Gallery, Downloads, Support, Forums, and Blogs. A search bar is located at the top right. Below the navigation, there's a banner for Microsoft Ignite with a calendar for September 2016. The main content area features a news item about Visio updates and AutoCAD support, with a play button icon and links to watch Microsoft Mechanics and try Office 365 Enterprise. To the right, there's a sidebar with sections for Troubleshooting, Downloads, Subscriptions, and Training, each with a plus sign for more options.

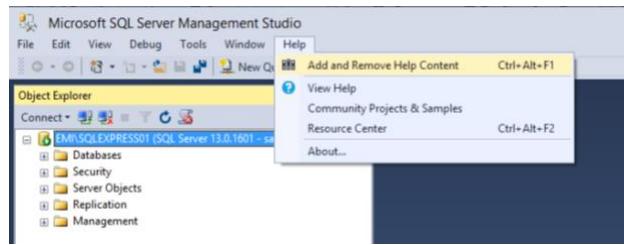
The Library menu was to be access, then SQL Server menu.

The screenshot shows the TechNet Library page for Microsoft SQL Server. The left sidebar has a navigation tree with categories like Scripting with Windows PowerShell, Security Guidance and Updates, Solutions Guidance for IT Professionals, and a expanded section for SQL Server with links to Microsoft SQL Server Language Reference, Samples, Microsoft StreamInsight, SQL Server Tools, SQL Server API Reference, and SQL Data Developer. The main content area title is "Microsoft SQL Server". It includes a "Print", "Export (O)", and "Share" button. Below the title, it says "Updated: September 9, 2016". The text states that SQL Server is the foundation of Microsoft's data platform, delivering mission-critical performance with in-memory technologies and faster insights on any data, whether on-premises or in the cloud. It also mentions that this page is the landing page for the SQL Server technical documentation library. The "IN THIS ARTICLE" sidebar on the right lists links to SQL Server 2016, Blogs and resources, Product documentation, Azure SQL Database, SQL Server on an Azure Virtual Machine, Azure SQL Data Warehouse, and DocumentDB.

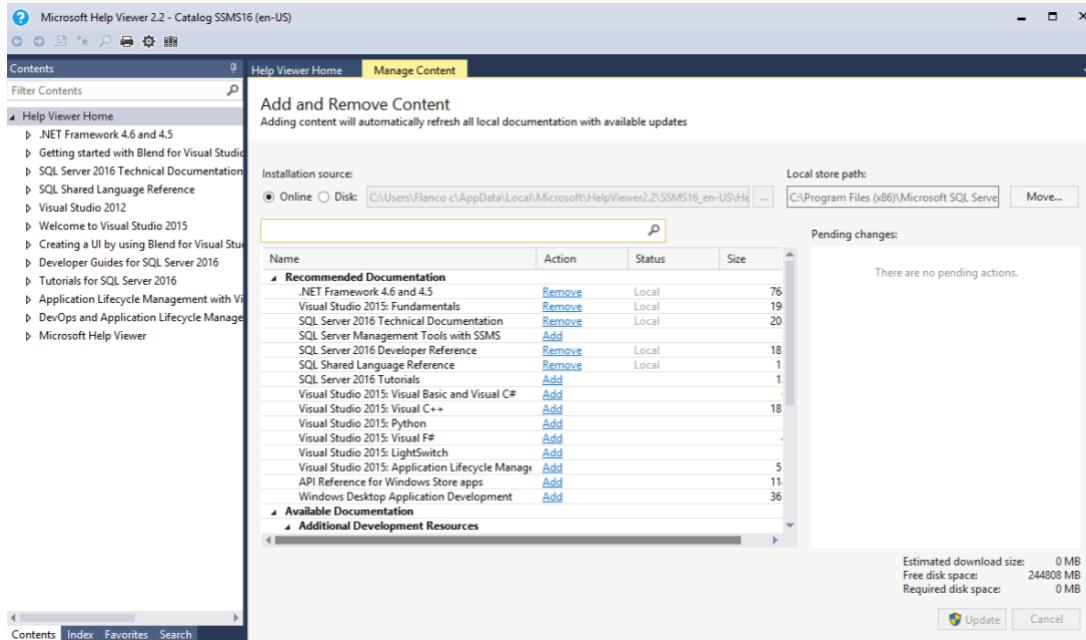
The documentation for SQL Server 2016 can be found there:

[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.

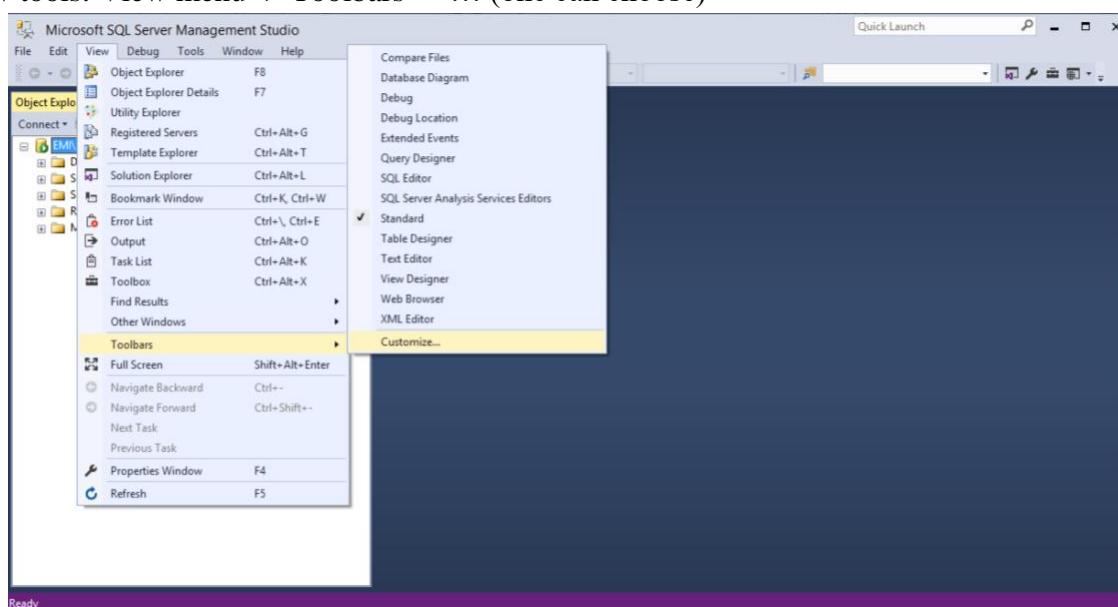


The SQL Server 2016 Technical Documentation, SQL Shared Language Reference and SQL Server 2016 Tutorials should be included by pressing Add and the Update.

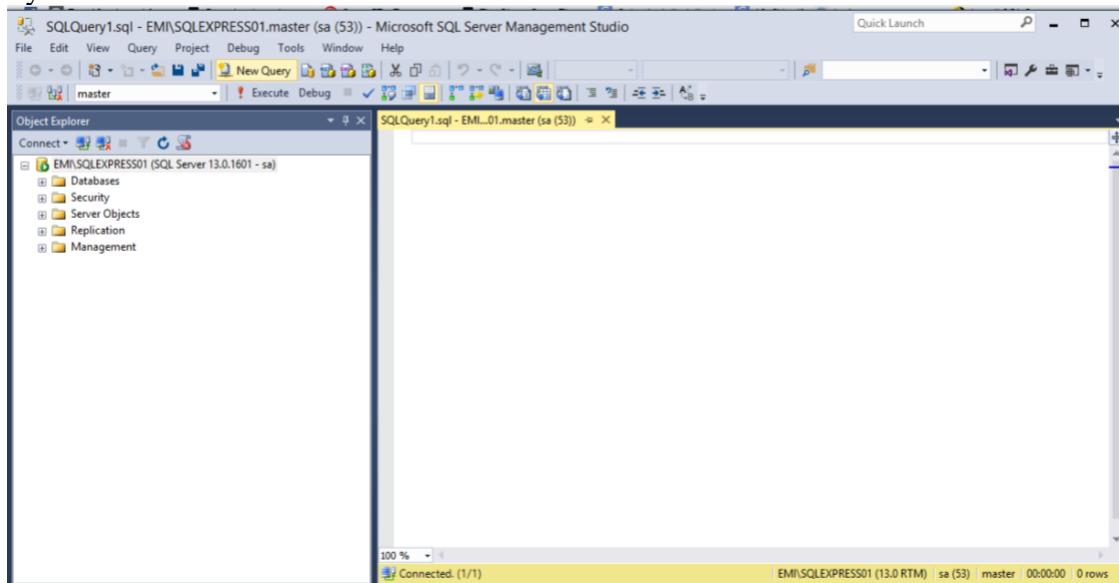


## SQL Server Management Studio

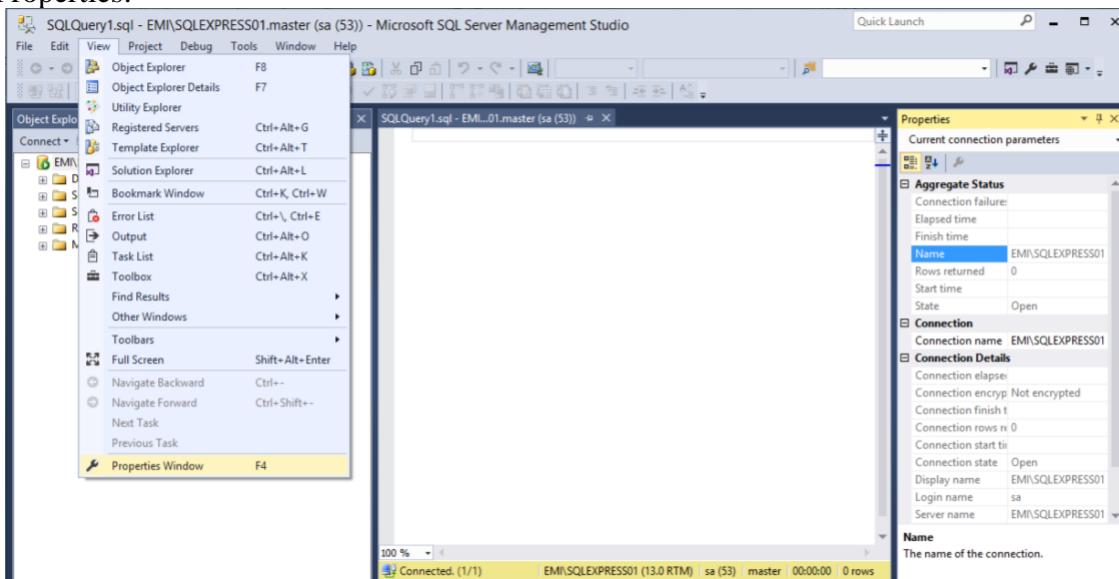
Add new tools: View menu -> Toolbars -> ... (one can choose)



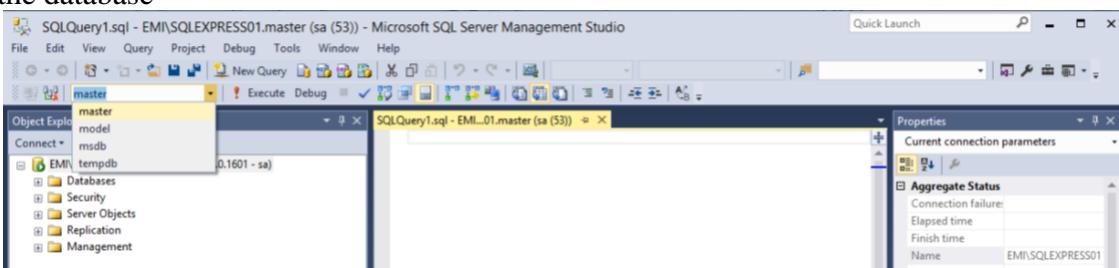
## New Query:



## See the Properties:



## Choose the database



## Install a Sample Database

<http://msftdbprodsamples.codeplex.com/>

The screenshot shows the CodePlex project page for Microsoft SQL Server Database Product Samples. It features a navigation bar with links for HOME, SOURCE CODE, DOWNLOADS, DOCUMENTATION, ISSUES, PEOPLE, and LICENSE. Below the navigation is a search bar and a 'Follow' button. The main content area displays two download links: 'Download AdventureWorks Databases – 2014' and 'Download AdventureWorks Databases – 2008, 2008R2 and 2012'. To the right, there's a 'downloads' section with a count of 20256, a 'RELATED PROJECTS' section for 'Microsoft SQL Server Community & Samples', and a sidebar with activity and download statistics.

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

The screenshot shows the MSDN library page for Microsoft SQL Server Samples. The left sidebar includes links for Microsoft SQL Server Language Reference, Samples (selected), Microsoft StreamInsight, SQL Server Tools, SQL Server API Reference, SQL Data Developer, SQL Server Release Notes, Install and Configure Help for SQL Server, and SQL Server 2016. The main content area features a heading 'Microsoft SQL Server Samples' and a sub-section 'New!! Wide World Importers sample database'. It describes the new sample database called Wide World Importers (WWI) and its features. Other sections include 'Documentation' (linking to WWI documentation on MSDN) and 'SQL Server Samples repository'.

Official Microsoft GitHub Repository containing code samples for SQL Server

571 commits | 25 branches | 7 releases | 23 contributors

Branch: master | New pull request | Find file | Clone or download

**rgward committed on GitHub Update readme.md**

- media: adding image for in-memory oltp perf
- samples: Update readme.md
- .gitignore: simplifying deployment scripts
- README.md: Update README.md
- README\_samples\_template.md: Update README\_samples\_template.md
- license.txt: MIT license

**Clone with HTTPS**  
Use Git or checkout with SVN using the web URL.  
<https://github.com/Microsoft/sql-server-samples>

**Open in Desktop** | **Download ZIP**

6 days ago | 4 months ago | 6 months ago

README.md

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

Wide World Importers sample database v1.0

jodebru released this on Jun 8 · 303 commits to master since this release

WideWorldImporters sample database for SQL Server (starting 2016) and Azure SQL Database. For details see the corresponding documentation.

This release includes the following artifacts:

- SQL Server Evaluation/Developer/Enterprise Edition
  - WideWorldImporters-Full.bak - full sample database for OLTP (OnLine Transaction Processing) and HTAP (hybrid transaction and analytical processing aka real-time operational analytics). For SQL Server 2016 (or higher) Evaluation/Developer/Enterprise Edition.
    - Update (8/12/2016): updated stats on system tables to support efficient reverse engineering with Entity Framework
  - WideWorldImportersDW-Full.bak - full sample database for OLAP (OnLine Analytical Processing). For SQL Server 2016 (or higher) Evaluation/Developer/Enterprise Edition.
- SQL Server Standard Edition
  - WideWorldImporters-Standard.bak - standard edition OLTP sample database in backup format. For SQL Server 2016 (or higher) Standard Edition.
    - Update (8/15/2016): updated stats on system tables to support efficient reverse engineering with Entity Framework
  - WideWorldImportersDW-Standard.bak - standard edition OLAP sample database in backup format. For SQL Server 2016 (or higher) Standard Edition.

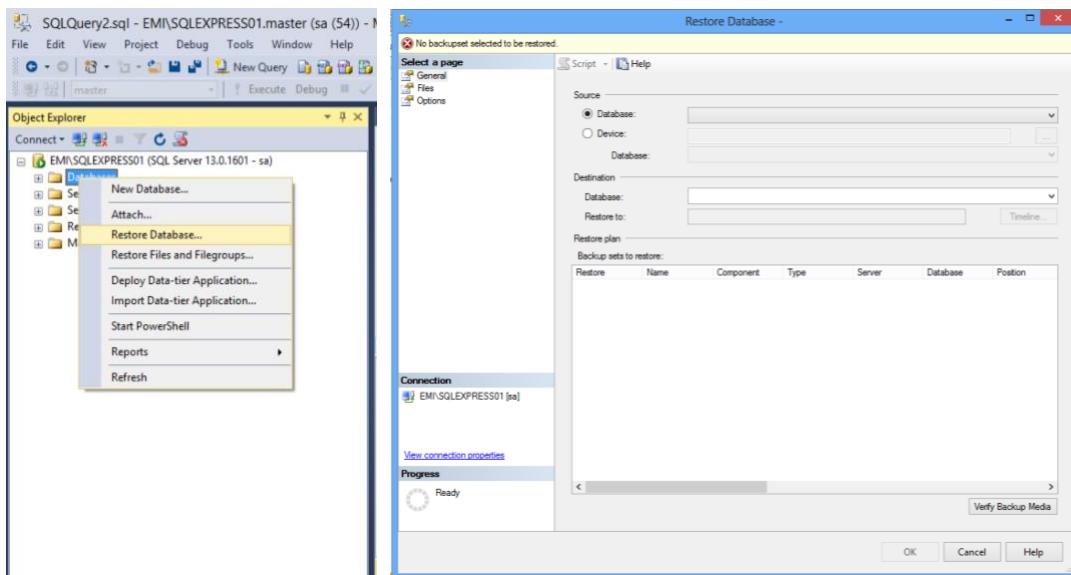
The database (the backup file that had been downloaded) has to be placed in:

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

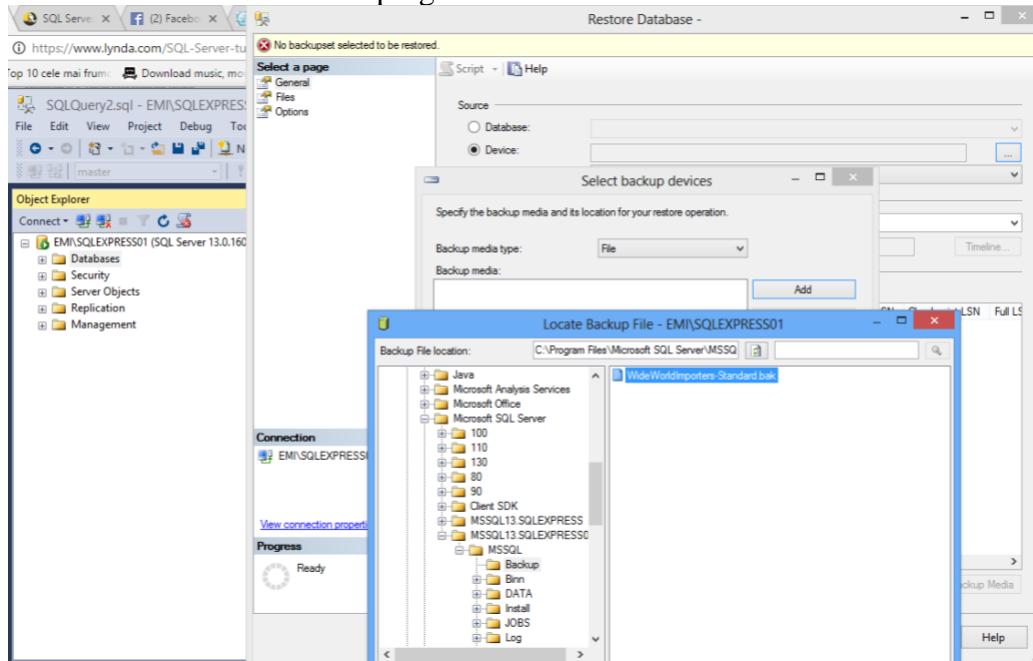
Name	Date modified	Type	Size
WideWorldImporters-Standard.bak	9/21/2016 4:21 PM	BAK File	123,964 KB

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

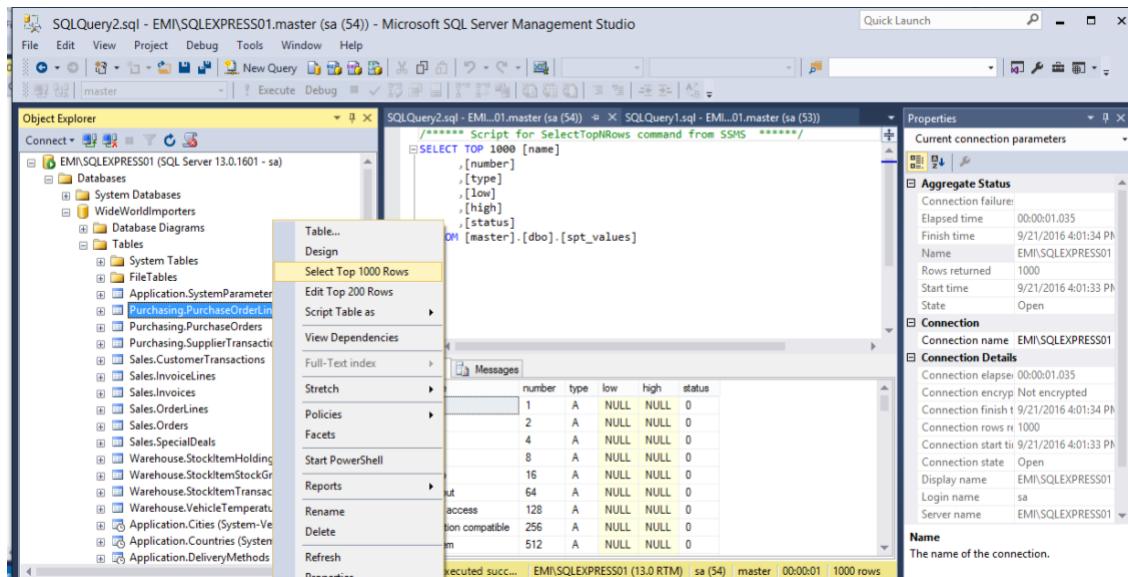
Import the database into Microsoft SQL Server 2016 Management Studio: Database-> right click -> Restore databases



Now, the database can be restored in the program

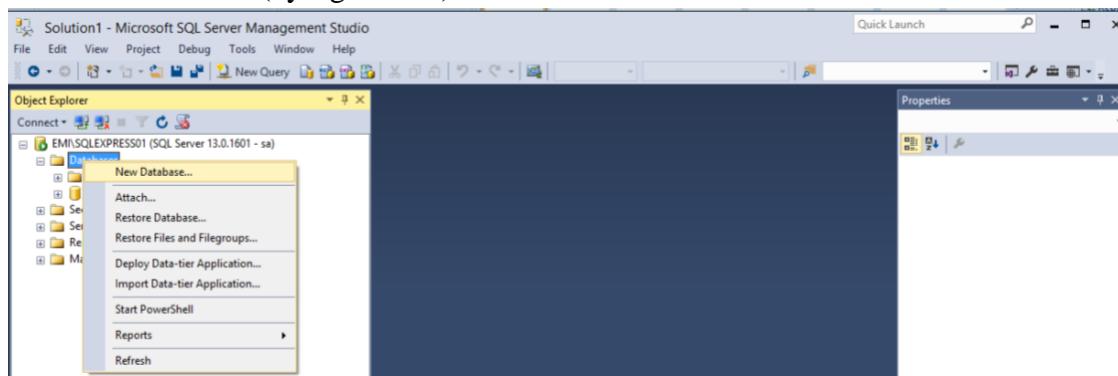


Check the database (Refresh = F5) and it appear

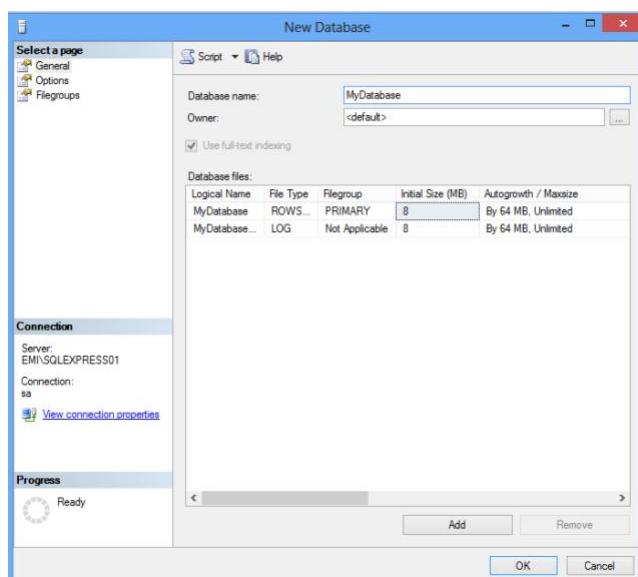


### Create a new Database on the Server

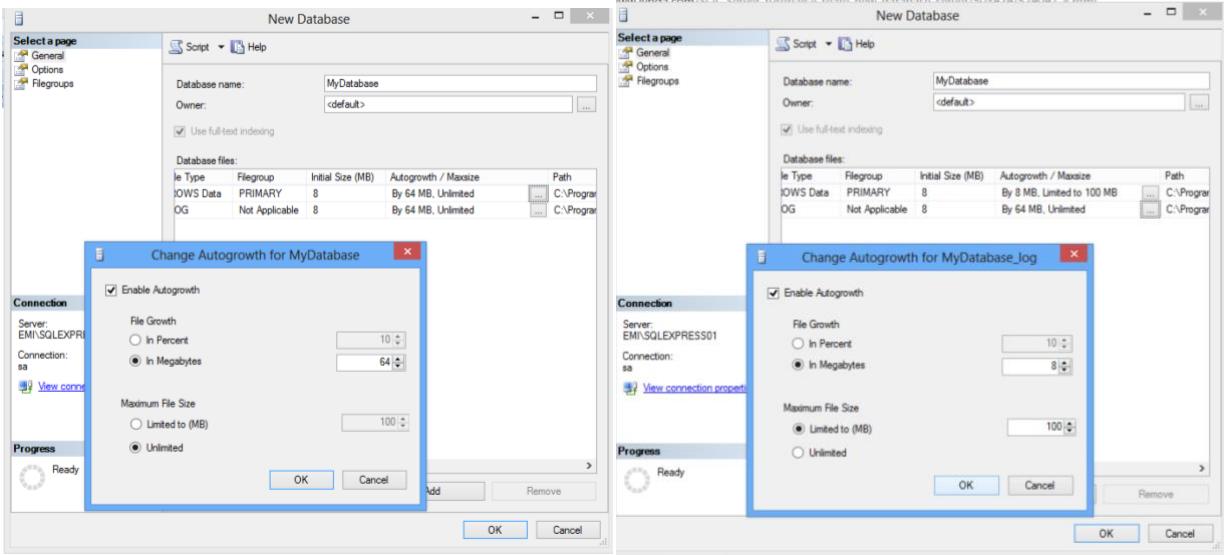
Databases -> New Database (by right click)



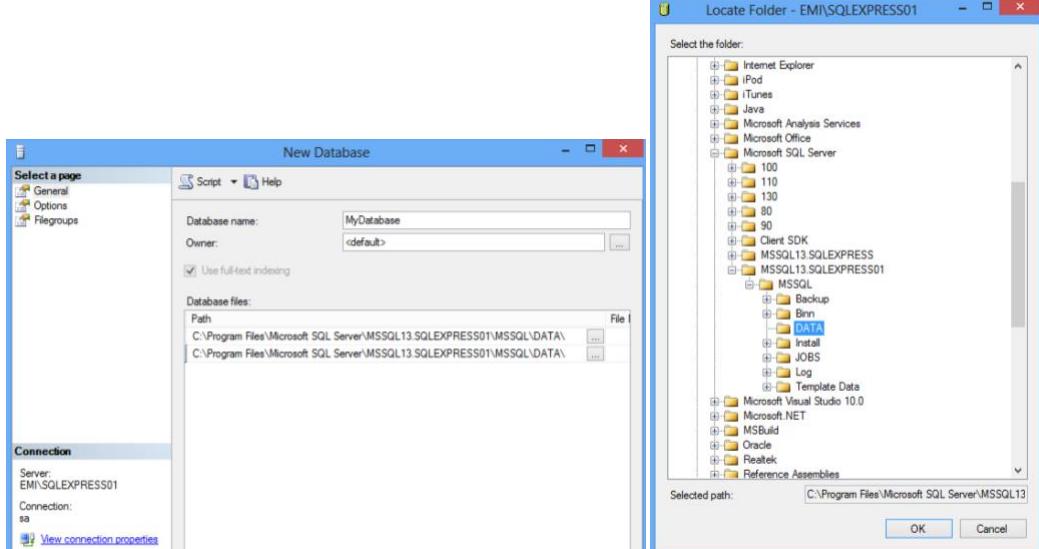
Create a database: General menu -> name it



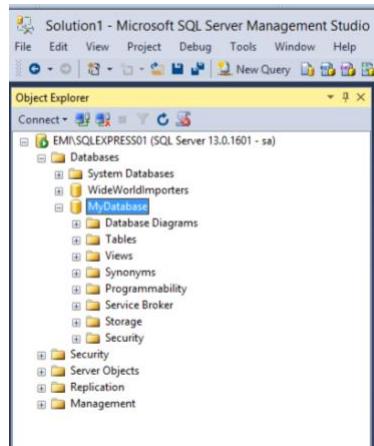
Change the space that the database will occupy



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

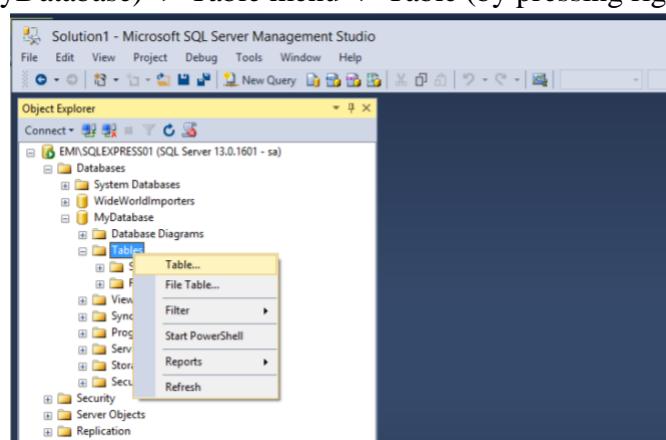
**Date**

**Currency**

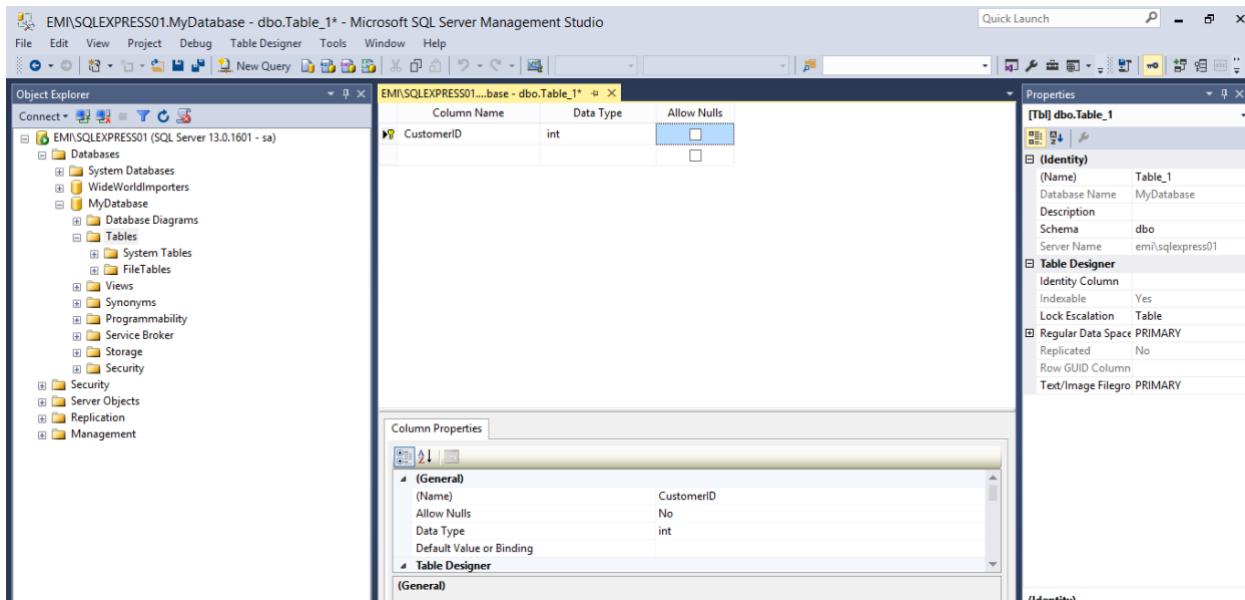
**Geographic coordinates ...**

### **Create a table**

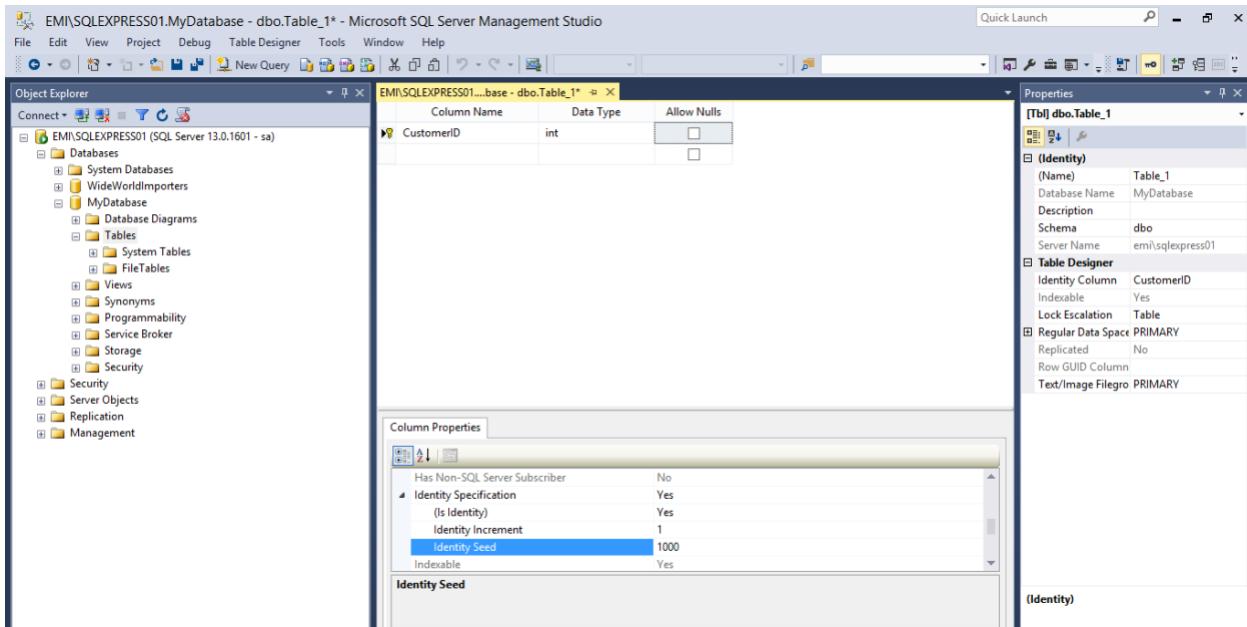
Inside of the Database (MyDatabase) -> Table menu -> Table (by pressing right click)



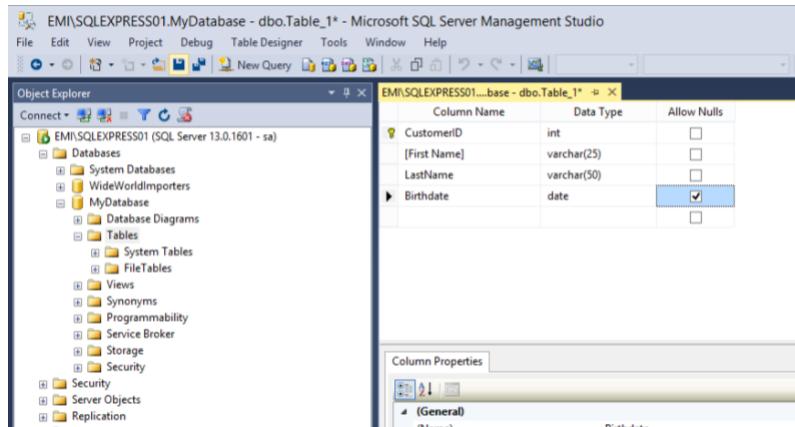
A column



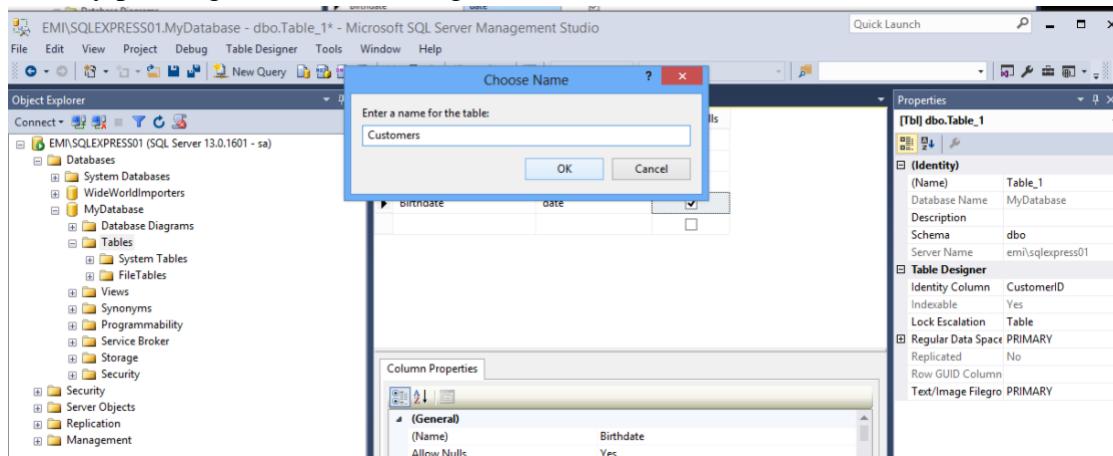
A identity of the instances: Yes – 1 – 1000 (for example)



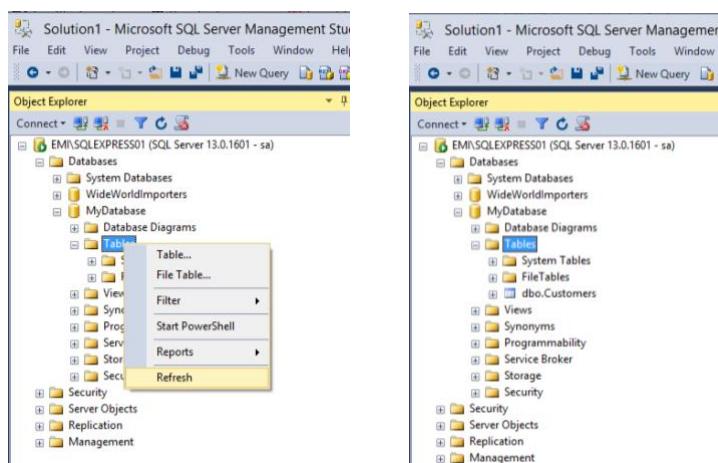
Introducing more fields (If another add will be required later than the save of the table: right click on table -> Design)



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 screenshot shows the Object Explorer and a table named 'dbo.Customers' in the 'MyDatabase' database. A context menu is open over the table, with 'Edit Top 200 Rows' selected.

**Object Explorer:**

- EMI\SQLEXPRESS01 (SQL Server 13.0.1601 - sa)
  - Databases
    - System Databases
    - WideWorldImporters
    - MyDatabase
  - Database Diagrams
  - Tables
    - Sys
    - File
    - dbo
    - Views
    - Synonyms
    - Programmability
    - Service
    - Storage
    - Security
  - Server Objects
  - Replication
  - Management

**Properties Window:**

- Query1.dtq
- (Identity)
  - (Name) Query1.dtq
  - Database Name MyDatabase
  - Server Name emi\sqlexpress01
- Query Designer
  - Destination Table
  - Distinct Values No
  - GROUP BY Extensi <None>
  - Output All Column No
  - Query Parameter L No parameters have been defined
  - SQL Comment \*\*\*\*\* Script for SelectTo
  - Top Specification Yes

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

The UNIQUE IDENTIFIER in the table = PRIMARY KEY

The screenshot shows the Object Explorer and the 'dbo.Customers' table in the 'MyDatabase' database. The 'Table Designer' is open, and the 'CustomerID' column is selected.

**Object Explorer:**

- EMI\SQLEXPRESS01 (SQL Server 13.0.1601 - sa)
  - Databases
    - System Databases
    - WideWorldImporters
    - MyDatabase
  - Database Diagrams
  - Tables
    - System Tables
    - FileTables
    - dbo
    - Views
    - Synonyms
    - Programmability
    - Service Broker
    - Storage
    - Security
  - Server Objects
  - Replication
  - Management

**Properties Window:**

- [TBL] dbo.Customers
- (Identity)
  - (Name) Customers
  - Database Name MyDatabase
  - Description
  - Schema dbo
  - Server Name emi\sqlexpress01
- Table Designer
  - Identity Column CustomerID
  - Indexable Yes
  - Lock Escalation Table
  - Regular Data Space PRIMARY
  - Replicated No
  - Row GUID Column
  - Text/Image Filegro PRIMARY

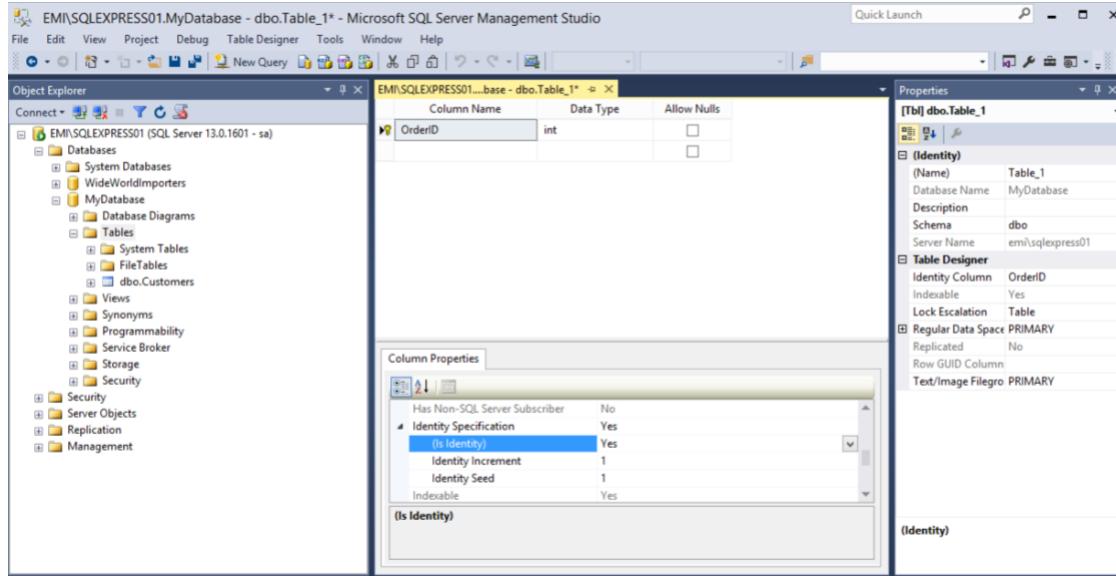
**Column Properties:**

Column Name	Data Type	Allow Nulls
CustomerID	int	<input type="checkbox"/>
[First Name]	varchar(25)	<input type="checkbox"/>
LastName	varchar(50)	<input type="checkbox"/>
Birthdate	date	<input checked="" type="checkbox"/>

### *Join tables together with keys*

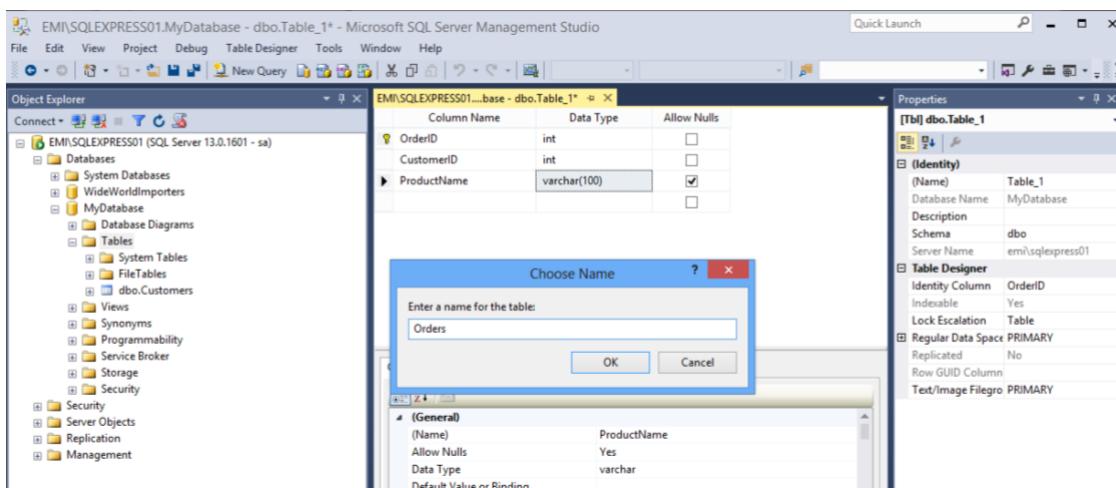
Primary key from a table

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

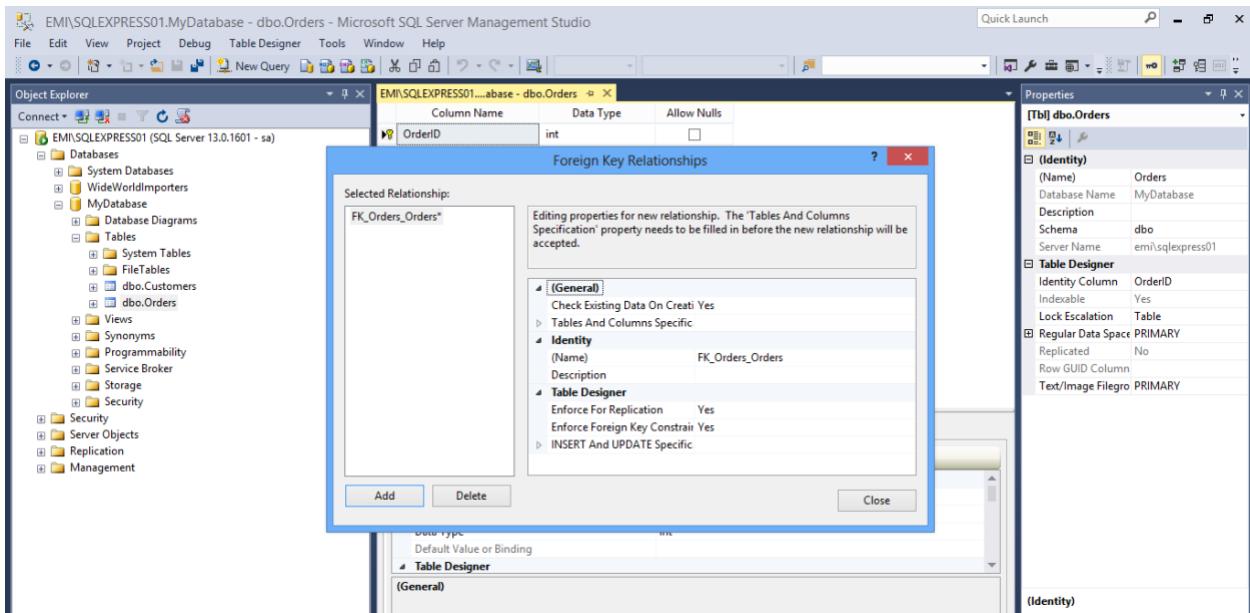


Foreign key – CustomerID – from Customers table

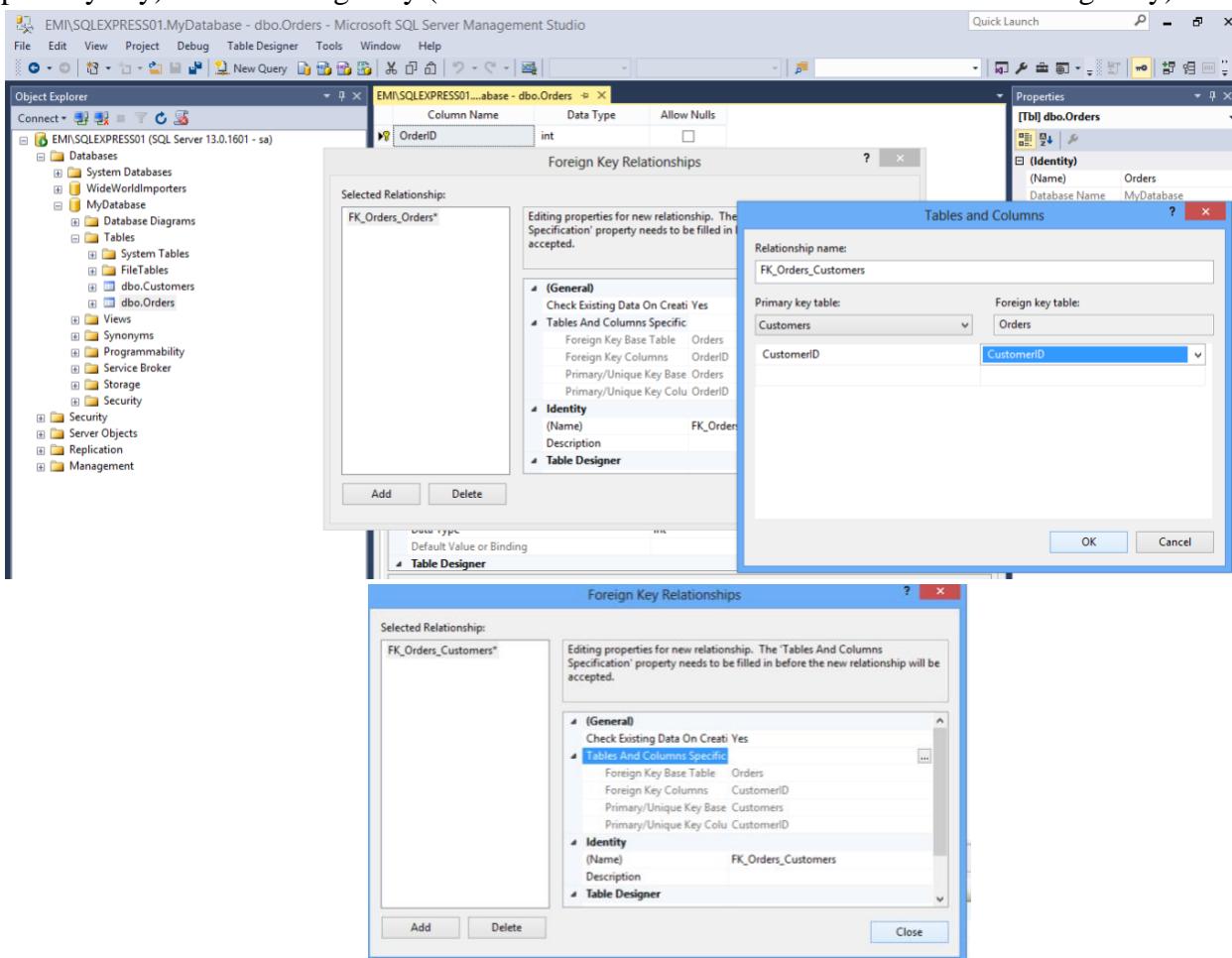
- the same type like in that table where is primary key (int)
- the same values as where it is primary key, but not necessarily unique (a value can appear more than once)
- Allow Null – Never



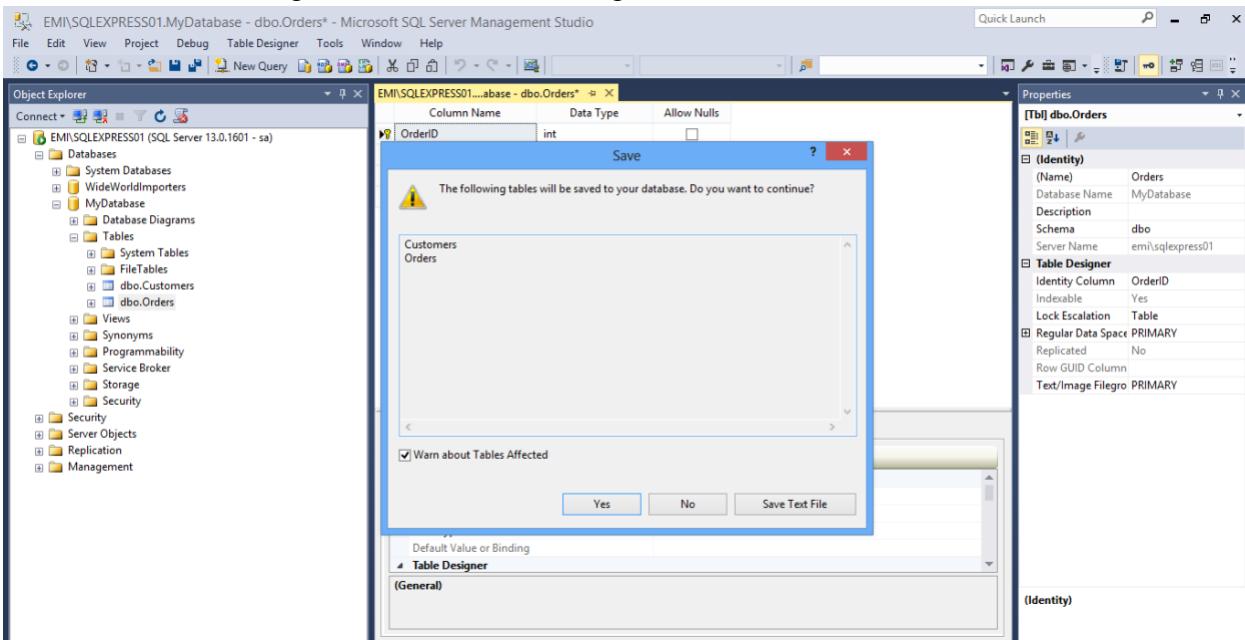
Relationships – right click on the left part where the fields are -> Add a new relationship



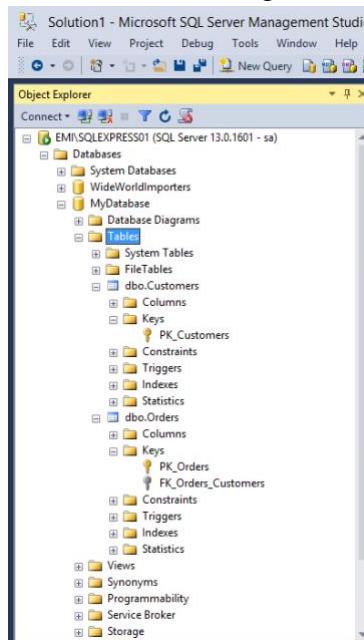
The Tables and Columns Specific -> has to be access from ... -> complete the tables that are in the relationship and corresponding to those the primary key (the first table – Customers – the table with the primary key) and the foreign key (the second table – Orders – the table with the foreign key)



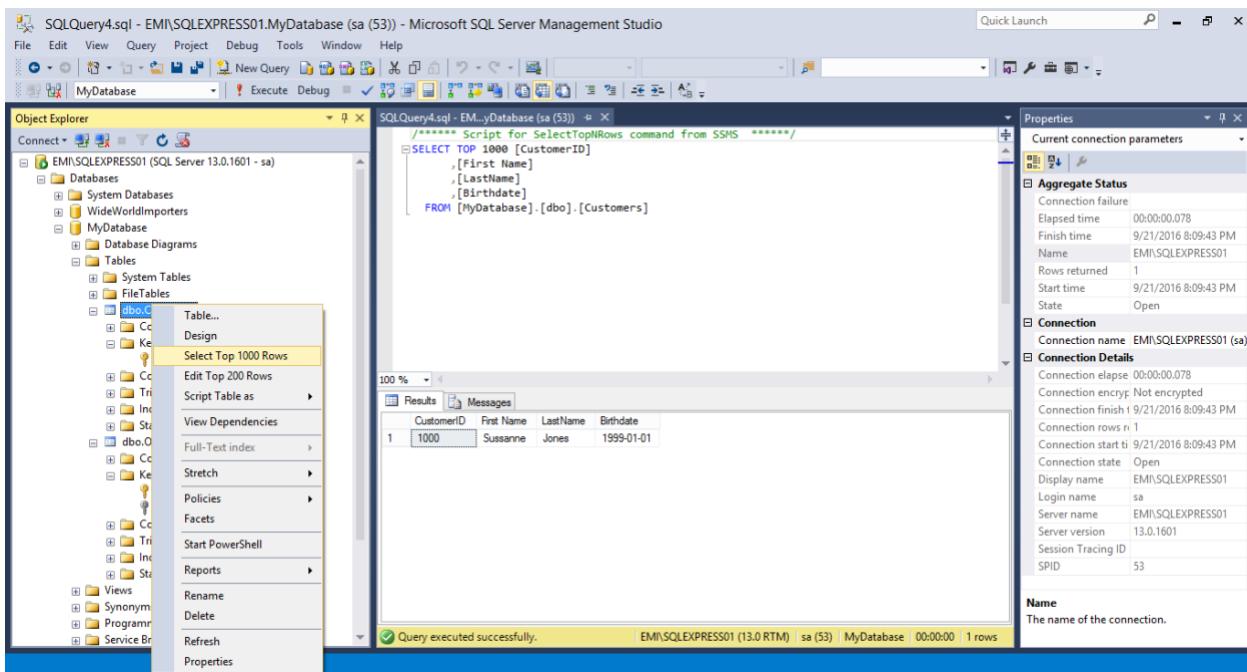
SAVE after these changes and Yes to the message that follows.



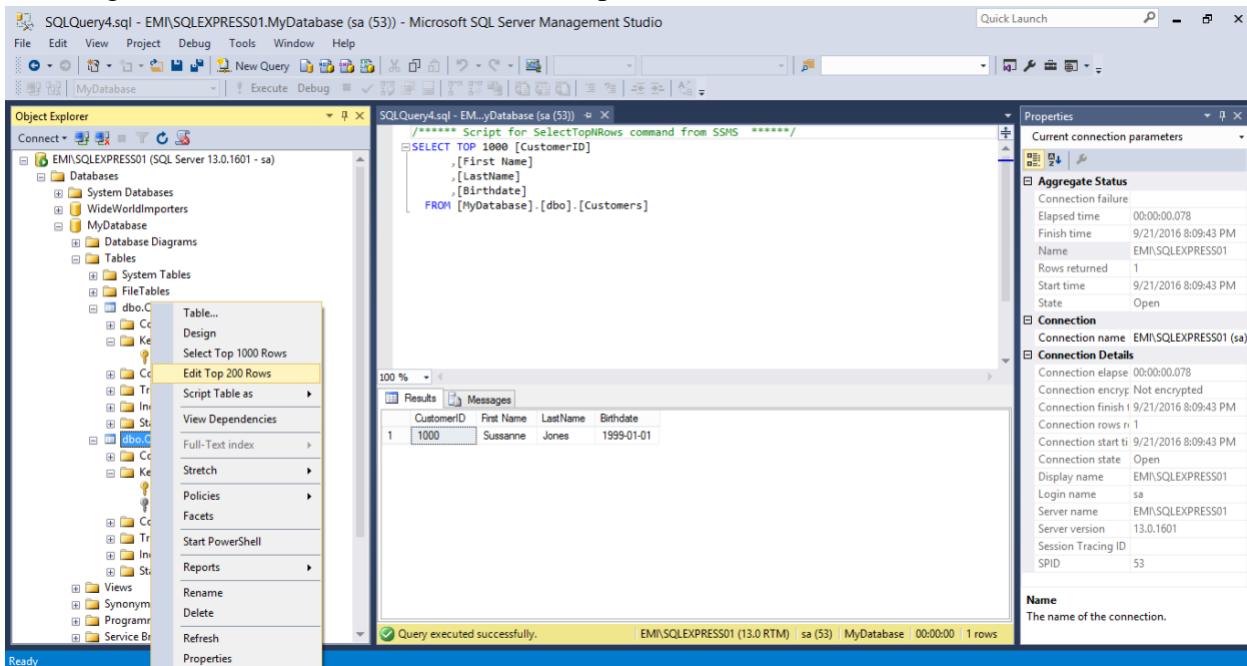
The primary keys and foreign key can be seen in the configuration part after a Refresh.



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

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Properties

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(Identity)

(Name) Query1.dtq

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SQL Comment \*\*\*\*\* Script for SelectToText

Top Specification Yes

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