**Applications Development 2B Workbook 2022**

Database **First Approach**

* When database already exists, you just need to develop application.
* When the database structure is very complex and need to involve DBA professional.
* When you are interested to work both coding and DB part of your application.
* Manual changes in database are very easy in this **approach**, because it’s not directly dependent on **code**.   
   Change database, update model, works smoothly.

**Code** **First** **Approach** using Data Annotation

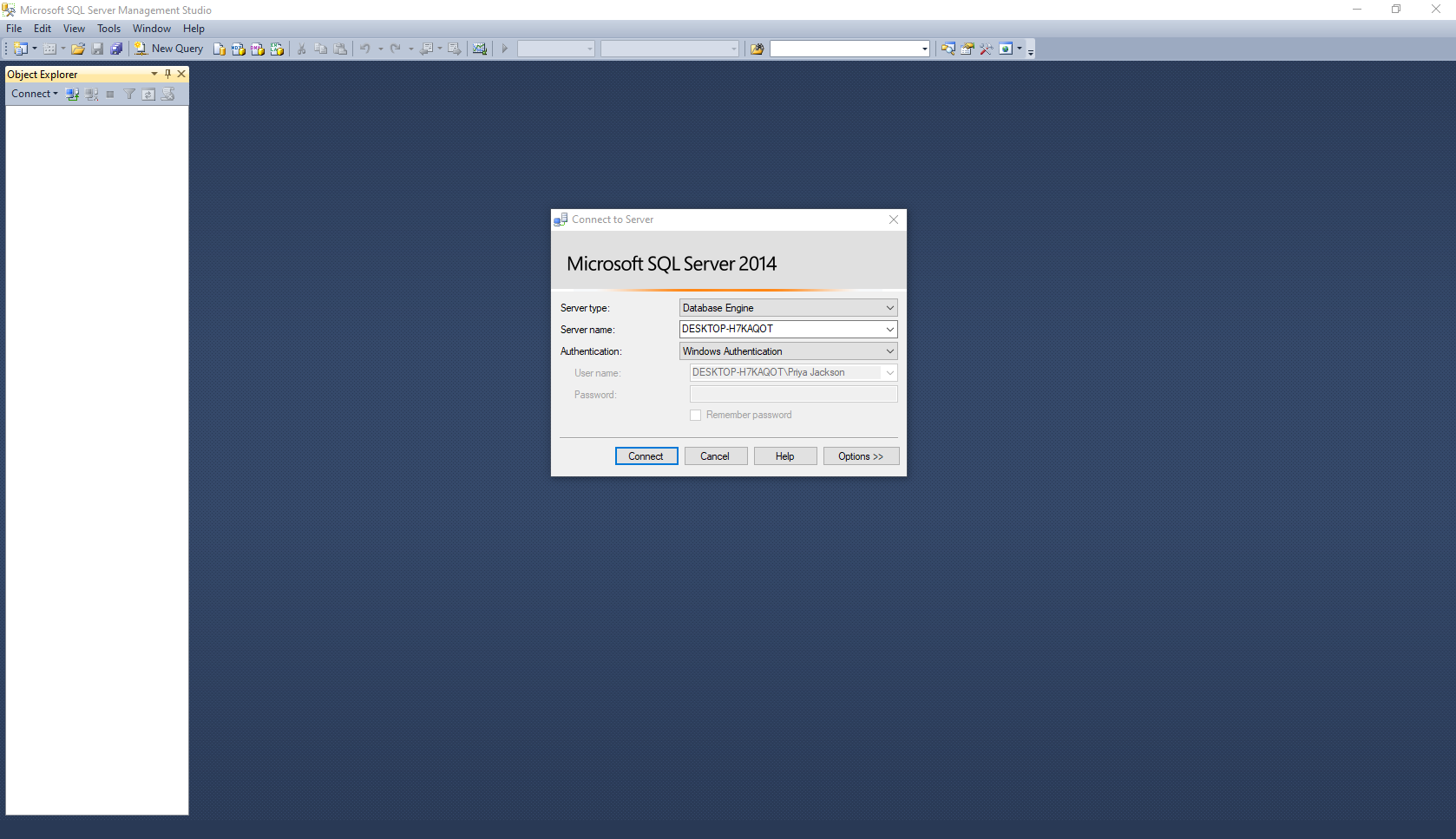
* **For teams with no DBAs and no people who know how databases are designed.** They can either try to do it by hand (and fail), or let the tool do the job. Even if the tool won't do a great job, it will still be not much worse (or even better) compared to what an inexperienced programmer can do when designing a database schema.
* **For tiny projects.** If I am doing my personal website which will be used by me and a few of my friends, there is really no need to use indexes or chose carefully how tables are linked together. Any design (or lack of thereof) will work.
* **For prototypes.** The goal is not to do well, but to do fast. If code-first approach means that you can finish the feature in four hours instead of seven, this is a great benefit.

**Database First Approach**

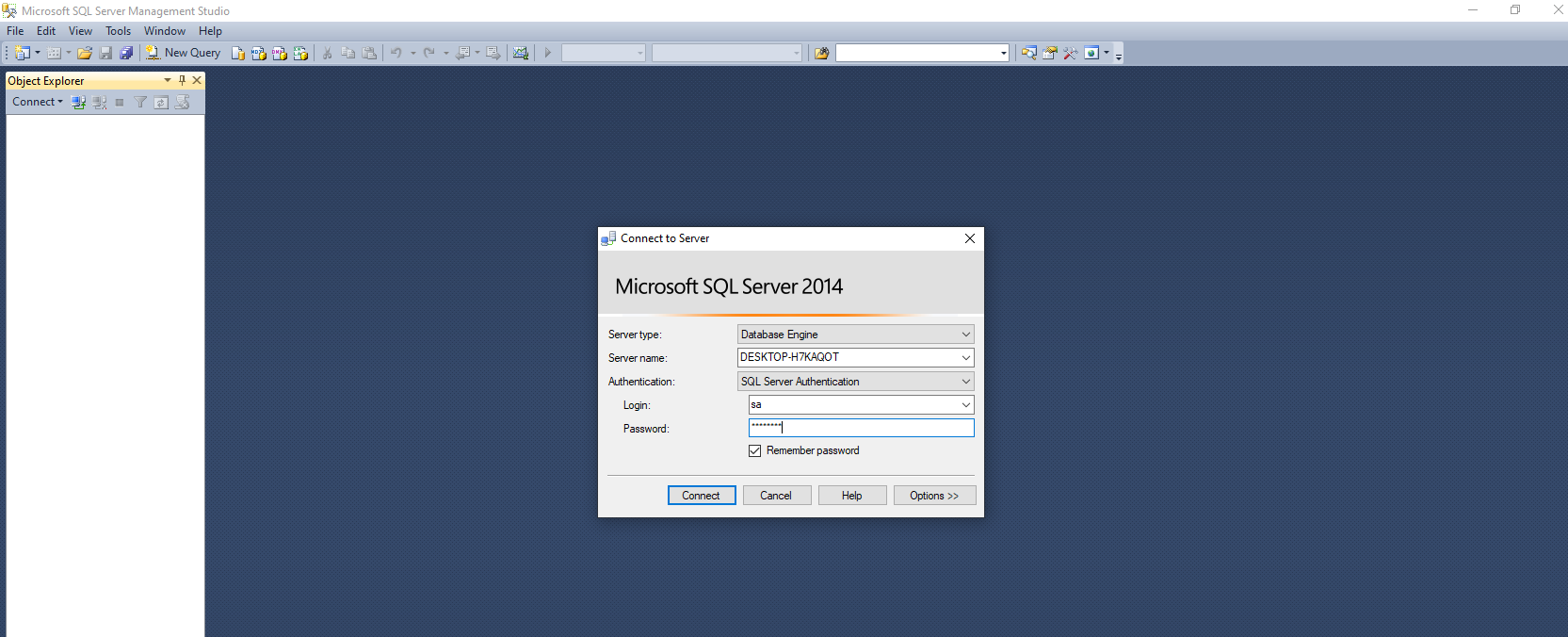
There are 2 approaches when creating a database together with your MVC ASP.net application. Firstly, you need to understand that the database first approach involves many steps and moving from the SQL server management studio and visual studio. The latest versions that the university has available to download will be downloaded.

Open SQL Server Management Studio and the screenshot below will come up, then you need to select the authentication type either windows or SQL authentication.

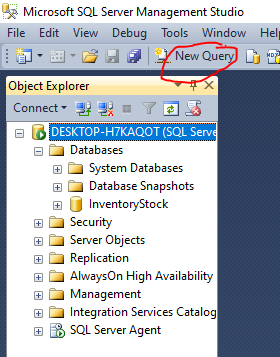
The different between these two authentications is that the windows authentication will use your login credentials for that particular machine. Then click connect and your windows credentials will log you into SQL server management studio. Since you are using the windows authentication, your database and tables will be created on this machine you are working on.

  
Fig1

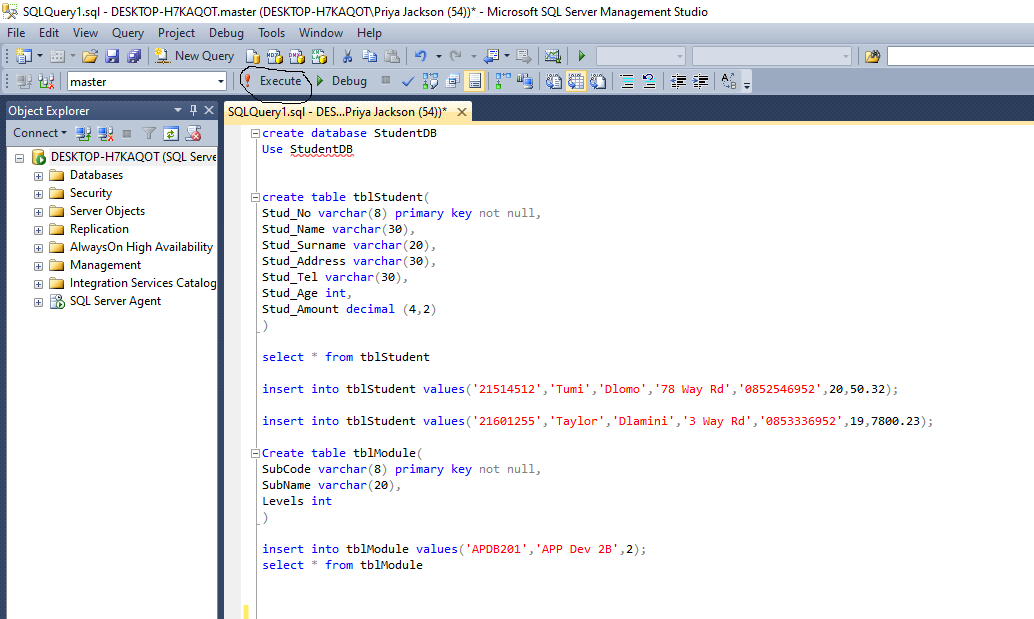
Otherwise, if there is a server available like on campus at DUT, then you may use the SQL authentication. The user name is **sa** and password is **Server01**. Since you have selected the SQL authentication, then your database and tables will be created under the lab server.

  
Fig2

In Fig3, I have circled in red, to create a new query script. Please select that and create a new query script. Save the query script in a folder where an MVC application for this example will be stored.

****Fig3

Write the following code in the SQL script seen below. Each time you wish to execute and run a line/s of code here in SQL server, please highlight the line/s and click on execute, which is circled below in Fig4. Execute the table by selecting all lines of code for the table only and execute to create the table.

  
Fig4

create database StudentDB1 code in SQL Server Management Studio to create a database and specify to use it.

Use StudentDB1

create table tblStudent(

Stud\_No varchar(8),

Stud\_Name varchar(30),

Stud\_Surname varchar(20),

Stud\_Address varchar(30), code to create table

Stud\_Tel varchar(30),

Stud\_Age int,

Stud\_Amount decimal (4,2)

)

insert into tblStudent values('21514512','Tumi','Dlomo','78 Way Rd','0852546952',20,50.32); insert records   
 into the table   
 insert into tblStudent values('21601255','Taylor','Dlamini','3 Way Rd','0853336952',19,7800.23); created above

Since we created a table without specifying a primary key, we have to drop this table, add the primary key syntax and recreate it.

Each time you wish to execute and run a line/s of code here in SQL server, please highlight the line/s and click on execute

drop table tblStudent

Add the code in red below, then highlight all the code below and execute the query to create a table with primary key.

create table tblStudent(

Stud\_No varchar(8) primary key not null,

Stud\_Name varchar(30),

Stud\_Surname varchar(20),

Stud\_Address varchar(30),

Stud\_Tel varchar(30),

Stud\_Age int,

Stud\_Amount decimal (4,2)

)

insert into tblStudent values('21514512','Tumi','Dlomo','78 Way Rd','0852546952',20,50.32); insert records   
 into the table   
 insert into tblStudent values('21601255','Taylor','Dlamini','3 Way Rd','0853336952',19,7800.23); created above

Another table called Module must be created.

Create table tblModule(

SubCode varchar(8) primary key not null,

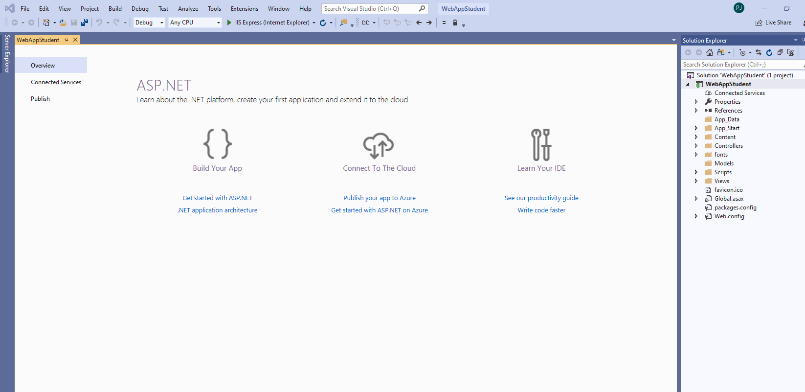
SubName varchar(20),

Levels int

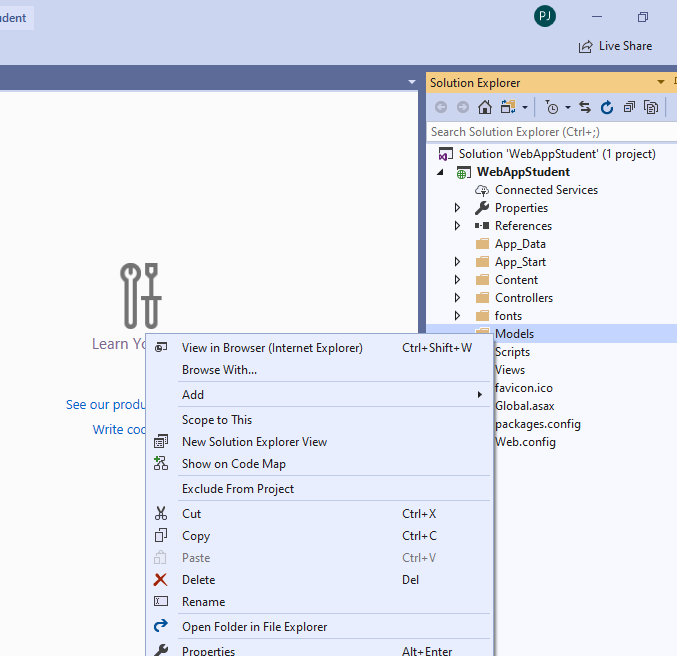
)

insert into tblModule values('APDB201','APP Dev 2B',2); insert record into the table created above

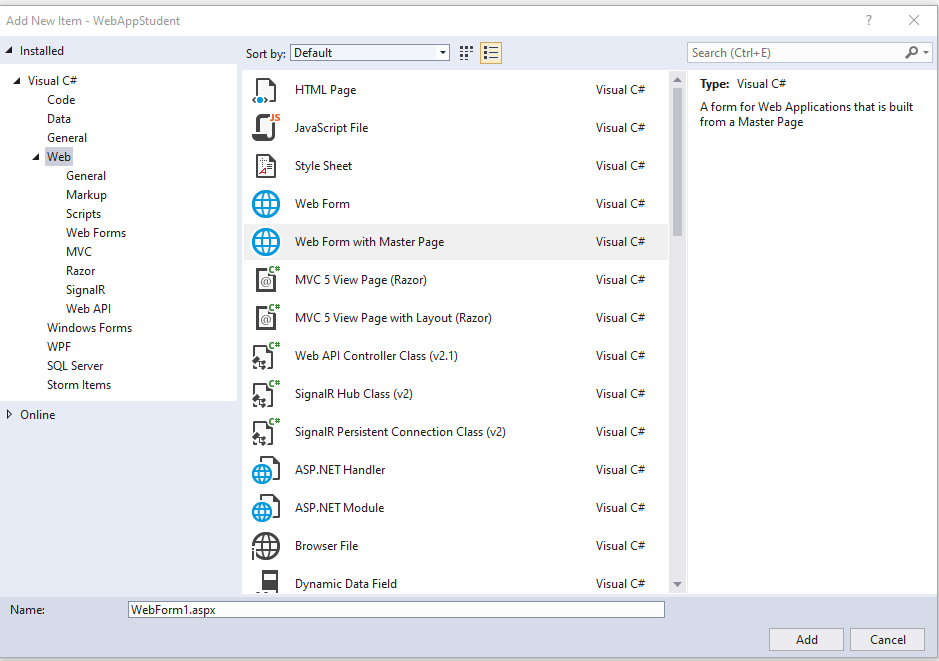
So we have created 2 tables, one is called tblStudent and tblModule. They have been saved to the database StudentDB1. Now we need to go to visual studio and create the MVC ASP.net application as well as use the wizard to import the database and tables into the application so that we can view the data inserted using the SQL script. The script that was created is referred to as a native language code written in the SQL script. You may read about it online.

Step 3. Open visual studio and create an ASP.net MVC application as seen in Fig5.   
Fig5

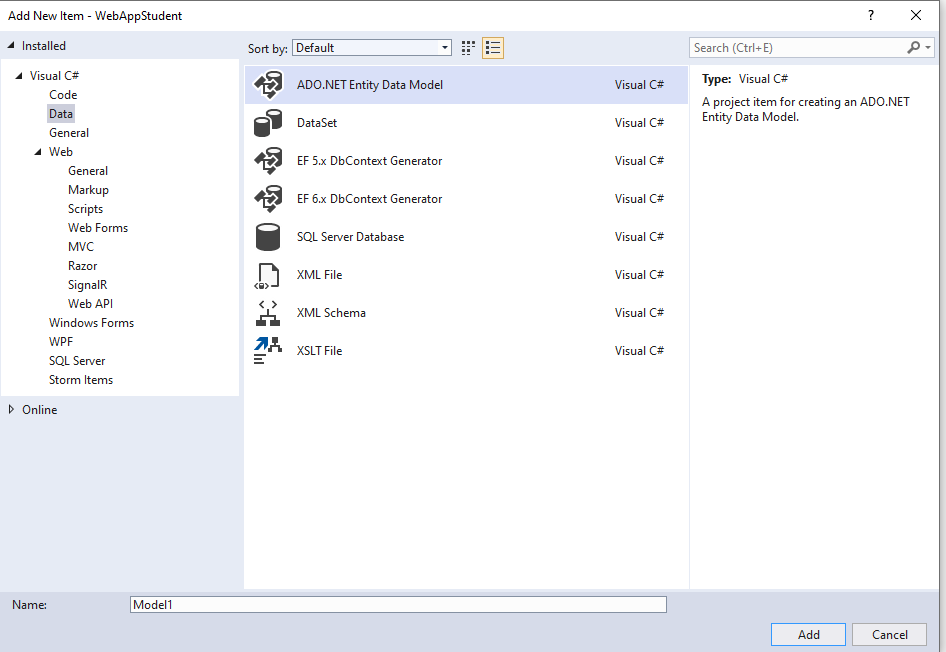
Now that we have our MVC ASP.net application, we need to right click in the solution explorer on models as seen in Fig6. Then we need to go to Add, then New Item.

  
Fig6

This is the window seen in Fig 7 below that comes up and we have to select on the left side under Visual C#, select Data.

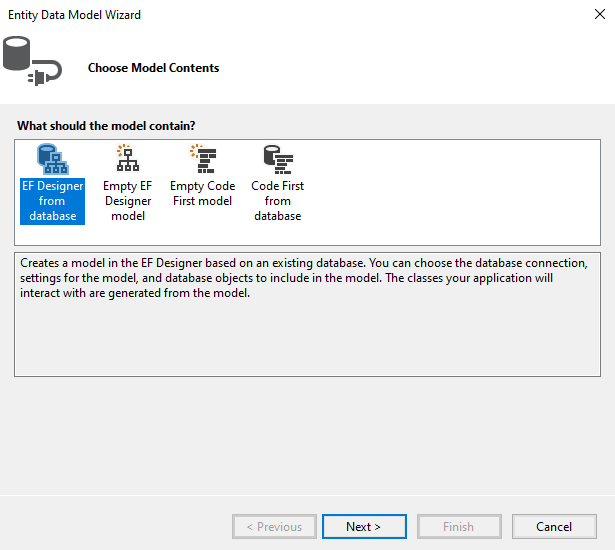
  
Fig7

In Fig 8 below, it shows that once we have selected Data on the left side, the center displays the different types of data models to assist with connecting to the SQL Server database. We will select ADO.NET Entity Data Model as we are currently using the Database first approach.

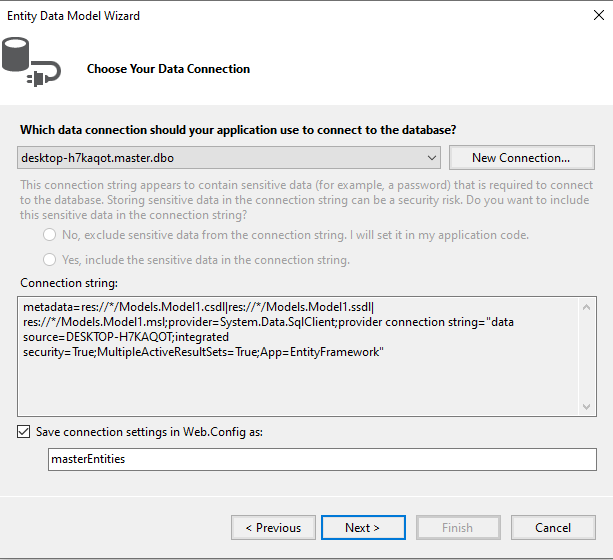
  
Fig8

Now we will use the ADO.net entity data models wizard to create a connection to the database called StudentDB1 which was created in SQL script. The name of the ADO.net model is Model1 as seen in Fig8 above.

Next step is to select the **EF Designer from Database** as seen in Fig9 below and click next.

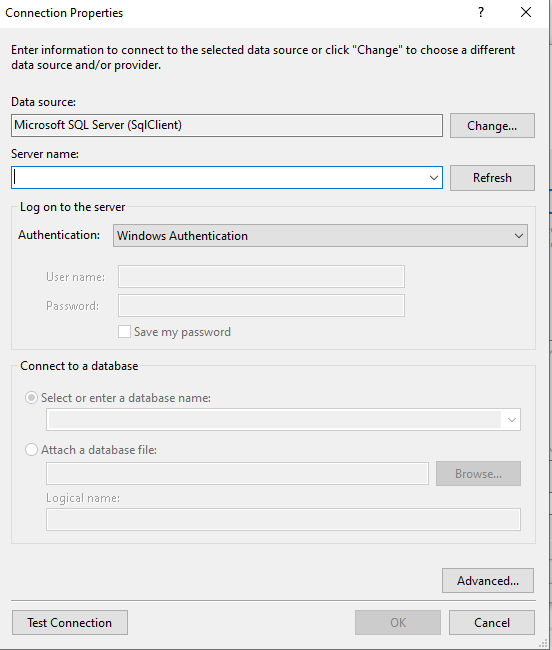
  
Fig9

After clicking next in Fig 9, this is the connection string that must be created to link to the database created above. You will notice that in Fig 10, at the bottom it has master entities so we have to create the connection to the StudentDatabase1. We then click Connection and Fig 11 comes up.

  
Fig10

In Fig11, you must select a data sources, however the data source is correct, then you select a server name by clicking in the down arrow (this is usually the laptop name). The authentication is windows authentication so it will use your windows credentials, if you select SQL authentication, then the   
username: sa  
password: Server01

use the above credentials. Once we select that, in the connect to database tab, the select or enter database name will allow us to select a database that we have created which is StudentDatabase1.

  
Fig11

Then test the connectioon and if its successful, then you have created the correct connection. Click next and go to next screenshot.

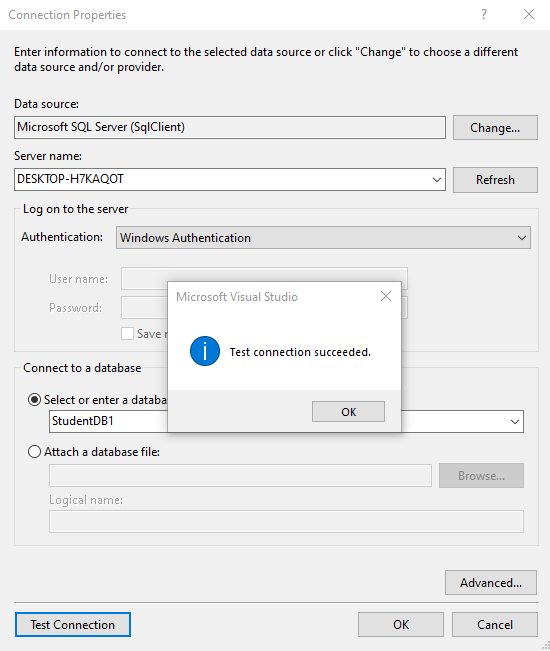


Fig12

We get a new connection string and if you look now at the bottom of screen, it says StudentDB1Entitiies, this is the connection settings name. That means its connected the Entitiy framework model to the SQL server database seen in Fig13.

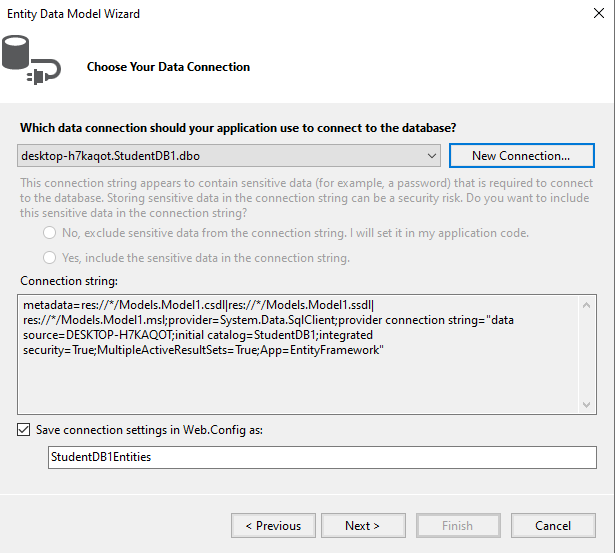
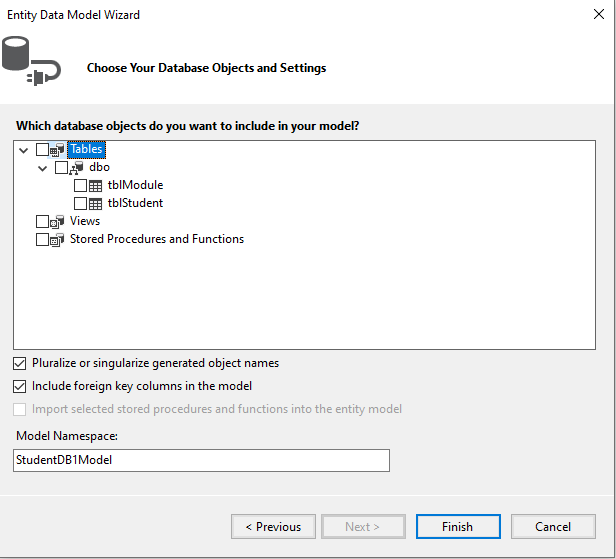


Fig13

In Fig13, we clik on tables arrows to make sure the connection is correct and we have selected the correct database with tables and below you will see 2 tables we want a connection to. Click inside the tables check box and select those tables and then click next. Now it will add the entity framework model to the models folder and we have use the database first approach to creating and linking the database to visual studio mvc application. For each table created in the database scaffold the views and controller for this application now. Run the application now and add test data to the tables.

  
Fig14