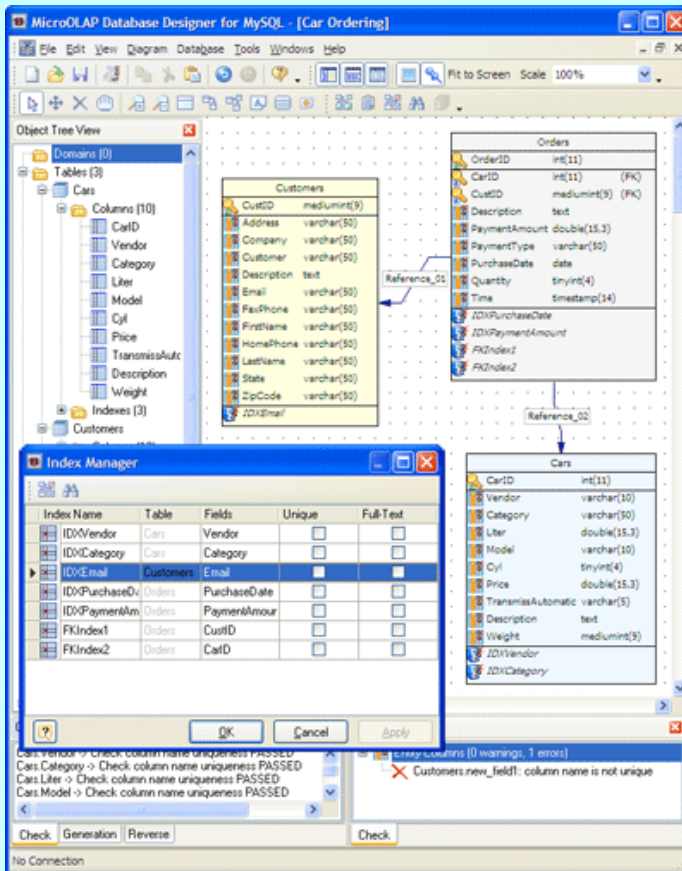


Database Systems



Topic 10 : SQL Server Database - Introduction

Unit 11 : Database in SQL Server

Objective :

- At the end of this unit, you should be able to:
 - Learn the Integrated Development Environment (IDE) in MS Visual Studio, ASP.net C#
 - Create web site, web form.
 - Create database tables & establish relationship
 - Create SQL statements.
 - Import database into the system.

Web Technology & Programming Language

Web Technology
(ASP.Net)

**Programming
Language**
(VB.Net, C#.Net)

Web Technology

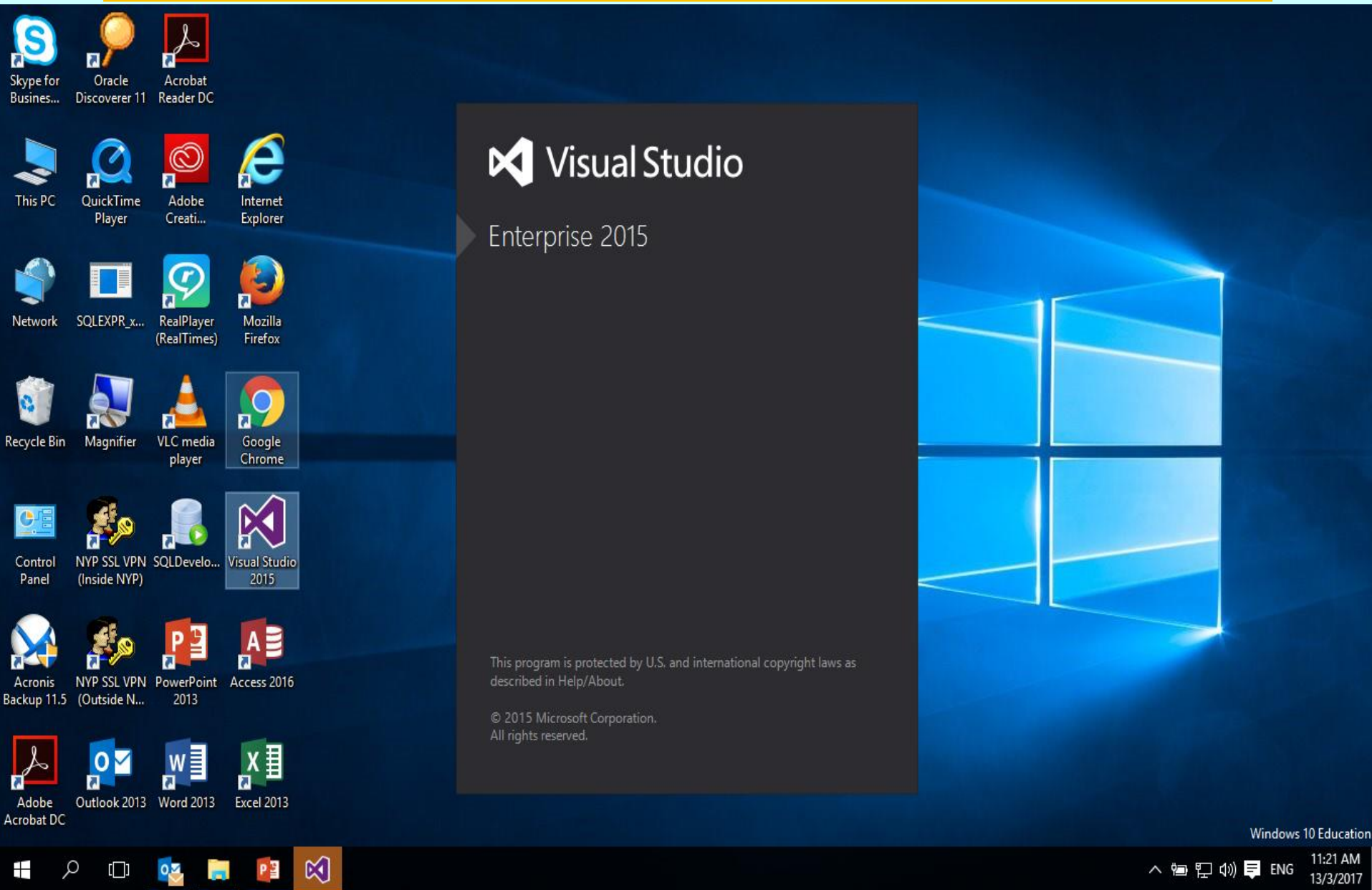
- ASP .Net

Programming Language

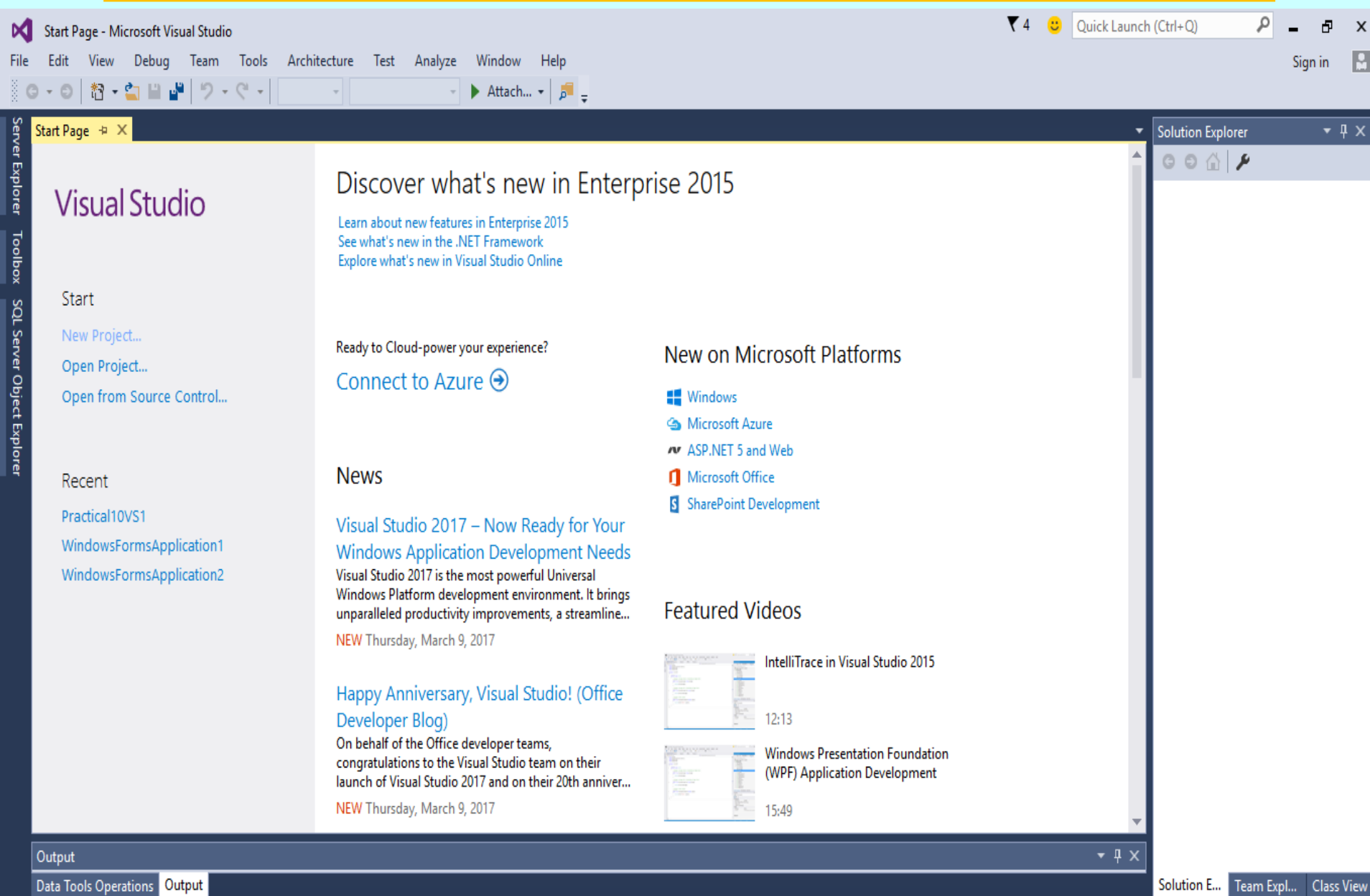
- VB. Net

- C# . Net

Launching of Visual Studio 2015



Start Page of Visual Studio 2015



The screenshot displays the Visual Studio 2015 Start Page. The interface includes a top menu bar with options like File, Edit, View, Debug, Team, Tools, Architecture, Test, Analyze, Window, and Help. A toolbar below the menu contains icons for various actions, including opening files and debugging. The main content area is divided into several sections:

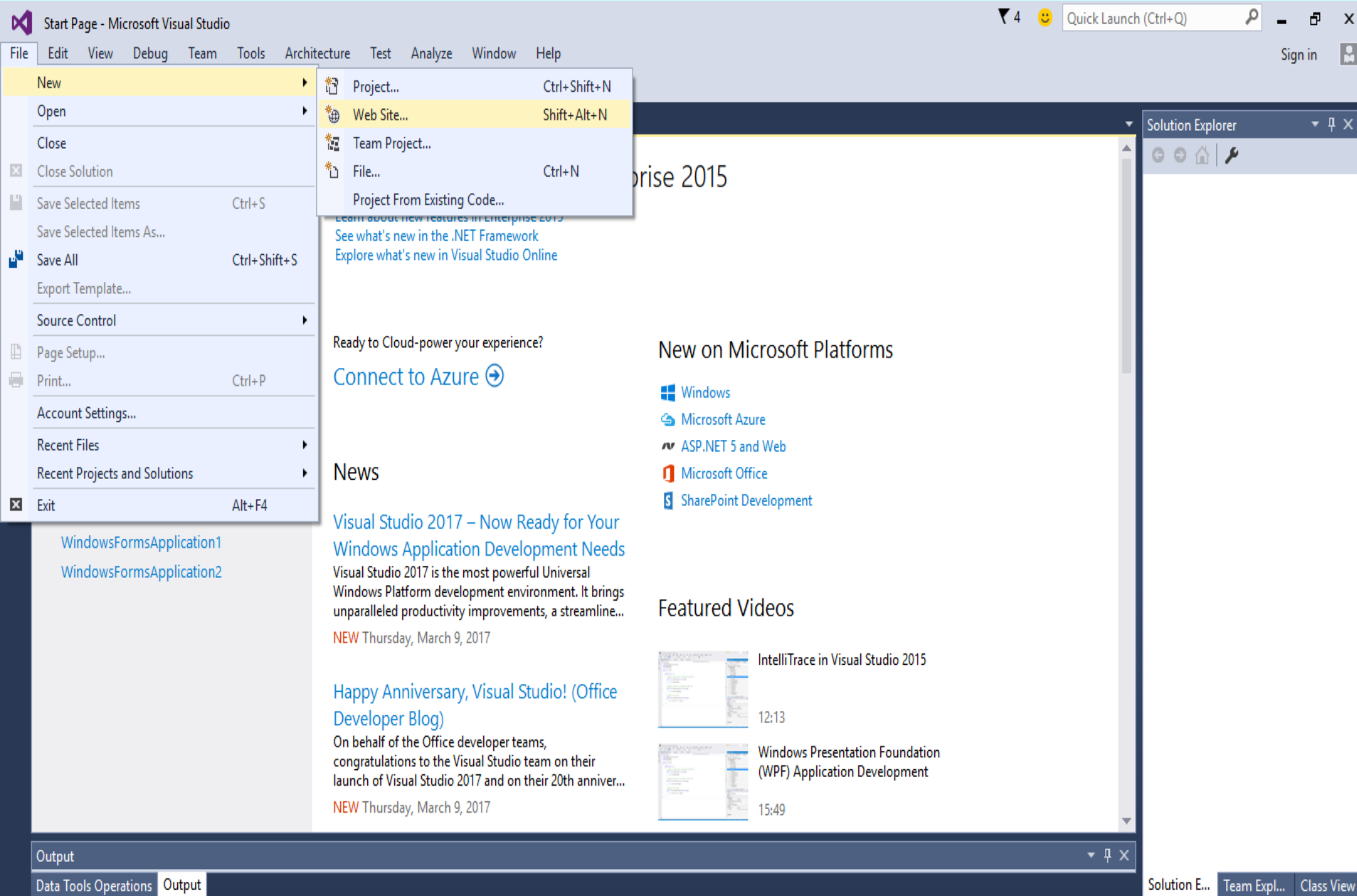
- Visual Studio**: A large heading on the left side.
- Start**: A section with links for [New Project...](#), [Open Project...](#), and [Open from Source Control...](#).
- Recent**: A list of recent projects, including [Practical10VS1](#), [WindowsFormsApplication1](#), and [WindowsFormsApplication2](#).
- Discover what's new in Enterprise 2015**: A section with links to [Learn about new features in Enterprise 2015](#), [See what's new in the .NET Framework](#), and [Explore what's new in Visual Studio Online](#).
- Ready to Cloud-power your experience?**: A section with a [Connect to Azure](#) button.
- News**: A section with a headline [Visual Studio 2017 – Now Ready for Your Windows Application Development Needs](#), followed by a paragraph about the new version and a date **NEW Thursday, March 9, 2017**.
- Happy Anniversary, Visual Studio! (Office Developer Blog)**: A section with a paragraph celebrating the Visual Studio team and their 20th anniversary, followed by a date **NEW Thursday, March 9, 2017**.
- New on Microsoft Platforms**: A section with links to [Windows](#), [Microsoft Azure](#), [ASP.NET 5 and Web](#), [Microsoft Office](#), and [SharePoint Development](#).
- Featured Videos**: A section with two video thumbnails and titles: [IntelliTrace in Visual Studio 2015](#) (12:13) and [Windows Presentation Foundation \(WPF\) Application Development](#) (15:49).

The right side of the interface features a **Solution Explorer** pane, which is currently empty. At the bottom, there is an **Output** pane with tabs for **Data Tools Operations** and **Output**.

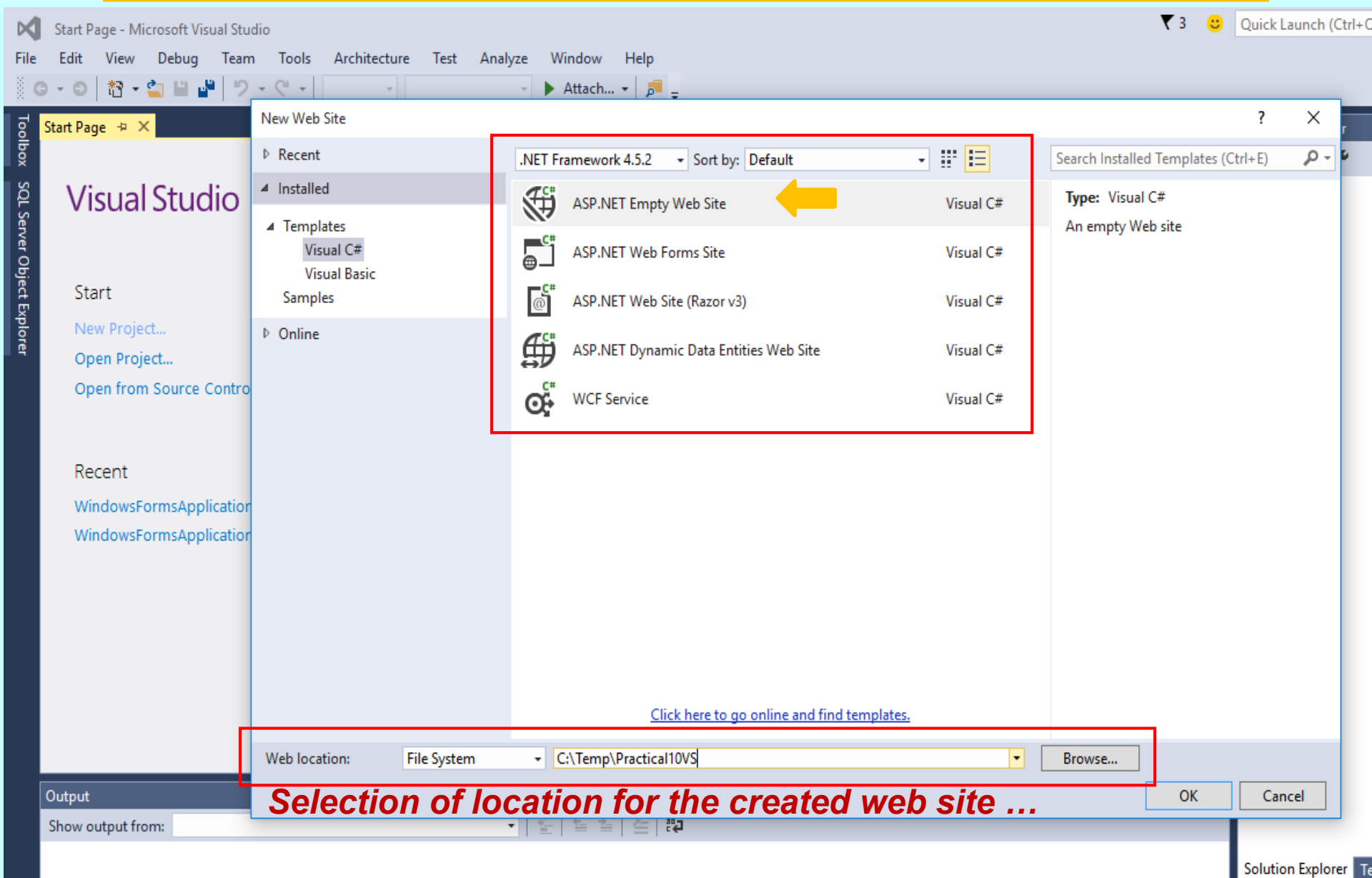
Database in SQL Server

- 1) How to create a new **Web Site** ?
- 2) How to create a **web form** & import data objects ?
- 3) How to create a new **SQL Server database** ?
- 4) How to create a new **database table**?
- 5) How to establish **relationship between tables**?
- 6) How to create **SQL Query** and execute it?
- 7) How to import an existing database ?

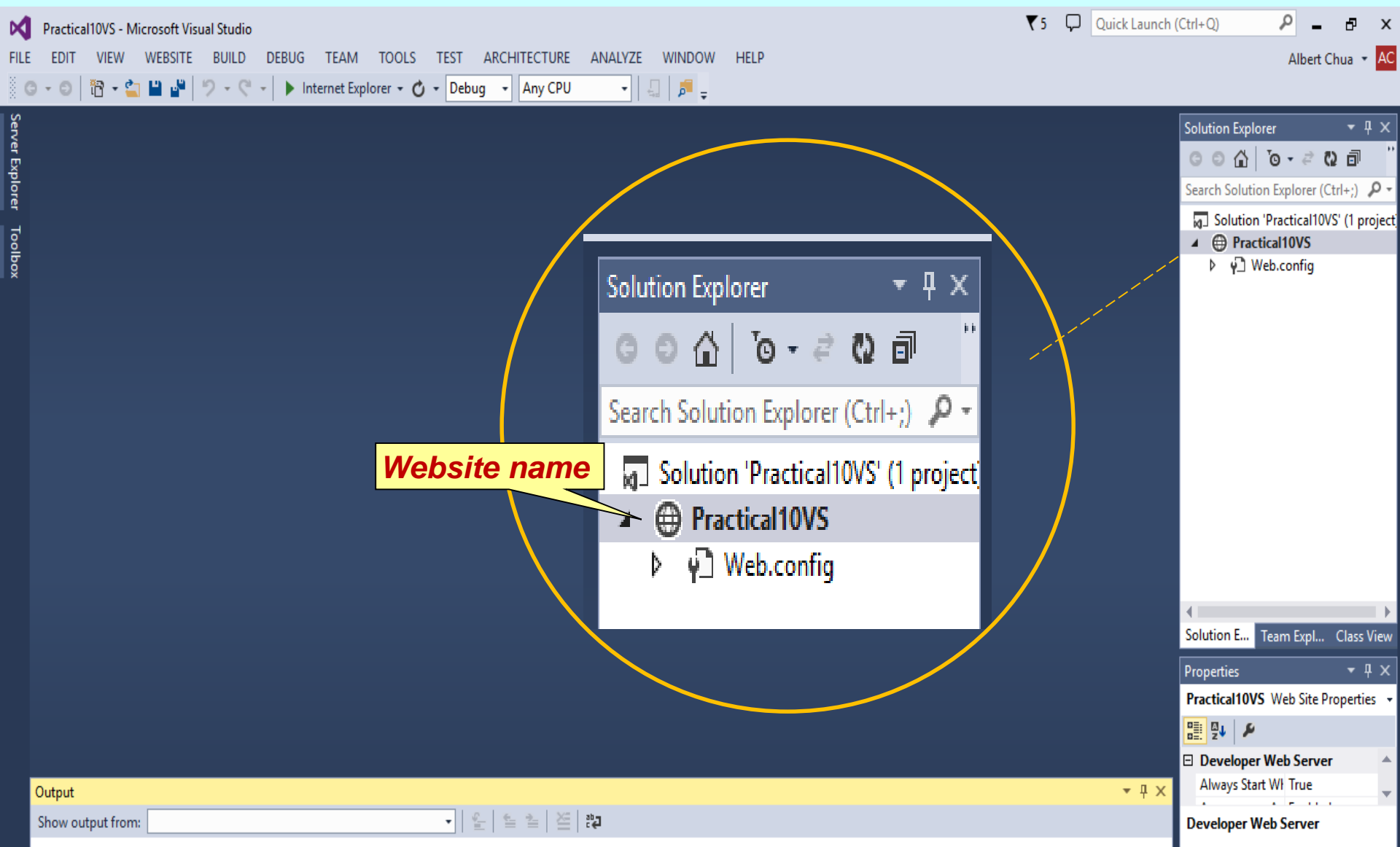
Creating a new website



Selection of ASP.Net Technology & C# Language



A New Website

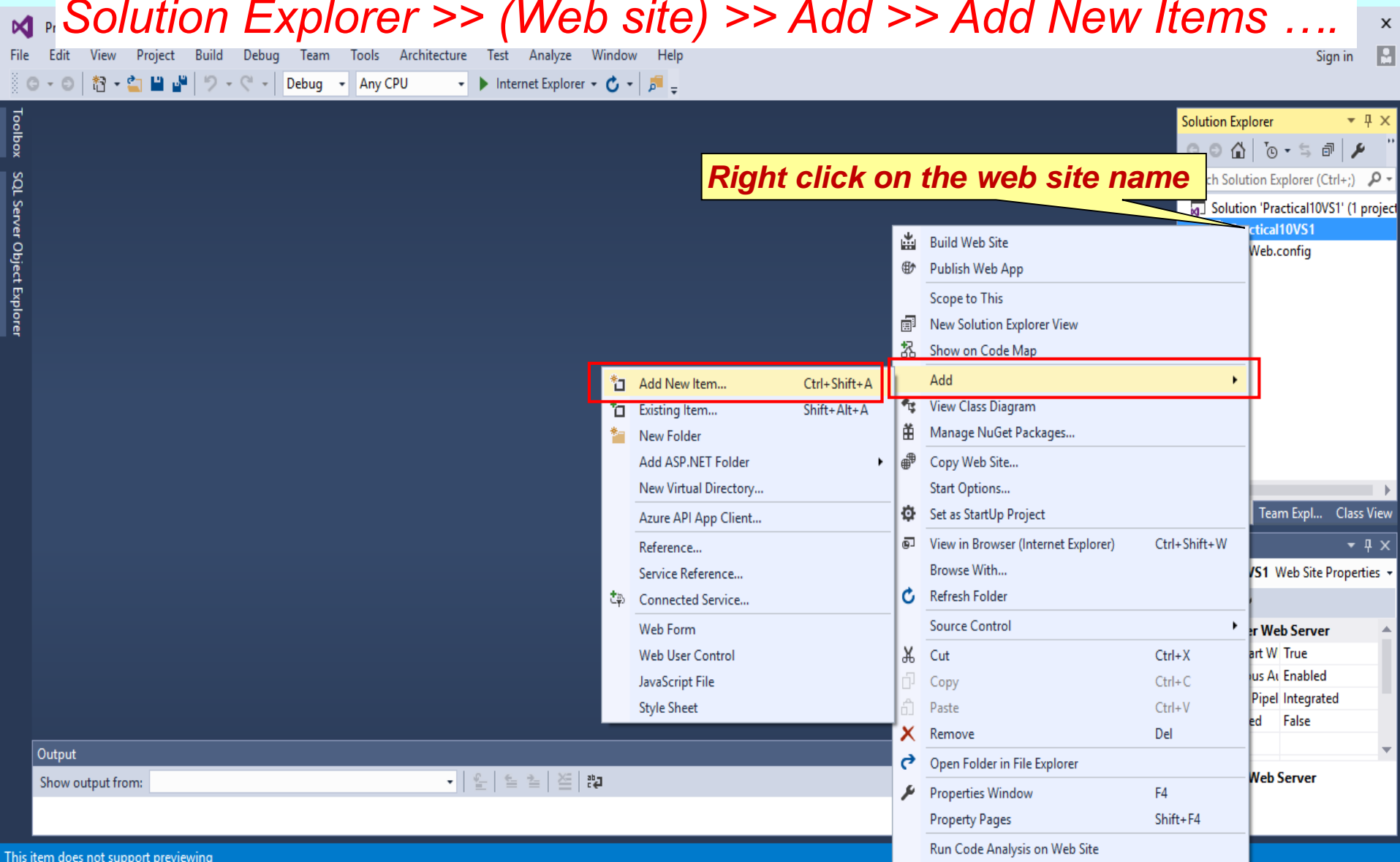


Database in SQL Server

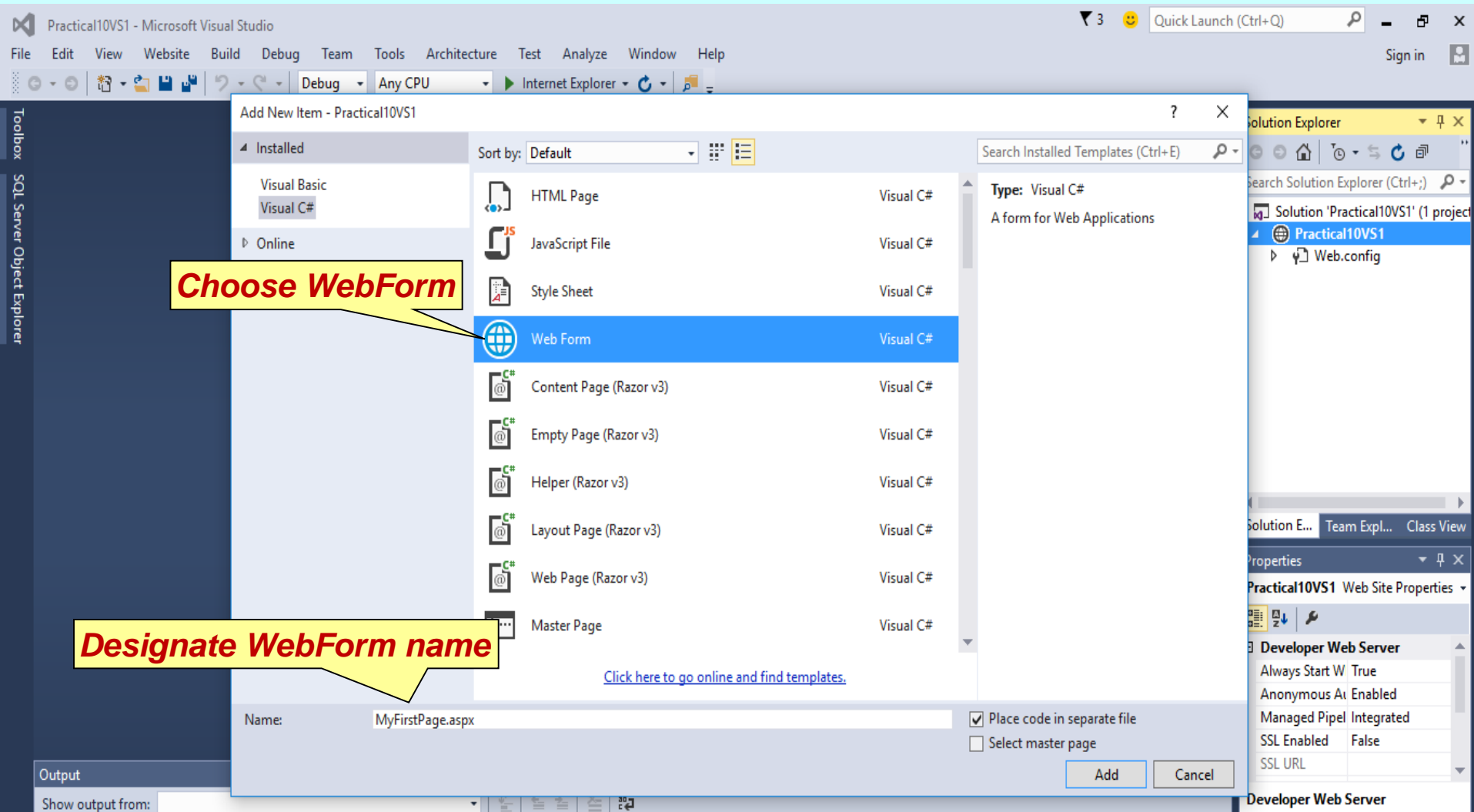
- 1) How to create a **Web Site** ?
- 2) How to create a **web form** & import data objects ?
- 3) How to create a new **SQL Server database** ?
- 4) How to create a new **database table**?
- 5) How to establish **relationship between tables**?
- 6) How to create **SQL Query** and execute it?
- 7) How to import an existing database ?

Add a new web form

Solution Explorer >> (Web site) >> Add >> Add New Items



Add a new web form



A Web form – Design & Source

The screenshot displays the Microsoft Visual Studio interface for a project named 'Practical10VS'. The main editor window shows the source code of 'MyFirstPage.aspx' in 'Source' view. The code is as follows:

```
<%@ Page Language="VB" AutoEventWireup="false" CodeFile="MyFirstPage.aspx.vb" Inherits="MyFirstPage" %>

<!DOCTYPE html>

<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
    <title></title>
</head>
<body>
    <form id="form1" runat="server">
        <div>

        </div>
    </form>
</body>
</html>
```

A yellow callout box labeled 'MyFirstPage.aspx' points to the file in the Solution Explorer on the right. The Solution Explorer shows the project structure: 'Practical10VS' containing 'MyFirstPage.aspx' and 'Web.config'.

Below the main editor, a smaller window shows the 'Design' view of the same file. A red box highlights the 'Source' button in the bottom-left corner of the Design view, indicating the switch between views.

At the bottom of the interface, the 'Output' window is visible, showing 'Show output from:' and 'ASP.NET'.

A Web form – Coding Behind

Practical10VS - Microsoft Visual Studio

File Edit View Website Build Debug Team Tools Architecture Test Analyze

MyFirstPage.aspx.cs MyFirstPage.aspx

Practical10VS MyFirstPage

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Web;
using System.Web.UI;
using System.Web.UI.WebControls;
```

2 references

```
public partial class MyFirstPage : System.Web.UI.Page
{
    0 references
    protected void Page_Load(object sender, EventArgs e)
    {
    }
}
```

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'Practical10VS' (1 project)

Practical10VS

MyFirstPage.aspx

MyFirstPage.aspx.cs

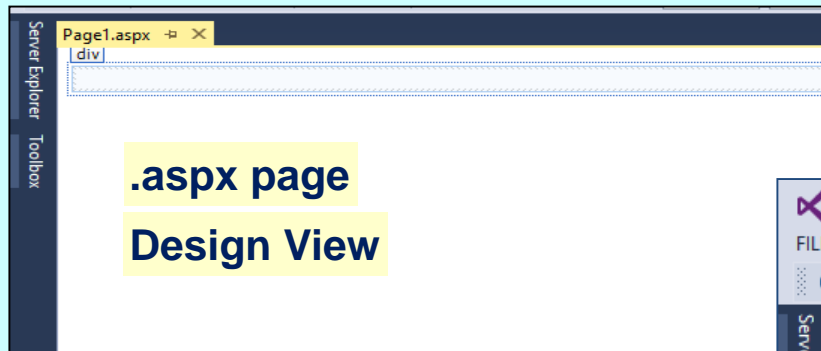
Web.config

MyFirstPage.aspx.cs

Two-page Web form Programming Model

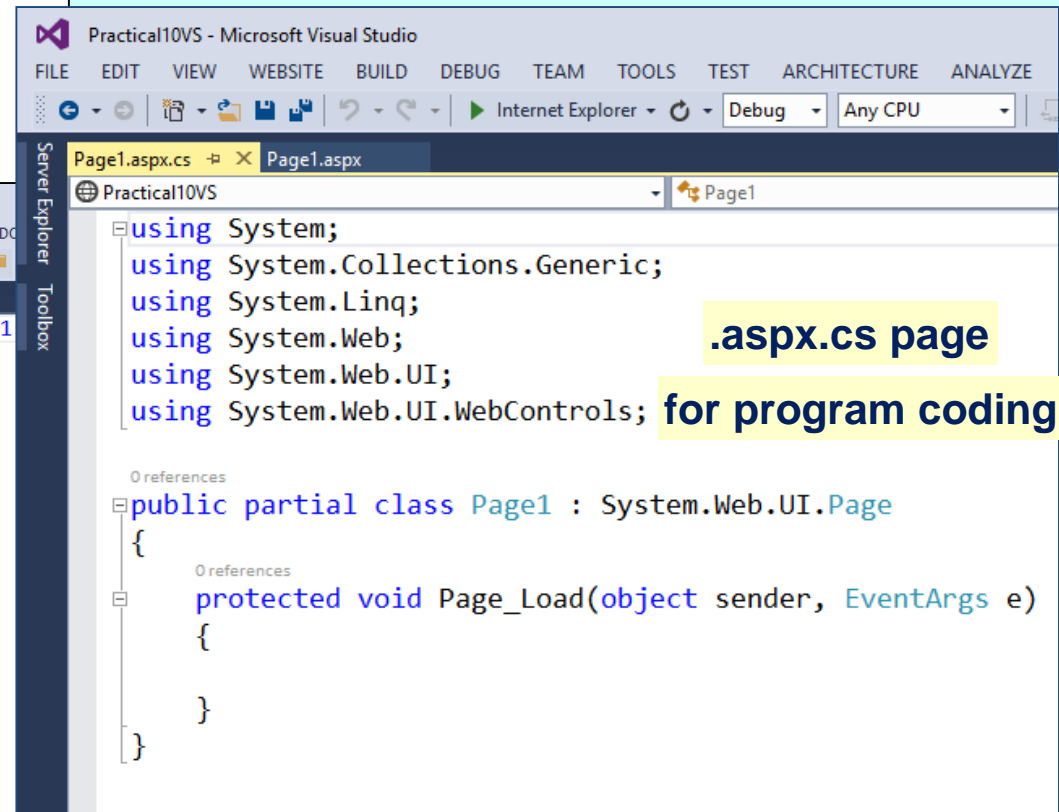
.aspx Page

Presentation-centric code



.aspx.cs Page

*Logical execution
(business) code*



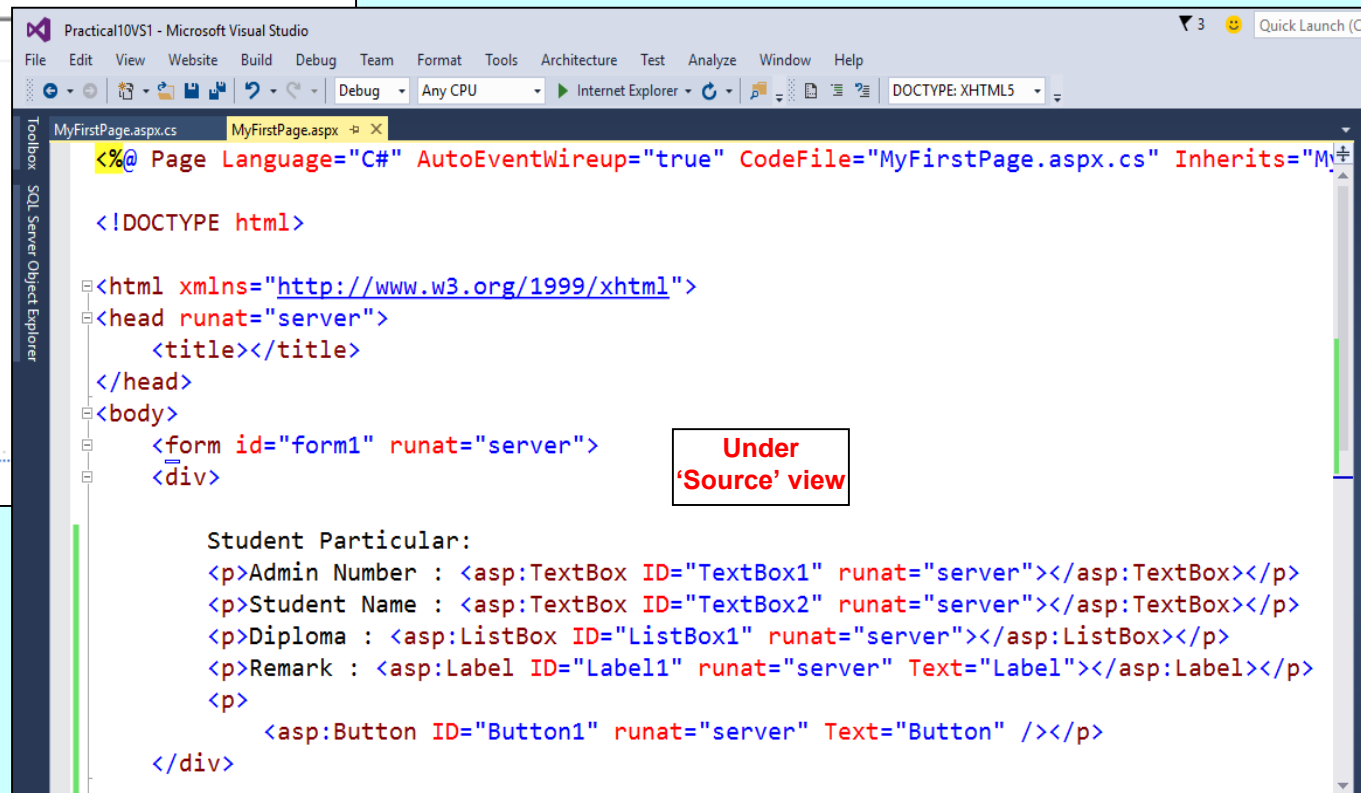
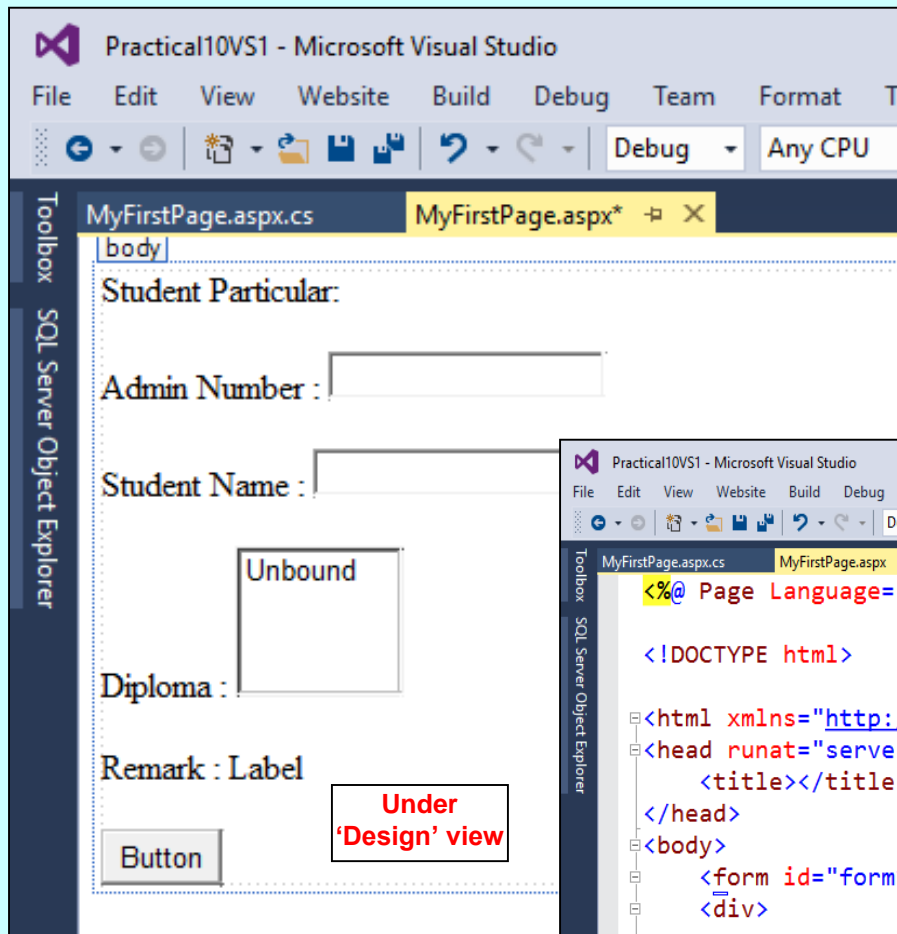
**.aspx page
Source View**

```
<%@ Page Language="C#" AutoEventWireup="true" CodeFile="Page1
<!DOCTYPE html>
<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
<title></title>
</head>
<body>
<form id="form1" runat="server">
<div>
</div>
</form>
</body>
</html>
```

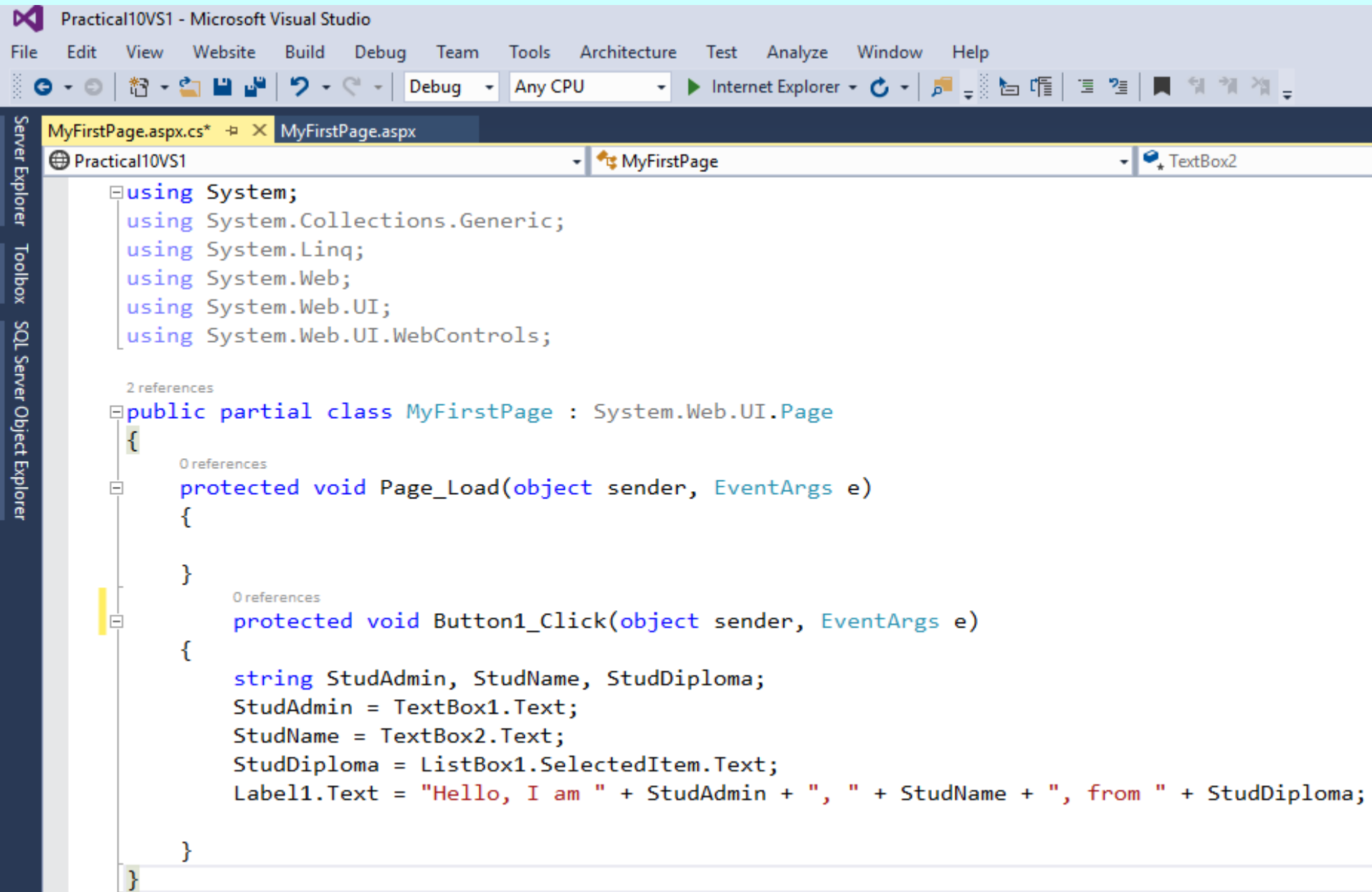
Two-page Web form Programming Model

.aspx Page

- *Presentation-centric code*



.aspx.cs page – the Logical execution (business) code



Practical10VS1 - Microsoft Visual Studio

File Edit View Website Build Debug Team Tools Architecture Test Analyze Window Help

Debug Any CPU Internet Explorer

MyFirstPage.aspx.cs* MyFirstPage.aspx

Practical10VS1 MyFirstPage TextBox2

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Web;
using System.Web.UI;
using System.Web.UI.WebControls;

2 references
public partial class MyFirstPage : System.Web.UI.Page
{
    0 references
    protected void Page_Load(object sender, EventArgs e)
    {

    }

    0 references
    protected void Button1_Click(object sender, EventArgs e)
    {
        string StudAdmin, StudName, StudDiploma;
        StudAdmin = TextBox1.Text;
        StudName = TextBox2.Text;
        StudDiploma = ListBox1.SelectedItem.Text;
        Label1.Text = "Hello, I am " + StudAdmin + ", " + StudName + ", from " + StudDiploma;
    }
}
```

Two-page Web form Programming Model

.aspx Page

*Presentation-centric
code*

.aspx.cs Page

*Logical execution
(business) code*

- 1) How does .aspx page knows that the code behind file is .aspx.cs?

In MyFirstPage.aspx page, it starts with a directive:

```
<% @ Page Language="C#" AutoEventWireup="true"  
CodeFile="MyFirstPage.aspx.cs" Inherits="MyFirstPage" %>
```

- 2) What is the benefit of the two-page web form design?

*It allows a cleaner separation of presentation-centric code and
logical execution (business) code*

To Run (execute) the web page

The screenshot displays the Microsoft Visual Studio interface for a project named 'Practical10VS1'. The main window shows the 'MyFirstPage.aspx' file in design view, featuring a form with fields for 'Student Particular:', 'Admin Number:', 'Student Name:', 'Diploma:' (with a dropdown menu showing 'DIT', 'DBI', 'DCS', 'DFI', 'DSF'), 'Remark: Label', and a 'Button'.

Three callout boxes highlight different methods to run the web page:

- Option 1: Click ►** Points to the 'Run' button (a green play icon) in the top toolbar.
- Option 2: Click Debug >> Start Debugging** Points to the 'Debug' menu and the 'Start Debugging' option (F5) within the menu.
- Option 3: Right Click Website >> View in Browser** Points to the context menu that appears when right-clicking the 'MyFirstPage.aspx' file in the Solution Explorer, specifically the 'View in Browser (Internet Explorer)' option (Ctrl+Shift+W).

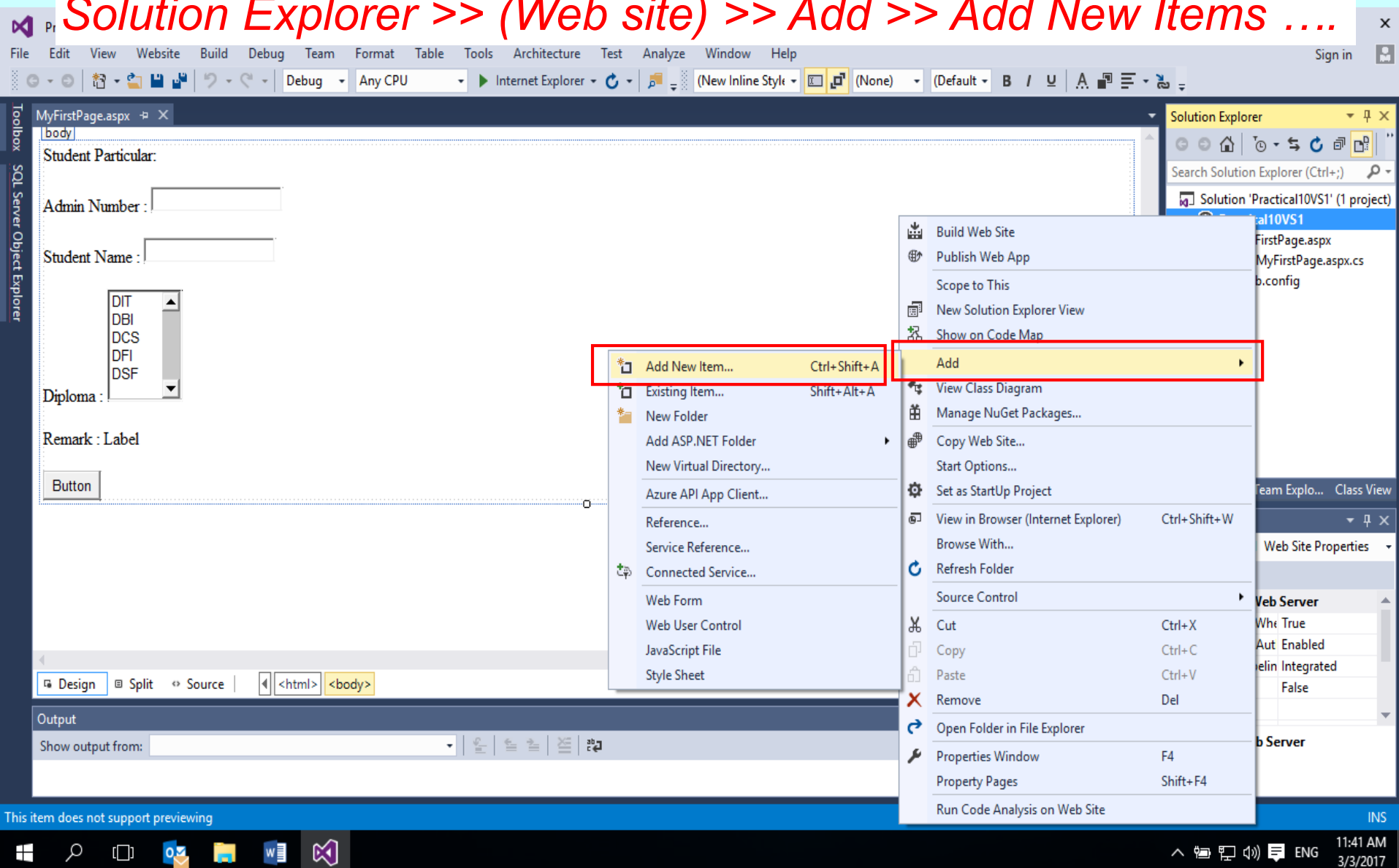
The Solution Explorer on the right shows the project structure, including 'MyFirstPage.aspx.cs' and 'WebFile Properties'.

Database in SQL Server

- 1) How to create a **Web Site** ?
- 2) How to create a **web form** & import data objects?
- 3) How to create a new **SQL Server database** ?
- 4) How to create a new **database table**?
- 5) How to establish **relationship between tables**?
- 6) How to create **SQL Query** and execute it?
- 7) How to import an existing database ?

Create a New SQL Server Database

Solution Explorer >> (Web site) >> Add >> Add New Items



Create a New SQL Server Database

The screenshot shows the Microsoft Visual Studio interface with the 'Add New Item - Practical10VS1' dialog box open. The 'SQL Server Database' option is selected in the list of templates. The 'Name' field is set to 'MyDatabase.mdf'. The 'Add' button is highlighted. Red annotations and numbered circles (1, 2, 3) guide the user through the steps.

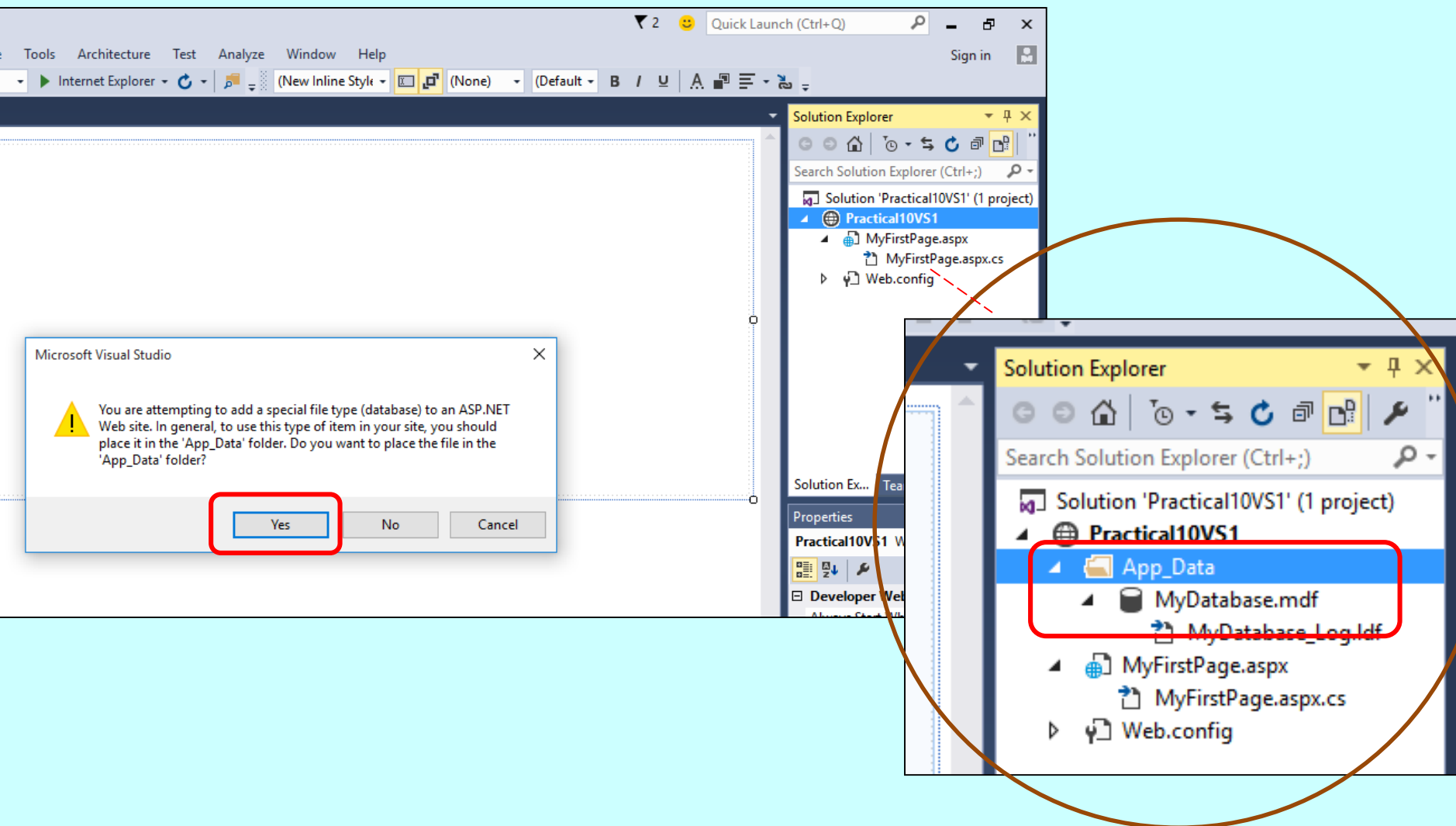
1 Select SQL Server Database

2 Enter file name

3 Add

Under Solution Explorer

Where to park the database base file ?

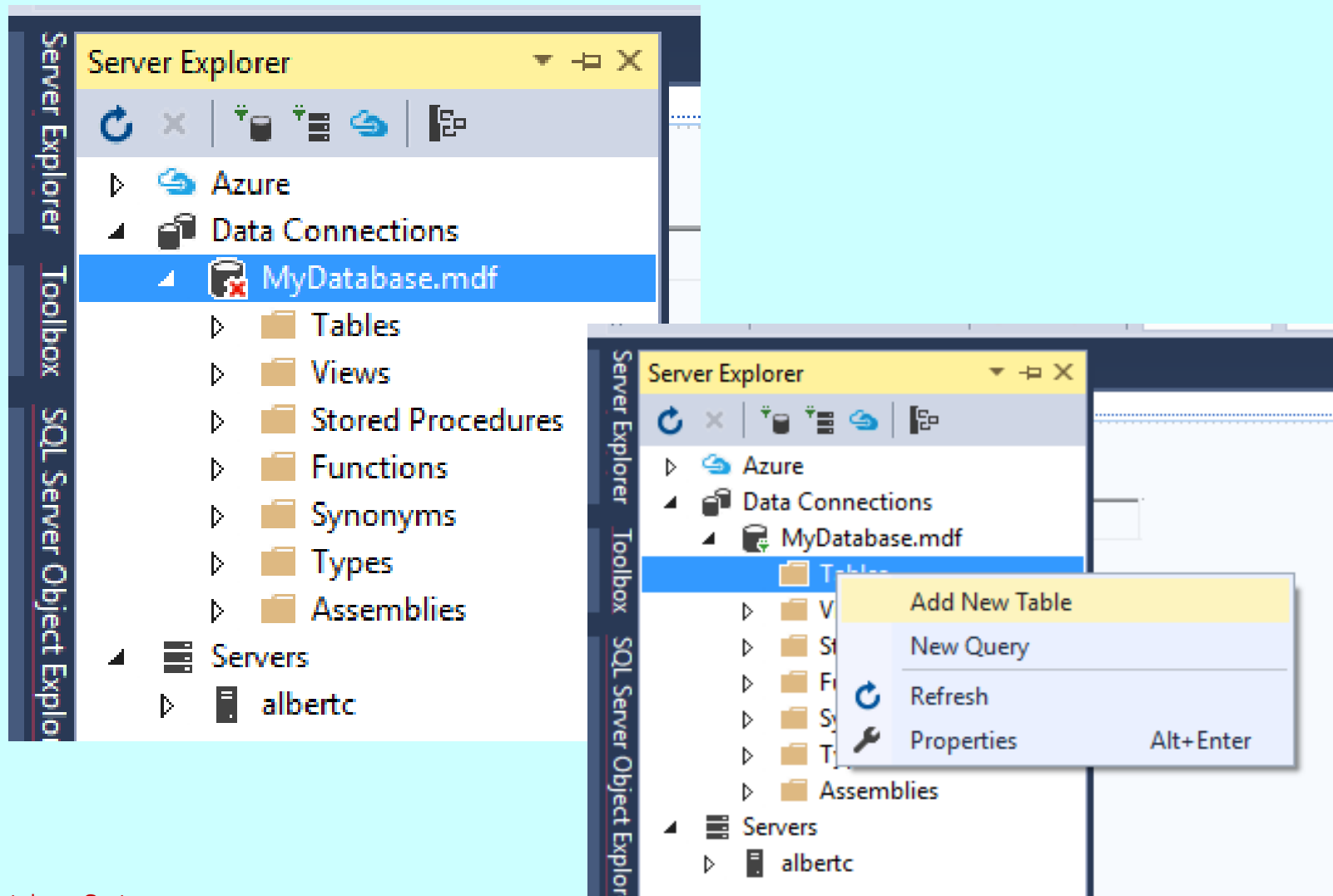


Database in SQL Server

- 1) How to create a **Web Site** ?
- 2) How to create a **web form** & import data objects?
- 3) How to create a new **SQL Server database** ?
- 4) How to create a new **database table**?
- 5) How to establish **relationship between tables**?
- 6) How to create **SQL Query** and execute it?
- 7) How to import an existing database ?

Under Server Explorer

Database name appears ... & Create new table...



Under Server Explorer

Define table fields...data type and field sizes...

Practical10VS1 - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Debug Any CPU Internet Explorer

Server Explorer Toolbox SQL Server Object Explorer

dbo.Table [Design] MyFirstPage.aspx

Update Script File: dbo.Table.sql

Name	Data Type	Allow Nulls	Default
Id	int	<input type="checkbox"/>	
		<input type="checkbox"/>	

Keys (1)
<unnamed> (Primary Key, Clustered: Id)
Check Constraints (0)
Indexes (0)
Foreign Keys (0)
Triggers (0)

Design T-SQL

```
CREATE TABLE [dbo].[Table]
(
    [Id] INT NOT NULL PRIMARY KEY
)
```

Server Explorer Toolbox SQL Server Object Explorer

dbo.Table [Design]* MyFirstPage.aspx

Update Script File: dbo.Table.sql*

Name	Data Type	Allow Nulls	Default
CourseID	nchar(6)	<input type="checkbox"/>	
CourseName	nchar(10)	<input type="checkbox"/>	
Year-Sem	nchar(7)	<input checked="" type="checkbox"/>	
CohortSize	int	<input checked="" type="checkbox"/>	
		<input type="checkbox"/>	

Design T-SQL

```
CREATE TABLE [dbo].[Table]
(
    [CourseID] NCHAR(6) NOT NULL PRIMARY KEY,
    [CourseName] NCHAR(10) NOT NULL,
    [Year-Sem] NCHAR(7) NULL,
    [CohortSize] INT NULL
)
```

Server Explorer Toolbox SQL Server Object Explorer

dbo.COURSE [Design]* MyFirstPage.aspx

Update Script File: dbo.Table.sql*

Name	Data Type	Allow Nulls	Default
CourseID	nchar(6)	<input type="checkbox"/>	
CourseName	nchar(10)	<input type="checkbox"/>	
Year-Sem	nchar(7)	<input checked="" type="checkbox"/>	
CohortSize	varchar(30)	<input checked="" type="checkbox"/>	
		<input type="checkbox"/>	

Design T-SQL

```
CREATE TABLE [dbo].[COURSE]
(
    [CourseID] NCHAR(6) NOT NULL PRIMARY KEY,
    [CourseName] NCHAR(10) NOT NULL,
    [Year-Sem] NCHAR(7) NULL,
    [CohortSize] VARCHAR(30) NULL
)
```

Under Server Explorer

Update database...

Practical10VS1 - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Debug Any CPU Internet Explorer

Server Explorer

Update Script File: dbo.Table.sql*

Name	Data Type	Allow Nulls
CourseID	nchar(6)	<input type="checkbox"/>
CourseName	nchar(10)	<input type="checkbox"/>
Year-Sem	nchar(7)	<input checked="" type="checkbox"/>
CohortSize	varchar(30)	<input checked="" type="checkbox"/>

Design T-SQL

```
CREATE TABLE [dbo].[COURSE]
(
    [CourseID] NCHAR(6) NOT NULL
    [CourseName] NCHAR(10) NOT NULL
    [Year-Sem] NCHAR(7) NULL,
    [CohortSize] VARCHAR(30) NULL
)
```

Preview Database Updates

Highlights: None

User actions: Create [dbo].[COURSE] (Table)

Supporting actions: None

Update Database Cancel

Server Explorer

Azure Data Connections MyDatabase.mdf

- Tables
 - COURSE
- Views
- Stored Procedures
- Functions
- Synonyms
- Types
- Assemblies
- Servers
 - albertc

Solution Explorer

Search Solution Explorer (Ctrl+;)

Solution 'Practical10VS1' (1 project)

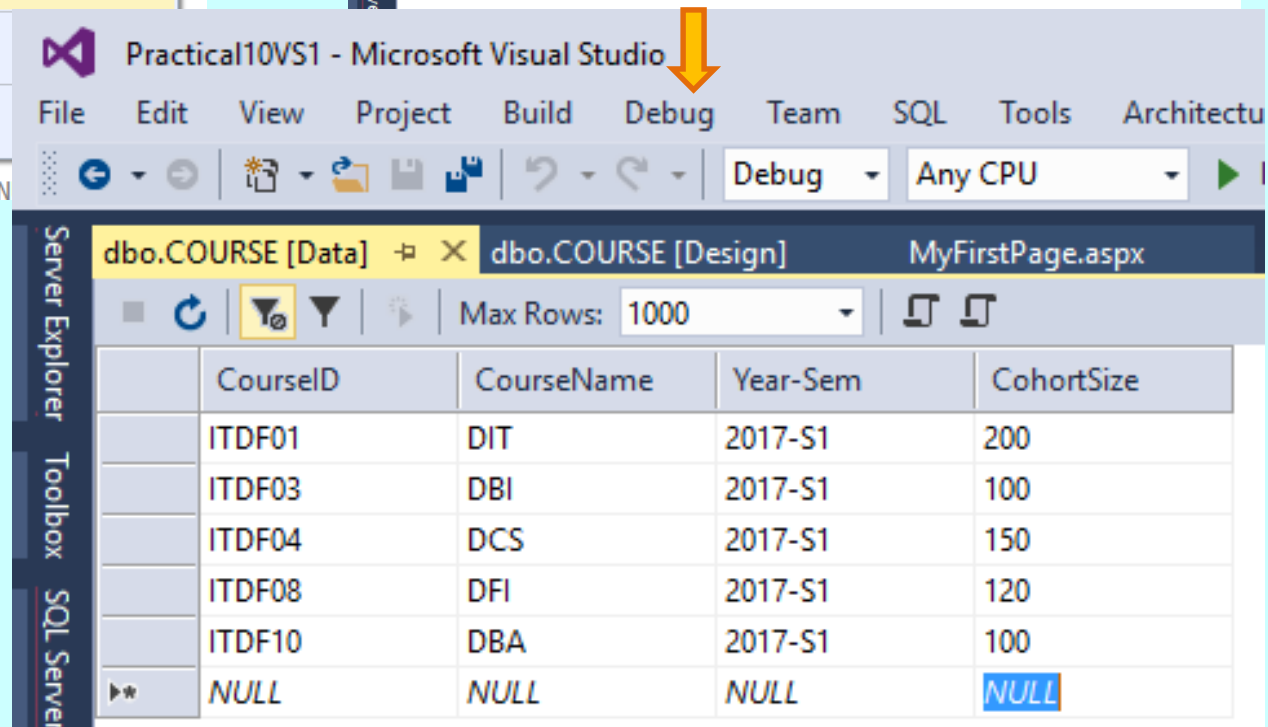
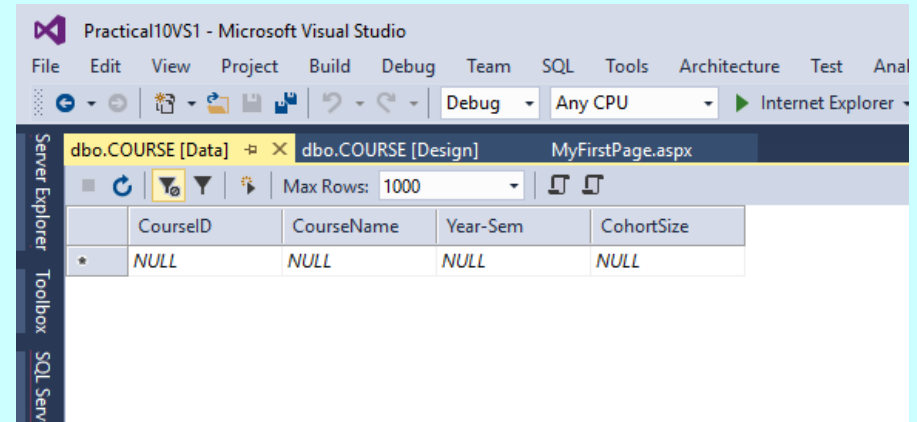
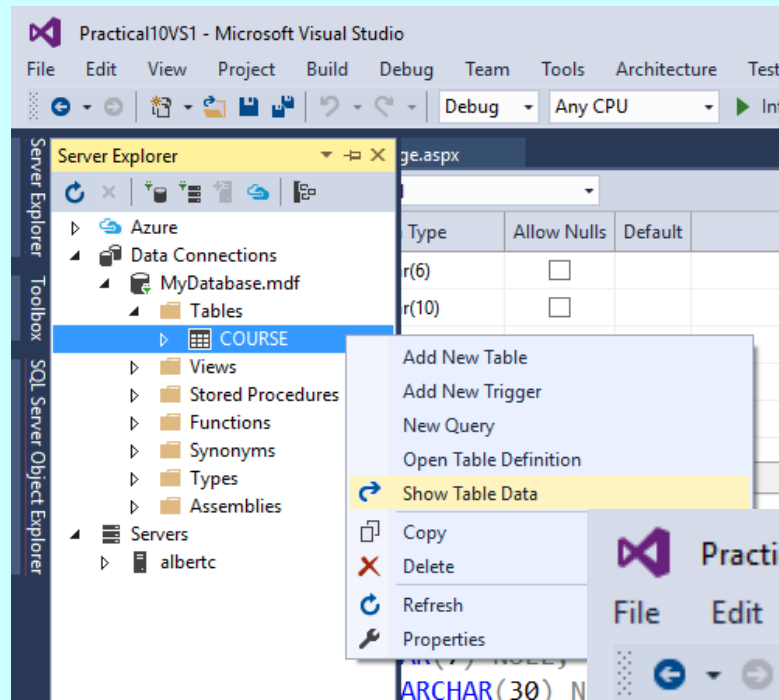
- Practical10VS1
 - App_Data
 - MyFirstPage.aspx
 - Web.config

Solution Explorer Team Explorer Class View

Properties

MyFirstPage.aspx

Populate data in a new Table

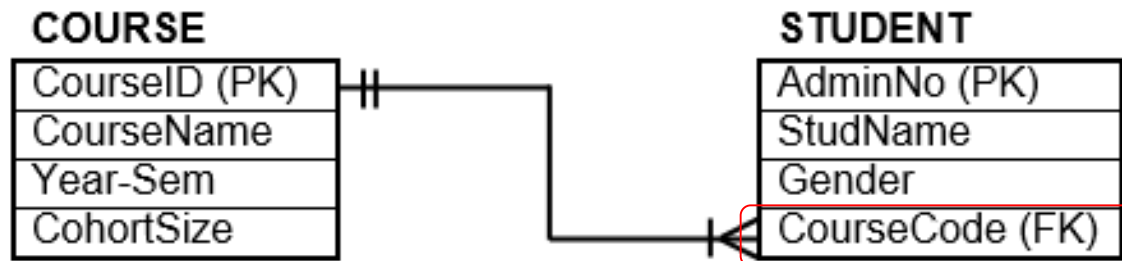


Database in SQL Server

- 1) How to create a **Web Site** ?
- 2) How to create a **web form** & import data objects?
- 3) How to create a new **SQL Server database** ?
- 4) How to create a new **database table**?
- 5) How to establish **relationship between tables**?
- 6) How to create **SQL Query** and execute it?
- 7) How to import an existing database ?

Establish relationship between Tables

In the Entity Relationship Diagram below, COURSE table 'CourseID' is the primary key whereas STUDENT table 'CourseCode' is the foreign key.



Server Explorer >> Data Connection >> (Database name) >> Tables ...

The screenshot displays the Microsoft Visual Studio interface. On the left, the 'Server Explorer' pane shows a tree view of the database structure. Under 'Data Connections' > 'MyDatabase.mdf' > 'Tables', the 'STUDENT' table is selected and highlighted with a red box. A context menu is open over the 'STUDENT' table, showing options like 'Add New Table', 'Add New Trigger', 'New Query', 'Open Table Definition', 'Show Table Data', 'Copy', 'Delete', and 'Refresh'. The 'Open Table Definition' option is highlighted. On the right, the 'SQL Server Enterprise Designer' shows the 'STUDENT' table design. The table has four columns: 'StudAdmin' (nchar(7), NOT NULL, Primary Key), 'StudName' (nvarchar(30), NOT NULL), 'Gender' (varchar(6), NULL), and 'CourseCode' (nchar(6), NOT NULL). The 'Keys' pane on the right shows '(1)' key: '<unnamed> (Primary Key, Clustered: StudAdmin)'. The 'Foreign Keys' section is highlighted with a red box and shows '(0)' foreign keys. The 'T-SQL' pane at the bottom shows the 'CREATE TABLE' script for the 'STUDENT' table.

```

CREATE TABLE [dbo].[STUDENT] (
    [StudAdmin] NCHAR (7) NOT NULL,
    [StudName] NVARCHAR (30) NOT NULL,
    [Gender] VARCHAR (6) NULL,
    [CourseCode] NCHAR (6) NOT NULL,
    PRIMARY KEY CLUSTERED ([StudAdmin] ASC)
);
  
```

Establish relationship between tables

dbo.STUDENT [Design]*

Update | Script File: dbo.STUDENT.sql*

Name	Data Type	Allow Nulls	Default
StudAdmin	nchar(7)	<input type="checkbox"/>	
StudName	nvarchar(30)	<input type="checkbox"/>	
Gender	varchar(6)	<input checked="" type="checkbox"/>	
CourseCode	nchar(6)	<input type="checkbox"/>	

Keys (1)
<unnamed> (Primary Key, Clustered: StudAdmin)

Check Constraints (0)

Indexes (0)

Foreign Keys (0)

Triggers (0)

Add New Foreign Key

Switch to T-SQL Pane

Design | T-SQL

```
CREATE TABLE [dbo].[STUDENT] (
  [StudAdmin] NCHAR (7) NOT NULL,
  [StudName] NVARCHAR (30) NOT NULL,
  [Gender] VARCHAR (6) NULL,
  [CourseCode] NCHAR (6) NOT NULL,
  PRIMARY KEY CLUSTERED ([StudAdmin] ASC)
);
```

dbo.STUDENT [Design]*

Update | Script File: dbo.STUDENT.sql*

Name	Data Type	Allow Nulls	Default
StudAdmin	nchar(7)	<input type="checkbox"/>	
StudName	nvarchar(30)	<input type="checkbox"/>	
Gender	varchar(6)	<input checked="" type="checkbox"/>	
CourseCode	nchar(6)	<input type="checkbox"/>	

Keys (1)
<unnamed> (Primary Key, Clustered: StudAdmin)

Check Constraints (0)

Indexes (0)

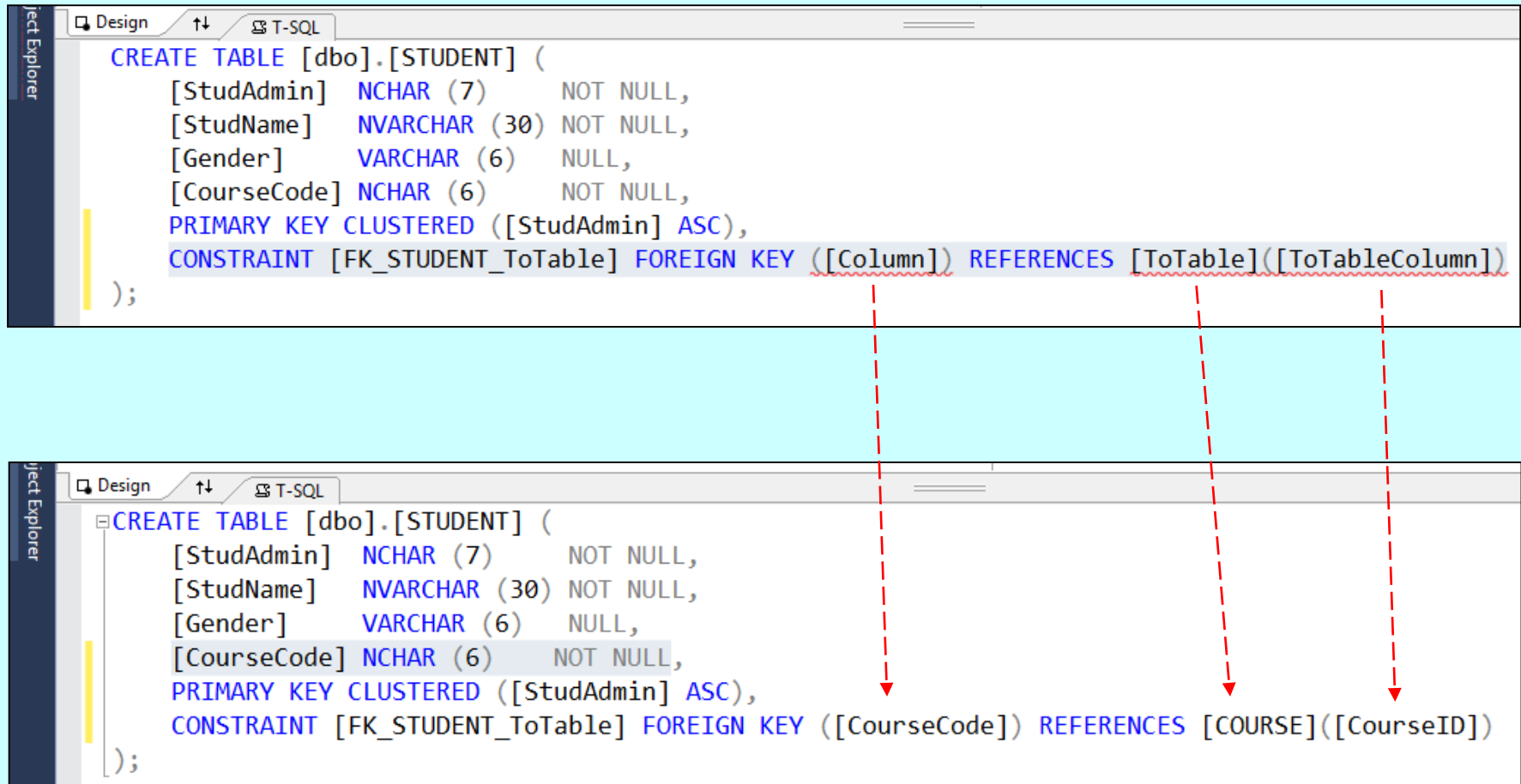
Foreign Keys (1)
FK_STUDENT_ToTable (ToTableColumn)

Triggers (0)

Design | T-SQL

```
CREATE TABLE [dbo].[STUDENT] (
  [StudAdmin] NCHAR (7) NOT NULL,
  [StudName] NVARCHAR (30) NOT NULL,
  [Gender] VARCHAR (6) NULL,
  [CourseCode] NCHAR (6) NOT NULL,
  PRIMARY KEY CLUSTERED ([StudAdmin] ASC),
  CONSTRAINT [FK_STUDENT_ToTable] FOREIGN KEY ([Column]) REFERENCES [ToTable]([ToTableColumn])
);
```

Establish relationship between Tables



Save the established relationship

Practical10VS1 - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Debug Any CPU

Server Explorer

SQL Server Object Explorer

dbo.STUDENT [Design]*

Update Script File: dbo.STUDENT.sql*

Name	Data Type	Allow Nulls	Default
StudAdmin	nchar(7)	<input type="checkbox"/>	
StudName	nvarchar(30)	<input type="checkbox"/>	
Gender	varchar(6)	<input checked="" type="checkbox"/>	
CourseCode	nchar(6)	<input type="checkbox"/>	

Design T-SQL

```
CREATE TABLE [dbo].[STUDENT] (
  [StudAdmin] NCHAR (7) NOT NULL
  [StudName] NVARCHAR (30) NOT NULL
  [Gender] VARCHAR (6) NULL,
  [CourseCode] NCHAR (6) NOT NULL
  PRIMARY KEY CLUSTERED ([StudAdmin]
  CONSTRAINT [FK STUDENT ToTable] FOREIGN KEY ([CourseCode]) REFERENCES [COURSE]([CourseID])
```

Preview Database Updates

Highlights: None

User actions: None

Supporting actions: None

☒ Include transactional scripts

Generate Script Update Database Cancel

Practical10VS1 - Microsoft Visual Studio

File Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help

Debug Any CPU

Server Explorer

SQL Server Object Explorer

dbo.COURSE [Design] dbo.STUDENT [Design]*

Update Script File: dbo.STUDENT.sql

Name	Data Type	Allow Nulls	Default
StudAdmin	nchar(7)	<input type="checkbox"/>	
StudName	nvarchar(30)	<input type="checkbox"/>	
Gender	varchar(6)	<input checked="" type="checkbox"/>	
CourseCode	nchar(6)	<input type="checkbox"/>	

Keys (1)

<unnamed> (Primary Key, Clustered: StudAdmin)

Check Constraints (0)

Indexes (0)

Foreign Keys (1)

FK_STUDENT_ToTable (CourseID)

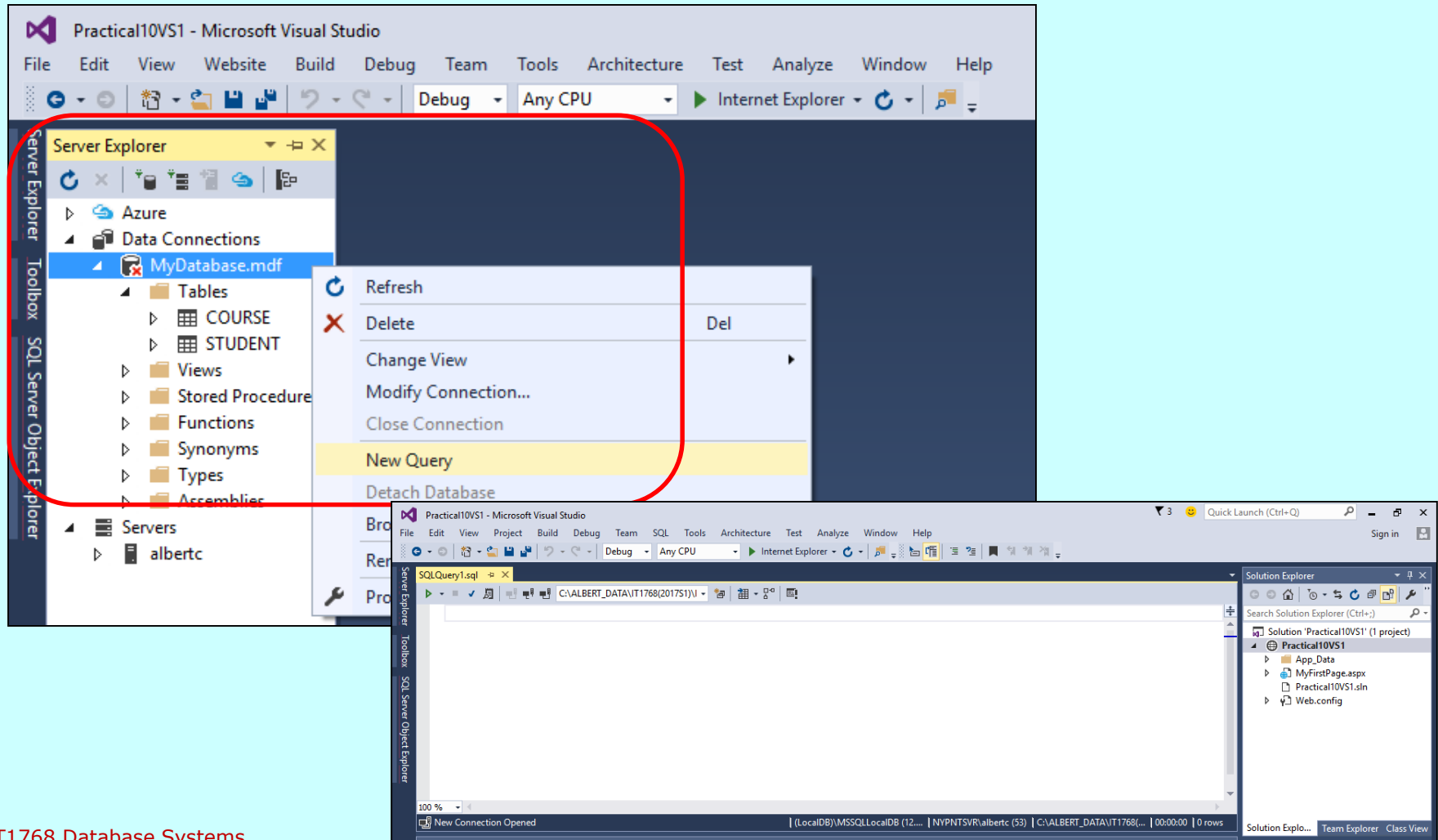
Triggers (0)

Database in SQL Server

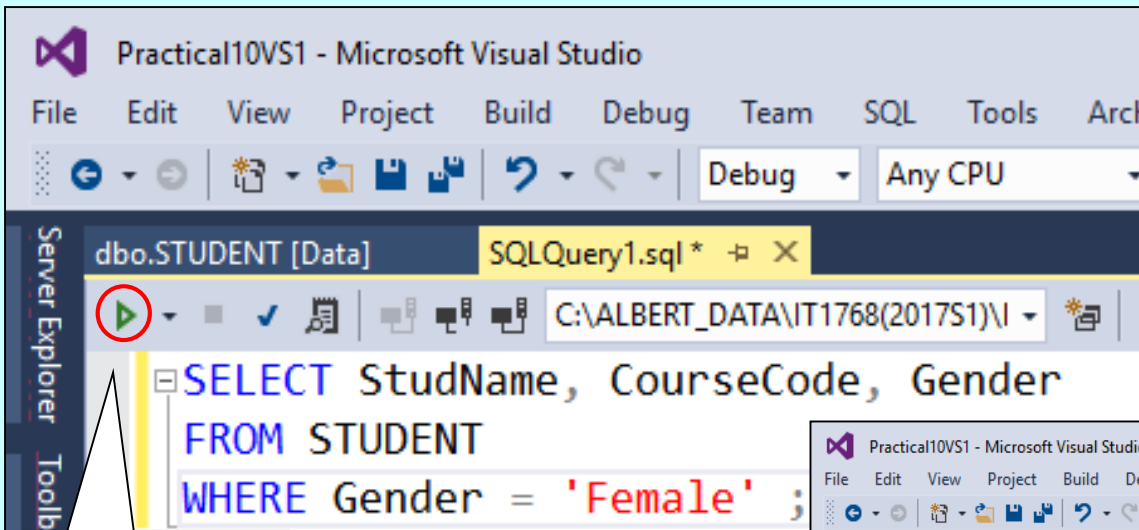
- 1) How to create a **Web Site** ?
- 2) How to create a **web form** & import data objects?
- 3) How to create a new **SQL Server database** ?
- 4) How to create a new **database table**?
- 5) How to establish **relationship between tables**?
- 6) How to create **SQL Query** and execute it?
- 7) How to import an existing database ?

Create SQL Query from Database

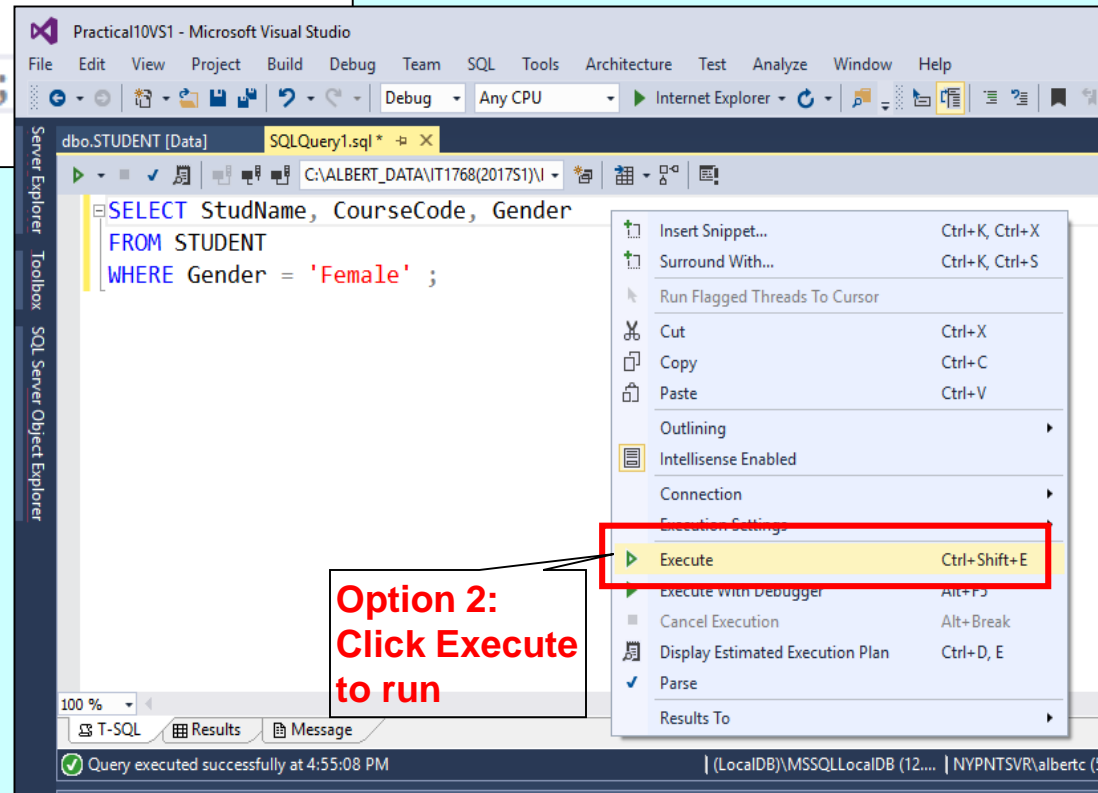
***Server Explorer >> Data Connection >> (Database)
>> New Query***



Type SQL statement and execute (run)



Option 1:
Click ► to run



Display Query and Save Query

The screenshot shows the Microsoft Visual Studio interface with the file 'SQLQuery1.sql' open. The query editor contains the following SQL code:

```
SELECT StudName, CourseCode, Gender
FROM STUDENT
WHERE Gender = 'Female'
```

Below the query editor, the 'Results' tab is active, displaying a table with the following data:

	StudName	CourseCode	Gender
1	Chole	ITDF04	Female
2	Daryl	ITDF08	Female
3	Eileen	ITDF10	Female

A red rectangle highlights the query editor and the results table. An orange arrow points from the results table to the right-hand screenshot.

The screenshot shows the same Visual Studio interface, but with the 'Save' context menu open over the 'SQLQuery1.sql' file. The menu options are:

- Save SQLQuery1.sql (Ctrl+S)
- Close (Ctrl+F4)
- Close All Documents
- Close All But This
- Copy Full Path
- Open Containing Folder
- Float
- Float All
- Pin Tab
- New Horizontal Tab Group
- New Vertical Tab Group

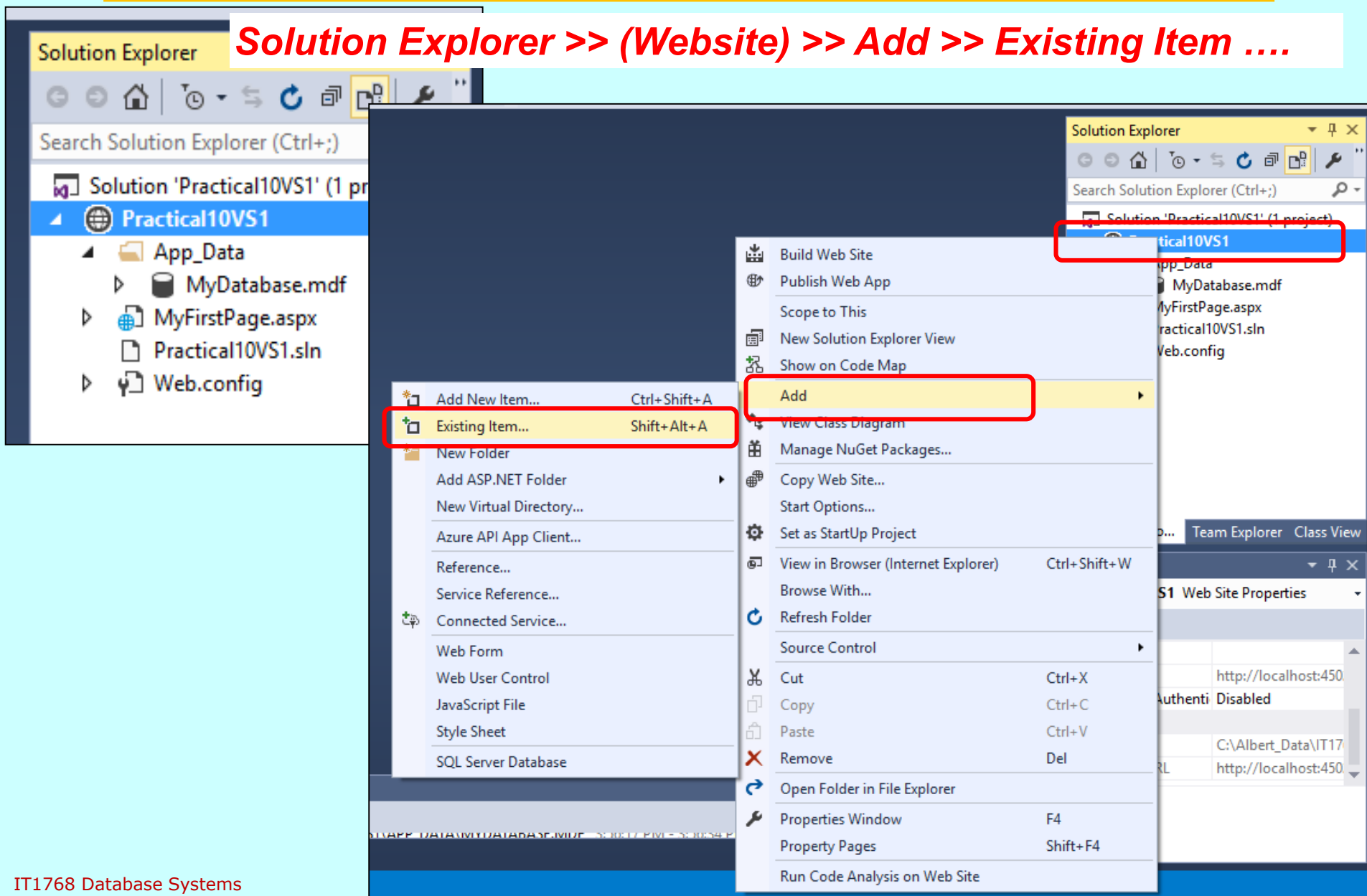
A red rectangle highlights the 'Save SQLQuery1.sql' option.

Database in SQL Server

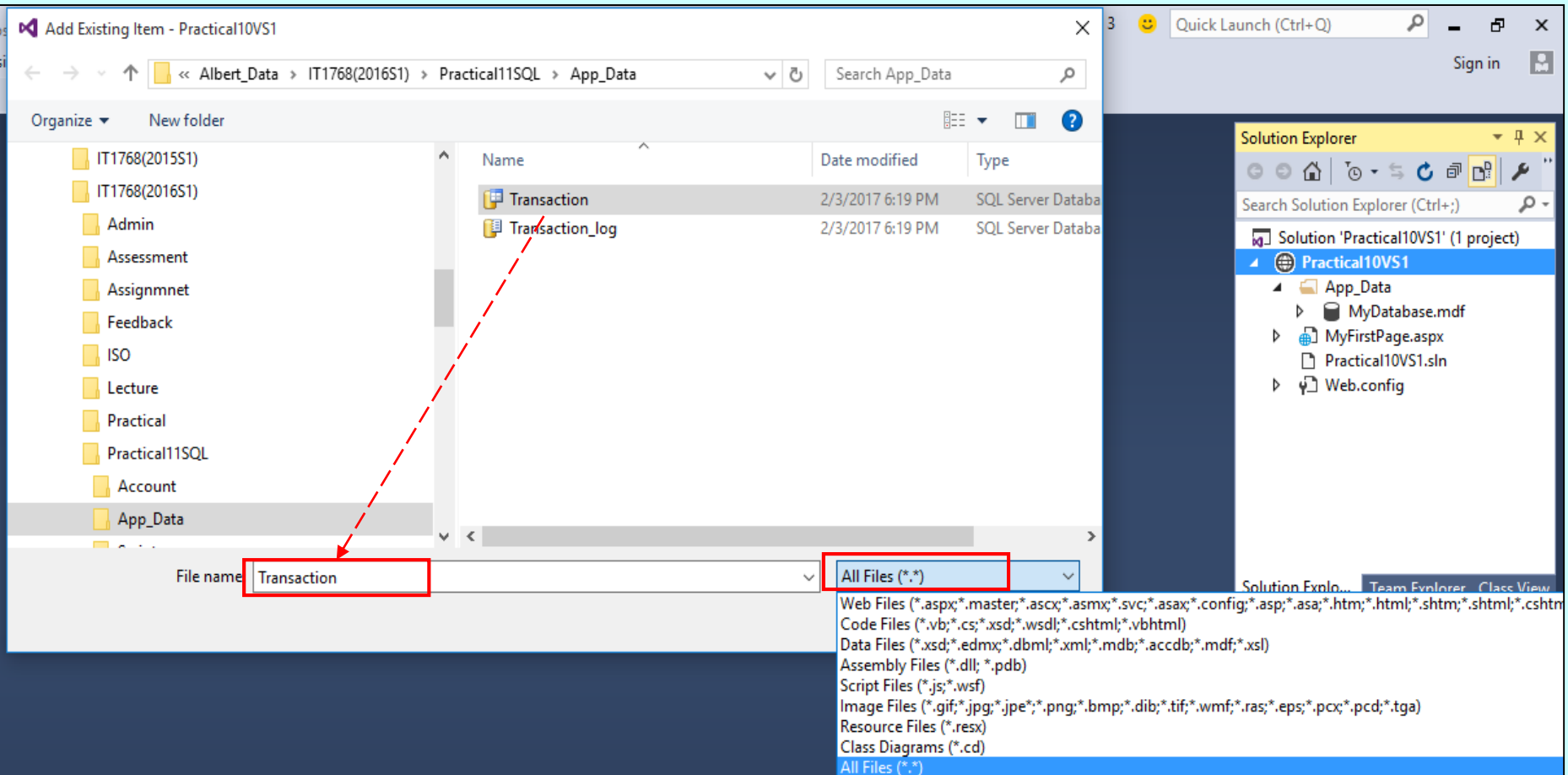
- 1) How to create a **Web Site** ?
- 2) How to create a **web form** & import data objects?
- 3) How to create a new **SQL Server database** ?
- 4) How to create a new **database table**?
- 5) How to establish **relationship between tables**?
- 6) How to create **SQL Query** and execute it?
- 7) How to import an existing database ?

Import an Existing Database

Solution Explorer >> (Website) >> Add >> Existing Item

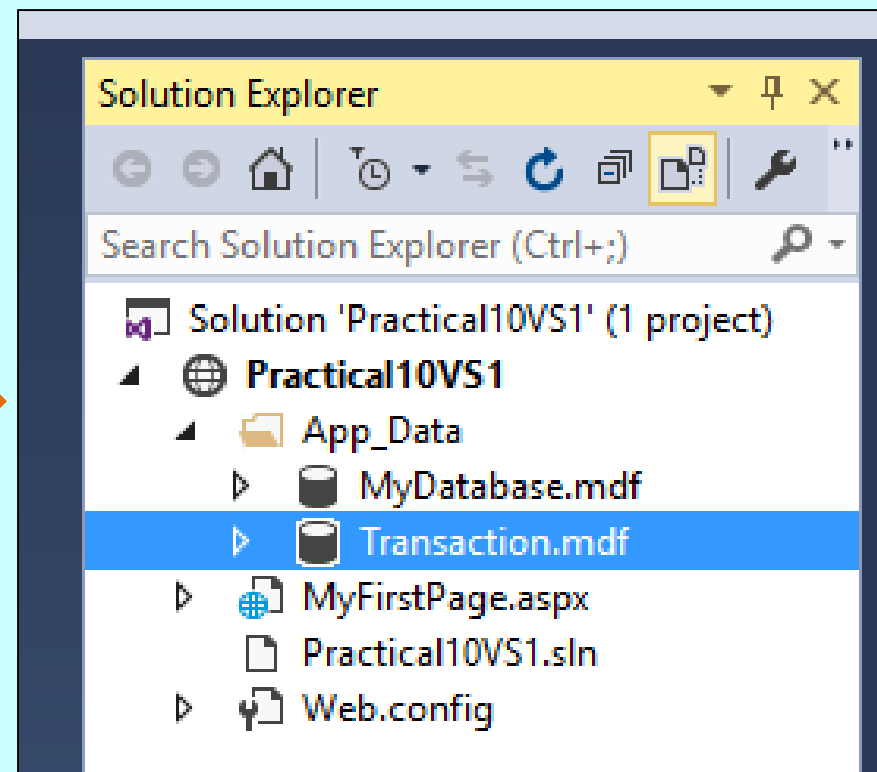
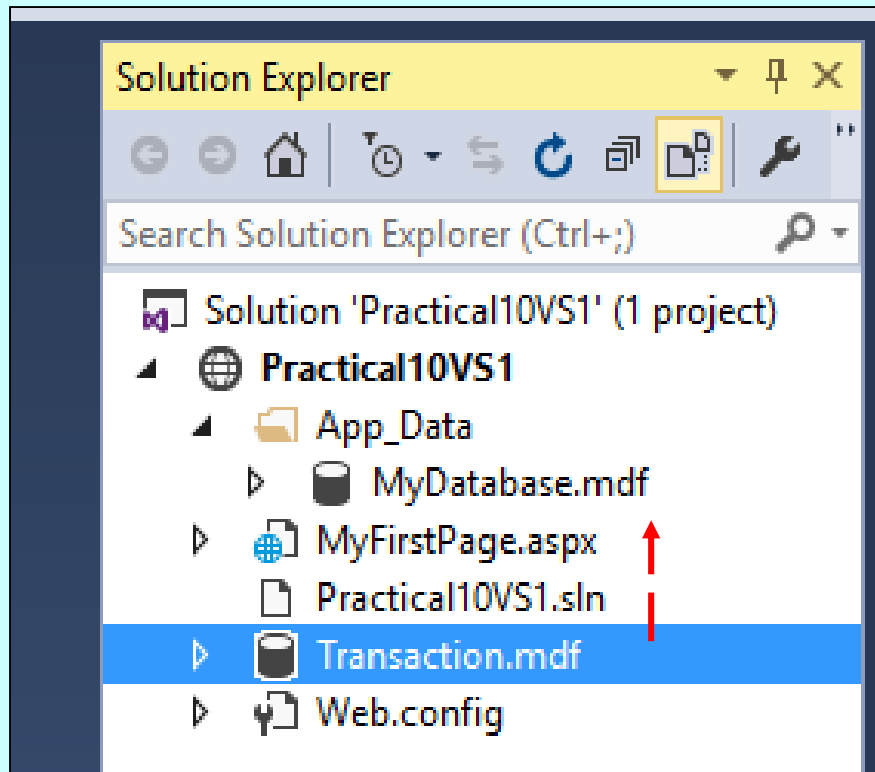


Import an Existing Database



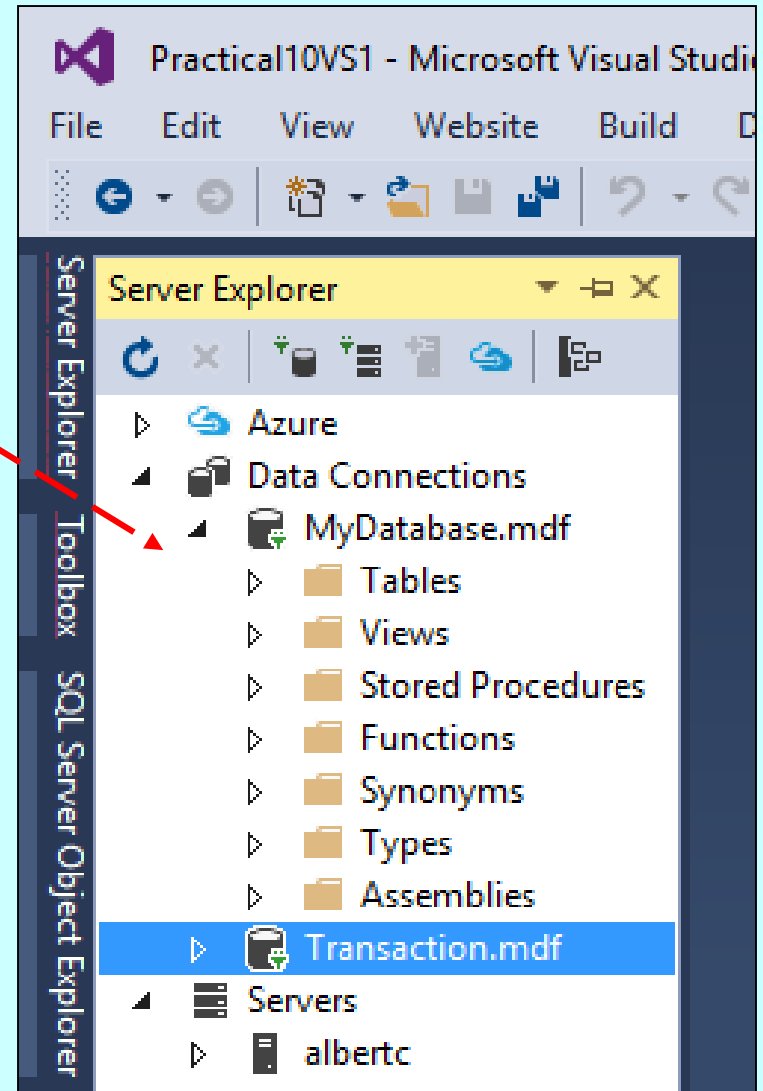
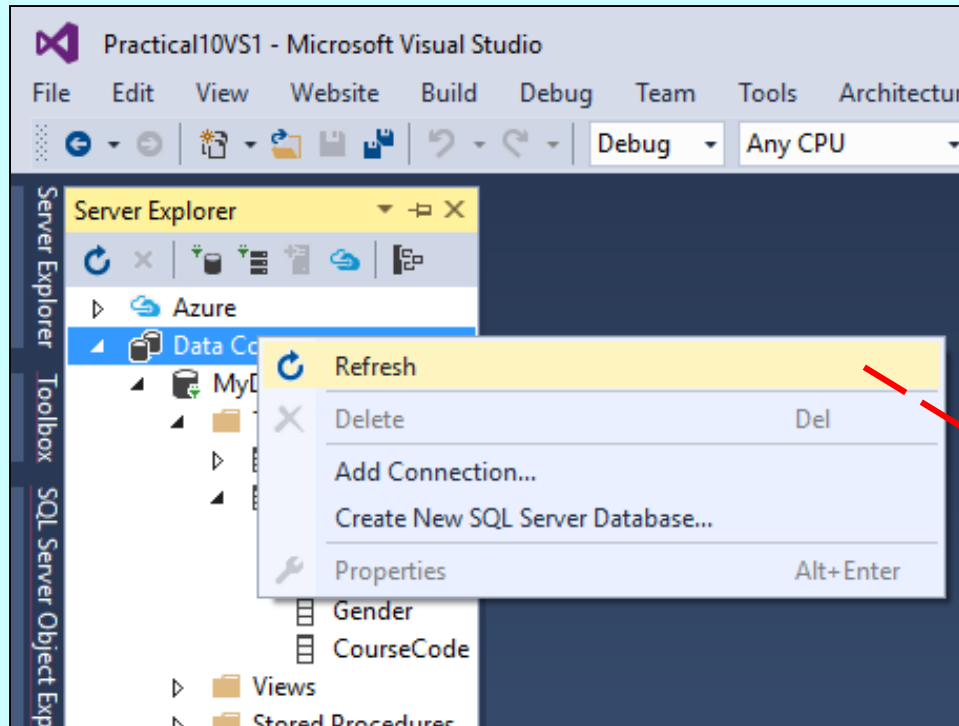
Import an Existing Database

Database imported under Website initially



Move Database under App_Data

Import an Existing Database



Import an Existing Database

Website with more than one databases

The screenshot displays the Microsoft Visual Studio interface for a project named 'Practical10VS1'. The interface is divided into several panes:

- Server Explorer (Left):** Shows the 'Data Connections' folder under 'Azure'. The 'Transaction.mdf' database is highlighted with a red box. A red arrow points from this box to the 'Transaction.mdf' entry in the 'Server Explorer' pane.
- Server Explorer (Middle):** Shows the 'Data Connections' folder under 'Azure'. The 'Transaction.mdf' database is highlighted with a red box. A red arrow points from this box to the 'Transaction.mdf' entry in the 'Server Explorer' pane.
- Solution Explorer (Right):** Shows the project structure. The 'App_Data' folder is highlighted with a red box. A red arrow points from this box to the 'Transaction.mdf' entry in the 'Server Explorer' pane.
- Solution Explorer (Bottom Right):** Shows the project structure. The 'App_Data' folder is highlighted with a red box. A red arrow points from this box to the 'Transaction.mdf' entry in the 'Server Explorer' pane.

Red arrows indicate the flow of the process: from the 'Transaction.mdf' database in the 'Server Explorer' to the 'App_Data' folder in the 'Solution Explorer'.

End of Topic 10