SIT 221: Event-Driven Programming

Lecture 2 : Introduction to Visual Studio . Net

Overview of .NET

- ✓ Visual Basic .NET (VB.NET) is an object-oriented computer programming language implemented on the .NET Framework. Although it is an evolution of classic Visual Basic language, it is not backwards-compatible with VB6, and any code written in the old version does not compile under VB.NET.
- ✓ Like all other .NET languages, VB.NET has complete support for object-oriented concepts. Everything in VB.NET is an object, including all of the primitive types (Short, Integer, Long, String, Boolean, etc.) and user-defined types, events, and even assemblies. All objects inherits from the base class Object.
- ✓ VB.NET is implemented by Microsoft's .NET framework. Therefore, it has full access to all the libraries in the .Net Framework.
- ✓ It's also possible to run VB.NET programs on Mono, the open-source alternative to .NET, not only under Windows, but even Linux or Mac OSX.

Reasons Why VB.Net is a Widely Used Professional Language

- ✓ Modern, general purpose.
- ✓ Object oriented.
- ✓ Component oriented.
- ✓ Easy to learn.
- ✓ Structured language.
- ✓ It produces efficient programs.
- ✓ It can be compiled on a variety of computer platforms.
- ✓ Part of .Net Framework.

Strong Programming Features VB.Net

VB.Net has numerous strong programming features that make it endearing to multitude of programmers worldwide. Let us mention some of these features:

- ✓ Boolean Conditions
- ✓ Automatic Garbage Collection
- ✓ Standard Library
- ✓ Assembly Versioning
- ✓ Properties and Events
- ✓ Delegates and Events Management
- ✓ Easy-to-use Generics
- ✓ Indexers
- ✓ Conditional Compilation
- ✓ Simple Multithreading

Environment Setup - The .Net Framework

- The .Net framework is a revolutionary platform that helps you to write the following types of applications:
  - ✓ Windows applications
  - ✓ Web applications
  - ✓ Web services
- The .Net framework applications are multi-platform applications. The framework has been designed in such a way that it can be used from any of the following languages: Visual Basic, C#, C++, Jscript, and COBOL, etc.
- All these languages can access the framework as well as communicate with each other.
- The .Net framework consists of an enormous library of codes used by the client languages like VB.Net. These languages use object-oriented methodology.

Components of the .Net Framework

- ✓ Common Language Runtime (CLR)
- ✓ The .Net Framework Class Library
- ✓ Common Language Specification
- ✓ Common Type System
- ✓ Metadata and Assemblies
- ✓ Windows Forms
- ✓ ASP.Net and ASP.Net AJAX
- ✓ ADO.Net
- ✓ Windows Workflow Foundation (WF)
- ✓ Windows Presentation Foundation
- ✓ Windows Communication Foundation (WCF)
- ✓ LINQ

For the jobs each of these components perform, please see ASP.Net

Integrated Development Environment (IDE) For VB.Net

- ✓Microsoft provides the following development tools for VB.Net programming:
  - ✓Visual Studio 2010 (VS)
  - ✓Visual Basic 2010 Express (VBE)
  - ✓Visual Web Developer
- ✓The last two are free. Using these tools, you can write all kinds of VB.Net programs from simple command-line applications to more complex applications.
- ✓Visual Basic Express and Visual Web Developer Express edition are trimmed down versions of Visual Studio and has the same look and feel. They retain most features of Visual Studio.
- ✓In this class, we will use Visual Basic 2019 Express and Visual Web Developer.

Writing VB.Net Programs on Linux or Mac OS

- Although the .NET Framework runs on the Windows operating system, there are some alternative versions that work on other operating systems. Mono is an open-source version of the .NET Framework which includes a Visual Basic compiler and runs on several operating systems, including various flavors of Linux and Mac OS.
- The most recent version is VB 2019.
- The stated purpose of Mono is not only to be able to run Microsoft .NET applications cross-platform, but also to bring better development tools to Linux developers.
- Mono can be run on many operating systems including Android, BSD, iOS, Linux, OS X, Windows, Solaris and UNIX.

- Microsoft has released Visual Studio 2019 preview recently. VS 2019 allows you to code in different programming languages and different platforms, Visual Basic 2019 is one of them.
- The other Programming languages are C# C++, F#, JavaScript, Java and Python.
- Visual Basic 2019 is the latest version VB.NET programming language released by Microsoft.
- Visual Studio Express can be downloaded from the link below.
- https://visualstudio.microsoft.com/vs/express/
- After downloading and installing VS Express, you are now ready to launch Visual Studio and start programming in Visual Basic 2019.

Visual Studio 2019 Start Page

- The VS 2019 start page is quite different from VS 2017.
- When you first launch Visual Studio 2019, the following start Page appears, as shown in Figure 1.1.
- You can quickly launch recently open recently opened projects, clone from GitHub, open a project or solution, open a local folder or create a new project.

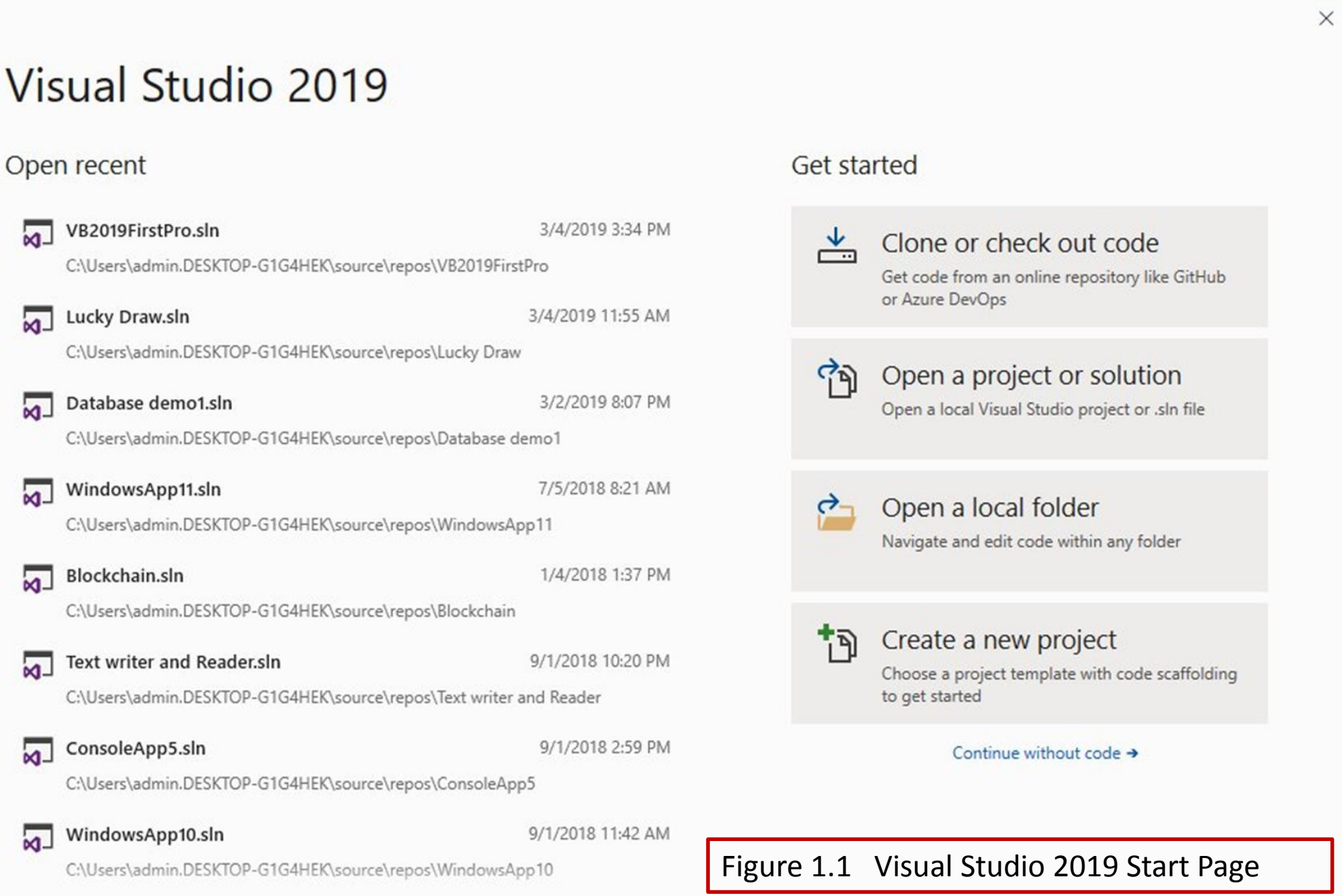


Figure 1.1 Visual Studio 2019 Start Page

Create a New Project

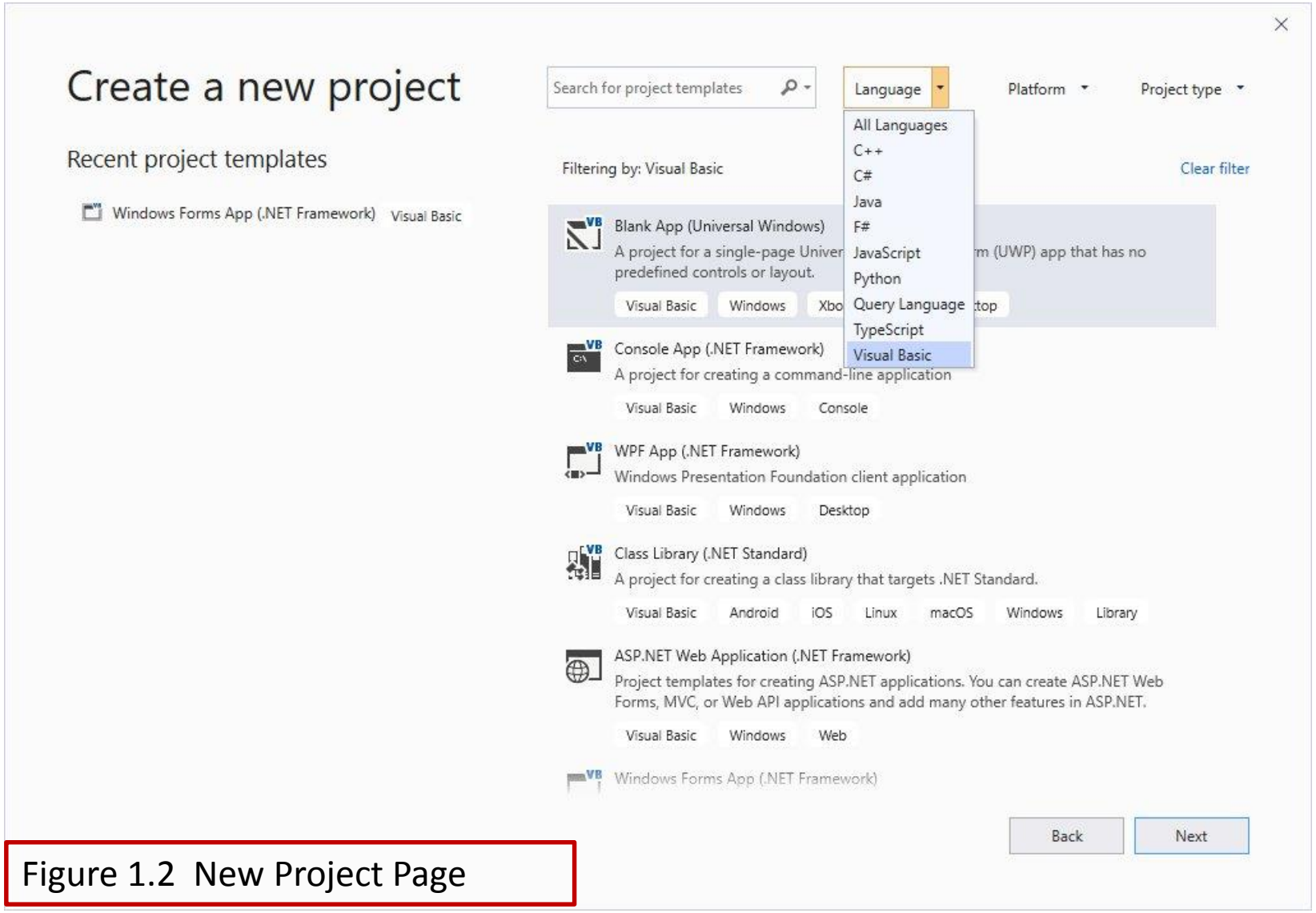


Figure 1.2 New Project Page

In the Create new project page, we select Windows Forms App

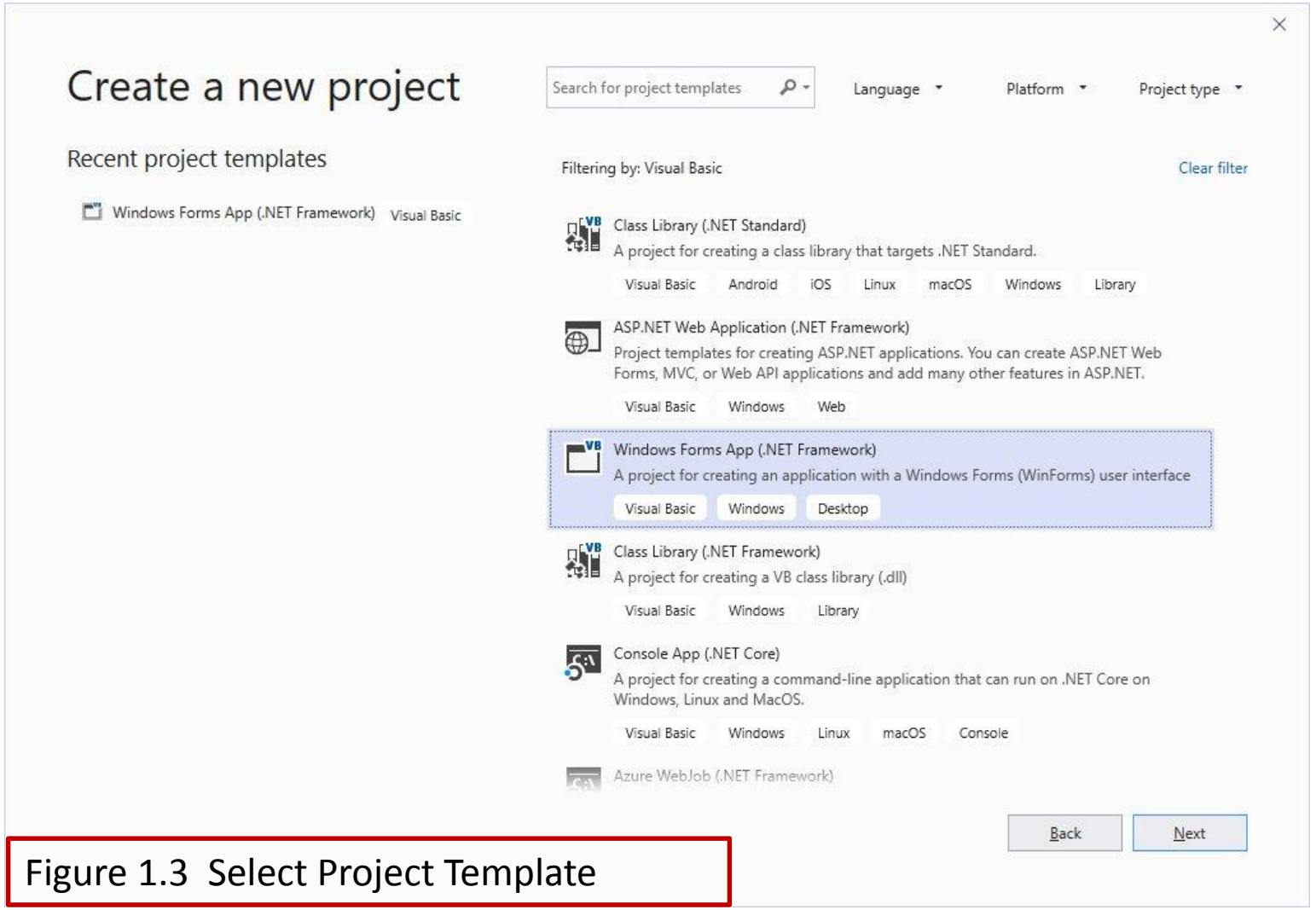
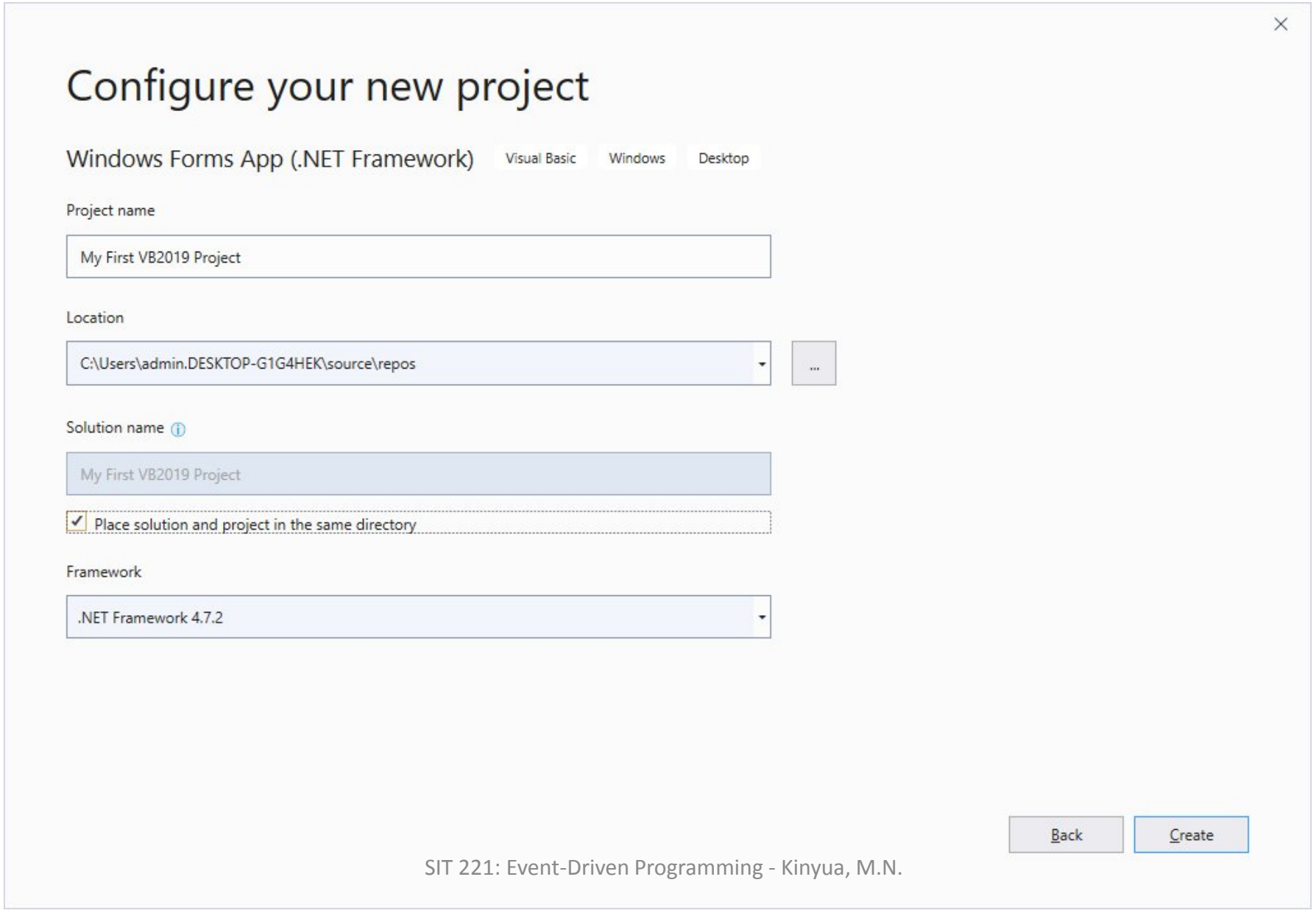
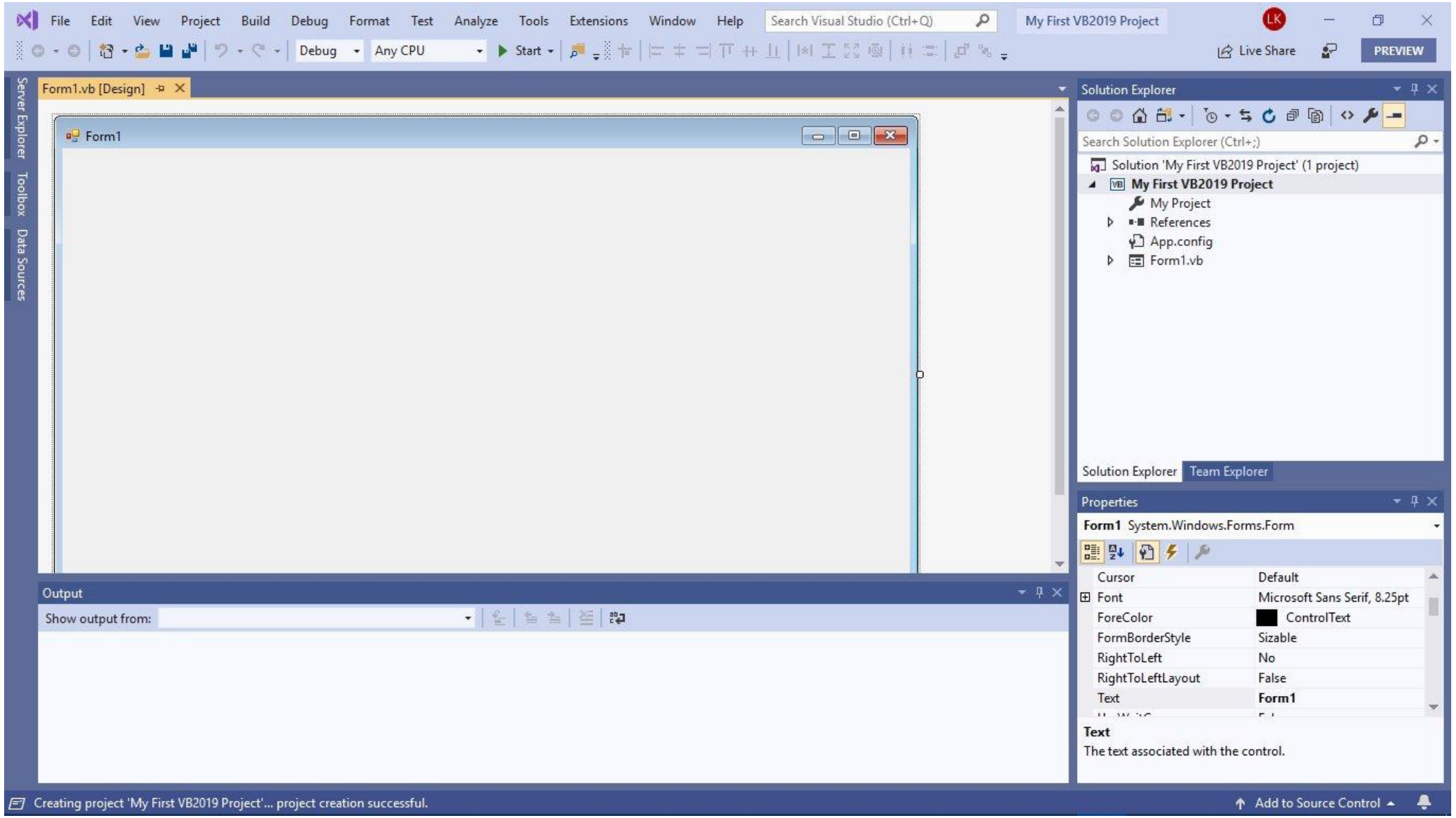


Figure 1.3 Select Project Template

Project Configuration Page



Visual Basic 2019 IDE



- VB2019 IDE comprises a few windows, the Form window, the Solution Explorer window and the Properties window. It also consists of a toolbox which contains many useful controls that allow a programmer to develop his or her Visual Basic 2019 program. The toolbox can be hidden or dragged to the bottom or side of the window.
- Now, we shall proceed to show you how to create your first program in Visual Basic 2019. First, change the text of the form to My First vb2019 Program in the properties window, it will appear as the title of the program.
- Next, insert a button and change its text to Display Hidden Message. The design interface is shown in Figure 1.6

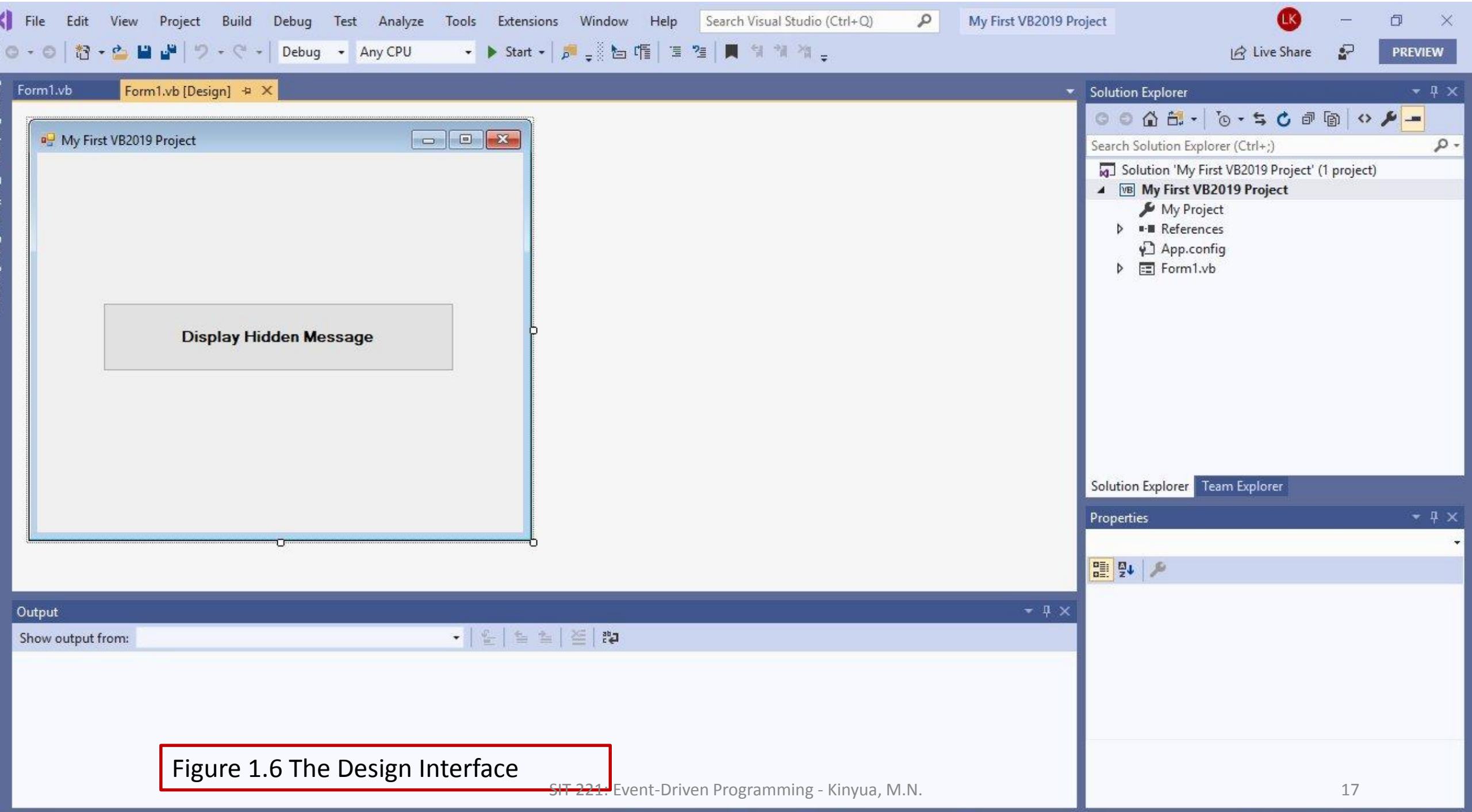


Figure 1.6 The Design Interface

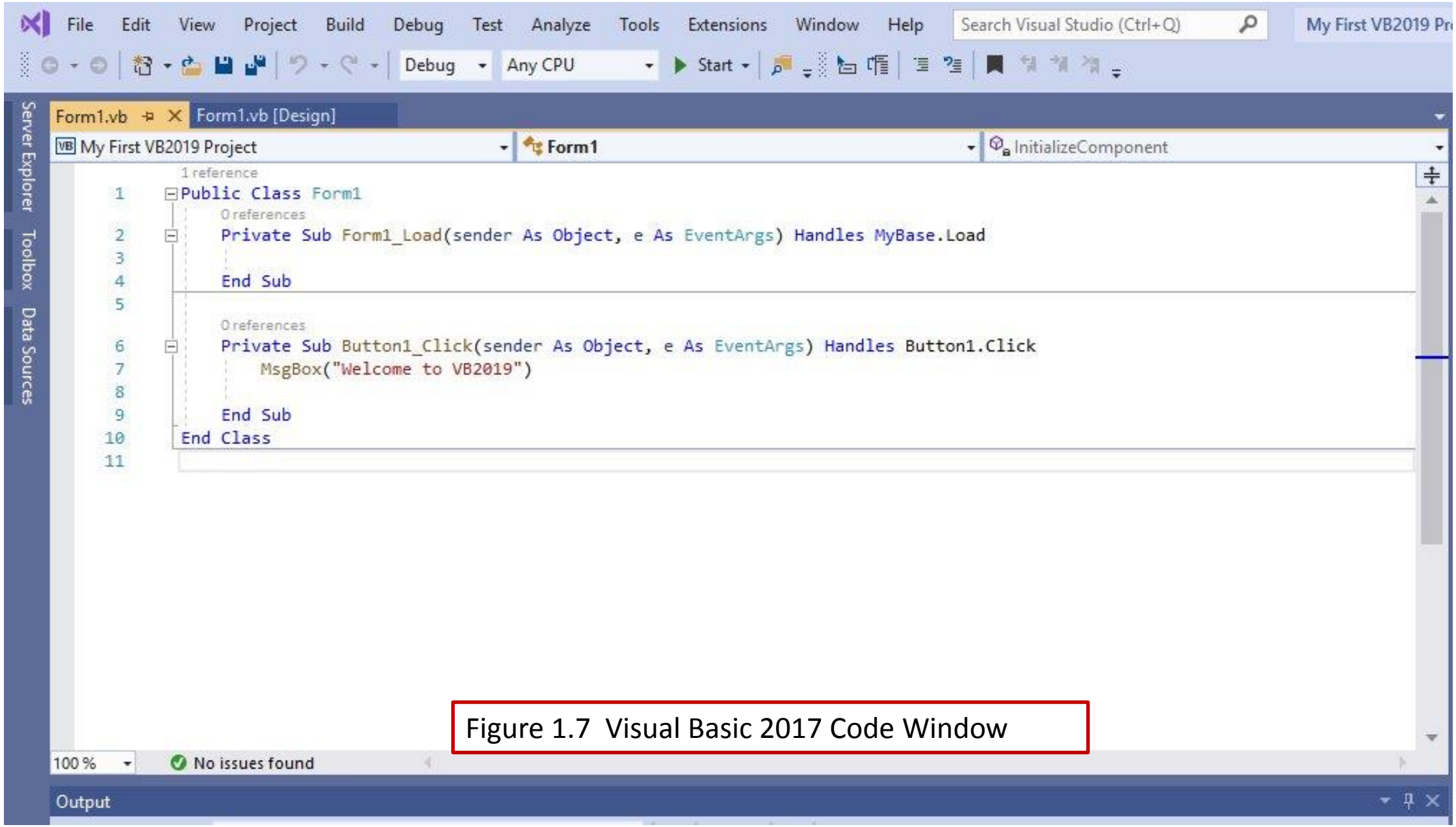


Figure 1.7 Visual Basic 2017 Code Window

- When you run this program and click on the Display Hidden Message button, you should get the following popup message box.

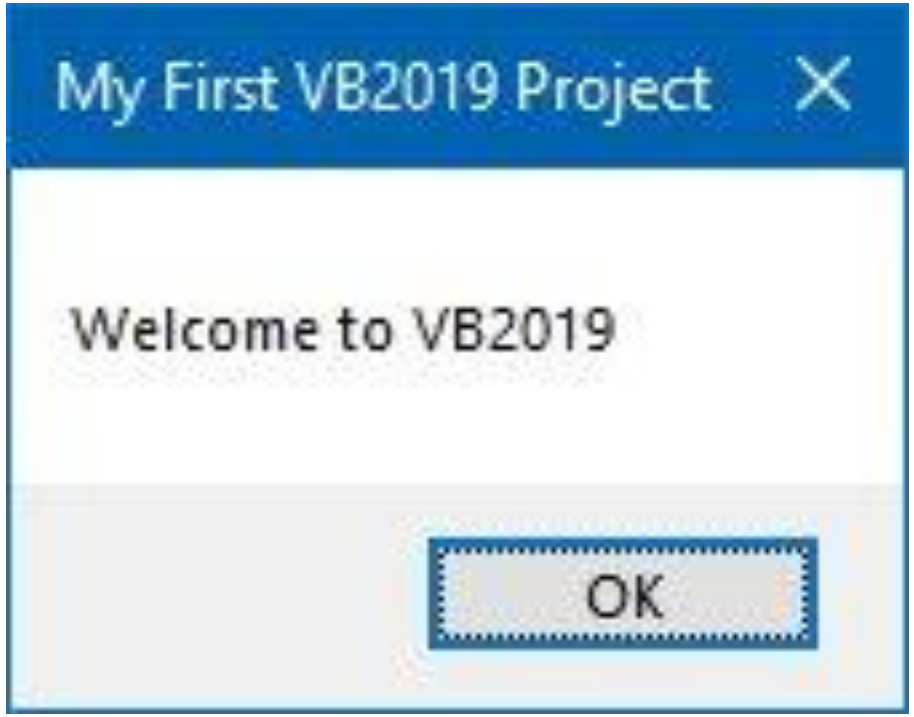


Figure 1.8 The Message Box

- The function MsgBox is a built-in function of Visual Basic 2019 and it will display the text enclosed within the brackets. Now you have created your first program in Visual Basic 2019, we shall learn more Visual Basic 2019 programming techniques in coming lessons.

Part II

Designing the User Interface(UI)

- Prior to creating a Visual Basic 2019 project, you need to conceive an idea of what kind of project you intend to develop.
- Maybe you want to develop a desktop game, a multimedia app, a financial app, a database management app and so forth.
- Once you have decided on the app you wish to develop, the first step is to design the User Interface(UI).
- To design the UI, we suggest you sketch it first on a piece of paper before working on it in the VB2019 IDE.
- After completed and refined your design on paper, then only you start designing the app on the VB2019 IDE.

- To start designing your VB2019 app, start VS 2019 and launch the VB2019 project. In the VB209 IDE, you should customize your default form first by using the properties windows.
- Properties that you can set for the default form are its size, background color, foreground color, font size, title and more.
- After customizing the default form, you can start adding various controls from the toolbox to the default form and then customize their properties.
- After designing the app UI, you can then write code for all the controls. We will learn more about coding in the coming lessons.

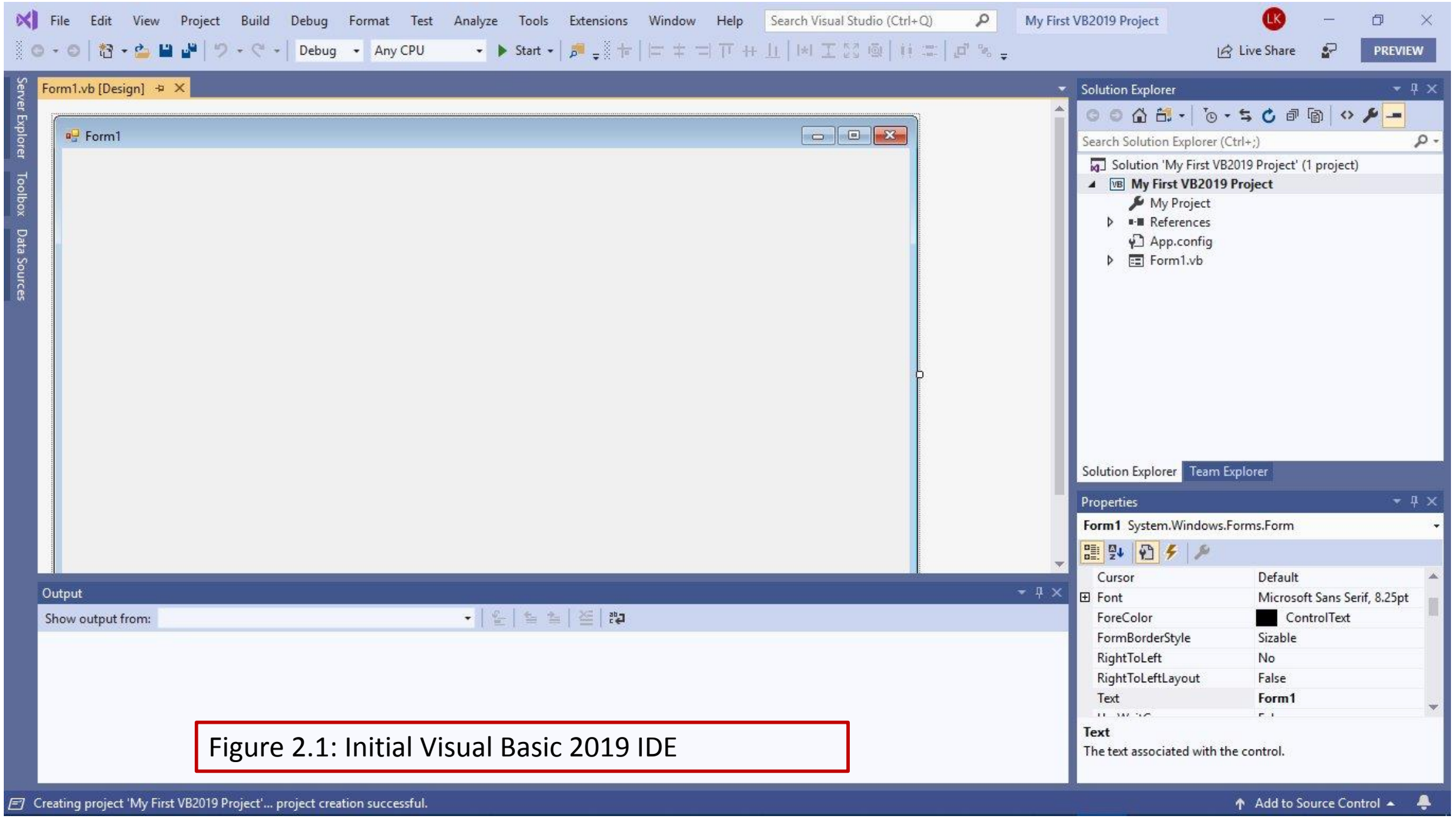


Figure 2.1: Initial Visual Basic 2019 IDE

- The properties window comprises an object drop-down list, a list of properties and the bottom section that shows a description of the selected property.
- As the only object on the IDE is the default form by the name of Form1, the properties window displays all properties related to Form1 and their corresponding attributes or values, as shown in Figure 2.2.
- You can change the name of the Form, the title of the Form, the background color, the foreground color, the size and more.
- Properties can be changed by typing a value or select a value from a drop-down list. For the color setting, you just need to select a color rectangle or from a color palette.

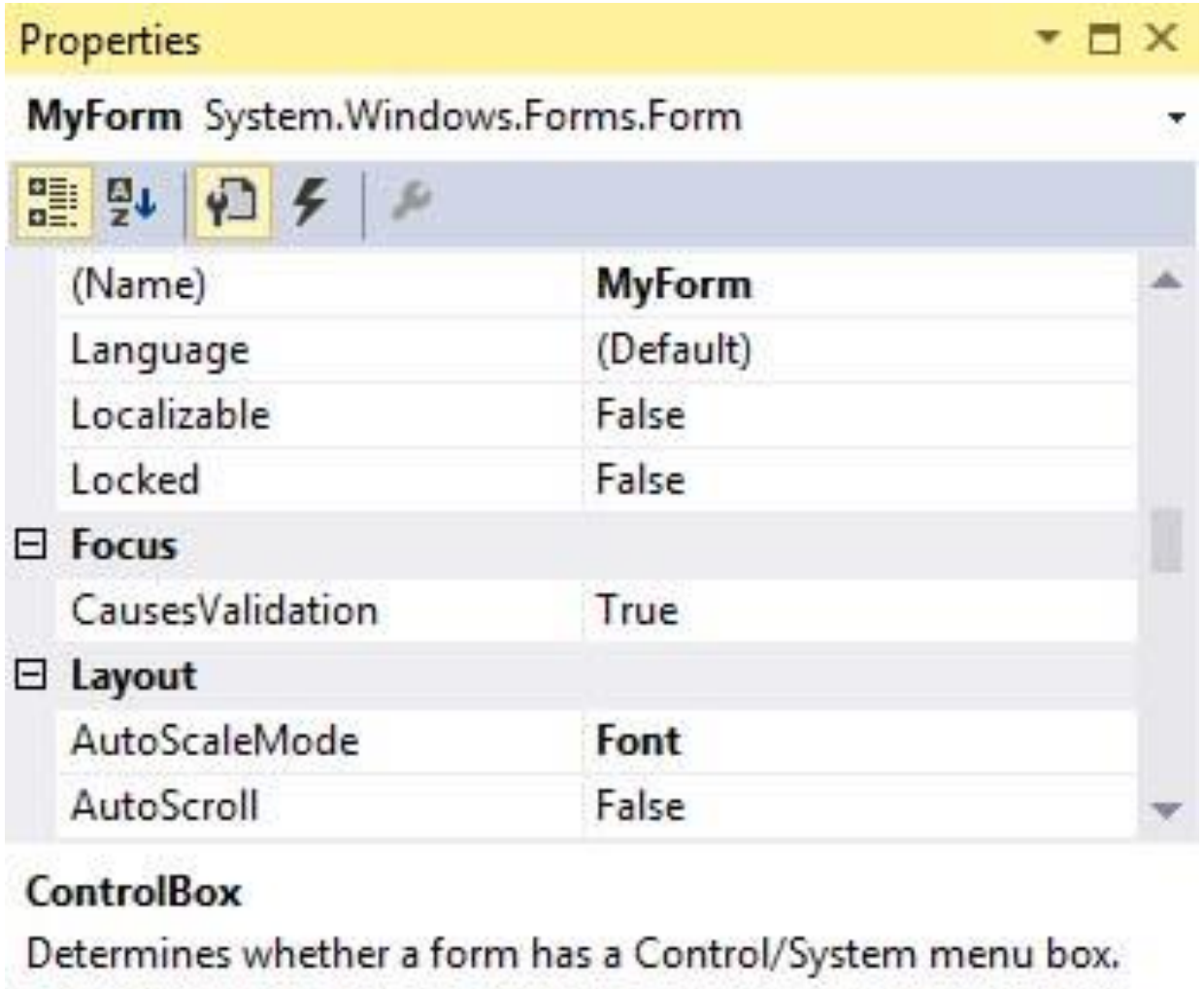


Figure 2.2: The Properties window

Now let us specify the following properties for Form1.

Property	Value
Name	MyForm
Text	My First vb2019 Program
BackColor	255, 51, 153
ForeColor	White
MaximizeBox	False
Font	Arial, 9.75pt

- The value for Backcolor (background color) 255, 51, 153 is the RGB color code for some kind of pink.
- The Foreground color will be the color of the text on a Label control places on the default Form.
- Instead of typing the RGB value, you can also select the color from the color drop-down list that comprises three tabs, Custom, Web, and System.
- Clicking on the drop-down arrow will bring out a color palette or a list of color rectangles where you can select a color, as shown in the figures below:

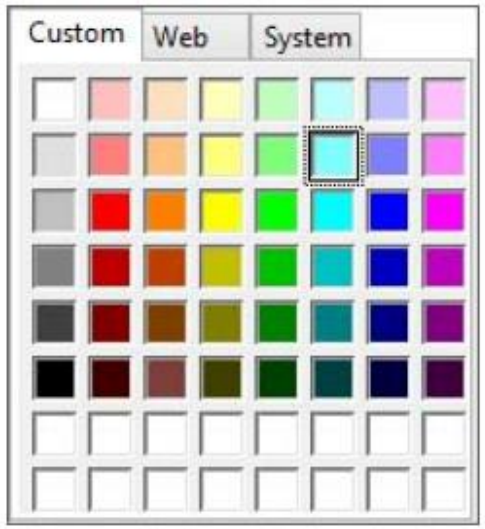


Figure 2.3: Custom Palette

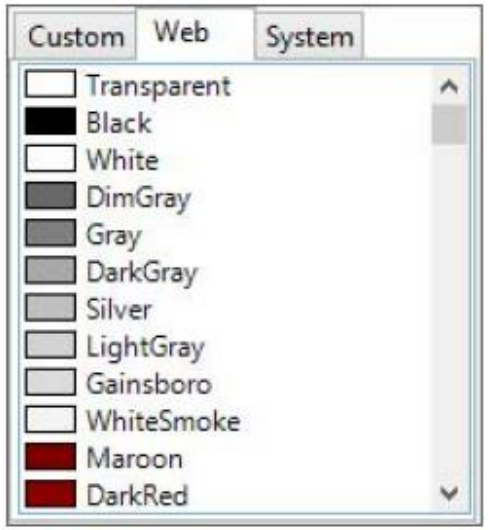


Figure 2.4: Web Colors

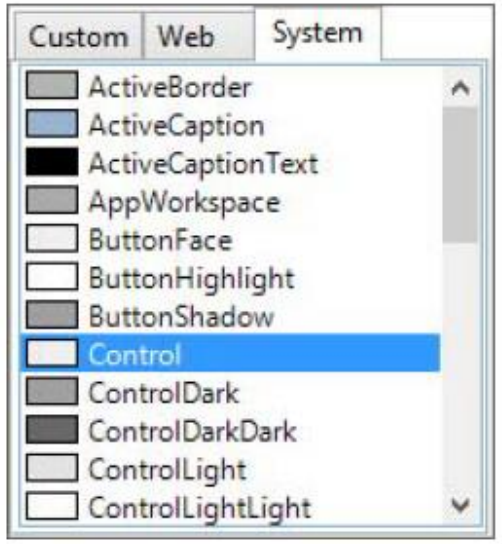


Figure 2.5: System Colors

- The runtime UI is shown in Figure 2.6. Notice that the title of the form has been changed from Form1 to My First VB2019 Project, the background color is pink, the Label is white and the window cannot be maximized.

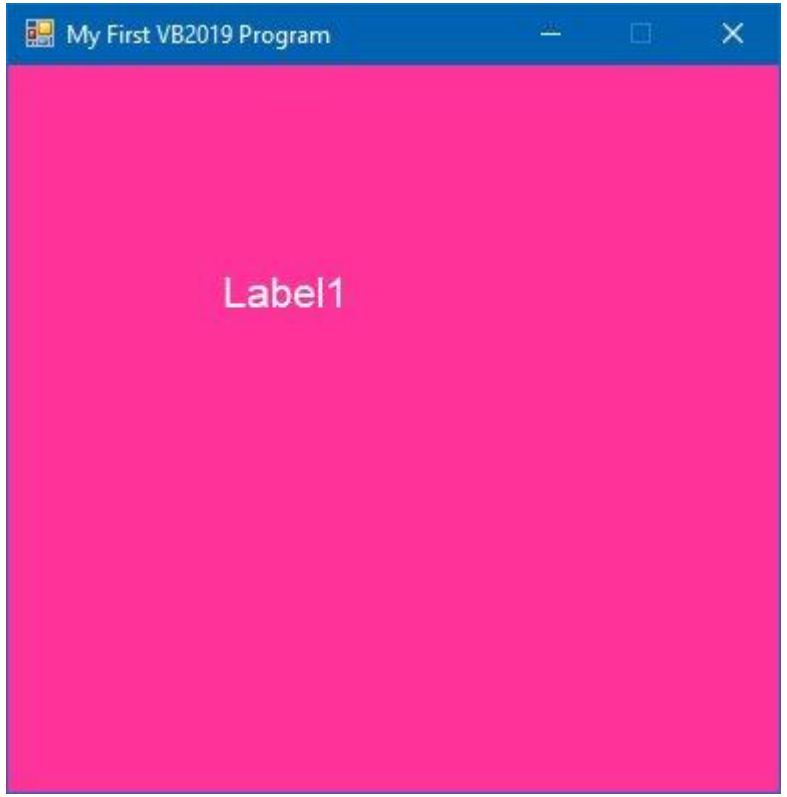


Figure 2.6: The Runtime UI

Changing the Properties of the Default-Form at Run-Time

- You can also change the properties of the form at run-time by writing the relevant codes. The default form is an object and an instant of the form can be denoted by the name **Me.** The property of the object can be defined by specifying the object's name follows by a dot or period:

`ObjectName.property`

For example, we can set the background color of the form to cyan using the following code

```
Me.BackColor=Color.Cyan
```

Example 2.1

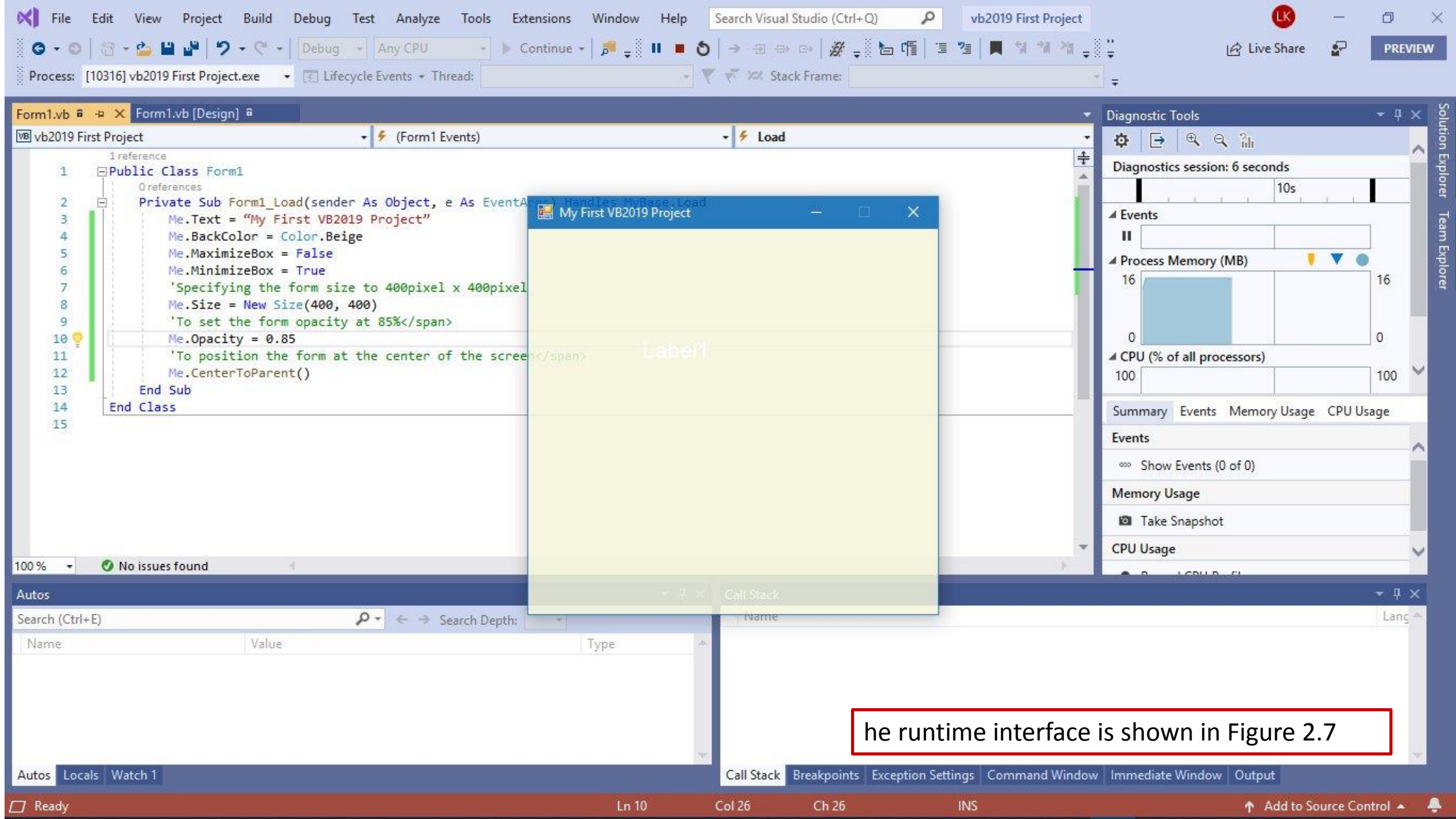
- To achieve the same interface as in Figure 2.6, type in the following code by clicking the form to enter the code window:

```
Public Class Form1
Private Sub Form1_Load(ByVal sender As Object, ByVal e As EventArgs)Handles
    MyBase.Load
    Me.Text = “My First vb2017 Program”
    Me.BackColor = Color.Pink
    Me.MaximizeBox=False
    Me.MinimizeBox = True
End Sub
End Class
```

Example 2.2

- You can also specify the size, the opacity and the position of the default form using the code, as follows:

```
Private Sub Form1_Load(sender As Object, e As EventArgs Handles MyBase.Load
        Me.Text = “My First VB2019 Project”
        Me.BackColor =Color.Beige
        Me.MaximizeBox = False
        Me.MinimizeBox = True
'Specifying the form size to 400pixel x 400pixel
        Me.Size = New Size(400, 400)
'To set the form opacity at 85%
        Me.Opacity = 0.85
'To position the form at the center of the screen
        Me.CenterToParent()
End Sub
```



he runtime interface is shown in Figure 2.7

Enhancing the UI

- In this lesson, we shall enhance the UI by adding controls to the default Form. Controls are objects that consist of three elements, namely properties, methods, and events.
- They can be added to the Form from the Toolbox. Among the controls, the most common ones are the button, label, text box, list box, combo box, PictureBox, checkbox, radio and more.
- We can make the controls visible or invisible at runtime. However, some controls will only run in the background and invisible at runtime, one such control is the timer.
- To add a control to the Form, just drag the control from the toolbox and drop it onto the Form. You can drag the control around the form and also resize it.

The Toolbox

- The Toolbox is usually is hidden when you start Visual Basic 2019. You can click View on the menu bar and then select Toolbox to reveal the toolbox. Besides that, you can also use shortcut keys Ctrl+Alt+x to bring out the toolbox. You can drag and dock the Toolbox around the IDE. It is docked at the left of the IDE window, as shown in Figure below.