Information Processing Techniques

Lab 2

Introduction to
Windows Form Application

4/16/2019

Introduction

In the last lab we have seen how to work with C# to create console based applications. But in a real-life scenario developer normally use Visual Studio and C# to create either Windows Forms or Web-based applications.

A windows form application is an application, which is designed to run on a computer, before jump into windows form app development let's have a brief overview of a framework which enable us to develop windows form application that is .Net framework.

.NET framework is designed and developed by Microsoft. The first version of .Net framework was released in the year 2002 named as **.Net 1.0**. It is used to develop Form-based application, web-based application, and Web services. There is a variety of programming languages available on the .Net platform, VB.Net and C# are the most commonly used. It is used to build applications for Windows, phone, web etc. It provides a lot of functionalities and also supports industry standards.

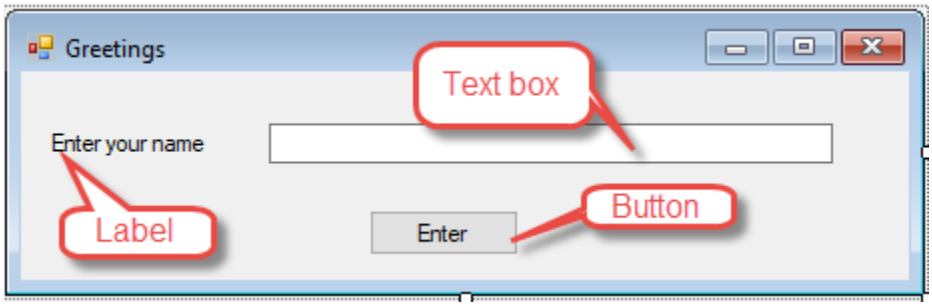
Release History of .NET Framework and its compatibility with the different Windows version

.NET VERSION	CLR VERSION	DEVELOPMENT TOOL	WINDOWS SUPPORT
1.0	1.0	Visual Studio .NET	XP SP1
1.1	1.1	Visual Studio .NET 2003	XP SP2, SP3
2.0	2.0	Visual Studio 2005	N/A
3.0	2.0	Expression Blend	Vista
3.5	2.0	Visual Studio 2008	7, 8, 8.1, 10
4.0	4	Visual Studio 2010	N/A
4.5	4	Visual Studio 2012	8
4.5.1	4	Visual Studio 2013	8.1
4.5.2	4	N/A	N/A
4.6	4	Visual Studio 2015	10 v1507
4.6.1	4	Visual Studio 2015 Update 1	10 v1511
4.6.2	4	N/A	10 v1607
4.7	4	Visual Studio 2017	10 v1703
4.7.1	4	Visual Studio 2017	10 v1709
4.7.2	4	Visual Studio 2017	10v 1803

Windows forms application

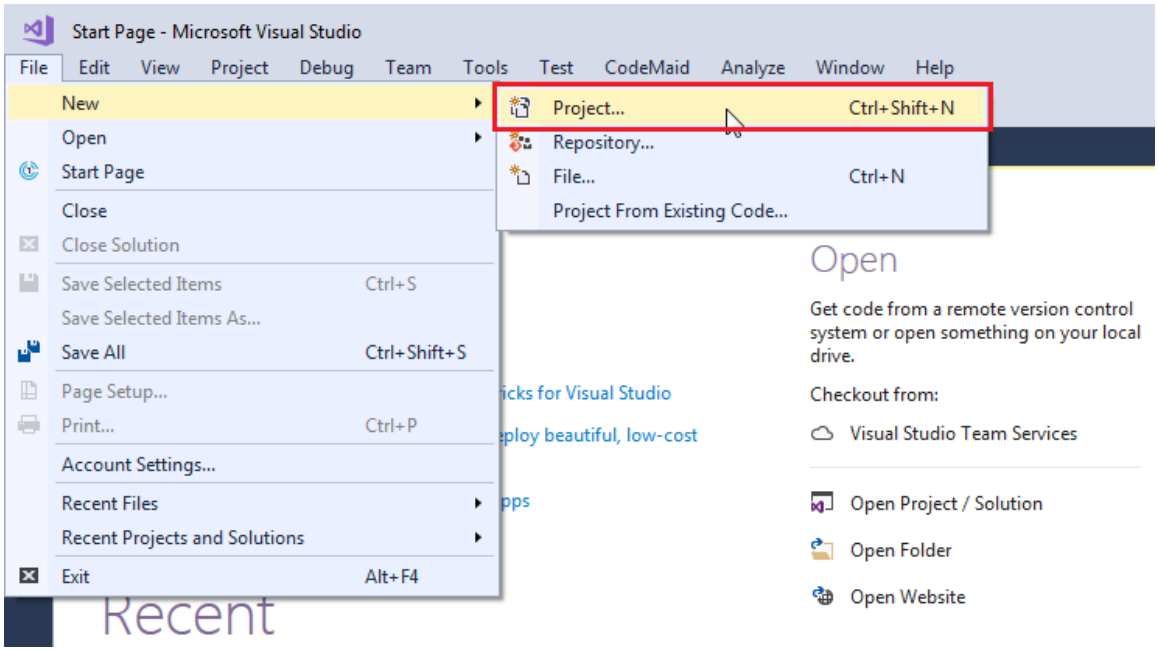
A Windows forms application is one that runs on the desktop or laptop computer. A Windows forms application will normally have a collection of controls such as labels, textboxes, buttons, menus, list boxes, etc.

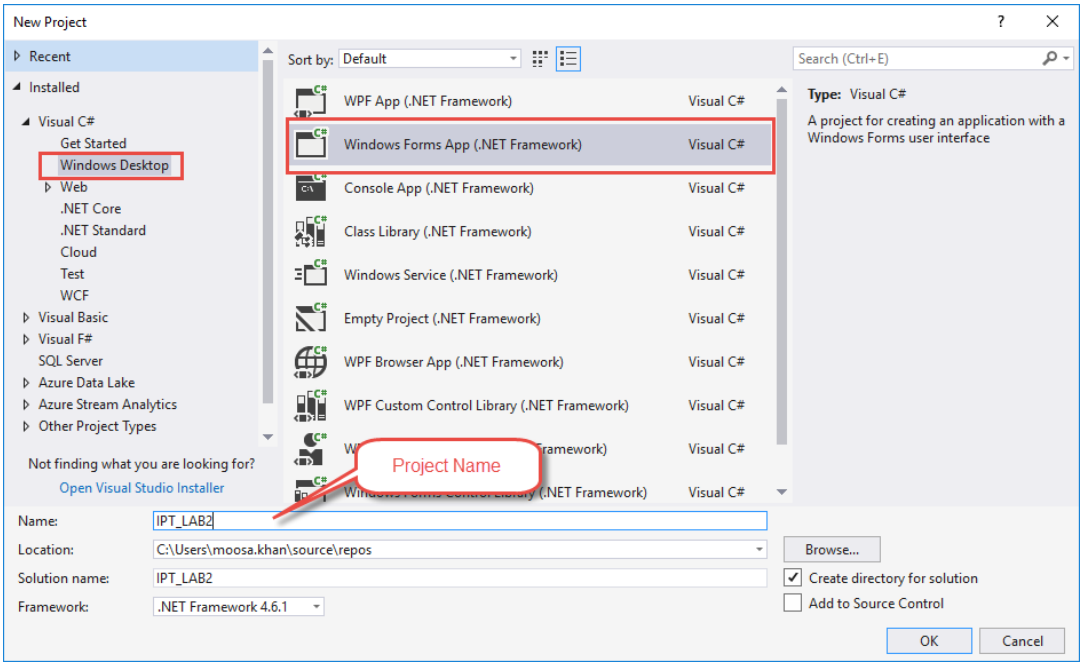
Below is an example of a simple Windows form application. It shows a simple screen, which is accessible by the user. The user will enter the name and get a welcome message.



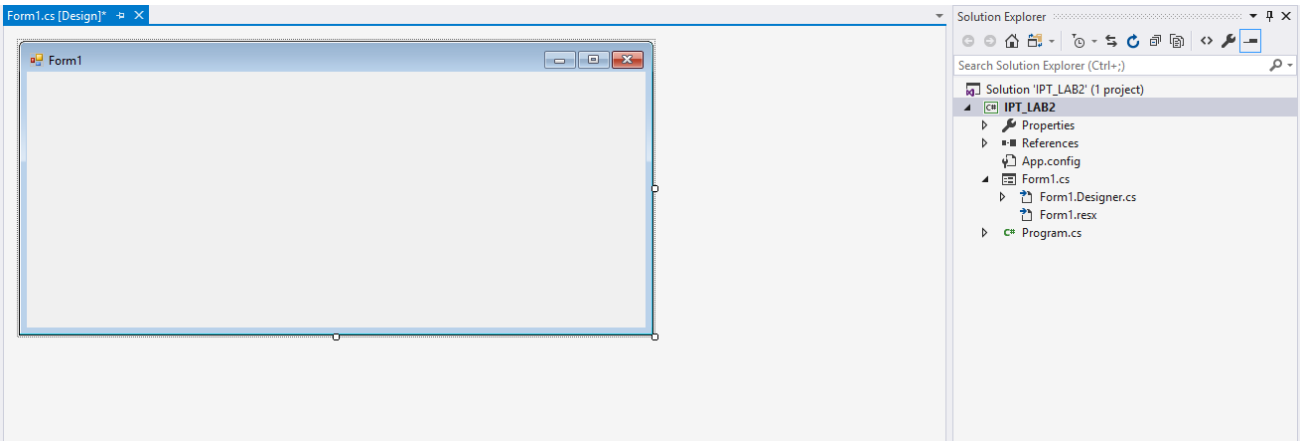
Creating windows application project on VS

Open visual studio and follow the steps to create new project.

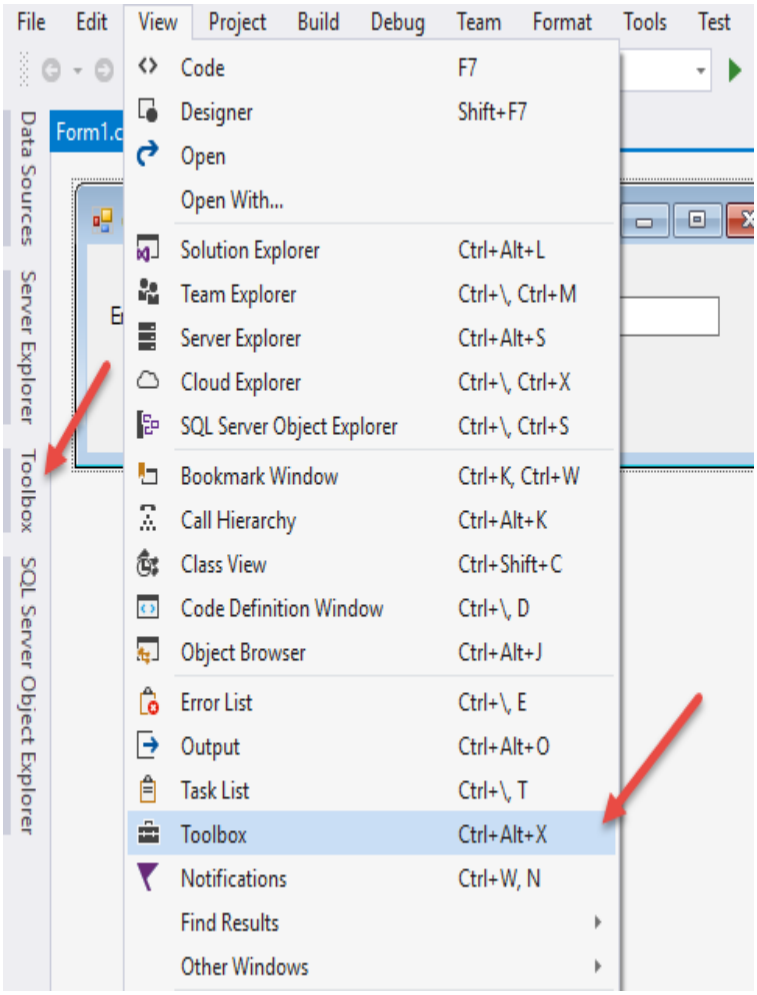


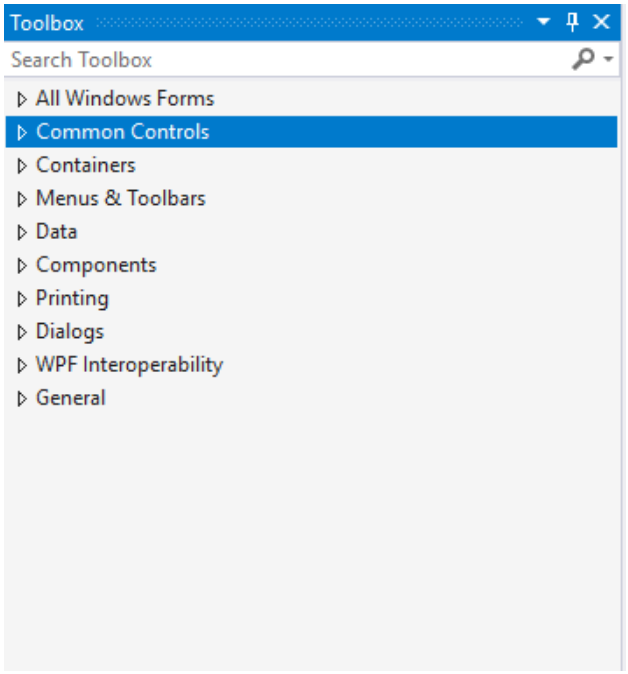


Once you create new project visual studio automatically created **program.cs** which will be the main for the project and **Form1.cs** which is a default form automatically created my project.

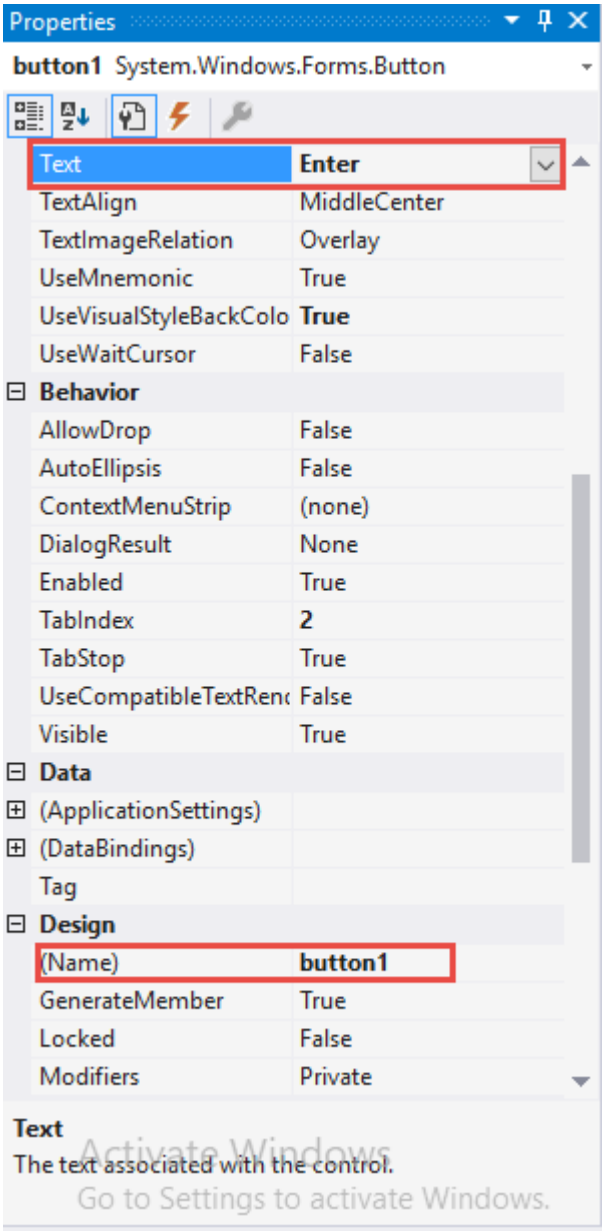


All the controls you need while working on windows application are available in toolbox , toolbox is usually available on left site of the screen.





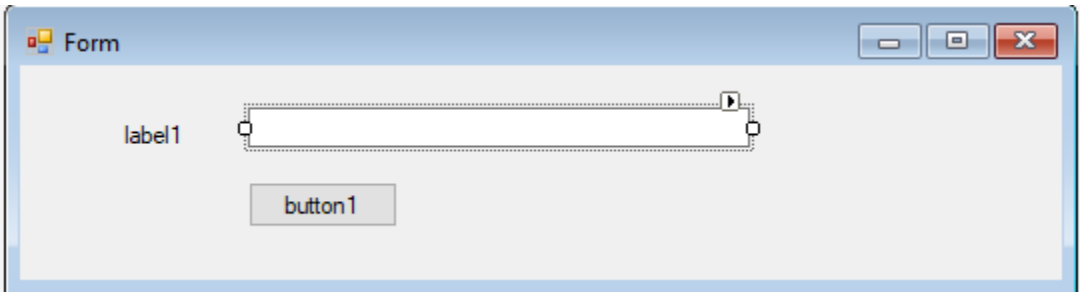
Each control has properties, property related to a control is listed on property pan available on the right site of the screen, and you can also find property by selecting a control and press **F4** button. There are much properties of a single control but the most useful are **Name** and **Text**.



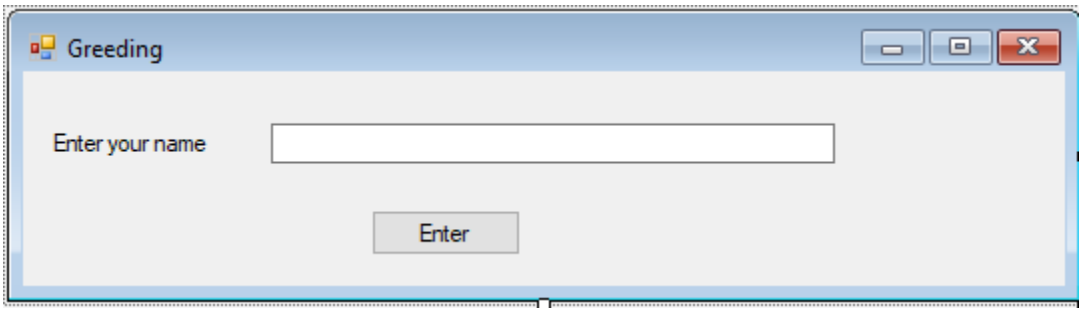
Name is used to call control from a code file while text is used to display text on UI screen.

Greeting Program

On an empty form drag controls from toolbox to create UI given below



Form title: Form title can be changed using text property of form.
Label text: Label text can be changed using text property of label.
Button Value: Button value can be changed using text property of button.



Double click on button to go to code file, double click on control automatically create click event of the button.

```
namespace IPT_LAB2
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }

        private void button1_Click(object sender, EventArgs e)
        {

        }
    }
}
```

Button click event

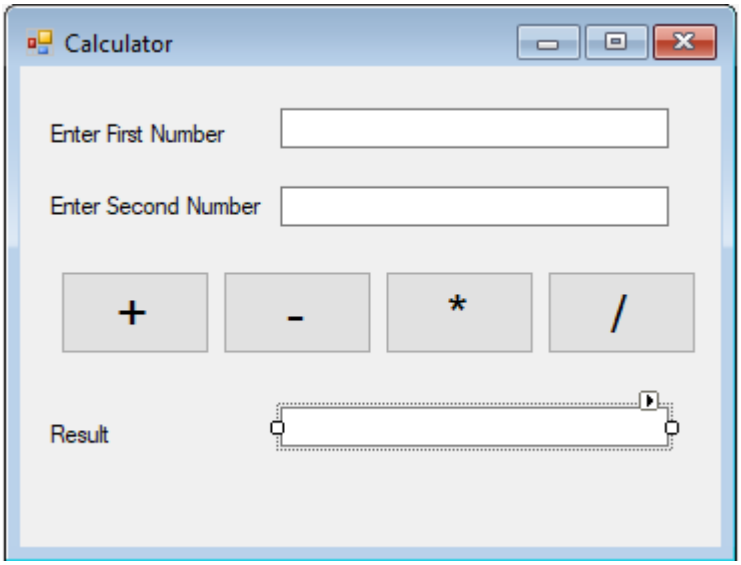
Now write a code in click event to show welcome message on same text box and a message box.

```
private void button1_Click(object sender, EventArgs e)
{
    String welcomeMessage = "Welcome ";
    welcomeMessage = welcomeMessage + textBox1.Text;

    //To show welcome message on the same text box
    textBox1.Text = welcomeMessage;

    //To show welcome message on saperate message box
    MessageBox.Show(welcomeMessage, "Message", MessageBoxButtons.OK);
}
```

Practice Questions

- **All questions should be Windows form application using C# (on Visual Studio)**
- **Solutions of each questions would be uploaded on google classroom by 11:59 PM**
- **Submitted code should have all of the files and can be compiled.**

1- Create a simple Calculator that takes numeric values as input and perform addition, subtraction, multiplication and division. UI design can be changed, you can create UI as good as you want. Simplest UI can be



Hint:

a) Use this to check if value is numeric

```
System.Text.RegularExpressions.Regex.IsMatch(textBox1.Text, "[^0-9]")
```

b) Number divided by zero is infinity.

2- Console App: Generate an array of 1 million random numbers and perform 'searching' on that array. You should list all occurrence of that number. Measure time difference on the following techniques:

- Search the Array on one thread (no threading code required)
- Search Array using 5 different threads

You should print the time taken when no thread was used and when 5 different threads are used. Display the indices on which the data was found.

Note: You can use the following code to start a parameterized thread.

```
ParameterizedThreadStart param1 = new ParameterizedThreadStart(MethodToCall);
Thread th1 = new Thread(param1);
th1.Start(new ClassObject(StartingIndex, EndingIndex));
```

3- Using the multi-threaded code of Question 2, modify the code such that the Search function is accessed by one thread at a time and compare timing with results of Question 2. Hint: MethodImpl

4- Console App: Using HttpClient (System.Net.Http), download the contents of "http://www.bing.com" and display on the screen. While the page is downloading data, you should display "Downloading…". To complete this task, you can use async/await keywords.