Writing a simple Calculator using C#

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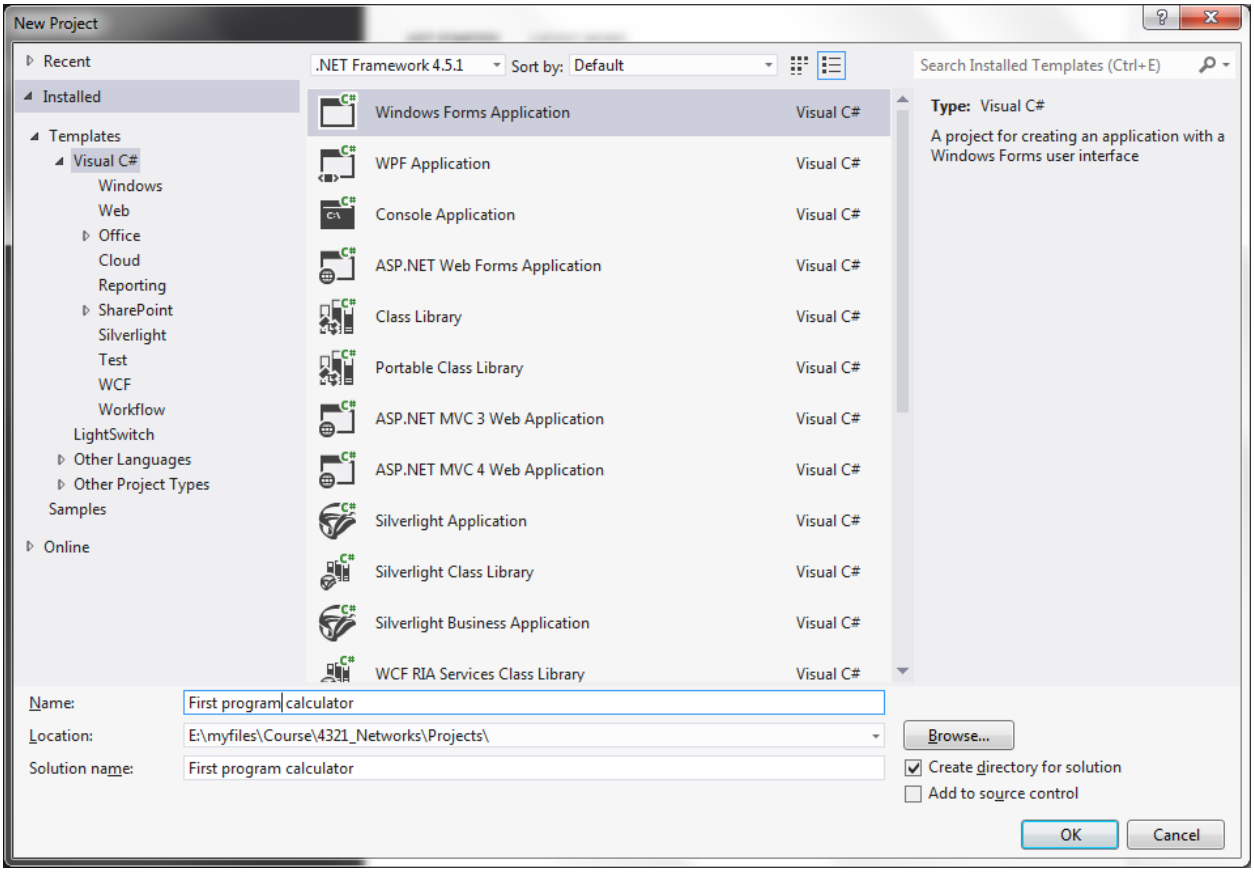
This tutorial is made for beginners for learning Windows Application programming using VS C#.
It is designed for you to learn by following step-by-step as provided. Please don't skip the steps and follow the steps given below.

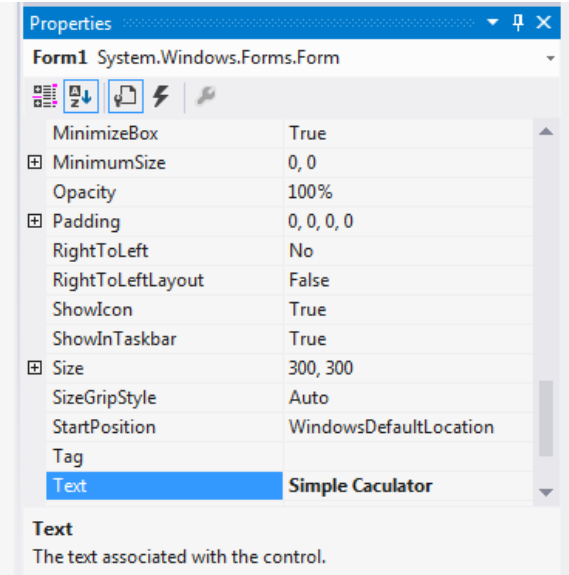
Run VS 2012. From the Start page, press **New Project …**
Select **Visual C#** and **Windows Forms Application**.
Enter the project name, "**First program calculator**". You cannot use symbols such as # in the project folder name but can use spaces and numeric numbers.
Select your project location using the **Browse ...** button.

An example screen capture of this step is shown below. If you followed all the steps, you may now press the **OK** button to create a new project.



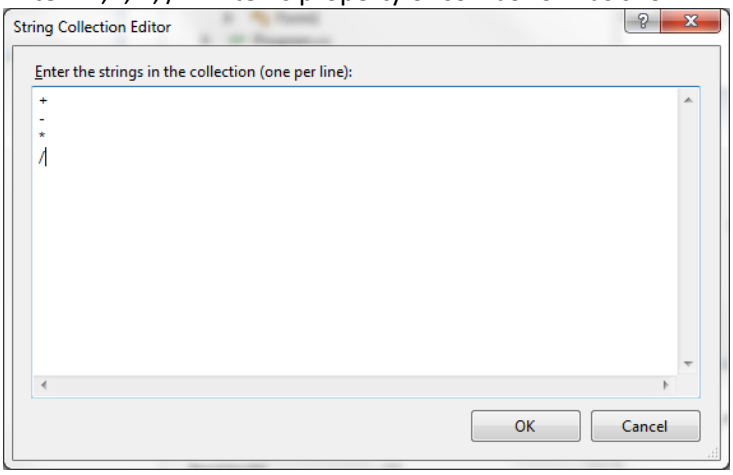
It then creates a blank form and will bring out the VS programming environment.

Let's first change the title of the form from "**Form1**" to "**Simple Calculator**".
This is simply done by changing the **Text** property of Form1, as shown in the next screen.

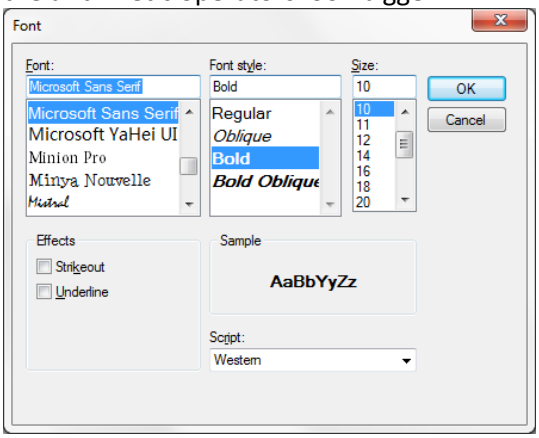


Next, drag and drop three **textboxes**, one **combobox,** and one **Label** from **Toolbox,** as shown in the next screen.

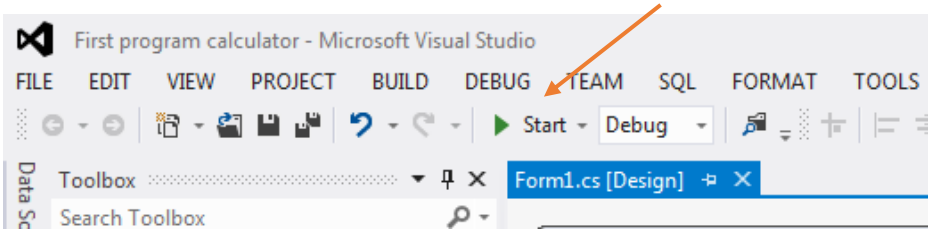
Change the Text property of Label to "=".
Enter "+, -, *, /" in Items property of comboBox1 as shown in the next screen.



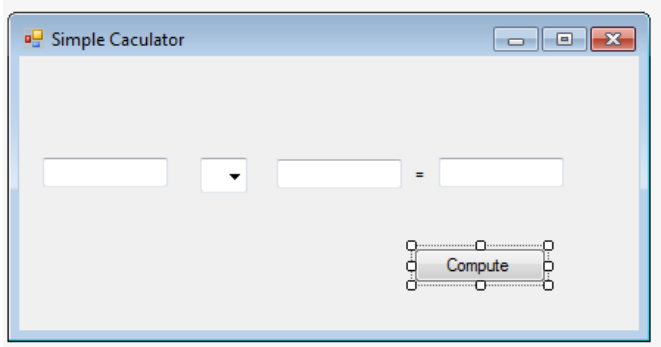
Click the **Font** property of comboBox1 and change the Size to **10** and to **Bold** as shown below to make the arithmetic operators look bigger.



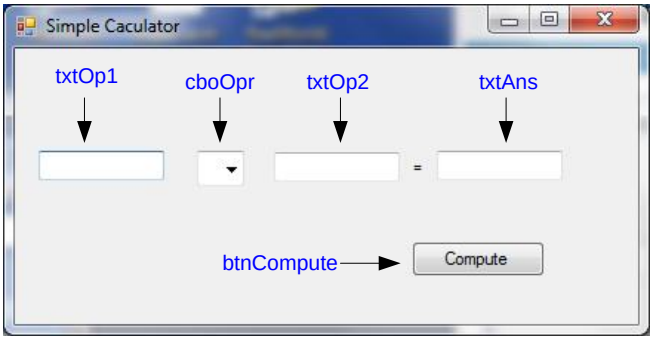
Although you have not written the code yet, but you can still test GUI by running the program. Please press the green **Start** button and test the combobox.



Next drag and drop a **Button** from Toolbox and change its text property to "**Compute**" so the final screen looks like the following.



If you look at the properties for each of these Windows components, you will find the **(Name)** property. Please change the name properties as shown below. This naming is critically important for later programming.



Notice that I am using prefix **txt** for Textbox, **cbo** for Combobox, and **btn** for Button. There is a convention of using prefix for naming Windows components, and most commonly used are shown in below table.

Windows Name	Prefix
Form	frm
Button	btn
CheckBox	chk
CheckedListBox	clst
ComboBox	cbo
Label	lbl
ListBox	lst
ListView	lvw
PictureBox	pic
Textbox	txt
TreeView	trv
Menu	mnu
Timer	tmr
OpenFileDialog	opf
SaveFileDialog	svf
FolderBrowserDialog	fbr
ColorDialog	cld
FontDialog	fnd
RadioButton	rdo

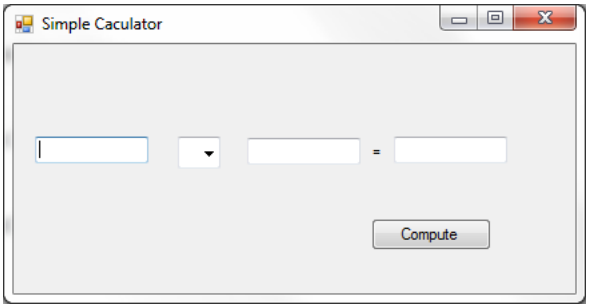
Next, double click the **Compute** button to create the button click event and its coding area, i.e., the code should be executed when the **Compute** button is pressed. Your cursor should be at the btn_Compute_Click() routine as shown in the next screen.

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

        private void btnCompute_Click(object sender, EventArgs e)
        {


        }
    }
}
```

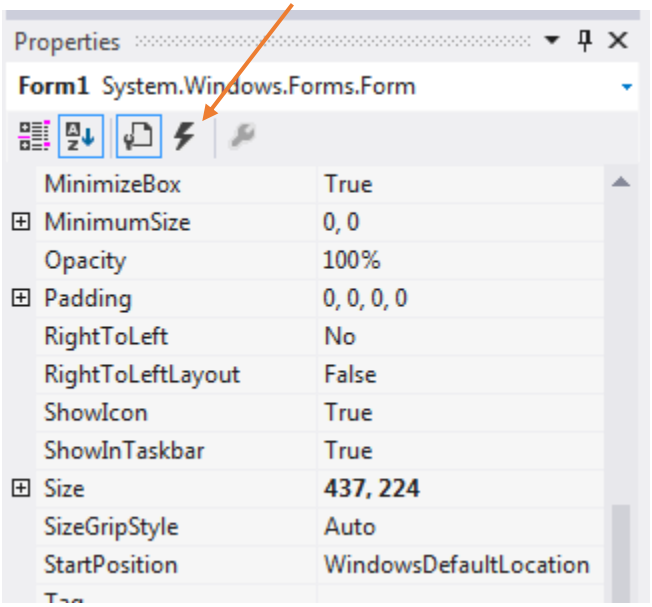
Now, add the code to the click event routine as follows.

```
private void btnCompute_Click(object sender, EventArgs e)
{
    double op1, op2, ans;

    op1 = Convert.ToDouble(txtOp1.Text);
    op2 = Convert.ToDouble(txtOp2.Text);

    switch (cboOpr.SelectedItem.ToString())
    {
        case "+":
            ans = op1 + op2;
            txtAns.Text = ans.ToString();
            break;
        case "-":
            ans = op1 - op2;
             txtAns.Text = ans.ToString();
            break;
        case "*":
            ans = op1 * op2;
            txtAns.Text = ans.ToString();
            break;
        case "/":
            ans = op1 / op2;
            txtAns.Text = ans.ToString();
            break;
        default:
            //do nothing
            break;
    }

}
```

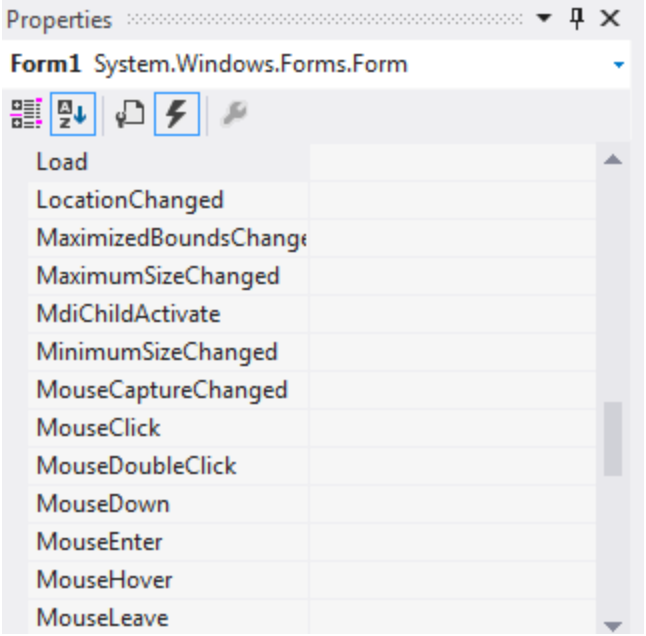
Run the program by pressing the green start button. You will see the following screen. Enter numeric number in Op1 and Op2, and selector an operator, then press the Compute button to see how it works.



Next, we want to display a default operator such as + when the form is loaded. This can be done through a form load event. To do this, select the Form and press the event icon which is a lightening symbol in the property.



You will now see the item **Load** at top as shown in the next screen.



Double click on the **Load** item which should bring you to the form Load event programming area. Please type in a single line of code as given.

```
    private void Form1_Load(object sender, EventArgs e)
    {
        cboOpr.SelectedIndex = 0;
    }
}
```

It will then select the first item in the comboBox when the form is loaded.

As a final step, we need to prevent potential divided zero error. If a user select 0 for op2 and "/" operation is selected, it causes a divided-by-zero error. Therefore, we need to modify the case for the "/" code. This code segment is given below and type in the same way into your code. Notice a format string "F4" in string conversion. This limits the numbers to display after decimal point up to four digits when floating point numbers are converted to string.

```
case "/":
    if (op2 == 0)
    {
        MessageBox.Show("Divided by zero error!!!", "User error", MessageBoxButtons.OK, MessageBoxIcon.Warning);
    }
    else
    {
        ans = op1 / op2;
        txtAns.Text = ans.ToString("F4");
    }
        break;
default:
```

You have successfully completed this tutorial. It is rudimentary, but you have successfully learned the basics of event programming and created a working calculator using C#.