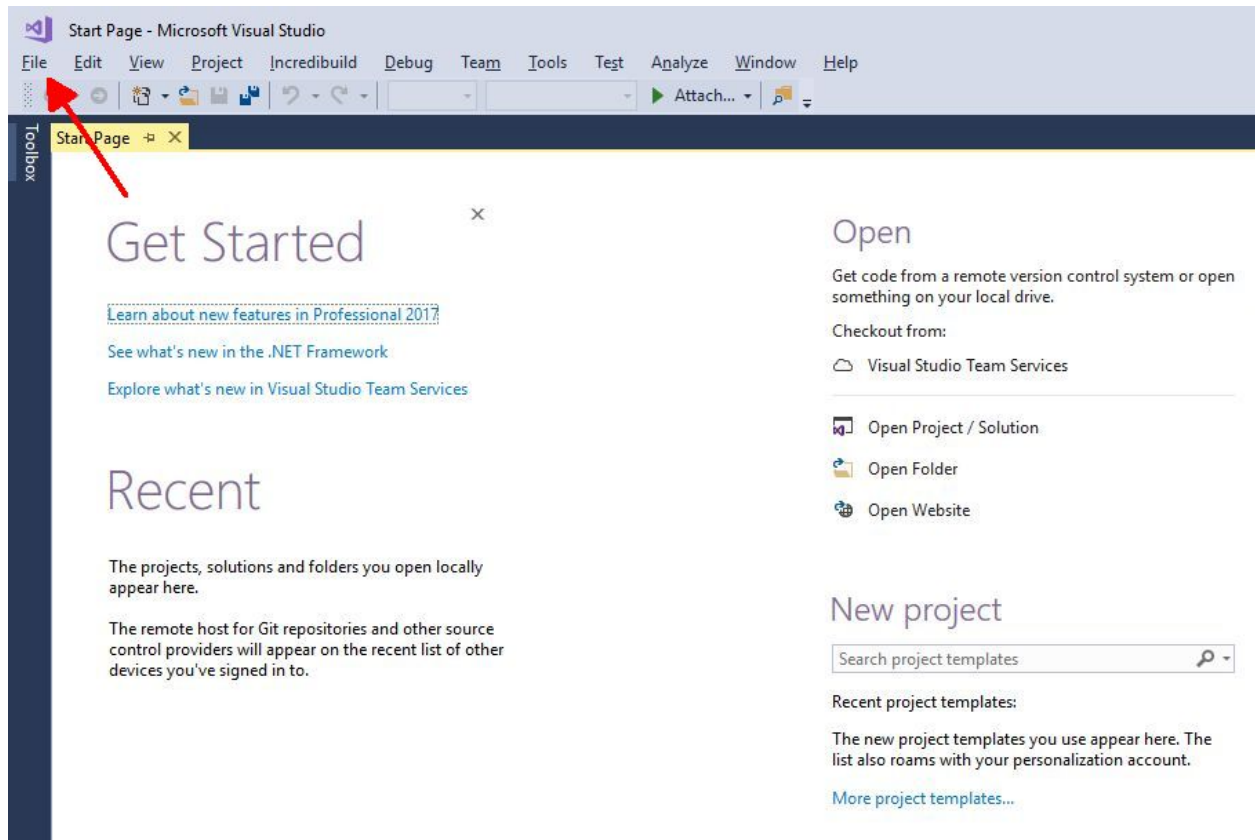# Your First C# Program

Drawing a House on the Computer

It's time to use Visual Studio to write a computer program. We'll write a program that draws a picture of a house in a window. If Visual Studio isn't running, start it now. When Visual Studio starts up, it will look something like this:

Create a New Project

Click the "File" > "New" > "Project…" in the menu (see arrow above) to start the process of creating a new project. (You can also use the New Project button 🗔 in the toolbar.) You'll see a window like this (the list of project types in the middle might have additional items depending on your computer):
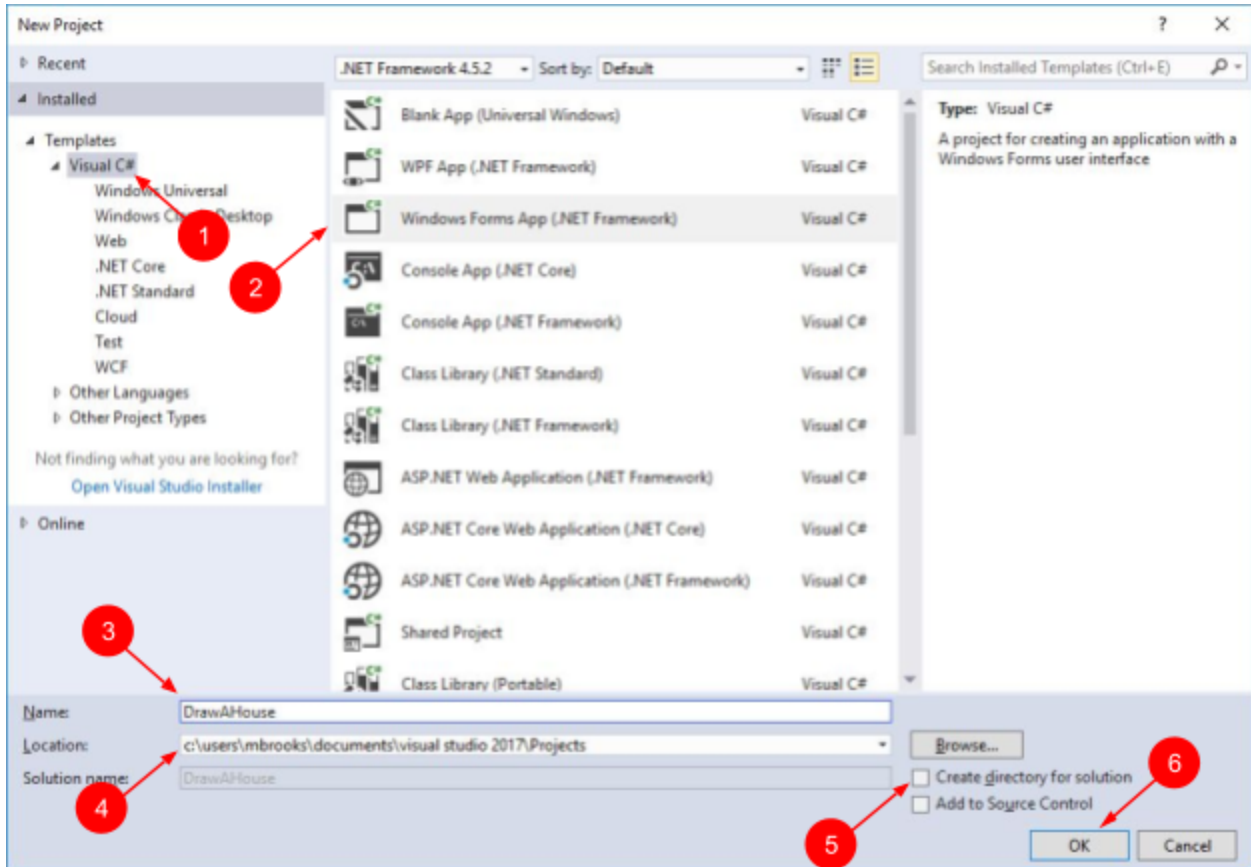
First, make sure "Visual C#" is selected in the left pane (1). Then select "Windows Forms App" in the middle pane (2), then change the name to "DrawAHouse" (3).

Pay close attention to the location (4). Visual Studio will create a new folder under this location for your project and put all the files there. Make sure it's a location you'll be able to find again later. It's also a good idea to uncheck the "Create directory for solution" box (5) so you don't have unnecessary extra folders.

Once you've made the necessary choices in the New Project dialog, click OK (6). This will create the new project and the Visual Studio window will look like this:

Now you will write the program to draw a house.

Write the Program

Now that you've created a new project in Visual Studio, you're ready to add C# code to the program to draw a house.
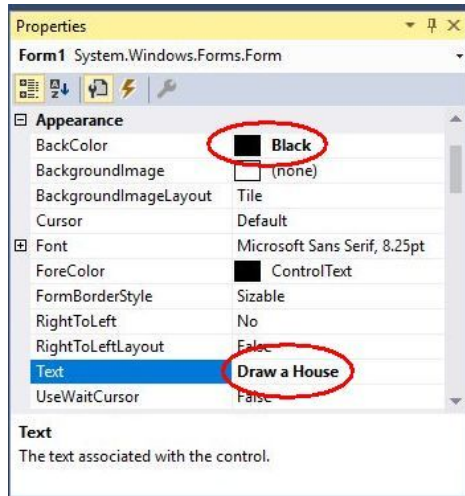

First, we'll change the background of the window to black and the caption of the window to say "Draw a House". We'll use the properties window to do this. You should see it in the lower right corner of the Visual Studio window. (If you don't see it, you can make it appear by choosing "Properties Window" from the View menu.)

The properties window will initially have the Text property selected. This is the text that is displayed in the caption of the window form. The value of this property right now is "Form1". (If this isn't the case, make sure that the Form1 window is selected in the designer (note the dashed lines around the Form1 window which looks like a regular Windows application window).) Change the value of the Text property to "Draw a House". (Do this by double-clicking on the "Form1" text, so it's selected, then typing "Draw a House".) (See figure at left.) Press enter to accept the value, then notice that the caption in the window form changes to "Draw a House".

Next, find the BackColor property, which should be a few properties up from Text (when the properties are sorted by category). Click on the property name ("BackColor") then press the Tab key to select the value of this property. Type Black and press enter. This will change the background color of the window form to black.

Now, scroll down to find the Size property, which will be in the Layout section. Change its value to "800, 800". (See figure at right.)


3
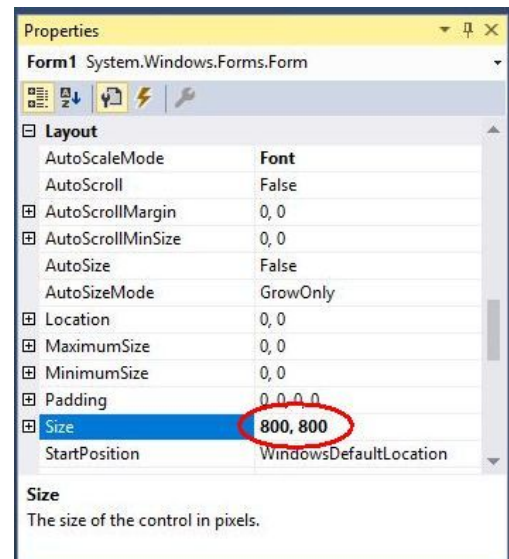
Now the Visual Studio window should look something like this:
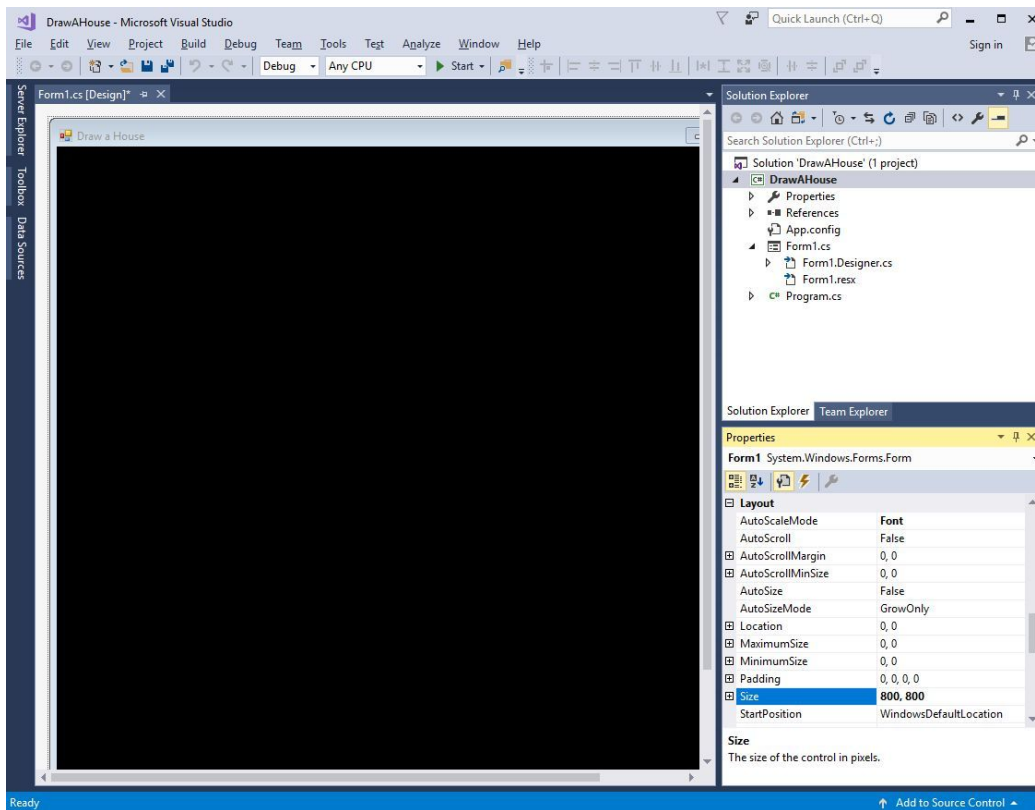
Now that the window form looks right, it's time to write the C# program code to draw the house in the window form.

First, we'll create an event handler for the paint event. This will allow us to write code that's executed whenever the window needs to be redrawn on the screen. To create the event handler, first click on the events button (⚡) at the top of the properties window, then scroll up to find the Paint event in the list (it is the only event in the Appearance category). (See figure at right.) Once you've found the Paint event, double-click on it. That will create an event handler function for the Paint event and switch to the code view so you can add code to the new function.
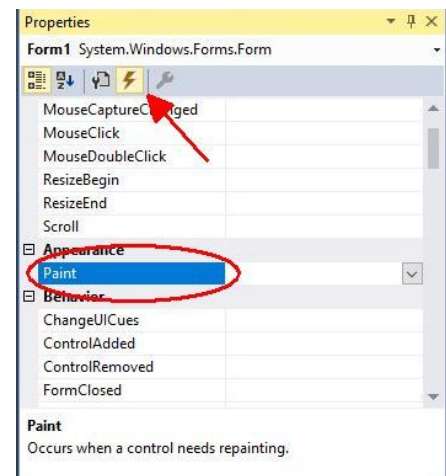
Now the Visual Studio window will look like the picture below:
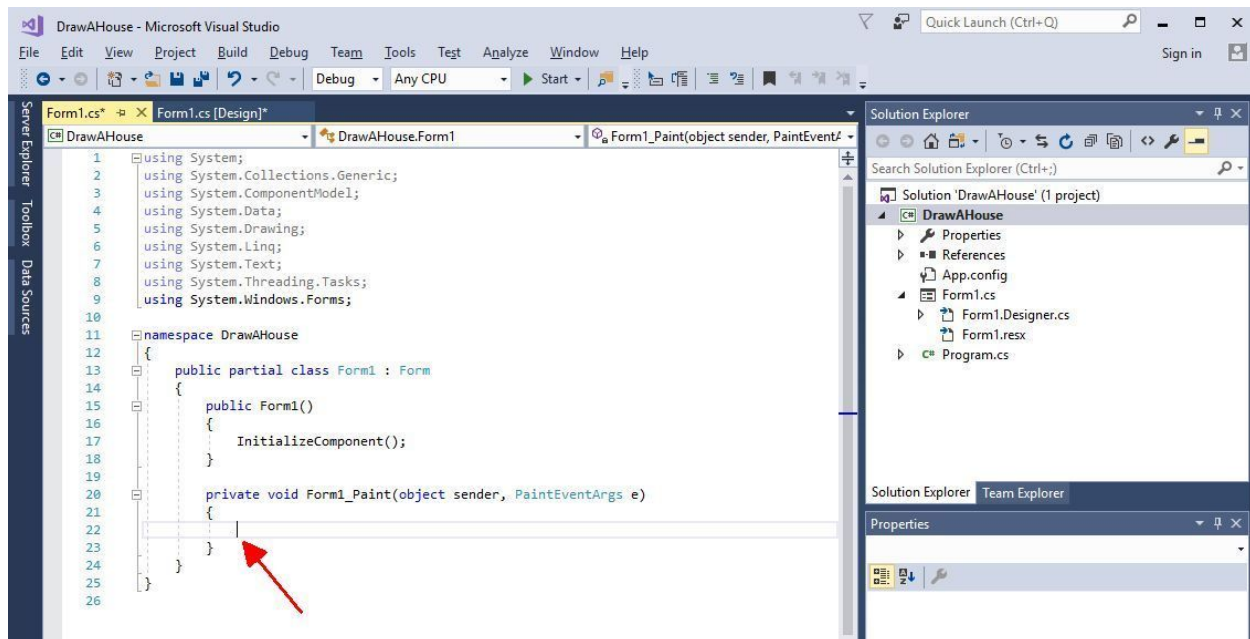
Notice that the text caret (the blinking vertical line on the source code page) is positioned between the opening and closing brace (**{** and **}**) of the function. (If the text caret in your window isn't positioned there, click there with the mouse to move the text caret to that position.) Now type the following code (exactly as given here—capitalization and punctuation matter; whitespace not so much):

```csharp
Pen bluePen = new Pen(Color.CornflowerBlue, 4.0f);

// Draw the roof
e.Graphics.DrawLine(bluePen, 40, 391, 400, 9);
e.Graphics.DrawLine(bluePen, 400, 9, 760, 391);

// Draw the walls
e.Graphics.DrawLine(bluePen, 80, 348, 80, 800);
e.Graphics.DrawLine(bluePen, 80, 800, 720, 800);
e.Graphics.DrawLine(bluePen, 720, 800, 720, 348);
bluePen.Dispose();

// Draw windows
Pen yellowPen = new Pen(Color.PaleGoldenrod, 4.0f);
e.Graphics.DrawRectangle(yellowPen, 200, 371, 120, 154);
e.Graphics.DrawRectangle(yellowPen, 480, 371, 120, 154);
e.Graphics.DrawLine(yellowPen, 260, 371, 260, 525);
e.Graphics.DrawLine(yellowPen, 200, 448, 320, 448);
e.Graphics.DrawLine(yellowPen, 540, 371, 540, 525);
e.Graphics.DrawLine(yellowPen, 480, 448, 600, 448);
yellowPen.Dispose();
```

```
// Draw door
Pen greenPen = new Pen(Color.LightGreen, 4.0f);
e.Graphics.DrawLine(greenPen, 340, 800, 340, 600);
e.Graphics.DrawLine(greenPen, 340, 600, 460, 600);
e.Graphics.DrawLine(greenPen, 460, 600, 460, 800);
e.Graphics.DrawEllipse(greenPen, 428, 680, 18, 18);
greenPen.Dispose();
```

As you're typing the code, you will notice little windows popping up trying to help you write the code (see an example at right). You can ignore these windows completely (they will go away when you finish typing each part of the line) or press Enter to add the selected text to the code if it matches what you want to type.
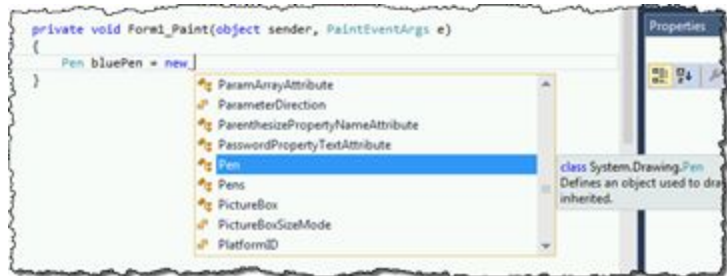
Now your Visual Studio window will look like this:
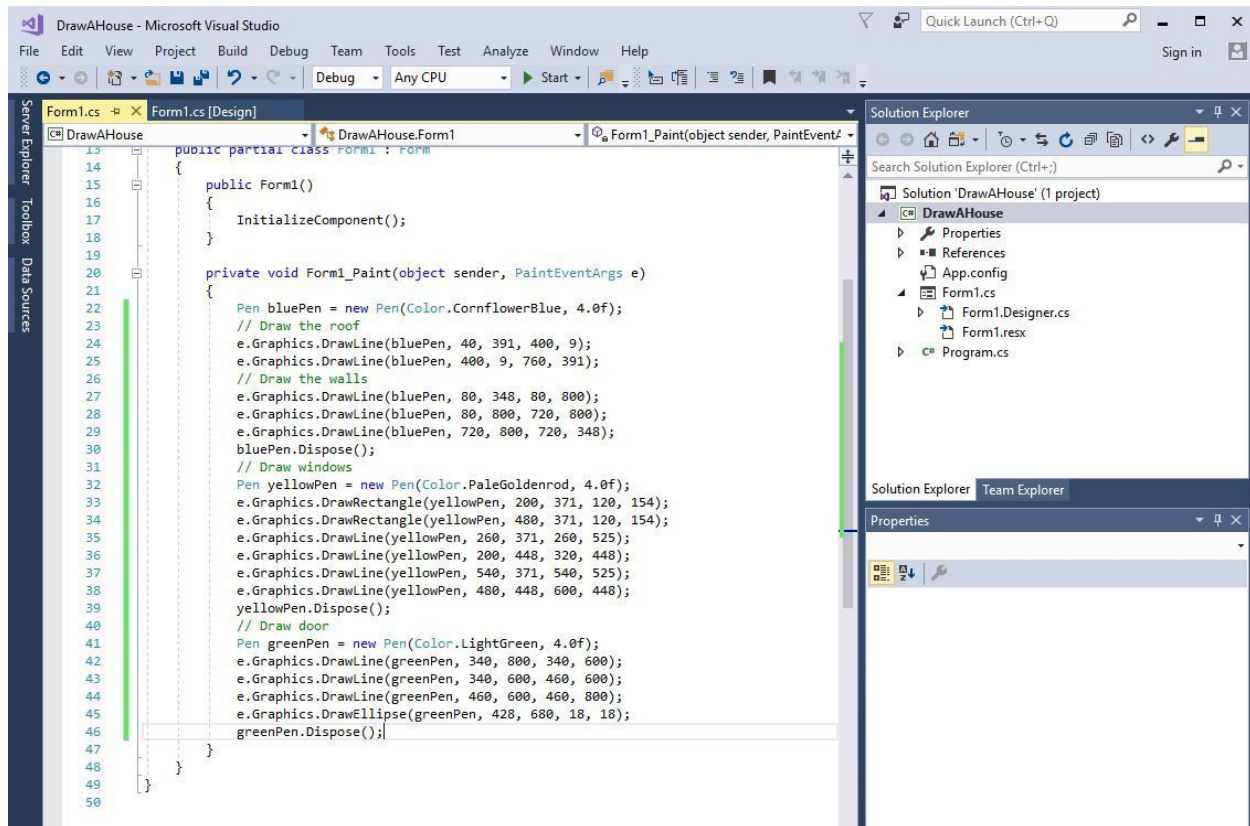
If you see any wavy red underlines in the code once it's all typed in, then something is wrong—double check the text (don't forget the semicolons!) and make sure it's all there and in the right order.

If everything looks good, you're ready to run your program. Click on the Start Debugging button (

▶ Start) on the toolbar at the top of the Visual Studio window. (Or just press the F5 key.) This will run the program. A window should appear that looks like this (I changed the background color for this picture so it wouldn't waste ink on the printer):
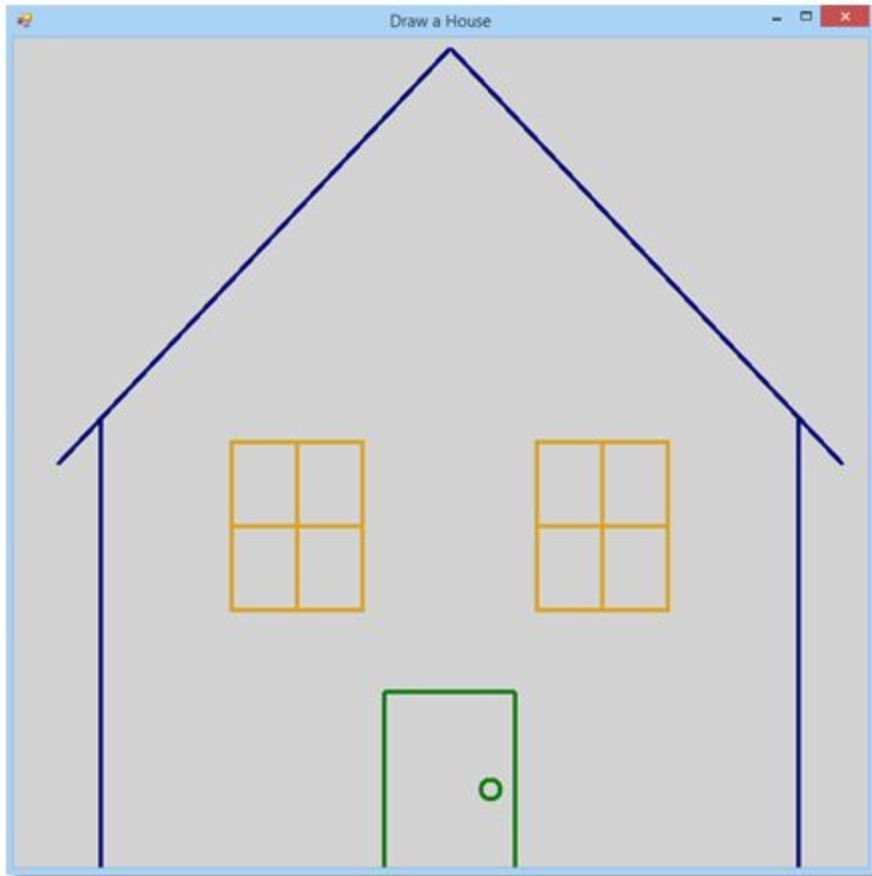
Show your work to Mr. Brooks or a TA.

Click the red X at the upper right corner of the window to end the program.

Congratulations!!! You are now a Windows programmer!