## 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):

New Project				? ×	
Recent		NET Framework 4.5.2 + Sort by: Default	• # E	Search Installed Templates (Ctrl+E)	
4 Installed		Blank App (Universal Windows)	Visual C#	Type: Visual C#	
Visual C# Windows Chronesel Windows Chronesektop Web NET Core .NET Standard		WPF App (.NET Framework) Visual		Windows Forms user interface	
		Windows Forms App (.NET Framework)	Visual C#		
		Console App (.NET Core)	Visual C#		
Cloud Test	-	Console App (NET Framework)	Visual C#		
WCF • Other Languages		Class Library (.NET Standard)	Visual C#		
D Other Project Types		Class Library (.NET Framework)	Visual C#		
Not finding what y Open Visual S	you are looking for? Studio Installer	ASP.NET Web Application (.NET Framework)	Visual C#		
▷ Online		ASP.NET Core Web Application (.NET Core)	Visual C#		
		ASP.NET Core Web Application (.NET Framework)	) Visual C#		
3		Shared Project	Visual C#		
	*	Class Library (Portable)	Visual C#	¥.	
Name:	DrawAHouse				
Location	c:\users\mbrooks\a	documents\visual studio 2017\Projects	•	Browse	
Solution name:	DrawAHouse		Create directory for solution Add to Source Control		
-			5	OK Cancel	

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.

Form1 System.Windows.Fo	rms.Form	T
E 2↓ ₽ <i>F</i> ₽		
Appearance	$\sim$	*
BackColor	Black	-
BackgroundImage	(none)	
BackgroundImageLayout	Tile	
Cursor	Default	
🗄 Font	Microsoft Sans Serif, 8.25pt	
ForeColor	ControlText	
FormBorderStyle	Sizable	
RightToLeft	No	
RightToLeftLayout	Fala	
Text	Draw a House	
UseWaitCursor	Faise	
Text	control	

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.)

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🗆 Layout		1
AutoScaleMode	Font	
AutoScroll	False	
	0, 0	
	0, 0	
AutoSize	False	
AutoSizeMode	GrowOnly	
E Location	0, 0	
⊞ MaximumSize	0, 0	
⊞ MinimumSize	0, 0	
	0 0 0 0	
🗄 Size	800, 800	
StartPosition	WindowsDefaultLocation	
-		



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.

Properties	<b>-</b> ₽ ×
Form1 System.Windows.Forms.Form	
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MouseCaptureCaptged	
MouseClick	
MouseDoubleClick	
ResizeBegin	
ResizeEnd	
Scroll	
Paint	~
Benavier	
ChangeUICues	
ControlAdded	
ControlRemoved	
ControlRemoved FormClosed	
ControlRemoved FormClosed	

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):

```
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!