week2

January 18, 2018

1 Development Environment

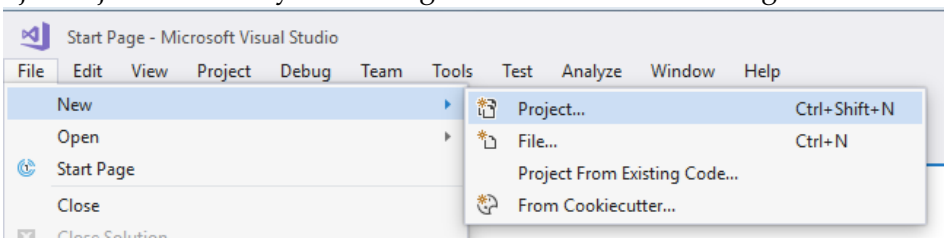
- You can use text editors like notepad to write your programs
- Alternatively you can use Integrated Development Environments (IDE) to make your life easier

2 Visual Studio (VS)

- We will use visual studio as our IDE
- Available for both Mac and PC
- Since we are working on VB, you have to use the PC version on mac
  - Use parallels to get it to work
- Get Visual Studio Community edition for free here

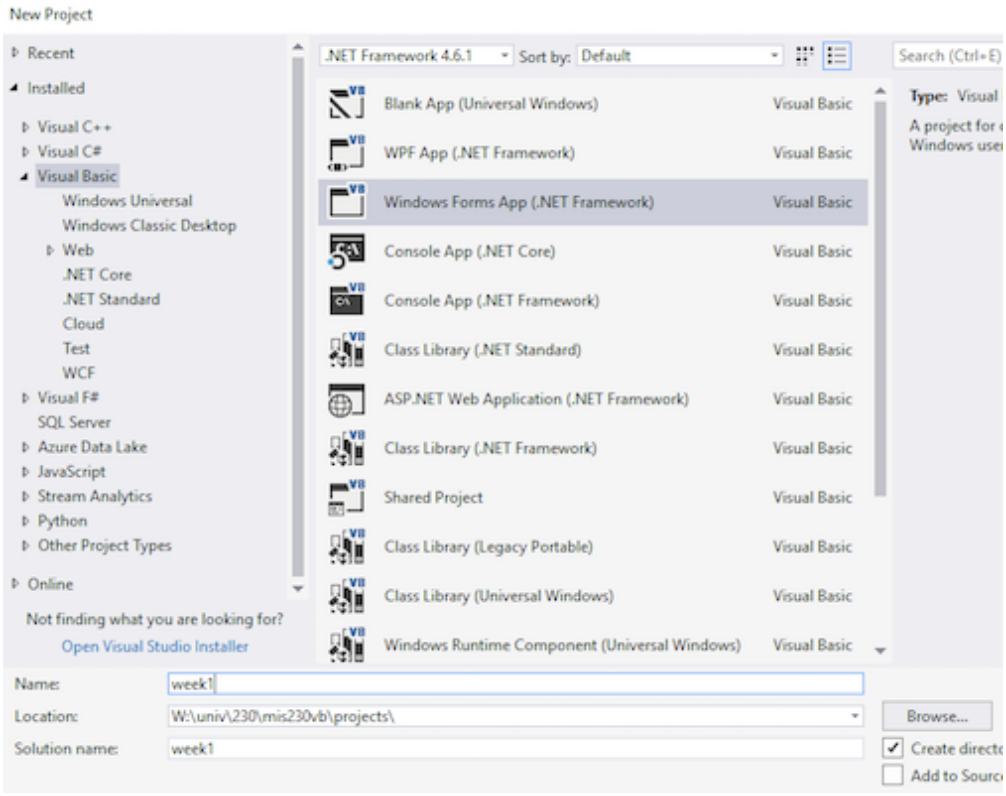
3 Starting Projects in VS

- You create programs by creating projects in VS
- A Project is just a directory containing the source files and configuration files needed by the IDE



4 Project Types

- You set the program type by selecting the language, and type of project
- Change ***Name*** to set the name of your project
- ***Location** is where you can find your project directory
- The project directory will have the same name as the project
- You can share your project by simply sharing the directory of the project



5 Types of Projects (Examples)

- Console
- Windows Forms App (.NET Framework)
- ASP.NET Web Application
- ... etc

6 Console

- Simplest form of program, computer doesn't do anything unless you instruct it to
- Used mostly to perform quick tasks and create server applications
- User interaction is not expected
- Will perform instructions sequentially
- Use this to get quick output from the computer

7 Windows Forms App (.NET Framework)

- A Windows based application the uses GUI for user interaction
- Event driven
- Making the window, buttons, and controls is handled for you
- You tell the computer what to do if an event occurs
- An event example is a button click or text input

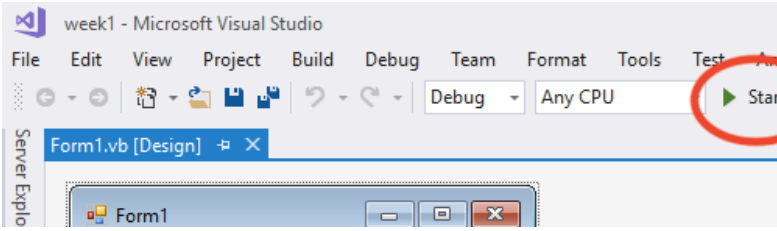
8 ASP.NET Web Application

- A browser based application
- Expected to run on a web server
- Client/Server Request/Response model
- Not covered this course

8.1 Keep in mind that programs come in different forms!

9 Our First Windows Forms Program

- Create a ***Windows Forms*** project named "HelloWorld"
- Start the program by clicking the ***Start*** button.



9.1 Can you explain what is happening?

10 Our Second Program

- Create a **Console** project and name it **HelloConsole**
- What is different about this project?
- Start the project and see what happens.
- Can you explain what is going on?

11 The Console Program

```
Module Module1

    Sub Main()

    End Sub

End Module
```

12 The Console Program Cont.

- The program does nothing!
- **Main** is the starting point for the program
- All instruction you write inside **Main** and before **End Sub** is executed
- Nothing else is done by the computer
- Let's tell the computer to type something for us

13 Updated Console Program

```
Module Module1

    Sub Main()
         Console.Out.WriteLine("Hello World!")
    End Sub

End Module
```

Run it and explain what happend

14 Updated Console Program

```
Module Module1

    Sub Main()
         Console.Out.WriteLine("Hello World!")
         Console.In.ReadLine()
    End Sub

End Module
```

Now What is happening?

15 The Statements

15.1 Console.Out.WriteLine

- This statement is used to output text
- You put the text inside the parantheses and the computer will display it

16 The Statements

16.1 Console.In.ReadLine

- This is an input statement
- It tells the computer to wait for the user to type some text on the keyboard
- Then what will it do with the text?

17 Challenge

- Try to display what the user types in the keyboard as output
- Can you add a message to let the user know what he/she needs to do?

18 Variables

- When getting input, we need to hold it somewhere to be able to use it
- This is where variables come in
- A Variable is like a bucket that holds data/input so we can use it elsewhere in the program
- Any input that is not placed in a variable is lost!

19 Using Variables in VB

1. You have to declare it first
2. You assign the input/data/result to the variable

20 What is a Declaration?

```
Dim myText as String
```

- **Dim** stands for **declare in memory**
- Tells the computer to keep some space in memory to store data in of a specific type (called **data type**), what is it here?
- Gives it a name so we can refer to it, what is it here?
- Where do you think we should place this statement in the program?

21 What is an Assignment?

```
myText = Console.In.ReadLine()
```

- Store whatever is on the right of the **=** operator, in the variable on the left
- Where should we place this statement?
- What do you think is the type of data returned by **ReadLine**?
- Data types must match or can be converted.

22 The Updated Program

- No need to show the sub main part:

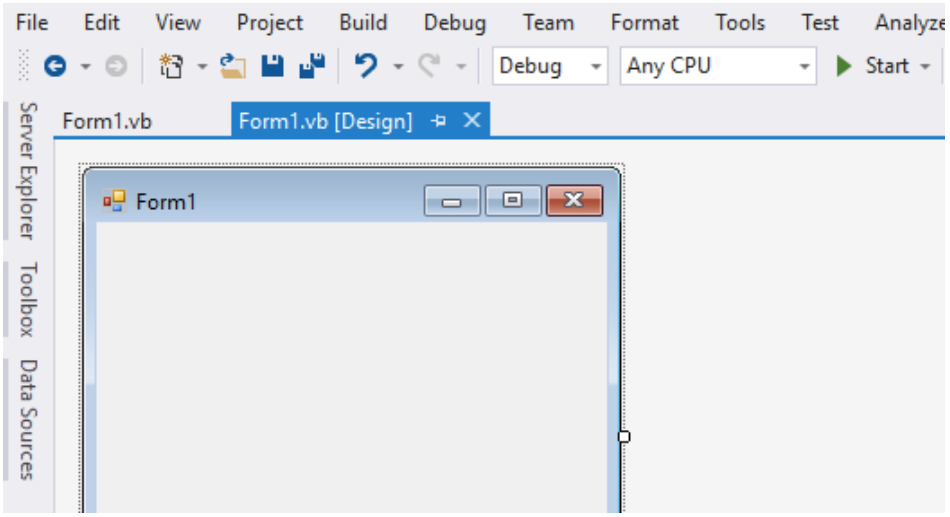
```
Dim myText As String
Console.Out.WriteLine("Please type message:")
myText = Console.In.ReadLine()
Console.Out.WriteLine(myText)
Console.In.ReadLine()
```

23 Review of Concepts

- Console vs Windows Forms vs Web apps
- Project creation and execution
- Variables and data types
- Declaration and assignment

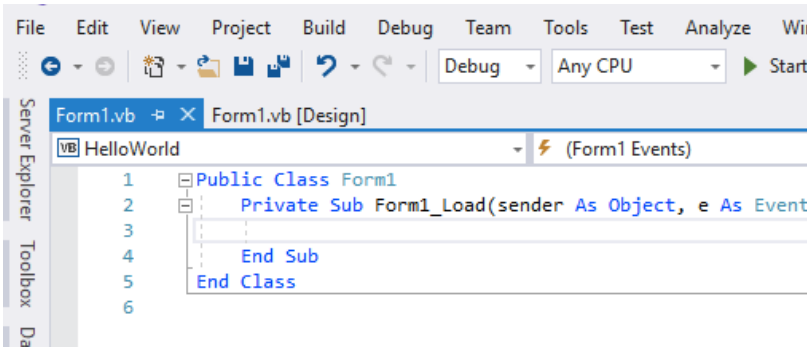
24 Hello World in Windows Forms

- Open your old windows form project, or create a new one named **Hello World**
- Look at form1
- This is known as the design view



25 Hello World in Windows Forms

- Double click anywhere on Form1
- This will open the coding view of the project



26 What is Form1_load?

- This is known as an event sub
- Remember **Main()** from console projects?
- Form1_load is similar to it
- It is executed only when Form1 is loaded
- This is known as an event sub and it is part of event based programming

27 What is Form1_load?

- In event based programming you do not execute the execution of the application
- The windows, buttons, forms, and all other GUI objects are already built for you

- Instead, as a programmer, you write subs that are executed when the user does specific actions

28 What is Form1_load?

- For example, in Form1_load, the user starts the application, and Form1 is loaded
- The event sub always consists of two parts, the name of the object/control, and the action that the user must do for the program to execute this code

29 Displaying Messages

- MSGBox can be used to display a message notification for the user in a windows form application
- Let's add a message to display "hello world" when form1 is loaded
- Double click on Form1 in design view, then inside the form1_load sub, type:

```
MsgBox("Hello World!")
```

30 Hello World in Windows forms

Your code should look like this:

```
Public Class Form1
    Private Sub Form1_Load(sender As Object, e As EventArgs) Handles MyBase.Load
        MsgBox("Hello World!")
    End Sub
End Class
```

30.1 Now start your program!

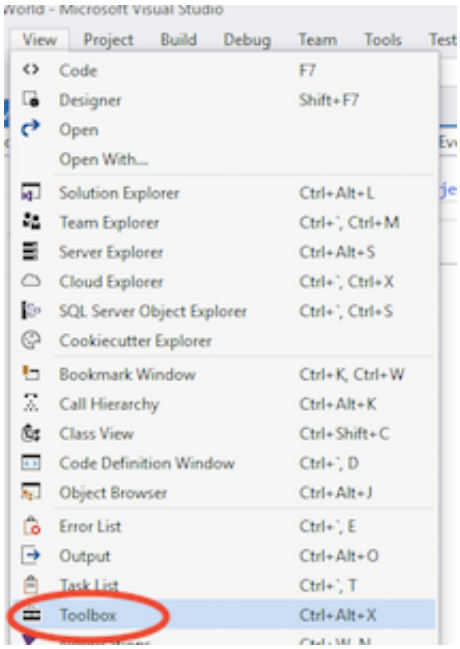
31 The running program

- Did you notice what MSGBox did?
- How is hello world different in windows forms compared to console

32 What Are Controls?

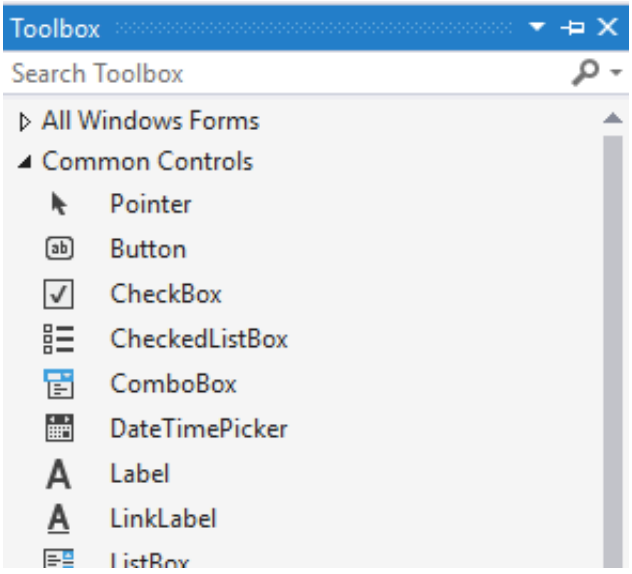
- they are all the graphical components that you can use to build an application

- Select Toolbox from View Menu while in **design view**



33 The Controls

- You can place these in forms to design the application



34 The Button Control

- Let's add a button to the project
- Go to the design view
- Drag a button from the toolbox and place the button anywhere on Form1
- Double click on the button in the design view

35 Your Code Now

```
Public Class Form1
    Private Sub Form1_Load(sender As Object, e As EventArgs) Handles MyBase.Load
        MsgBox("Hello World!")
    End Sub

    Private Sub Button1_Click(sender As Object, e As EventArgs) Handles Button1.Click

    End Sub
End Class
```

35.0.1 What Changed?

36 Button1_click

- This is the button1 click event sub
- When do you think this is executed?
- Add a statement to display a msgbox with the message:

```
The Button Has Been Clicked!
```

37 The Solution

```
Public Class Form1
    Private Sub Form1_Load(sender As Object, e As EventArgs) Handles MyBase.Load
        MsgBox("Hello World!")
    End Sub

    Private Sub Button1_Click(sender As Object, e As EventArgs) Handles Button1.Click
        MsgBox("The Button Has Been Clicked!")
    End Sub
End Class
```

38 Moving Forward

- I will not display complete code from the code view
- Instead, I will do the following:

```
Private Sub Button1_Click(sender As Object, e As EventArgs) Handles Button1.Click
    MsgBox("The Button Has Been Clicked!")
End Sub
```

- Do you think there is any difference if Button1_Click came before Form1_load? Try moving them

39 Challenge

- Is the MSGBox an Input or Output control?
- Is the Button an Input or Output control?
- When do we use it?
- Try adding 2 more buttons
- For each button display a different message