Enums and Strings

## Objective

See how to define and use the enum keyword to define a new type. Consolidate on knowledge of the functionality of class String and introduce the very useful StringBuilder class.

## Part 1 using an enum

1. Open the Game project you created previously.
2. Circle/oval is not the only shape! You can give the Ball class a property that dictates its shape. However, the shape must be limited to a list which you define. Let’s create this type as an **enum**.
3. Define a new **enum** type called **SHAPE\_TYPE** with following values

**Rectangle**

**ThreeDRectangle**

**RoundRectangle**

**Oval**

**Arc**

\*\* Please create this enum outside of the Ball class or put it in a new file.

1. Now you can see the name **Ball** does not look like a good choice!  
   Please change the name Ball to **Shape** in your project. The best way to do this is to open the Ball class and right mouse click on the word Ball and then choose the **Rename** menu option. The editor will change all references to Ball.
2. Define a new private field called **shapeType** of type **SHAPE\_TYPE**  
   as: **private** **SHAPE\_TYPE** **shapeType;**
3. Create a property getter for this field (private set). Call this **ShapeType**
4. Set the shapeType’s value inside the constructor.   
   Tip: Add a parameter of type SHAPE\_TYPE to the constructor.
5. Back in the paint method, you must examine the ShapeType property to see what to draw. for example

if ( **ShapeType** == SHAPE\_TYPE.**RoundRectangle**)

e.Graphics.DrawRectangle(Pens.Blue, b.x, b.y, b.w, b.h);

1. Run your application to see different shapes bouncing about!
2. You can also change the colour of your shape by creating a new property of type Color like: public Color Colour { get; set; }  
   Set its value in the Shape's constructor and also create a getter method.  
   You can then use this in paint when drawing a shape using code like:

Pen p = new Pen(b.Colour);

e.Graphics.DrawRectangle(p, b.x, b.y, b.w, b.h);

p.Dispose();

**Note**: **p.Dispose();** is a vital method call, otherwise you will be creating 1000’s of Pen objects and the graphics slows down considerably after a while.

## Part 2 using String

1. Back in the Labs project, create a new static method in the Program class called Lab4() and then call Lab4() from within Main(). Comment out other code from the previous labs in the Main() method.
2. Expand Lab4(), declare a string called **name.** Set name to say *Samantha* or any name made up of more than 3 characters.
3. Display its 3rd character using its index or by using the **Substring** method
4. Display it converted to lowercase and to uppercase.
5. Use a foreach loop to iterate over its characters and display each of them tab separated. Throw a line feed after this display.
6. Display whether it starts with a string of your own choosing.
7. Display whether it ends with a string of your own choosing.
8. Use the IndexOf method of string to display the position of the first occurrence of a character that you know is in the string, and also, for a character that you know is not in the string.
9. Concatenate the ‘name’ with a surname of your choice to make a variable called ‘fullname’ preferably with a space in the middle, then display this fullname. Concatenation is ok if it is all done in one statement.   
   You can use the + operator or use the C# 6 $”” str\*ings

## Part 3 Using StringBuilder

1. Back in Lab4() method, create a **StringBuilder** object called ’**sb**’. Use the constructor that allows you to initialise the object to contain the String

“Bruce Springsteen<space>”.   
(You can use the name of your favorite artist instead!)

1. Now use the Append() instance method of *StringBuilder* to append exactly the text “is the artist ever” (no error in that!).
2. Use the ToString() method of the StringBuilder to produce a string that you can display to see the current value of the StringBuilder.

You are looking at a strange sentence that needs some amending.

1. Now we would like you to Insert() an adjective in front of the word “artist”. Words like “greatest “obviously spring to mind, but make your own choice.
2. Now use the Replace() method of StringBuilder to replace the word

“artist” with a noun of your own choice. e.g “rock singer”. Display the final result.

**\*\* End \*\***