Advanced Programming C#

Lecture 3

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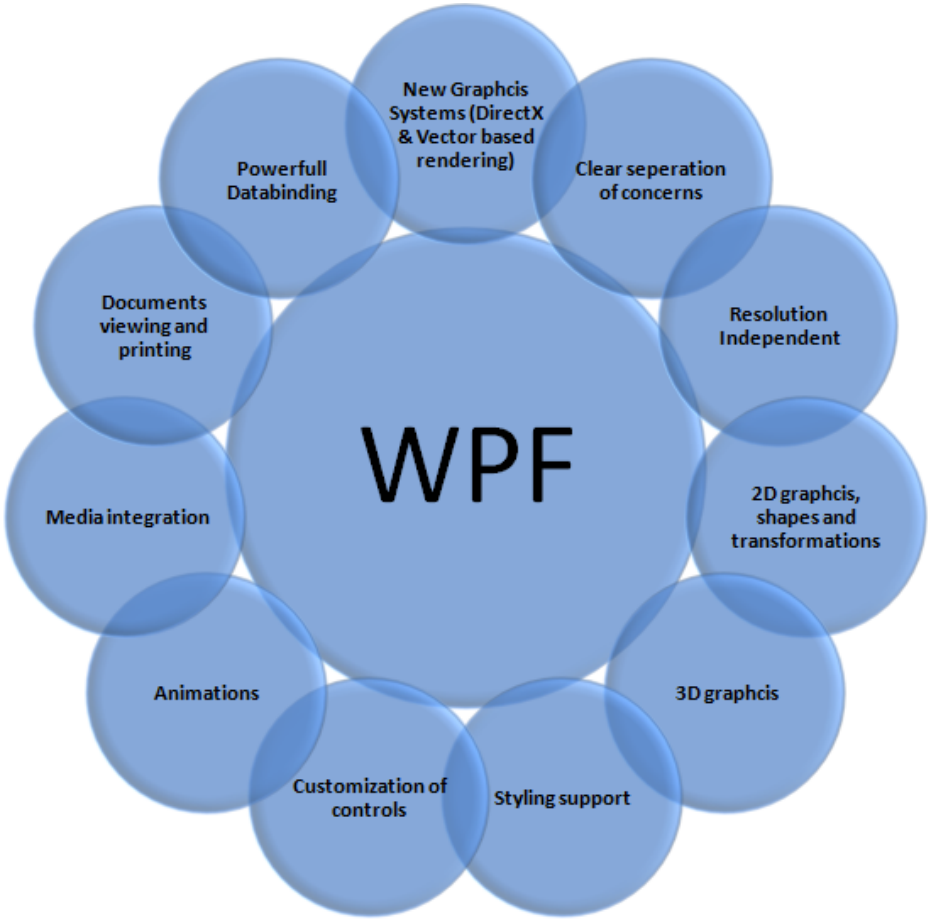
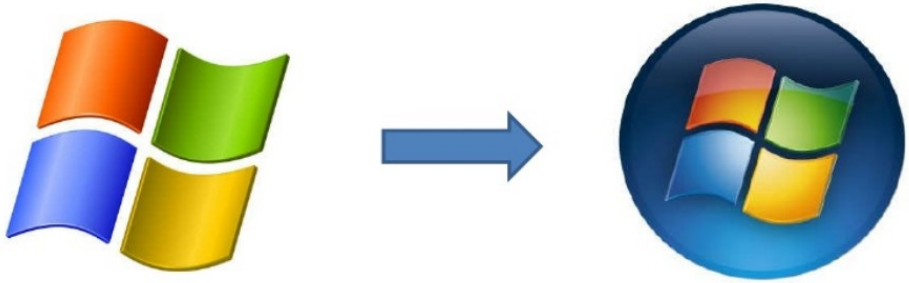
Windows Presentation Foundation

Windows Presentation Foundation

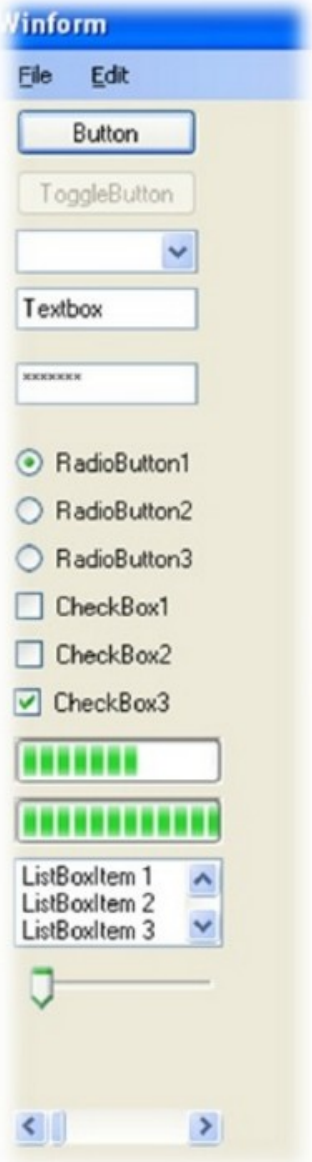


- Allows for clear separation between Design and Functionality
- Better GUI



WPF vs Windows Forms

Window Form



Windows Presentation Foundation

http://www.slideshare.net/nagaharish_movva/windows-presentation-foundation-4377923

Unified presentation

	GDI/Windows Forms	Flash	PDF	COM Interop	Directx	WPF
3D					✓	✓
Documents			✓			✓
Animation		✓			✓	✓
Video		✓		✓	✓	✓
Interactive UI controls	✓	✓		✓		✓

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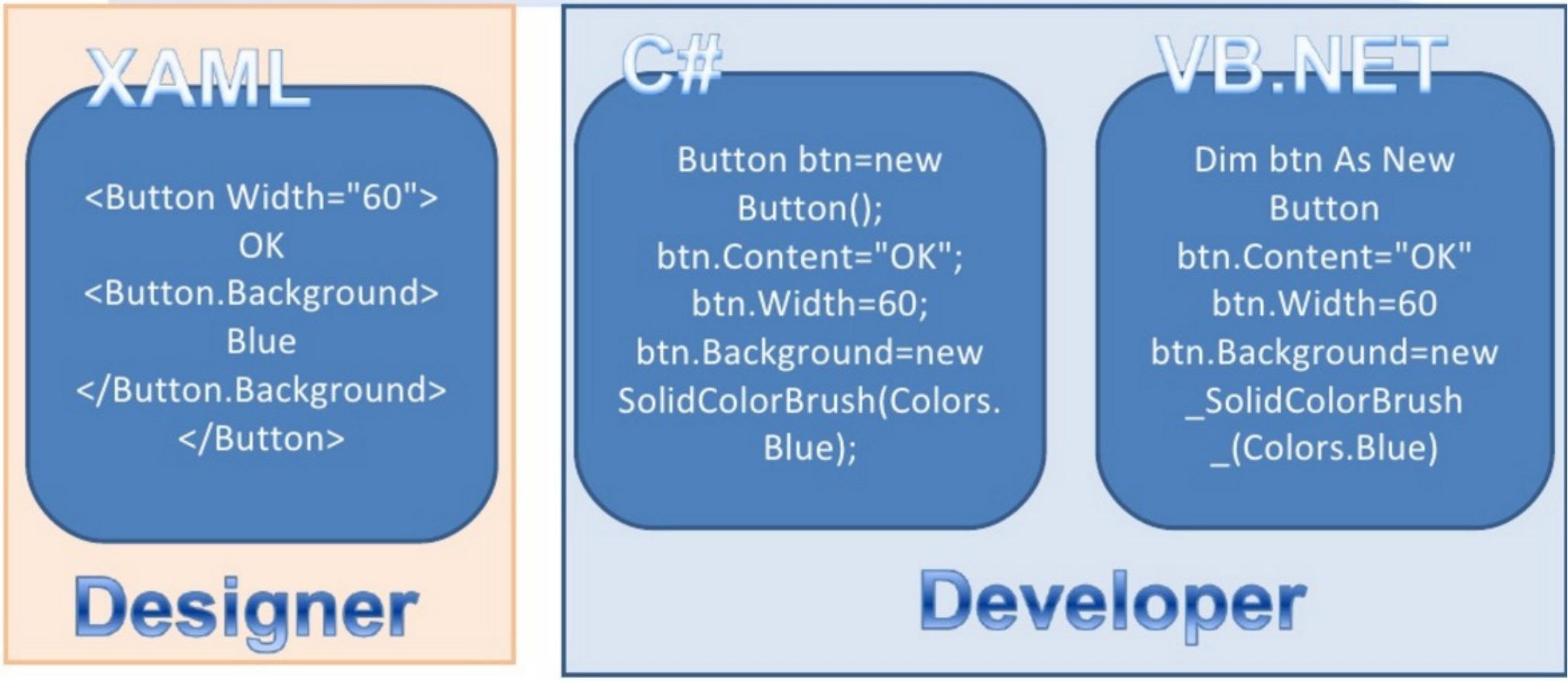
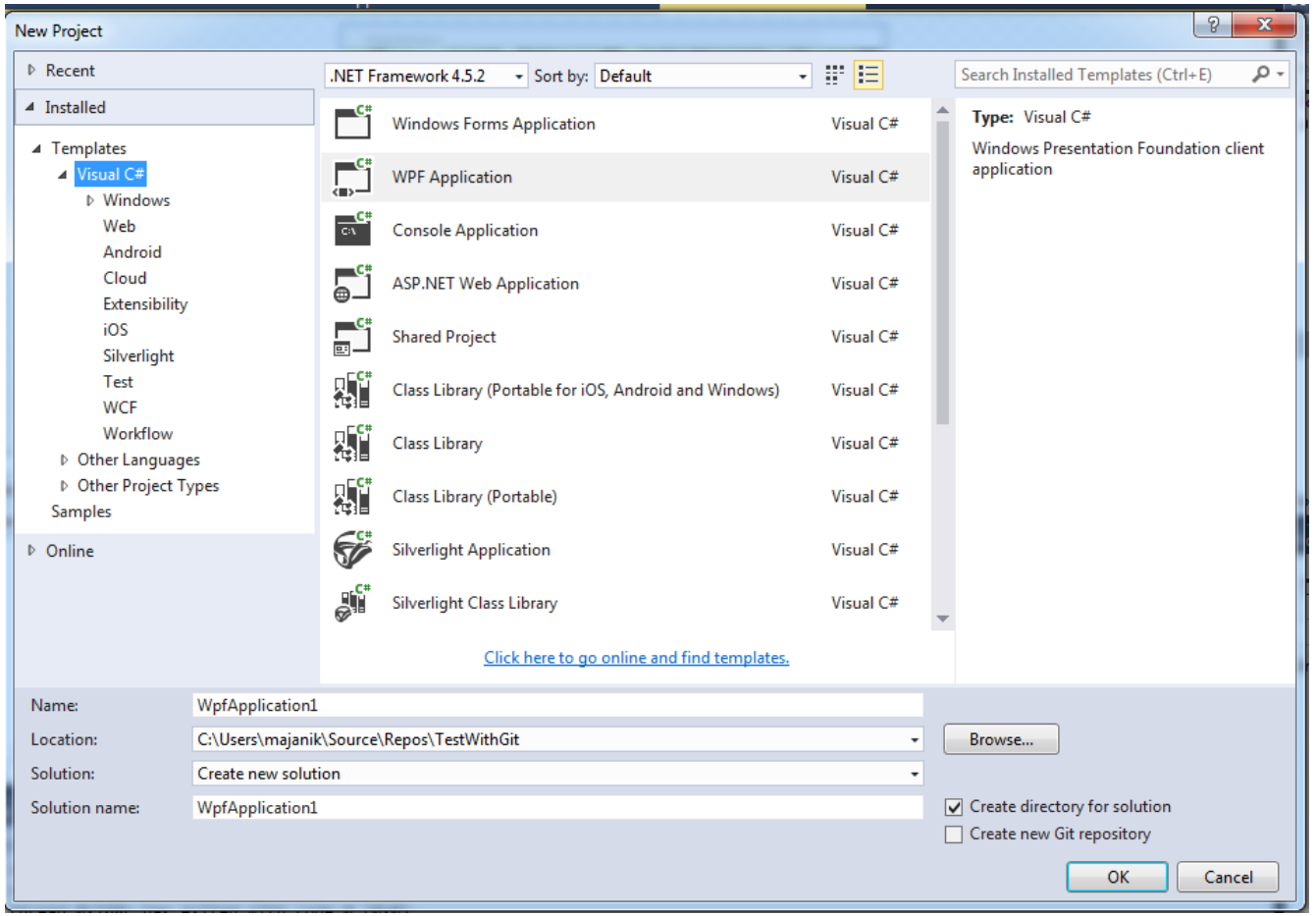
Working with WPF

- User interface is designed in XAML
- Underlying functionality is build using C#



New Project: WPF Application

- File → New → Project... → WPF Application

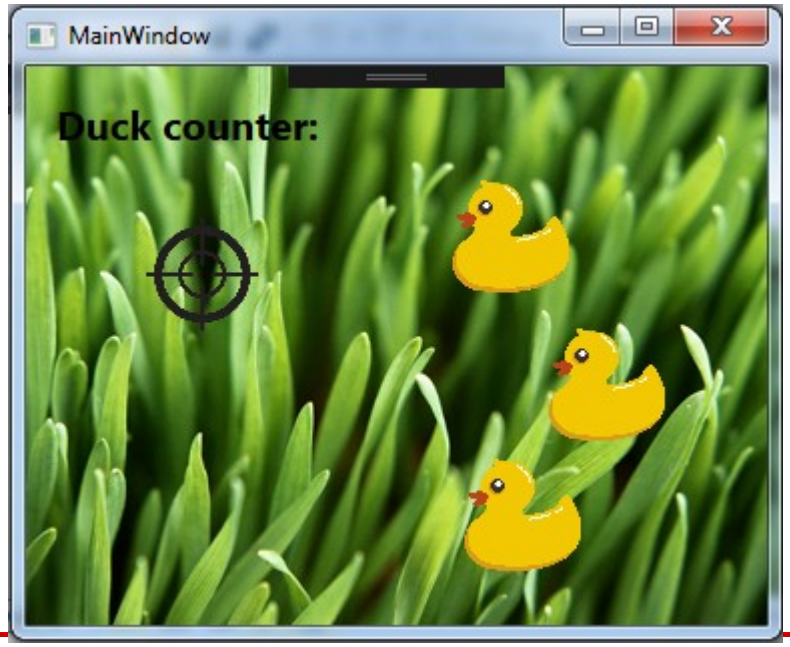


Today

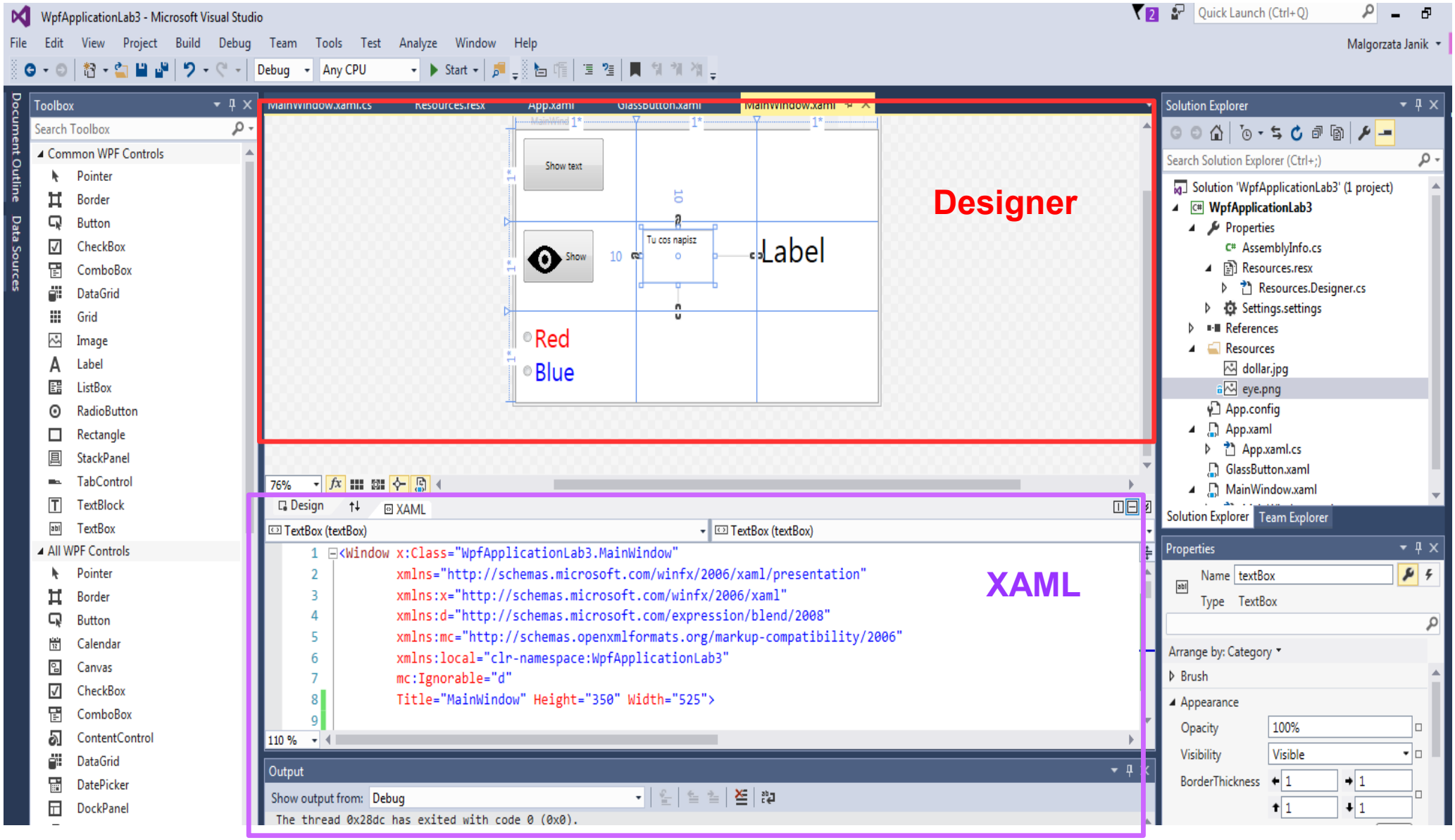
(1) WPF tutorial

(2) Advanced controls

(3) Ducks-shooting game

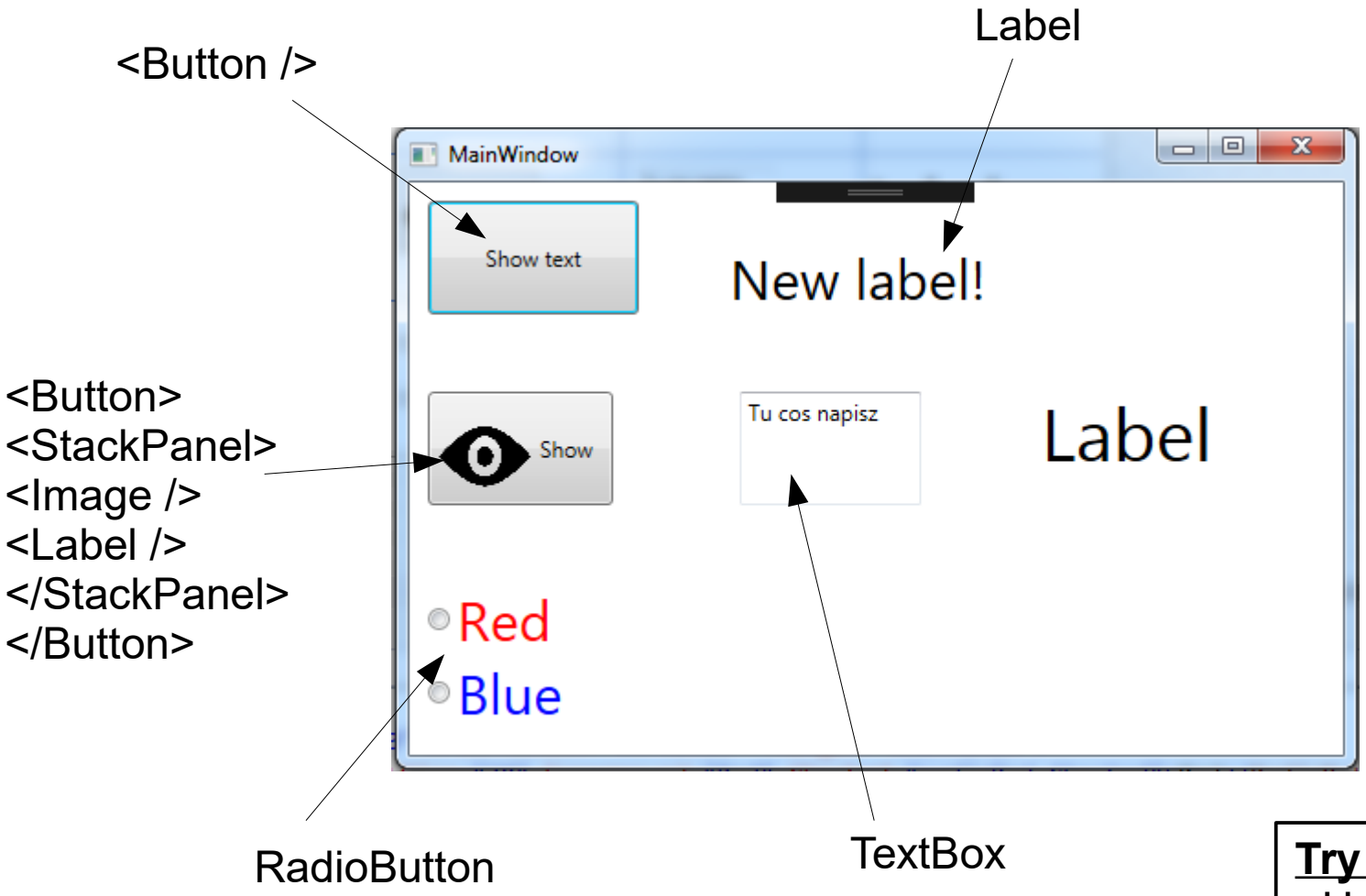


WPF



MainWindow.xaml → Design (XAML)
MainWindow.xaml.cs → Functionality (C#)

WPF Tutorial - Controls



Try both:
- Using Toolbox
- Creating Control by hand in XAML

WPF Tutorial - Properties

<Button **Content = ”Show text”** />

[Label] **Content = ”New label!”**
FontSize=”30”

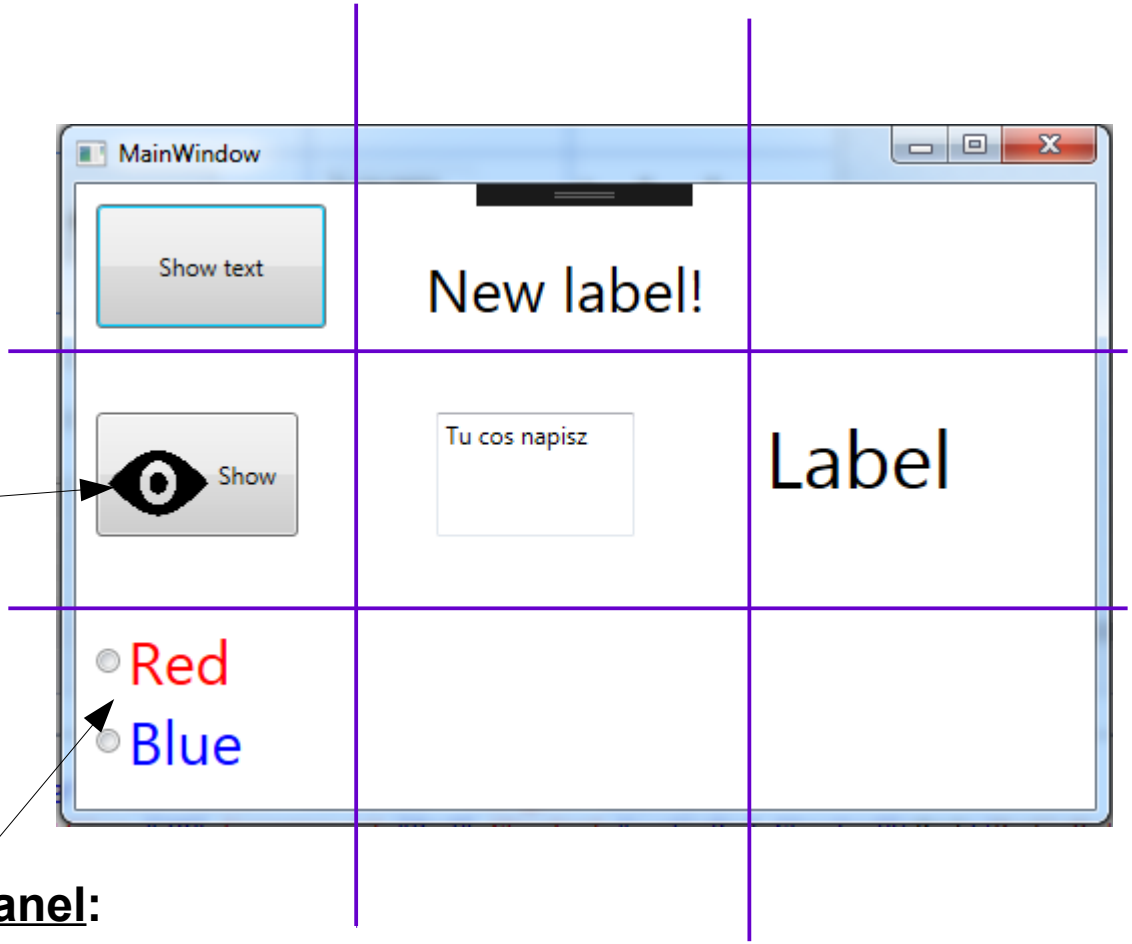
[Image]
Source=”...”

[RadioButton]
Foreground=”Blue”

Try both:
- Using Properties window
- Adding Property by hand in XAML

WPF Tutorial - Layouts

GridLayout: 3 rows, 3 columns



StackPanel: Horizontal

StackPanel: Vertical

WPF: Grid Layout

Everything between:

```
<grid>

</grid>
```

is in grid layout. By default there is 1 row and 1 column.

To create 2 rows and 3 columns we would need to add in the beginning following code:

```
<Grid.ColumnDefinitions>
    <ColumnDefinition></ColumnDefinition>
    <ColumnDefinition></ColumnDefinition>
    <ColumnDefinition></ColumnDefinition>
</Grid.ColumnDefinitions>
<Grid.RowDefinitions>
    <RowDefinition></RowDefinition>
    <RowDefinition></RowDefinition>
</Grid.RowDefinitions>
```

3 columns

2 rows

To put a control into certain column & row do:

```
<Button x:Name="button"  Grid.Row="0" Grid.Column="0"
        VerticalAlignment="Center"  Content="Show text" />
```

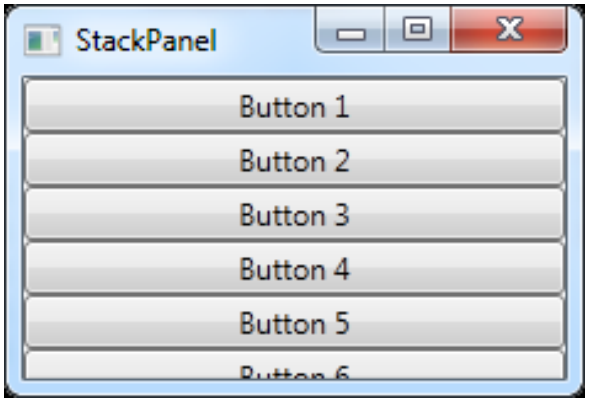
WPF: Stack Layout

Everything between:

```
<StackPanel>

</StackPanel>
```

is in stack layout. Basic property of the StackPanel is Orientation, which can be **`Horizontal`** or **`Vertical.`**




```
<StackPanel Orientation="Horizontal" Height="52">
    <Image x:Name="image1" HorizontalAlignment="Left" Height="60"
        VerticalAlignment="Top" Width="50" Source="Resources/eye.png" Stretch="Fill"/>
    <Label VerticalAlignment="Center">Show</Label>
</StackPanel>
```

Adding image

- Similarly as before, add to the project using **Resources.resx**
- After adding an image, do:

→ Right click the image file in the Solution Explorer

→ Click Properties

→ Select Build Action to Resource

→ Clean and Build (from menu)

(→ Afterwards add an image / reload the image in the Properties window again → Source property → click arrow → choose again from the list)

Events

- When event is added, we move to the c# in the MainWindow.xaml.cs file

Try both:
- Using Properties window
- Creating Event by hand in XAML

- Commands that may be useful:

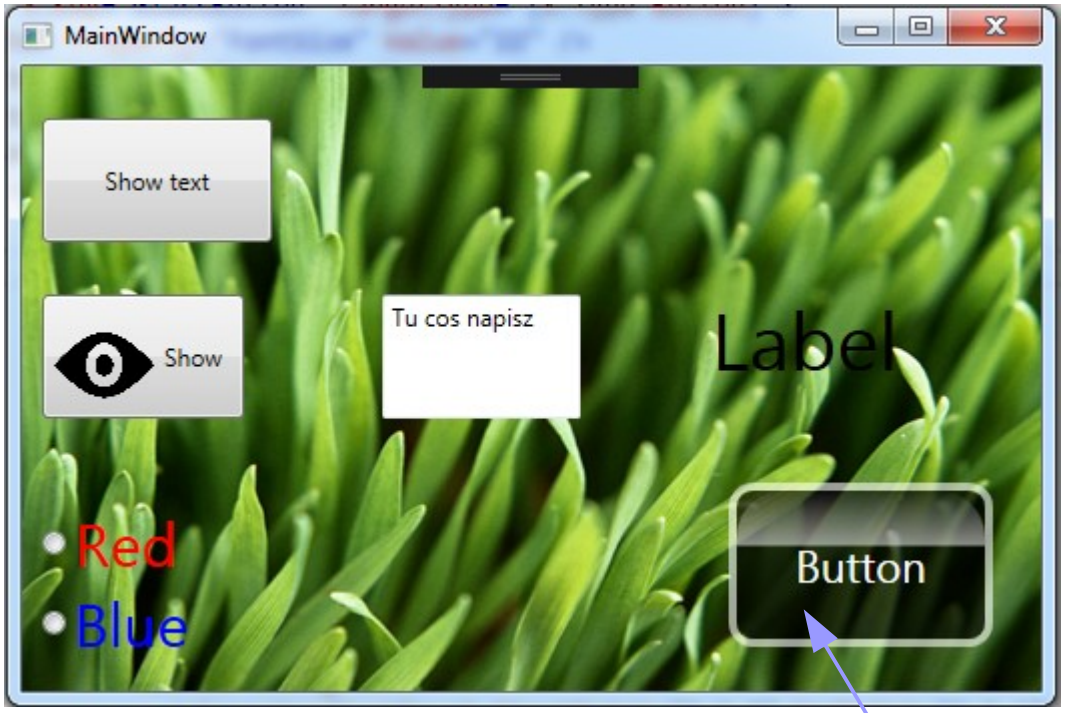
```
labelShowText.Visibility = Visibility.Visible;
labelCopyText.Foreground = Brushes.Red;
labelCopyText.Content = textBox.Text;
```

Designing New Control

- Glass Button

More info:
http://kishor-naik-dotnet.blogspot.com/2010/11/wpf-custom-glass-button-in-wpf.html

- Project → Add → Resource Dictionary...
- Resource Dictionary



Glass effect of transparency

Copy file:
http://www.if.pw.edu.pl/~majanik/data/Csharp/Files/GlassButton.xaml

To use our GlassButton style, we must now add a resource reference into App.xaml file:

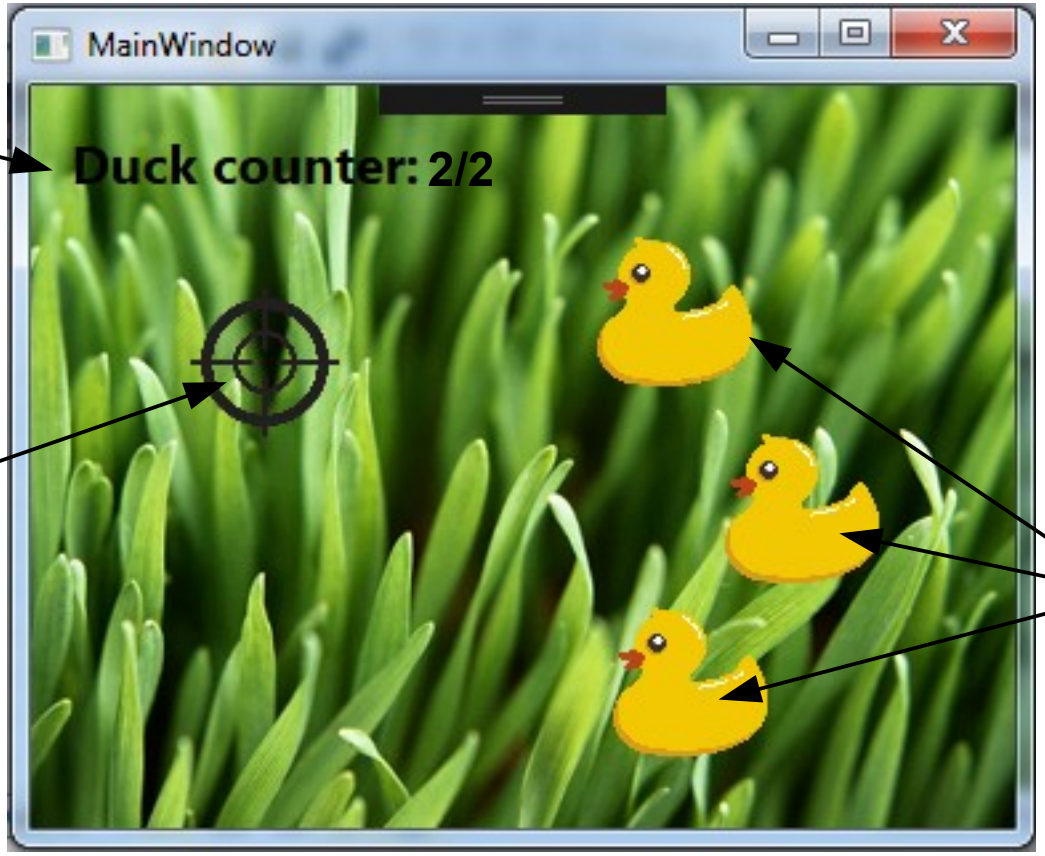
```
<ResourceDictionary Source="GlassButton.xaml"/>
```

Add control:

```
<Button Style="{DynamicResource GlassButton}"
        Margin="0,0,24,22" x:Name="buttonGlass1" Height="82"VerticalAlignment="Bottom"
        HorizontalAlignment="Right" Grid.Row="2" Grid.Column="2"
        Width="132" Click="buttonGlass1_Click">Button</Button>
```

Shooting ducks

COUNTER
Label control (changes when duck is shot or dissaper)



TARGET
Image control (moved with mouse)

DUCKS
Image control (moved by the Timer)

Useful tools

- Moving objects:

```
duck.Margin = new Thickness(duck1.Margin.Left + 2, duck1.Margin.Top, 0, 0);
```

- Get Mouse Position:

```
var point = e.GetPosition(imageBackground);
```

- Timer

```
System.Windows.Threading.DispatcherTimer dispatcherTimer = new
                                    System.Windows.Threading.DispatcherTimer();

            dispatcherTimer.Tick += dispatcherTimer_Tick; //event!!

            dispatcherTimer.Interval = new TimeSpan(20, 0, 0);

            dispatcherTimer.Interval = TimeSpan.FromMilliseconds(1);

            dispatcherTimer.Start();
```

Useful tools

- Flip image:

```
duck.RenderTransformOrigin = new Point(0.5, 0.5);

                ScaleTransform flipTrans = new ScaleTransform();

                flipTrans.ScaleX = -1; // or 1

                //flipTrns.ScaleY = -1;

                duck.RenderTransform = flipTrans;
```

Resources that can be used

- Eye:

  http://www.if.pw.edu.pl/~majanik/data/Csharp/Files/eye.png

- Glass button:

  http://www.if.pw.edu.pl/~majanik/data/Csharp/Files/GlassButton.xaml

- Ducks:

  http://www.if.pw.edu.pl/~majanik/data/Csharp/Files/duck.png
  http://www.if.pw.edu.pl/~majanik/data/Csharp/Files/Aero_Grass.jpg
  http://www.if.pw.edu.pl/~majanik/data/Csharp/Files/target.png

THE END

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