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Windows Presentation Foundation

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Intoduction

- The Windows Presentation Foundation is Microsofts next generation UI framework to create applications
- WPF combines application UIs, 2D graphics, 3D graphics, documents and multimedia into one single framework.
- Its vector based rendering engine uses hardware acceleration of modern graphic cards.

Introduction

- The units used in WPF are not pixels but $1/96$ of an inch
- WPF treat shapes such as lines, rectangles etc as user controls and thus they have events

Markup and Code

- WPF separates the appearance of a user interface from its behavior
- The appearance is generally specified in the Extensible Application Markup Language (XAML)
- The behavior is implemented in a managed programming language like C#
- The two parts are tied together by databinding, events and commands.

Markup and Code

```
<Window  
  xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"  
  xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"  
  x:Class="SDKSample.AWindow"
```

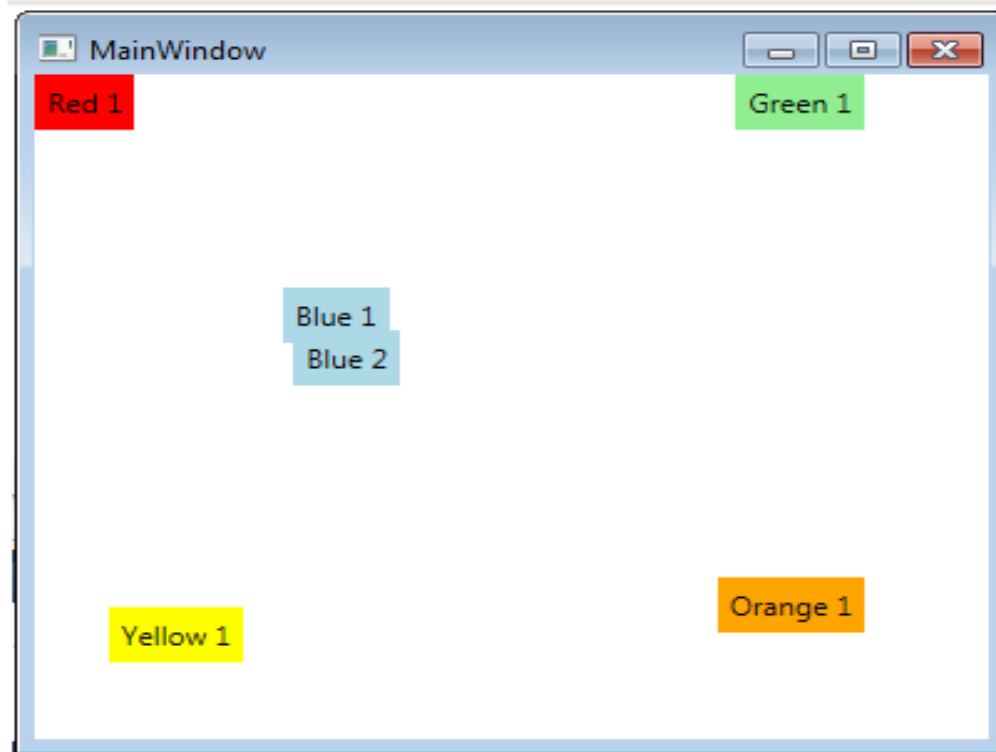


Layout

- Layouts are the mechanism that WPF uses to define how visual items will be displayed on the screen for standard 2D applications
- Canvas
- Grid
- StackPanel
- WrapPanel
- Viewbox, ScrollViewer...

Canvas

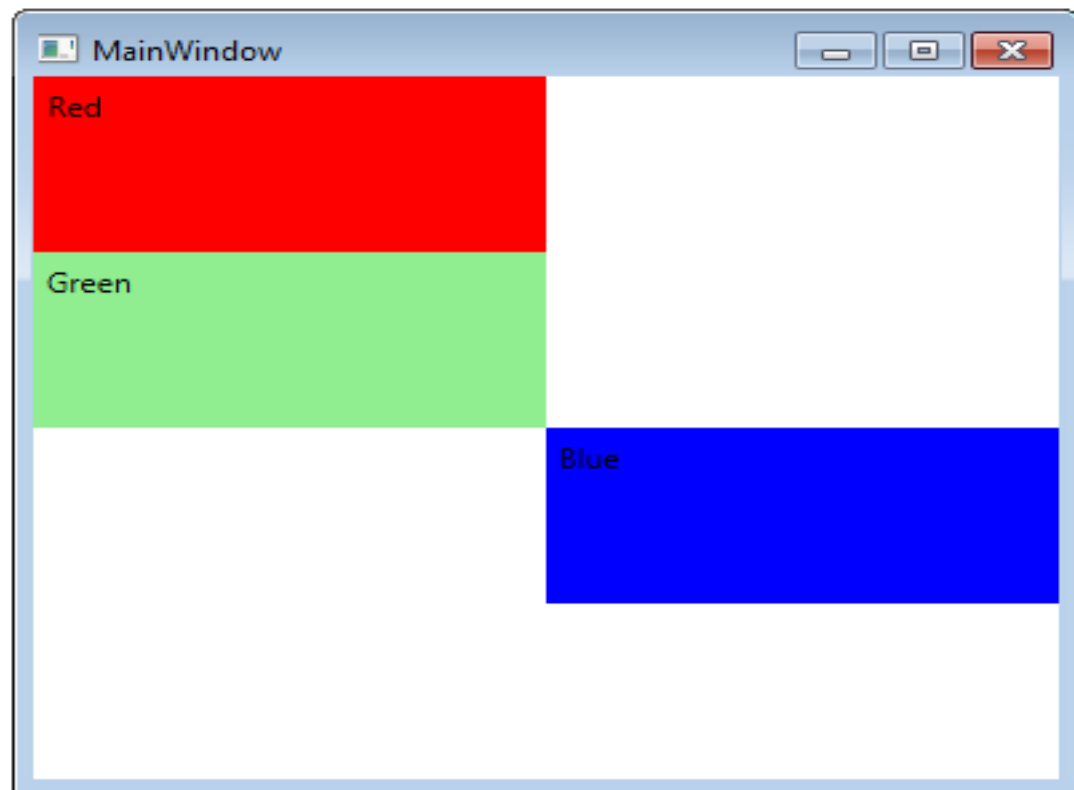
```
<Canvas>
  <!-- default coordinates 0,0 from top left; like WinForms -->
  <Label Background="Red">Red 1</Label>
  <Label Canvas.Right="50" Background="LightGreen" >Green 1</Label>
  <Label Canvas.Top="100" Canvas.Left="100" Background="LightBlue" >Blue 1</Label>
  <Label Canvas.Bottom="166" Canvas.Right="237" Background="LightBlue" >Blue 2</Label>
  <Label Canvas.Right="300" Canvas.Top="250" Background="Yellow" >Yellow 1</Label>
  <Label Canvas.Right="50" Canvas.Bottom="50" Background="Orange" >Orange 1</Label>
</Canvas>
```



Grid

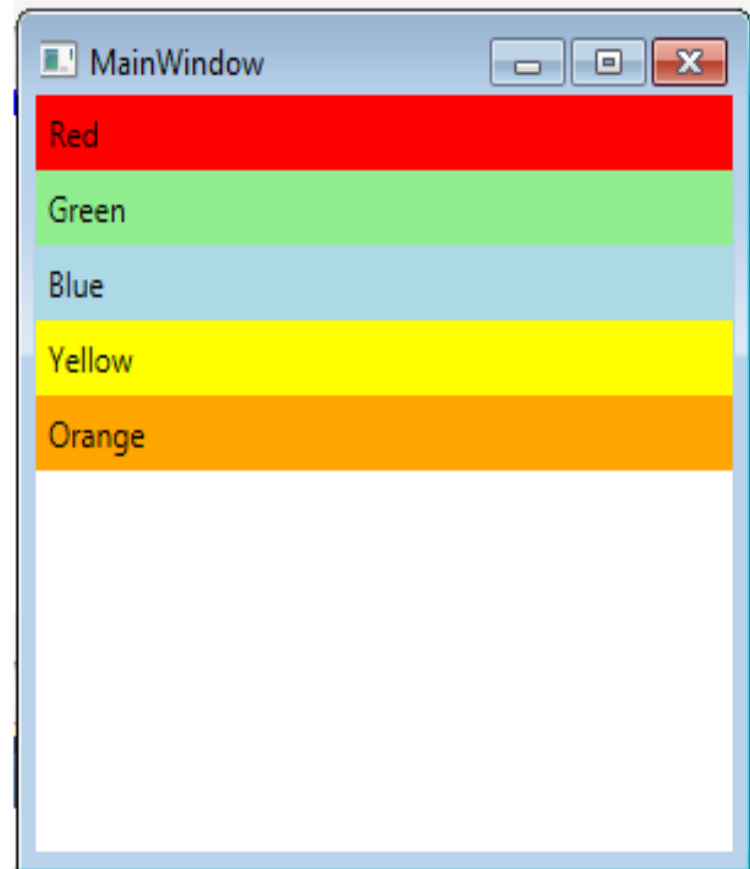
```
<Grid>  
  <Grid.ColumnDefinitions>  
    <ColumnDefinition />  
    <ColumnDefinition />  
  </Grid.ColumnDefinitions>  
  <Grid.RowDefinitions>  
    <RowDefinition />  
    <RowDefinition />  
    <RowDefinition />  
  </Grid.RowDefinitions>
```

```
  <Label Grid.Column="0" Grid.Row="0" Background="Red">Red </Label>  
  <Label Grid.Column="0" Grid.Row="1" Background="LightGreen">Green </Label>  
  <Label Grid.Column="1" Grid.Row="2" Background="Blue">Blue </Label>  
</Grid>
```



StackPanel

```
<StackPanel Orientation="Vertical">  
    <Label Background="Red">Red</Label>  
    <Label Background="LightGreen">Green</Label>  
    <Label Background="LightBlue">Blue</Label>  
    <Label Background="Yellow">Yellow</Label>  
    <Label Background="Orange">Orange</Label>  
</StackPanel>
```



WrapPanel

```
<WrapPanel >  
  <Label Width="125" Background="Red">Red 1</Label>  
  <Label Width="100" Background="LightGreen">Green 1</Label>  
  <Label Width="125" Background="LightBlue">Blue 1</Label>  
  <Label Width="50" Background="Yellow">Yellow 1</Label>  
  <Label Width="100" Background="Orange">Orange 1</Label>  
  <Label Width="100" Background="Red">Red 2</Label>  
  <Label Width="100" Background="LightGreen">Green 2</Label>  
  <Label Width="75" Background="LightBlue">Blue 2</Label>  
  <Label Width="70" Background="Yellow">Yellow 2</Label>  
  <Label Width="175" Background="Orange">Orange 2</Label>  
</WrapPanel>
```



GUI Architecture for Score Editor

Root Grid

Row 0 for Menu Bar etc

ScrollViewer

ViewBox

Overlapping Grid

Staff StackPanel

Notes WrapPanel

Top Most Canvas

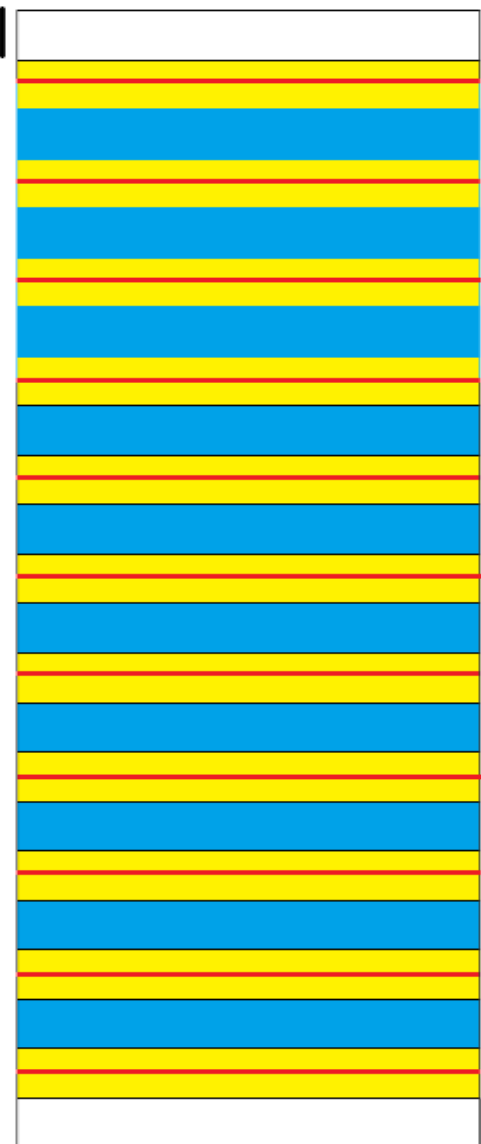
These three layers are overlapped.

The StackPanel consists of Canvases which contain each line of the staff.

The Notes WrapPanel is used to display the notes and there is a separate canvas for displaying each note.

The Top Most Canvas is used for Tie and other inter note symbols

11.56



6.25