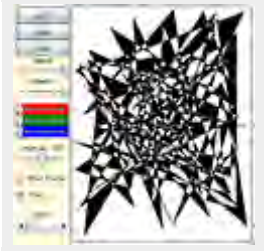


Course 2D_SL: 2D-Computer Graphics with Silverlight

Chapter C1: The Intro Project

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Install 1) [Visual Web Developer 2008 Express Edition with Service Pack 1 English](#)
and 2) [Silverlight Tools for Visual Studio 2008 SP1](#).

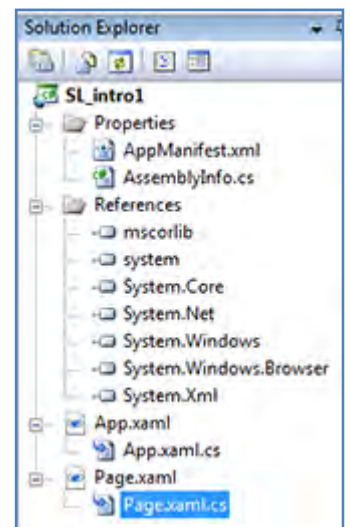
Preliminaries

Guidance for **Visual Web Developer 2008 Express**:

- 1) Main Menu after start of VWD Express: Tools → Options →
check lower left checkbox: Show all Settings →
→ Projects and Solutions → Projects location: → C:\temp.
→ Text Editor (double click) → All Languages (double click) → Tabs →
Indenting: None → Tab size: 2 → Insert spaces.
→ Text Editor (double click) → C# (double click) → Formatting →
uncheck all three check boxes → OK.

- 2) Main Menu after start of VWD Express: File → New Project... →
Project types: Visual C# (double click) → Silverlight →
Templates: Silverlight Application
Name: SL_intro1 → Location: C:\temp\SLProjects →
Create directory for solution: switch off → OK.
An Add Silverlight Application-Window appears. Choose
"Automatically generate a test page to host Silverlight at build time" →
OK.

The Solution Explorer - SL_intro1 window appears
as shown on the right.



In the Solution Explorer - SL_intro1 click the branch Page.xaml.
A split window will appear containing the default xaml code.
Delete this code completely and replace it by the code of **Version 01: Page.xaml**
which follows.

Version 01: Page.xaml

```
<UserControl x:Class="SL_intro1.Page"
  xmlns="http://schemas.microsoft.com/client/2007"
  xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
  Width="380" Height="150">
  <Grid Background="Cornsilk" ShowGridLines="True">
    <Grid.ColumnDefinitions>
      <ColumnDefinition Width="90"/>
    </Grid.ColumnDefinitions>
  </Grid>
</UserControl>
```

Version 02: Page.xaml

```
<UserControl x:Class="SL_intro1.Page"
  xmlns="http://schemas.microsoft.com/client/2007"
  xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
  Width="380" Height="150">
  <Grid Background="Cornsilk">
    <Grid.ColumnDefinitions>
      <ColumnDefinition Width="90"/>
    </Grid.ColumnDefinitions>
    <Button Grid.Column="0" Background="White" Content="left"/>
    <Button Grid.Column="1" Background="White" Content="right"/>
  </Grid>
</UserControl>
```

Version 03: Page.xaml

```
<UserControl x:Class="SL_intro1.Page"
  xmlns="http://schemas.microsoft.com/client/2007"
  xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
  Width="380" Height="150">
  <Grid Background="Cornsilk">
    <Grid.ColumnDefinitions>
      <ColumnDefinition Width="90"/>
    </Grid.ColumnDefinitions>
    <Button Grid.Column="1" Background="White">
      <Polygon Stroke="Black" Fill="Black"
        Points="20 20, 270 20, 190 130"/>
    </Button>
  </Grid>
</UserControl>
```

Version 04: Page.xaml and Page.xaml.cs

Page.xaml:

```
<UserControl x:Class="SL_intro1.Page"
  xmlns="http://schemas.microsoft.com/client/2007"
  xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
  Width="380" Height="150"
  x:Name="user_control">
  <Grid Background="Cornsilk">
    <Grid.ColumnDefinitions>
      <ColumnDefinition Width="90"/>
    </Grid.ColumnDefinitions>
    <Button x:Name="draw_area" Grid.Column="1" Background="White"
      Padding="0,0,8,8" Loaded="on_draw_area_loaded">
      <Polygon x:Name="polygon" Stroke="Black" Fill="Black"/>
    </Button>
  </Grid>
</UserControl>
```

Page.xaml.cs:

```
using System;
using System.Windows;
using System.Windows.Controls;
using System.Windows.Shapes;
namespace SL_intro1
{ public partial class Page : UserControl
    { Random r = new Random();
      int no_of_polygon_points = 100;
      double w, h;
      public Page()
      { InitializeComponent(); }
      private void on_draw_area_loaded( object sender, EventArgs e )
      { draw_area.Width = user_control.Width - 90;
        draw_area.Height = user_control.Height ;
        w = draw_area.Width - draw_area.Padding.Left
          - draw_area.Padding.Right;
        h = draw_area.Height - draw_area.Padding.Top
          - draw_area.Padding.Bottom;
        for ( int i=0; i < no_of_polygon_points; i++ )
            polygon.Points.Add( new Point( w * r.NextDouble(),
                                             h * r.NextDouble() ) );
      }
    }
}
```

Version 05: Page.xaml and Page.xaml.cs

Page.xaml:

```
<UserControl x:Class="SL_intro1.Page"
    xmlns="http://schemas.microsoft.com/client/2007"
    xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
    Width="380" Height="380" x:Name="user_control">
    <Grid Background="Cornsilk">
        <Grid.ColumnDefinitions>
            <ColumnDefinition Width="90"/>
            <ColumnDefinition/>
        </Grid.ColumnDefinitions>
        <Button x:Name="draw_area" Grid.Column="1" Background="White"
            Padding="0,0,8,8" Loaded="on_draw_area_loaded">
            <Polygon x:Name="polygon" Stroke="Black" Fill="Black"/>
        </Button>
        <StackPanel Grid.Column="0" Orientation="Vertical" Margin="3">
            <Button x:Name="start_button" Content="Start" Click="on_start_button_click"/>
            <Button x:Name="stop_button" Content="Stop" Click="on_stop_button_click"/>
            <Button x:Name="clear_button" Content="Clear" Click="on_clear_button_click"/>
        </StackPanel>
    </Grid>
</UserControl>
```

Page.xaml.cs:

```
using System;
using System.Windows;
using System.Windows.Controls;
using System.Windows.Shapes;
using System.Windows.Media;
using System.Windows.Threading;
namespace SL_intro1
{
    public partial class Page : UserControl
    {
        Random r = new Random(); int no_of_polygon_points = 100;
        DispatcherTimer timer = new DispatcherTimer(); double w, h;
        public Page()
        {
            InitializeComponent();
            timer.Tick += new EventHandler(on_timer);
        }
        private void on_draw_area_loaded(object sender, EventArgs e)
        {
            draw_area.Width = user_control.Width - 90;
            draw_area.Height = user_control.Height ;
            w = draw_area.Width - draw_area.Padding.Left - draw_area.Padding.Right;
            h = draw_area.Height - draw_area.Padding.Top - draw_area.Padding.Bottom;
            for ( int i=0; i < no_of_polygon_points; i++ )
                polygon.Points.Add( new Point( w*r.NextDouble(), h*r.NextDouble() ) );
        }
        private void on_start_button_click(object sender, EventArgs e)
        {
            timer.Start();
        }
        private void on_stop_button_click(object sender, EventArgs e)
        {
            timer.Stop();
        }
        private void on_clear_button_click(object sender, EventArgs e)
        {
            timer.Stop();
            draw_area.Content = null;
        }
        public void on_timer(object sender, EventArgs e)
        {
            int i = r.Next( no_of_polygon_points );
            polygon.Points.RemoveAt(i);
            polygon.Points.Insert( i, new Point( w * r.NextDouble(),
                                                    h * r.NextDouble() ) );

            draw_area.Content = 0;
            draw_area.Content = polygon;
        }
    }
}
```

Version 06: Page.xaml and Page.xaml.cs

Page.xaml:

Remove the last three lines `</StackPanel>`, `</Grid>` and `</UserControl>` from `Page.xaml` Version 05 and replace them by:

```
<TextBlock Text="Speed" FontSize="10" HorizontalAlignment="Center"/>
<Slider x:Name="time_interval_slider"
        Minimum="0" Maximum="1000" Value="0"
        ValueChanged="on_time_interval_slider_value_changed"
        IsDirectionReversed="True"/>
<TextBlock Text="Opacity" FontSize="10" HorizontalAlignment="Center"/>
<Slider x:Name="opacity_slider" Minimum="0" Maximum="1" Value="1"
        ValueChanged="on_opacity_slider_value_changed" />
<StackPanel Height="10" />
<StackPanel Background="red" >
    <Slider x:Name="red_slider" Minimum="0" Maximum="255" Value="0"
            ValueChanged="on_color_slider_value_changed" />
</StackPanel>
<StackPanel Background="green" >
    <Slider x:Name="green_slider" Minimum="0" Maximum="255" Value="0"
            ValueChanged="on_color_slider_value_changed" />
</StackPanel>
<StackPanel Background="blue" >
    <Slider x:Name="blue_slider" Minimum="0" Maximum="255" Value="0"
            ValueChanged="on_color_slider_value_changed" />
</StackPanel>
<StackPanel Height="10" />
<TextBlock x:Name="textblock_polygon_points" Text="Vertices: 100"
            FontSize="10" HorizontalAlignment="Center" />
<Slider x:Name="no_of_polygon_points_slider"
        Minimum="3" Maximum="200" Value="100"
        ValueChanged="on_no_of_polygon_points_slider_value_changed"/>
</StackPanel>
</Grid>
</UserControl>
```

Page.xaml.cs:

Remove the last two lines with the last two brackets `}"` from `Page.xaml.cs` Version 05 and replace them by:

```
public void on_time_interval_slider_value_changed
    ( object sender, EventArgs e )
{ int milliseconds = (int)time_interval_slider.Value ;
  timer.Interval = new TimeSpan(0, 0, 0, 0, milliseconds ) ;
}
public void on_opacity_slider_value_changed
    ( object sender, EventArgs e )
{ try {
  polygon.Stroke.Opacity = opacity_slider.Value;
  polygon.Fill.Opacity   = opacity_slider.Value;
} catch {}
}
public void on_color_slider_value_changed
    ( object sender, EventArgs e )
{ SolidColorBrush brush = (SolidColorBrush)polygon.Fill;
  Color c = brush.Color;
  switch ( ((Slider)sender).Name )
  { case "red_slider"   : c.R = (byte)red_slider .Value; break;
    case "green_slider": c.G = (byte)green_slider.Value; break;
    case "blue_slider"  : c.B = (byte)blue_slider .Value; break;
  }
  brush = new SolidColorBrush( c );
  polygon.Stroke = polygon.Fill = brush;
  draw_area.Content = 0;
  draw_area.Content = polygon;
}
```

```

        public void on_no_of_polygon_points_slider_value_changed
            ( object sender, EventArgs e )
        { try {
            no_of_polygon_points = (int)no_of_polygon_points_slider.Value;
            textblock_polygon_points.Text = "Vertices: " +
                no_of_polygon_points.ToString();

            polygon.Points.Clear();
            w = draw_area.ActualWidth - 8;
            h = draw_area.ActualHeight - 8;
            for ( int i=0; i < no_of_polygon_points; i++ )
                polygon.Points.Add( new Point( w * r.NextDouble(),
                                                h * r.NextDouble() ) );

            draw_area.Content = 0;
            draw_area.Content = polygon;
        } catch {}
    }
}
}

```

Version 07: Page.xaml and Page.xaml.cs

Page.xaml:

Remove the last three lines </StackPanel>, </Grid> and </UserControl> from Page.xaml Version 06 and replace them by:

```

<StackPanel Height="10" />
<RadioButton Content="Wire Frame"
               Click="on_radio_button_fill_mode_wire_frame_click"/>
<RadioButton Content="Filled" IsChecked="True"
               Click="on_radio_button_fill_mode_filled_click"/>

</StackPanel>
</Grid>
</UserControl>

```

Page.xaml.cs:

Remove the last two lines with the last two brackets "}" from

Page.xaml.cs Version 06 and replace them by:

```

        public void on_radio_button_fill_mode_wire_frame_click
            ( object sender, EventArgs e )
        { polygon.Fill = draw_area.Background;
          draw_area.Content = 0;
          draw_area.Content = polygon;
        }
        public void on_radio_button_fill_mode_filled_click
            ( object sender, EventArgs e )
        { polygon.Fill = polygon.Stroke;
          draw_area.Content = 0;
          draw_area.Content = polygon;
        }
    }
}
}

```