



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 3, Examination in Engineering, July 2017

Module Number: EE3204 Module Name: GUI Programming
Part - II
[2 hours]

[Answer all questions, each question carries 5 marks]

Q1. a) What are the advantages of using XAML in WPF and Universal Windows Platform Applications?

[1 mark]

b) Figure Q1.b, shows a layout in WPF. Explain how to create similar layout using XAML.

[2 marks]

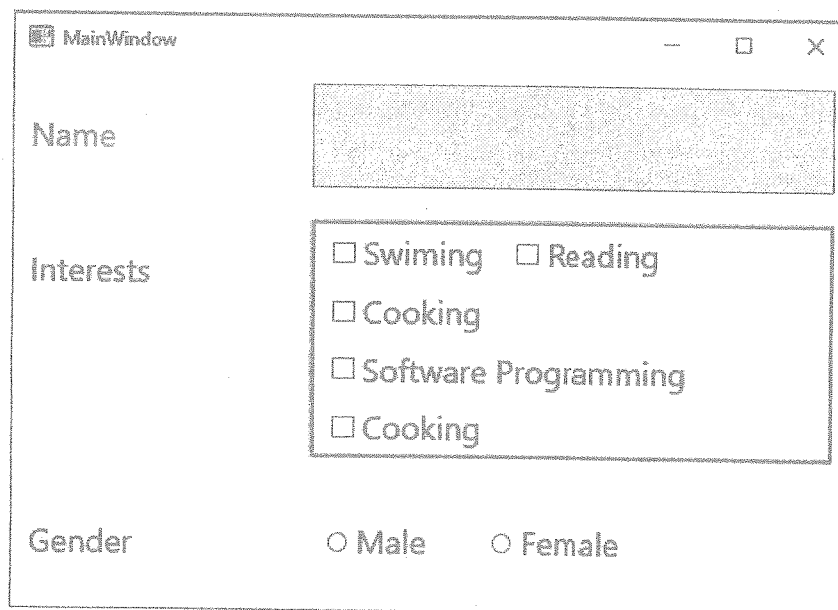


Figure Q1.b: Simple layout example with custom controls

c) Figure Q1.c, shows a layout in WPF. Explain how to create similar layout using XAML.

[2 marks]

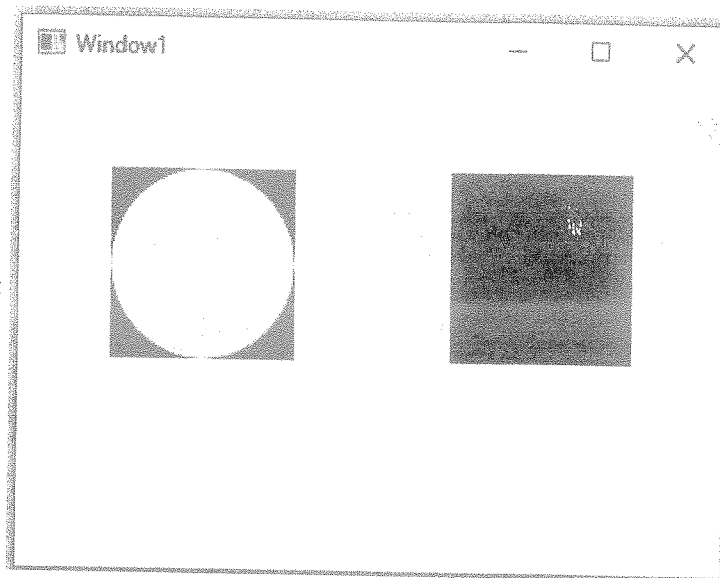


Figure Q1.c: Simple layout example with custom controls

Q2. a) a) Following methods can be found in a UWP application. Person class contains properties Name, Age and Address.

[3 marks]

- i) Explain when this method is called and functionality of the following code segment.

Listing 1: C# Code

```
protected override void OnNavigatedTo(NavigationEventArgs e)
{
    base.OnNavigatedTo(e);
    person = (Person)e.Parameter;
    this.DataContext = person;
}
```

- ii) Explain the functionality of the following code segment.

Listing 2: C# Code

```
private void Button_Click(object sender, RoutedEventArgs e)
{
    if (Frame.CanGoBack)
    {
        Frame.GoBack();
    }
}
```

- iii) Explain the functionality of the following code segment. Here the list view data context is set to a list of Person objects.

Listing 3: C# Code

```
private void ListView_ItemClick(object sender,
    ItemClickEventArgs e)
{
    var person = (Person)e.ClickedItem;
    ResultTextBlock.Text = "You Selected: " + person.Name;
    Frame.Navigate(typeof(Page21), person);
}
```

- b) What are the main differences between WPF and Universal Windows Platform (UWP) application. [1 marks]
- c) Draw the output of the following layout.

Listing 4: C# Code

```
<RelativePanel MinHeight="300">
    <Rectangle Name="RedRectangle" Fill="Red"
        Width="100" Height="100"
        RelativePanel.AlignRightWithPanel="True"/>
    <Rectangle Fill="Blue" Name="BlueRectangle"
        Width="50" Height="50"
        RelativePanel.LeftOf="RedRectangle"/>
    <Rectangle Fill="Green" Name="GreenRectangle"
        MinWidth="50" MinHeight="50"
        RelativePanel.AlignVerticalCenterWith="RedRectangle"
        RelativePanel.AlignHorizontalCenterWithPanel="True"/>
    <Rectangle Name="YellowRectangle"
        Fill="Yellow"
        MinHeight="50" MinWidth="50"
        RelativePanel.AlignBottomWithPanel="True"
        RelativePanel.AlignTopWith="PurpleRectangle"/>

    <Rectangle Name="PurpleRectangle"
        Fill="Purple"
        MinHeight="50" MinWidth="50"
        RelativePanel.Below="RedRectangle"
        RelativePanel.AlignRightWith="RedRectangle"
        RelativePanel.AlignLeftWith="GreenRectangle"/>
</RelativePanel>
```

[1 marks]

- Q3. a) Following code segment shows a Grid layout. We need to display the text of the TextBox in the TextBlock and change the font size of the TextBlock according to the value of the Slider. How would you do this using only XAML?

[2 marks]

```
<Grid>
  <Grid.RowDefinitions >
    <RowDefinition Height="40px" />
    <RowDefinition Height="40px" />
    <RowDefinition Height="*" />
  </Grid.RowDefinitions>
  <Slider Name="FontSizeSlider" Minimum="5"
    Maximum="100" Value="10" Grid.Row="0" />
  <TextBox Name="SizeTextBox"
    Grid.Row="1"/>
  <TextBlock Text="Example 01" Grid.Row="2"/>
</Grid>
```

- b) Explain the MVVM pattern used in the WPF applications?

[1.5 marks]

- c) What is the use of INotifyPropertyChanged?

[1.5 marks]

- Q4. a) Explain the following element positioning methods found in CSS using CSS code snippets and diagrams.

- i) Relative positioning.
- ii) Absolute positioning.

[2 marks]

- b) Explain each CSS rule and draw how the output of HTML/CSS code snippet in Listings 5 renders in the browser.

[3 marks]

Listing 5: HTML/CSS page example

```
<!DOCTYPE html>
<html>
  <head>
    <style>
      ul {
        list-style-type: none;
        margin: 0;
        padding: 0;
      }
    </style>
  </head>
  <body>
    <ul>
      <li></li>
    </ul>
  </body>
</html>
```

```

        overflow: hidden;
        background-color: black;
    }

    li {
        float: left;
    }

    li a {
        display: block;
        color: white;
        text-align: center;
        padding: 14px 16px;
        text-decoration: none;
    }

    li a:hover {
        background-color: gray;
    }
</style>
</head>
<body>

<ul>
    <li><a class="active" href="#home">Home</a></li>
    <li><a href="#news">News</a></li>
    <li><a href="#contact">Contact</a></li>
    <li><a href="#about">About</a></li>
</ul>

</body>
</html>

```

Q5. a) Why are layout panels needed for in WPF?

[1 marks]

b) Explain how following Layout panels arrange elements.

- i) DockPanel
- ii) Canvas
- iii) Grid
- iv) StackPanel

[2 marks]

c) Draw the output of the following XAML code.

```
<DockPanel LastChildFill="True">
  <Menu DockPanel.Dock="Top" Height="25" FontSize="15">
    <MenuItem Header="File" >
      <MenuItem Header="New" />
      <MenuItem Header="Open" />
    </MenuItem>
    <MenuItem Header="Edit" />
    <MenuItem Header="Draw">
      <MenuItem Header="ChangeColor" />
    </MenuItem>
    <MenuItem Header="Help" />
  </Menu>
  <Button DockPanel.Dock="Bottom" Height="20"
  HorizontalAlignment="Stretch" x:Name="btnFooter">

  <DockPanel LastChildFill="False" HorizontalAlignment="Stretch
  "
  Width="{Binding ActualWidth, ElementName=btnFooter}">
    <TextBlock Text="Ready" Width="40" DockPanel.Dock="Left"
    Margin="5 0" />
    <TextBlock Text="08.25" Width="30" DockPanel.Dock="Right"
    Margin="5 0" />
  </DockPanel>
</Button>
<Canvas Background="Pink">
  <Rectangle Width="100" Height="50" Fill="Yellow"
  Canvas.Left="40" Canvas.Top="50" />
  <Ellipse Width="50" Height="100" Fill="Green"
  Canvas.Right="200" Canvas.Top="100" />
</Canvas>
</DockPanel>
```

[2 marks]