Part I. Graphical User Interface Design

Overview

Table

Description automatically generated

Part C

Part B

Part A

The GUI contains 3 parts

1. **TextBlock**

To show the game rules

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| <TextBlock x:Name="Gamerule" HorizontalAlignment="Center" Height="120" Margin="0,10,0,0" TextWrapping="Wrap" VerticalAlignment="Top" Width="380" Grid.RowSpan="2"><Run Text="Game Rule:"/><LineBreak/><Run Text="1. "/><Run Text="Turn over two cards at each time"/><LineBreak/><Run Text="2. The cards remains open if the cards are the same"/><LineBreak/><Run Text="3."/><Run Text=" The game is won when all cards are turned."/><LineBreak/><LineBreak/><Run/></TextBlock> |

1. Button

To start or reset the game. The button is associated with public class Start\_button\_Click

|  |
| --- |
| <Button x:Name="Start\_button" Content="Start" HorizontalAlignment="Left" Height="30" Margin="10,72,0,0" VerticalAlignment="Top" Width="100" Grid.Row="1" FontSize="20" Click="Start\_button\_Click"/> |

1. WrapPanel contains buttons

To set up a list of buttons for showing contents for matching. Initially, the content of buttons are set to “?”

|  |
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| 1. <WrapPanel HorizontalAlignment="Center" Height="300" Margin="0,154,0,0" VerticalAlignment="Top" Width="240" Name="wrapPanel" Grid.Row="1"> 2. <Button x:Name="Label1" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red" BorderThickness="1,1,1,1"/> 3. <Button x:Name="Label2" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red" BorderThickness="1,1,1,1"/> 4. <Button x:Name="Label3" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red" BorderThickness="1,1,1,1"/> 5. <Button x:Name="Label4" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red" BorderThickness="1,1,1,1"/> 6. <Button x:Name="Label5" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red" BorderThickness="1,1,1,1"/> 7. <Button x:Name="Label6" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red" BorderThickness="1,1,1,1"/> 8. <Button x:Name="Label7" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red" BorderThickness="1,1,1,1"/> 9. <Button x:Name="Label8" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red" BorderThickness="1,1,1,1"/> 10. <Button x:Name="Label9" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red" BorderThickness="1,1,1,1"/> 11. <Button x:Name="Label10" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red" BorderThickness="1,1,1,1"/> 12. <Button x:Name="Label11" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red" BorderThickness="1,1,1,1"/> 13. <Button x:Name="Label12" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red" BorderThickness="1,1,1,1"/> 14. <Button x:Name="Label13" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red" BorderThickness="1,1,1,1"/> 15. <Button x:Name="Label14" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red" BorderThickness="1,1,1,1"/> 16. <Button x:Name="Label15" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red" BorderThickness="1,1,1,1"/> 17. <Button x:Name="Label16" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red" BorderThickness="1,1,1,1"/> 18. <Button x:Name="Label17" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red" BorderThickness="1,1,1,1"/> 19. <Button x:Name="Label18" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red"/> 20. <Button x:Name="Label19" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red"/> 21. <Button x:Name="Label20" Content="?" Height="60" Width="60" HorizontalAlignment="Center" VerticalAlignment="Center" FontSize="40" Background="#FFB8B1EC" BorderBrush="Red"/> 22. </WrapPanel> |

Part II. C# Programming

1. Set the environment to apply for the programming in .NET

Graphical user interface, text, application

Description automatically generated

1. Put all class in the public partial class MainWindow : Window inside namespace Matching\_Pair\_Game

Graphical user interface, text, application

Description automatically generated

1. A class to set buttons under wrappanel functional

Graphical user interface, text, application

Description automatically generated

1. The main functions of the game are contained in class MatchingPairGame

Text

Description automatically generated

List icons is to collect the string for comparing in the game. The list contains 10 pairs of string.

Buttons.Tag is to save each string assigned in the button.

Graphical user interface, application

Description automatically generated

1. Reset() randomly assigns a string to each button for matching. String[] symbol is created with “symbol + 1” + “symbol + 2” pair format to make them unique in the list. So, there will be no collision between each string in the List icons.

A picture containing text

Description automatically generated

1. Text

   Description automatically generated

When the first button is flipped, it is saved as firstClick. The second button is saved as secondClick. Call the checkwin() function to set whether the two buttons flipped contain the same content. The function is called when two buttons are flipped for each time.

1. Text

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|  |  |
| --- | --- |
| If the two buttons flipped are the same, the two buttons stayed opening. Add one to the counter for counting the number of pairs matched. | Table  Description automatically generated |
| Else, a message box is popped up to show the message of wrong. The pair are closed and return to “?”. | Text, table  Description automatically generated |
| When 10 pairs are matched, it means the player win the game. The message box to show “You win!” is popped up to congratulate the player. | Text, table  Description automatically generated |

1. When the “Start” button is clicked, the game is reset.

Table

Description automatically generated