

五專資工三甲

視窗程式設計

SB060024

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題目

請設計一個視窗程式，讓使用者輸入三個數值後，判斷此三個數值是否可以構成三角形。你的程式必須滿足以下要求。

- 三個 TextBox 來輸入三個邊長，如果某個輸入邊長不是數值(使用 `Double.TryParse` 方法)，或是數值小於 0 則顯示訊息方塊要求使用者重新輸入。
- 一個 Label 元件用來呈現此三個數值是否可以構成三角形。舉例如果三邊長 5, 6, 7 可構成三角形，則將此 Label 背景顏色設為綠色，並顯示"邊長 5, 6, 7 可構成三角形；否則將 Label 背景顏色設為紅色，並顯示"邊長 3, 4, 8 不可構成三角形"。
- 設計一個 Triangle 類別來儲存三角形資訊。屬性為三個 double 變數用來儲存三邊長資訊，以及一個 bool 變數用來儲存此三邊長是否可構成三角形。以 `List<Triangle>` 型態來產生 triangles 物件，用以儲存所有判斷的三角形，並將所有的測試過程顯示於一個 TextBlock 元件上。

請將你的 cs, xaml 與執行畫面放在作業內，並以你的學號當作 pdf 檔名繳交作業。

```
1 using System;
2 using System.Collections.Generic;
3 using System.Linq;
4 using System.Text;
5 using System.Threading.Tasks;
6 using System.Windows;
7
8 namespace TriangleCheck
9 {
10     internal class Triangle
11     {
12         public double side1 { get; set; }
13         public double side2 { get; set; }
14         public double side3 { get; set; }
15         public string message { get; set; }
16     }
17 }
18
```

```
1 using System;
2 using System.Collections.Generic;
3 using System.Linq;
4 using System.Text;
5 using System.Threading.Tasks;
6 using System.Windows;
7 using System.Windows.Controls;
8 using System.Windows.Data;
9 using System.Windows.Documents;
10 using System.Windows.Input;
11 using System.Windows.Media;
12 using System.Windows.Media.Imaging;
13 using System.Windows.Navigation;
14 using System.Windows.Shapes;
15
16 namespace TriangleCheck
17 {
18     /// <summary>
19     /// Interaction logic for MainWindow.xaml
20     /// </summary>
21     public partial class MainWindow : Window
22     {
23         List<Triangle> triangles = new List<Triangle>();
24         public MainWindow()
25         {
26             InitializeComponent();
27         }
28
29         private void TextBox_TextChanged(object sender,           ↗
30             TextChangedEventArgs e)
31         {
32         }
33
34
35         private void buttonClick(object sender, RoutedEventArgs e)
36         {
37             isTriangle();
38         }
39
40         private void isTriangle()
41         {
42             double number1, number2, number3;
43             bool success1 = double.TryParse(triangleInput1.Text, out   ↗
44                 number1);
45             bool success2 = double.TryParse(triangleInput2.Text, out   ↗
46                 number2);
47             bool success3 = double.TryParse(triangleInput3.Text, out   ↗
48                 number3);
49             outputBlock.Text = "";
50             if (success1 && success2 && success3)
51             {
52                 if (number1 > 0 && number2 > 0 && number3 > 0 && number1 ↗
```

```
+ number2 > number3 && number2 + number3 > number1 &&
number1 + number3 > number2)

50     {
51         triangles.Add(new Triangle { side1 = number1, side2
= number2, side3 = number3, message = "可以形成三角
形!" });
52         resultOutput.Background = Brushes.Green;
53         resultOutput.Text = $"{number1}、{number2}、{number3}
可以形成三角形!";
54     }
55     else
56     {
57         triangles.Add(new Triangle { side1 = number1, side2
= number2, side3 = number3, message = "無法形成三角
形!" });
58         resultOutput.Background = Brushes.Red;
59         resultOutput.Text = $"{number1}、{number2}、{number3}
無法形成三角形!";
60     }
61 }
62 else
63 {
64     MessageBox.Show("請輸入大於0的數字哦!");
65 }
66 foreach (Triangle triangle in triangles)
67 {
68     outputBlock.Text += $"{triangle.side1}、
{triangle.side2}、{triangle.side3}、{triangle.message}
\n";
69 }
70 }
71 }
72 }
73 }
```

```

<Window x:Class="TriangleCheck.MainWindow"
    xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
    xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
    xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
    xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
    xmlns:local="clr-namespace:TriangleCheck"
    mc:Ignorable="d"
    Title="MainWindow" Height="450" Width="800">
    <Grid Margin="4,0,-4,0" Background="#FFC3C3C3">
        <TextBox x:Name="triangleInput1" HorizontalAlignment="Left"
            Margin="60,108,0,0" TextWrapping="Wrap" VerticalAlignment="Top"
            Width="315" Height="37" TextChanged="TextBox_TextChanged"
            Background="#FFE4E4E4" FontFamily="Cascadia Code" FontSize="22"/>
        <TextBox x:Name="triangleInput2" HorizontalAlignment="Left"
            Margin="60,166,0,0" TextWrapping="Wrap" VerticalAlignment="Top"
            Width="316" Height="39" TextChanged="TextBox_TextChanged"
            Background="#FFE4E4E4" FontFamily="Cascadia Code" FontSize="22"/>
        <TextBox x:Name="triangleInput3" HorizontalAlignment="Left"
            Margin="61,225,0,0" TextWrapping="Wrap" VerticalAlignment="Top"
            Width="315" Height="38" TextChanged="TextBox_TextChanged"
            Background="#FFE4E4E4" FontFamily="Cascadia Code" FontSize="22"/>
        <TextBlock x:Name="resultOutput" TextWrapping="Wrap" Padding="6"
            Margin="401,108,64,0" Background="White" TextAlignment="Center"
            VerticalAlignment="Top" FontFamily="Cascadia Code" FontSize="18" />
        <ScrollViewer VerticalScrollBarVisibility="Auto"
            Margin="401,186,64,96" FontFamily="Cascadia Code">
            <TextBlock x:Name="outputBlock" Padding="12" TextWrapping="Wrap"
                Width="337" Background="White" FontSize="16"
                FontFamily="Cascadia Code"/>
        </ScrollViewer>

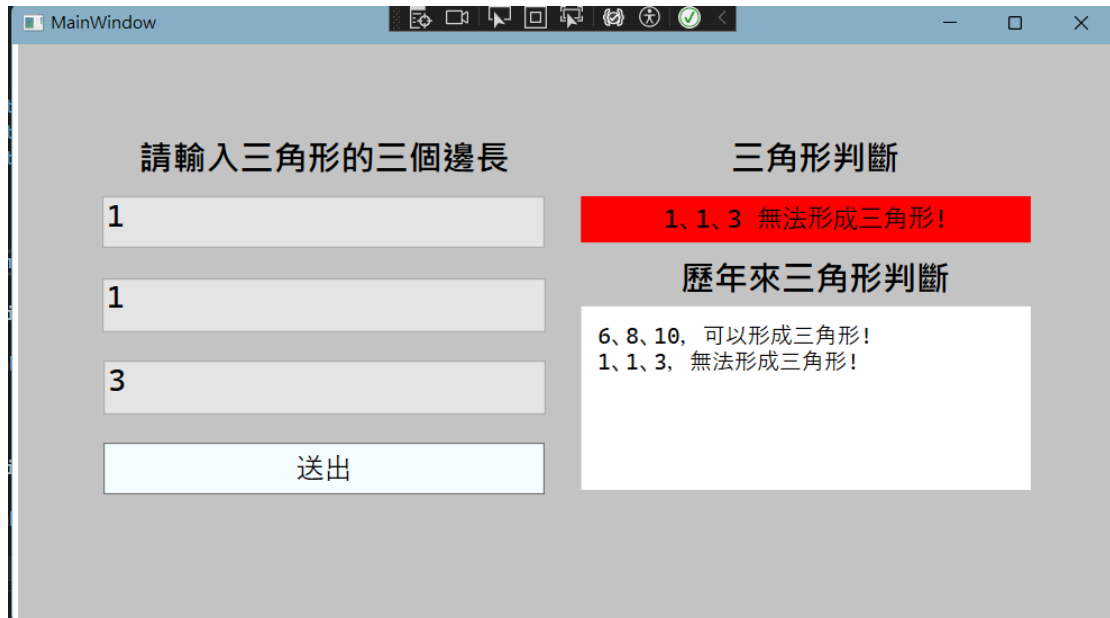
        <Button Content="送出" HorizontalAlignment="Left"
            Margin="61,283,0,0" VerticalAlignment="Top" Height="37"
            Width="314" FontSize="20" Click="buttonClick" FontFamily="Cascadia
            Code" Background="#FFF4FDFF"/>
        <TextBlock HorizontalAlignment="Left" Margin="86,67,0,0"
            TextWrapping="Wrap" VerticalAlignment="Top" FontSize="24"
            FontFamily="Cascadia Code SemiBold"><Run Language="zh-tw" Text="請
            輸入三角形的三個邊長"/></TextBlock>
        <TextBlock HorizontalAlignment="Left" Margin="508,67,0,0"
            TextWrapping="Wrap" VerticalAlignment="Top" FontSize="24"
            FontFamily="Cascadia Code SemiBold"><Run Language="zh-tw" Text="三
            角形判斷"/></TextBlock>
        <TextBlock HorizontalAlignment="Left" Margin="472,153,0,0"
            TextWrapping="Wrap" VerticalAlignment="Top" FontSize="24"
            FontFamily="Cascadia Code SemiBold"><Run Language="zh-tw" Text="歷

```

</Window>

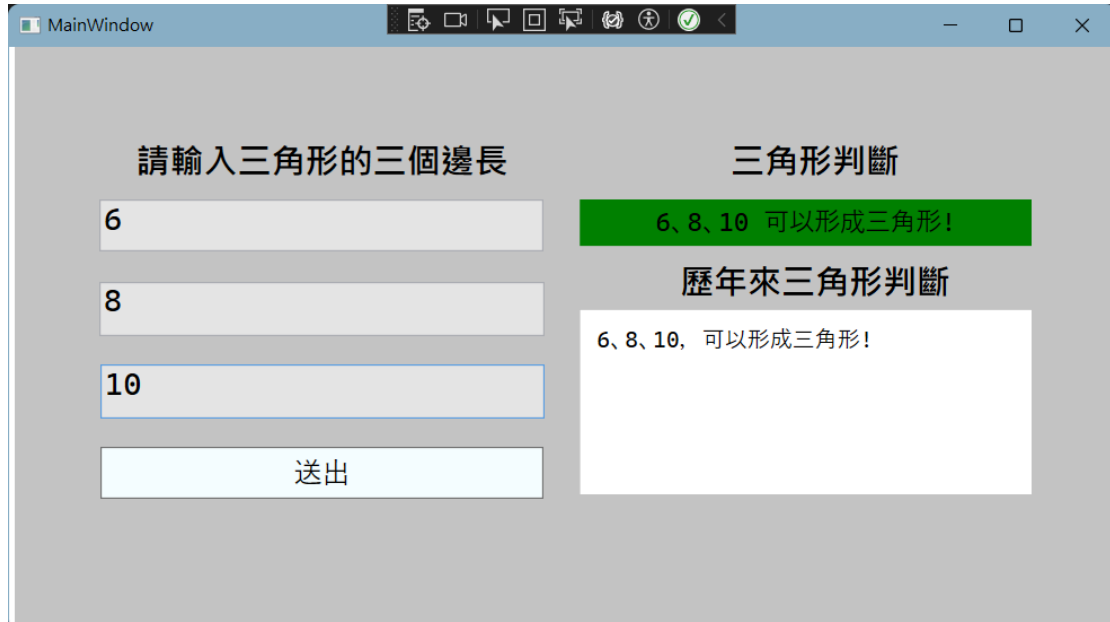
輸出結果：

1. 失敗結果



The screenshot shows a window titled "MainWindow" with a light gray background. On the left, under the heading "請輸入三角形的三個邊長" (Please enter the three sides of a triangle), there are three input fields containing the values "1", "1", and "3". Below these fields is a light blue button labeled "送出" (Submit). On the right, under the heading "三角形判斷" (Triangle Judgment), there is a red rectangular box containing the text "1、1、3 無法形成三角形!" (1, 1, 3 cannot form a triangle!). Below this, under the heading "歷年來三角形判斷" (Triangle Judgment in Past Years), there is a white box containing the text "6、8、10, 可以形成三角形!" (6, 8, 10 can form a triangle!) and "1、1、3, 無法形成三角形!" (1, 1, 3 cannot form a triangle!).

2. 成功結果



The screenshot shows the same "MainWindow" window. The input fields on the left now contain the values "6", "8", and "10". The "送出" (Submit) button is still present. On the right, under the heading "三角形判斷" (Triangle Judgment), there is a green rectangular box containing the text "6、8、10 可以形成三角形!" (6, 8, 10 can form a triangle!). Below this, under the heading "歷年來三角形判斷" (Triangle Judgment in Past Years), there is a white box containing the text "6、8、10, 可以形成三角形!" (6, 8, 10 can form a triangle!).

3. Scroll 滾輪效果

