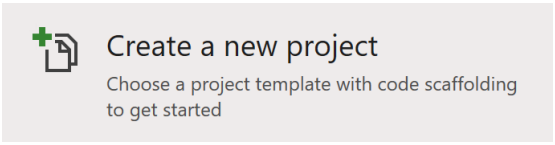
Universal Windows Platform – Cards Game

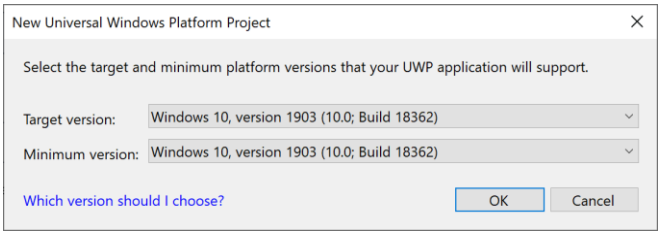
Cards Game shows how to create the look-and-feel of some **Playing Cards** and to see if it's possible to match a pair based on their face value in the game also known as **snap**

Step 1



Follow **Setup and Start** on how to Install and/or Get Started with **Visual Studio 2019** if not already or in **Windows 10** choose **Start**, find and select **Visual Studio 2019** then from the **Get started** screen select **Create a new project**

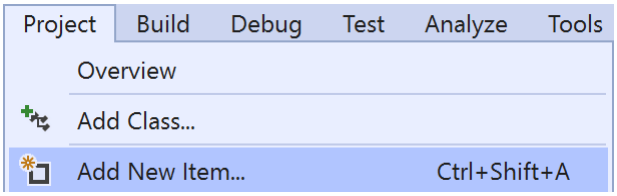
Then choose **Blank App (Universal Windows)** and select **Next** and then in **Configure your new project** enter the **Project name** as **CardsGame** and select **Create**



Finally, in **New Universal Windows Platform Project** pick the **Target version** and **Minimum version** to be at least **Windows 10, version 1903 (10.0; Build 18362)** and then select **OK**

Target Version will control the most recent features of Windows 10 your application can use. To make sure you always have the most recent version, check for any Notifications or Updates in Visual Studio 2019

Step 2



Choose **Project** then **Add New Item...** from the **Menu** in **Visual Studio 2019**

Step 3

Then choose **Code File** from **Add New Item** in **Visual Studio 2019**, enter the **Name** as **Library.cs** and select **Add**

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Step 4

In the **Code** View of **Library.cs** will be displayed and in this the following should be entered:

```
using System;
using System.Collections.Generic;
using System.Linq;
using Windows.UI;
using Windows.UI.Popups;
using Windows.UI.Xaml;
using Windows.UI.Xaml.Controls;
using Windows.UI.Xaml.Media;

public class Library
{
    private const string title = "Cards Game";
    private const string one = "one";
    private const string two = "two";
    private const int clubs = 127184;
    private const int diamonds = 127168;
    private const int hearts = 127152;
    private const int spades = 127136;
    private const int maximum = 52;
    private const int amount = 13;
    private readonly Dictionary<int, int> _suits =
        new Dictionary<int, int>()
    {
        { 1, clubs },
        { 14, diamonds },
        { 28, hearts },
        { 40, spades },
    };
    private readonly List<int> _faces = new List<int>()
    {
       14, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14
    };

    private int _first, _second;
    private int _score, _counter;
    private int _cardOne, _cardTwo;
    private List<int> _deckOne = new List<int>();
    private List<int> _deckTwo = new List<int>();
    private Random _random = new Random((int)DateTime.Now.Ticks);


}
```

There are `using` statements to include necessary functionality. `_suits` is a `Dictionary<int, int>` is a two-dimensional array of values that will represent the suit of a card and `_faces` is a `List<int>` which will represent the face of a card and `Random` is used to create the numbers for the cards

Then below the **`private Random _random = new Random((int)DateTime.UtcNow.Ticks);`** line the following **methods** should be entered:

```
public void Show(string content, string title)
{
    _ = new MessageDialog(content, title).ShowAsync();
}

private List<int> Choose(int total)
{
    return Enumerable.Range(1, total)
    .OrderBy(r => _random.Next(0, total)).ToList();
}
```

`Show` method is used to display a basic `MessageDialog` and `Choose` method pick a set of random numbers

Below **`private void Choose(...) { ... }` method** the following **method** should be entered:

```
private Viewbox Face(int face, Color fill)
{
    TextBlock textblock = new TextBlock()
    {
        IsColorFontEnabled = true,
        Text = char.ConvertFromUtf32(face),
        TextLineBounds = TextLineBounds.Tight,
        Foreground = new SolidColorBrush(fill),
        FontFamily = new FontFamily("Segoe UI Emoji"),
        HorizontalTextAlignment = TextAlignment.Center
    };
    return new Viewbox()
    {
        Margin = new Thickness(0, 0, 0, 2),
        Child = textblock
    };
}
```

`Face` method is used to create a `TextBlock` which be used for the front and back of a card

After the **`private void Face(...) { ... }` method** the following **method** should be entered:

```
private Viewbox Add(int value, Color? fill = null)
{
    int index = value % amount;
    int suit = _suits.Where(w => value >= w.Key)
        .Select(s => s.Value).LastOrDefault();
    int face = spades;
    if (suit > 0)
    {
        fill = (suit == hearts || suit == diamonds) ?
            Colors.Red : Colors.Black;
        face = suit + _faces[index];
    }
    return Face(face, fill.Value);
}
```

`Add` method is used create the `Face` of a card and will work out which `suit` and `face` it should be

Then after the **`private Viewbox Add()...) { ... }` method** the following **method** should be entered:

```
private void Card(Grid grid, string name, int value, Color fill)
{
    Grid card = new Grid()
    {
        Name = name,
        CornerRadius = new CornerRadius(5),
        Background = new SolidColorBrush(Colors.WhiteSmoke)
    };
    card.Children.Add(Add(value, fill));
    grid.Children.Clear();
    grid.Children.Add(card);
}
```

`Card` method is used to create the layout of a card using a `Grid` and uses the `Add` method

Next after the **`private void Card(...) { ... }` method** the following **method** should be entered:

```
private void Set(Grid grid, string name, int value)
{
    Grid card = (Grid)grid.FindName(name);
    card.Children.Clear();
    card.Children.Add(Add(value));
}
```

`Set` method uses `Add` to create each face of a card based on the given `value`

Then after **`private void Set(...) { ... }` method** the following `public` **method** should be entered:

```
public void New(Grid deckOne, Grid deckTwo)
{
    _score = 0;
    _counter = 0;
    _cardOne = 0;
    _cardTwo = 0;
    _deckOne = Choose(maximum);
    _deckTwo = Choose(maximum);
    Card(deckOne, one, 0, Colors.DarkRed);
    Card(deckTwo, two, 0, Colors.DarkBlue);
}
```

`New` method will select values for each deck using `Choose` and setup layout of each `Grid` using `Card` method

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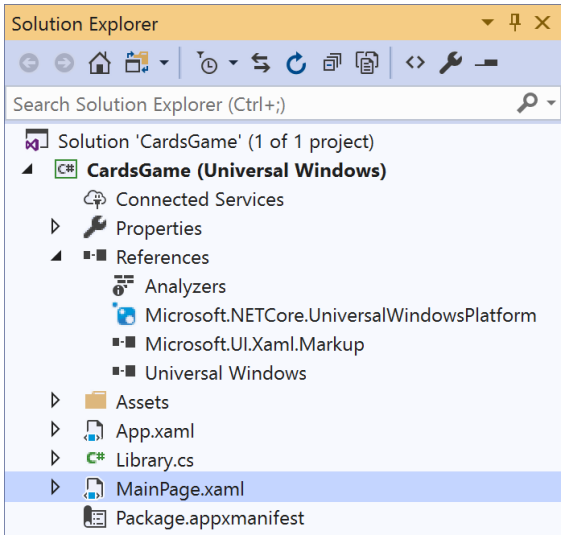
Finally after **`private void New(...) { ...}` method** the following `public` **method** should be entered:

```
public void Play(Grid deckOne, Grid deckTwo)
{
    if (_deckOne != null && _deckTwo != null)
    {
        if (_cardOne < maximum && _cardTwo < maximum)
        {
            _first = _deckOne[_cardOne];
            Set(deckOne, one, _first);
            _cardOne++;
            _second = _deckTwo[_cardTwo];
            Set(deckTwo, two, _second);
            _cardTwo++;
            // Ignore Suit or Face for Match
            if (_first % amount == _second % amount)
            {
                _score++;
                Show("Match!", title);
            }
            _counter++;
        }
        else
        {
            Show($"Game Over! Matched {_score} of {_counter}!", title);
        }
    }
}
```

`Play` method will play the game and will use `Set` to update a card and will then compare the selected ones to see if this is a match or not and if the game is over

Step 5



In the **Solution Explorer** of **Visual Studio 2019** select **MainPage.xaml**

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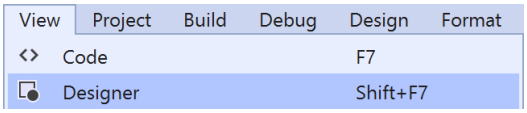
Step 6



Choose **View** then **Designer** from the **Menu** in **Visual Studio 2019**

Step 7

In the **Design** View and **XAML** View of **Visual Studio 2019** will be displayed, and in this between the **Grid** and **/Grid** elements enter the following **XAML**:

```
<Viewbox>
    <Grid>
        <Grid.RowDefinitions>
            <RowDefinition Height="*"/>
            <RowDefinition Height="Auto"/>
            <RowDefinition Height="*"/>
        </Grid.RowDefinitions>
        <Grid.ColumnDefinitions>
            <ColumnDefinition Width="*"/>
            <ColumnDefinition Width="Auto"/>
            <ColumnDefinition Width="*"/>
            <ColumnDefinition Width="Auto"/>
            <ColumnDefinition Width="*"/>
        </Grid.ColumnDefinitions>
        <Grid Name="DeckOne" Margin="50" Grid.Column="1" Grid.Row="1"
        Height="140" Width="100" Tapped="DeckOne_Tapped"/>
        <Grid Name="DeckTwo" Margin="50" Grid.Column="3" Grid.Row="1"
        Height="140" Width="100" Tapped="DeckTwo_Tapped"/>
    </Grid>
</Viewbox>
<CommandBar VerticalAlignment="Bottom">
    <AppBarButton Icon="Page2" Label="New" Click="New_Click"/>
</CommandBar>
```

The first block of XAML the main user interface features a Grid with two Grid Controls within to represent the cards. The second block of XAML is the CommandBar which contains New to reset the game

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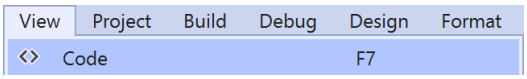
Step 8



Choose **View** then **Code** from the **Menu** in **Visual Studio 2019**

Step 9

Once in the **Code** View, below the end of **`public MainPage() { ... }`** the following Code should be entered:

```
private Library library = new Library();

private void New_Click(object sender, RoutedEventArgs e)
{
    library.New(DeckOne, DeckTwo);
}

private void DeckOne_Tapped(object sender, RoutedEventArgs e)
{
    library.Play(DeckOne, DeckTwo);
}

private void DeckTwo_Tapped(object sender, RoutedEventArgs e)
{
    library.Play(DeckOne, DeckTwo);
}
```

Below the MainPage method an instance of the `Library` class is created. In the `New_Click(...)` Event handler will setup the game with the `New` method, `DeckOne_Tapped(...)` and `DeckTwo_Tapped` will call the `Play` method in the `Library` class

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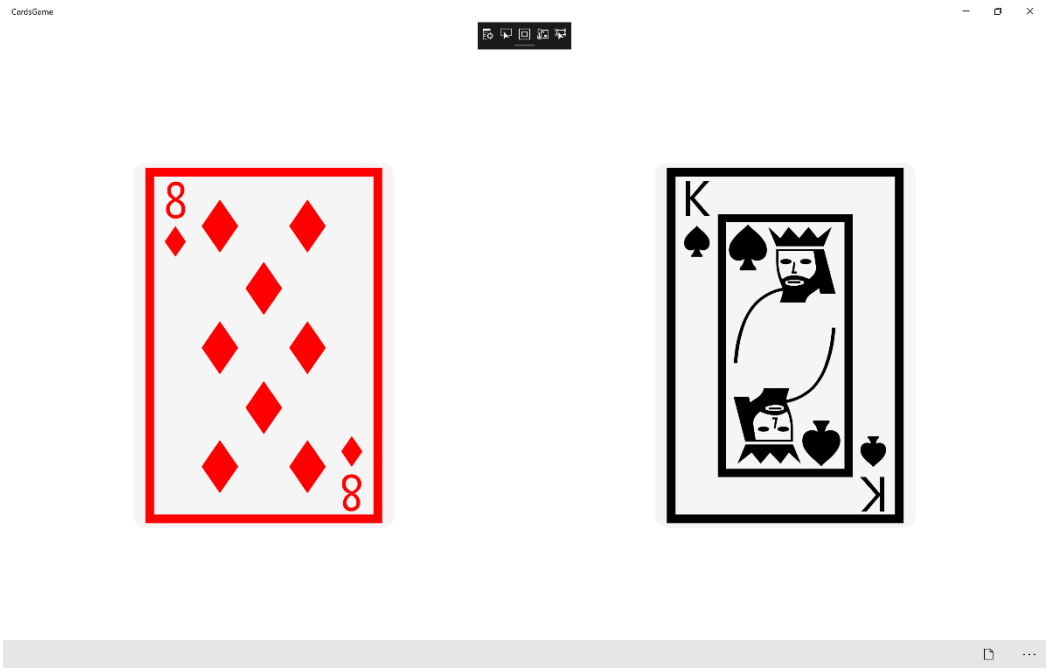
Step 10

That completes the **Universal Windows Platform** Application, in **Visual Studio 2019** select **Local Machine** to run the Application

Step 11

Once the Application is running you can then click the **New**, then Tap on either of the **decks** to show a **card**, match value in both **decks** to score a point, do this until all the **cards** have been displayed



Step 12

To Exit the Application, select the **Close** button in the top right of the Application