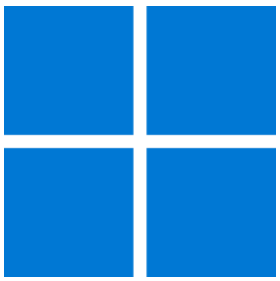
tutorial

Windows App SDK



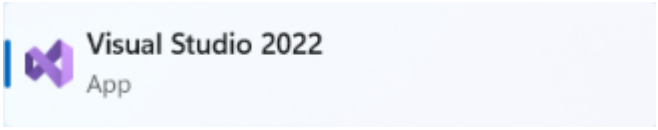
System Backdrops

System Backdrops shows how you can use **`SystemBackdrops`** within the Window of an Application using the **Windows App SDK**.

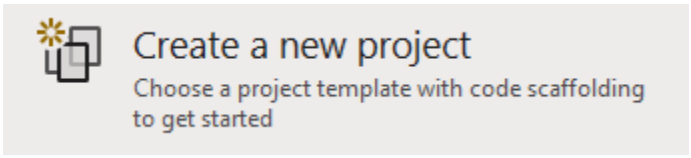
Step 1

Follow **Setup and Start** on how to get **Setup** and **Install** what you need for **Visual Studio 2022** and **Windows App SDK**.

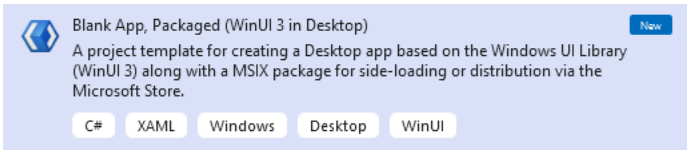
In **Windows 11** choose **Start** and then find or search for **Visual Studio 2022** and then select it.



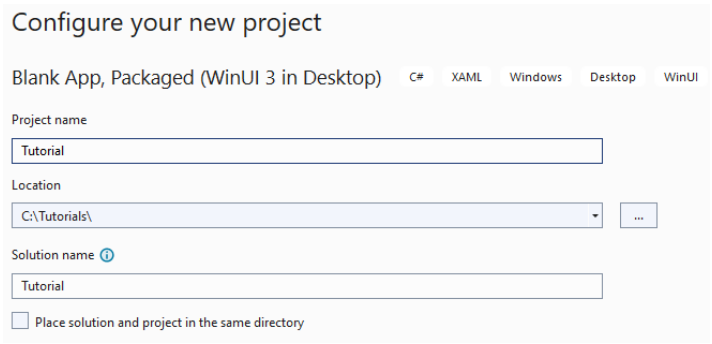
Once **Visual Studio 2022** has started select **Create a new project**.



Then choose the **Blank App, Packages (WinUI in Desktop)** and then select **Next**.

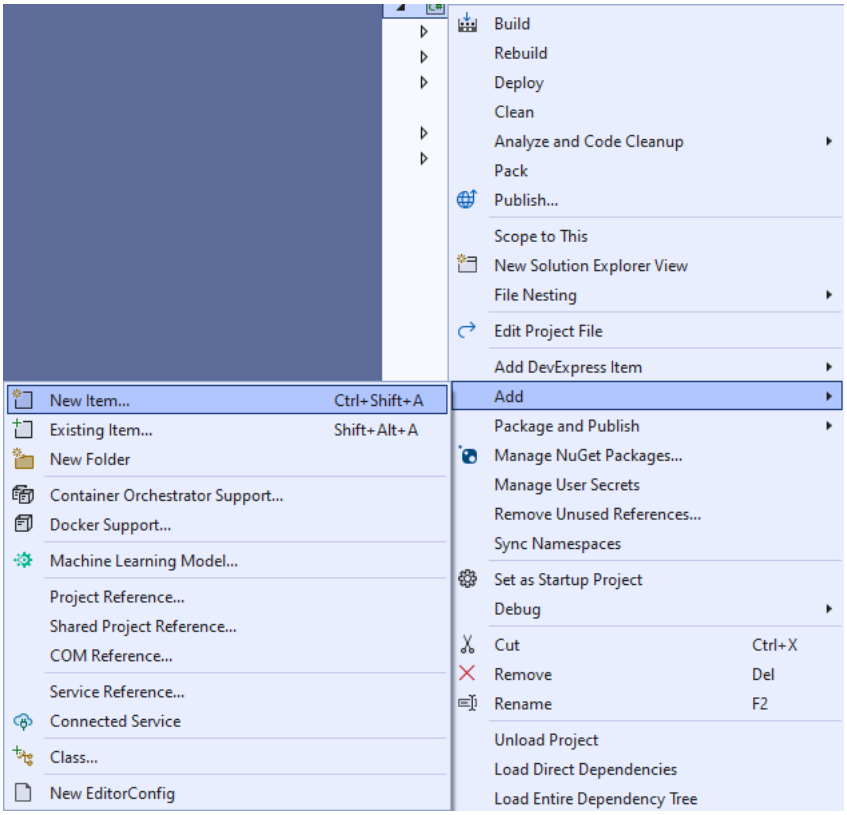


After that in **Configure your new project** type in the **Project name** as *SystemBackdrops*, then select a Location and then select **Create** to start a new **Solution**.



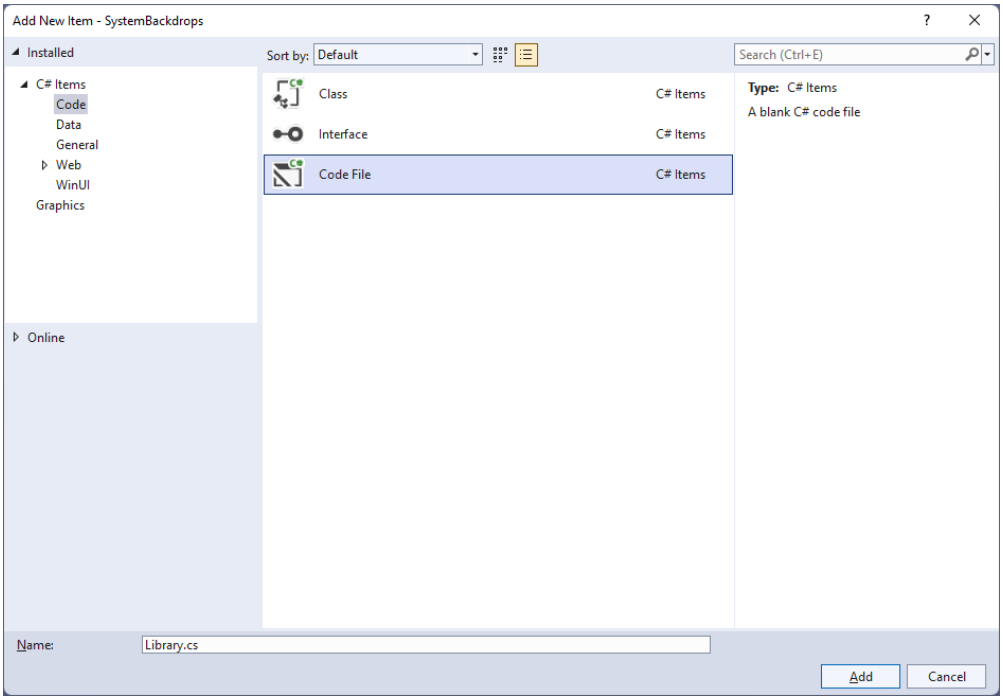
Step 2

Then in **Visual Studio** within **Solution Explorer** for the **Solution**, right click on the **Project** shown below the **Solution** and then select **Add** then **New Item...**



Step 3

Then in **Add New Item** from the **C# Items** list, select **Code** and then select **Code File** from the list next to this, then type in the name of *Library.cs* and then **Click** on **Add**.



Step 4

You will now be in the **View** for the **Code** of *Library.cs*, within this first type the following **Code**:

```
using Microsoft.UI.Composition;
using Microsoft.UI.Composition.SystemBackdrops;
using Microsoft.UI.Xaml;
using Microsoft.UI.Xaml.Controls;
using System.Runtime.InteropServices;
using Windows.System;
using WinRT;

internal class Library
{
    private object _queue;
    private ISystemBackdropControllerWithTargets _controller;

    [StructLayout(LayoutKind.Sequential)]
    struct DispatcherQueueOptions
    {
        internal int dwSize;
        internal int threadType;
        internal int apartmentType;
    }

    [DllImport("CoreMessaging.dll")]
    private static extern int CreateDispatcherQueueController(
        [In] DispatcherQueueOptions options,
        [In, Out, MarshalAs(UnmanagedType.IUnknown)]
        ref object dispatcherQueueController);

    private void EnsureDispatcherQueueController()
    {
        if (DispatcherQueue.GetForCurrentThread() != null)
            return;
        if (_queue == null)
        {
            DispatcherQueueOptions options;
            options.dwSize = Marshal.SizeOf(typeof(DispatcherQueueOptions));
            options.threadType = 2;    // DQTYPE_THREAD_CURRENT
            options.apartmentType = 2; // DQTAT_COM_STA
            _ = CreateDispatcherQueueController(options, ref _queue);
        }
    }

    // Set Backdrop
}
```

The **`Class`** that has been defined so far in *Library.cs* has a **Member** for an **`object`** and an **Interface** of **`ISystemBackdropControllerWithTargets`** then there is some code to make the **System Backdrops** work correctly. There is a **`struct`** that will be used with the **Method** which will use a **`DllImport`** for some **Unmanaged Code** that is part of the **API** for **Windows** to use **`CreateDispatcherQueueController`**. This is called from the **Method** which will configure a **`DispatcherQueue`** which will ensure the **System Backdrops** work as needed of **`EnsureDispatcherQueueController`**.

Step 5

While still in the **`Class`** for *Library.cs* and after the **Comment** of **`// Set Backdrop`** type in the following **Method**:

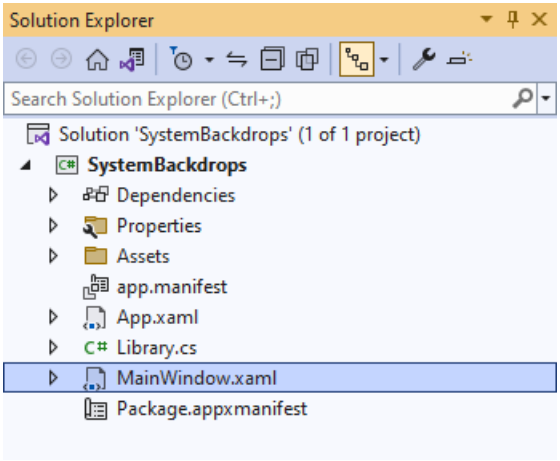
```
public void SetBackdrop(Window window, ComboBox options)
{

    if (_controller != null)
        _controller.Dispose();
    EnsureDispatcherQueueController();
    string value = (options.SelectedItem as ComboBoxItem).Content as string;
    switch (value)
    {
        case "Acrylic":
            if (DesktopAcrylicController.IsSupported())
            {
                _controller = new DesktopAcrylicController();
                _controller.AddSystemBackdropTarget(
                    window.As<ICompositionSupportsSystemBackdrop>());
                _controller.SetSystemBackdropConfiguration(
                    new SystemBackdropConfiguration());
            }
            break;
        case "Mica":
            if (MicaController.IsSupported())
            {
                _controller = new MicaController();
                _controller.AddSystemBackdropTarget(
                    window.As<ICompositionSupportsSystemBackdrop>());
                _controller.SetSystemBackdropConfiguration(
                    new SystemBackdropConfiguration());
            }
            break;
        default:
            _controller = null;
            break;
    }
}
```

This **Method** will check if **`ISystemBackdropControllerWithTargets`** has been set, or is not **`null`** then it will call the **Method** for **`EnsureDispatcherQueueController`** then it will get the value from the **`ComboBox`** that was passed in, then within a **`switch`** Statement, there is an option for **Acrylic** and **Mica** which is one of the **System Backdrops** that can be supported, to check this is supported the **Method** of **`IsSupported()`** of the **`Class`** of **`DesktopAcrylicController`** or **`MicaController`** is called, then the **Method** of **`AddSystemBackdropTarget`** and **`SetSystemBackdropConfiguration`** is used to apply the **System Backdrop** with **`ISystemBackdropControllerWithTargets`** to the **`Window`** that was passed in and the **`default`** option of the **`switch`** will set the **`ISystemBackdropControllerWithTargets`** to **`null`**.

Step 6

Then from **Solution Explorer** for the **Solution** double-click on **MainWindow.xaml** to see the **XAML** for the **Main Window**.



Step 7

In the **XAML** for **MainWindow.xaml** there be some **XAML** for a **`StackPanel`**, this should be **Removed** by removing the following:

```
<StackPanel Orientation="Horizontal"
HorizontalAlignment="Center" VerticalAlignment="Center">
    <Button x:Name="myButton" Click="myButton_Click">Click Me</Button>
</StackPanel>
```

Step 8

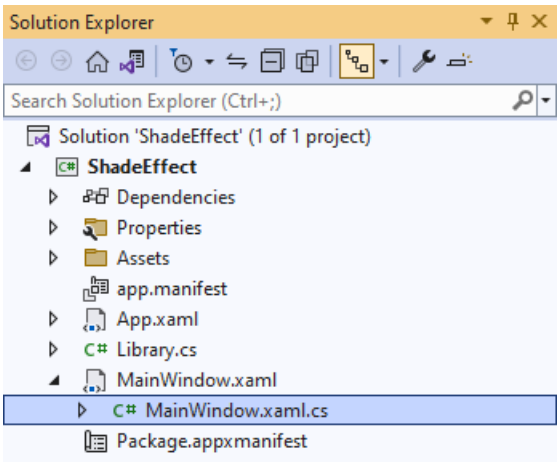
While still in the **XAML** for **MainWindow.xaml** above **`</Window>`**, type in the following **XAML**:

```
<Grid>
    <Grid.RowDefinitions>
        <RowDefinition Height="Auto"/>
        <RowDefinition Height="*"/>
    </Grid.RowDefinitions>
    <ComboBox Grid.Row="0" Name="Options" Margin="25" HorizontalAlignment="Stretch"
        SelectionChanged="Options_SelectionChanged">
        <ComboBoxItem IsSelected="True">None</ComboBoxItem>
        <ComboBoxItem>Acrylic</ComboBoxItem>
        <ComboBoxItem>Mica</ComboBoxItem>
    </ComboBox>
    <Viewbox Grid.Row="1">
        <StackPanel Spacing="5" Orientation="Horizontal"
            HorizontalAlignment="Center">
            <Rectangle Width="50" Height="50" Fill="Black"/>
            <Rectangle Width="50" Height="50" Fill="Gray"/>
            <Rectangle Width="50" Height="50" Fill="Red"/>
            <Rectangle Width="50" Height="50" Fill="Orange"/>
            <Rectangle Width="50" Height="50" Fill="Yellow"/>
            <Rectangle Width="50" Height="50" Fill="Green"/>
            <Rectangle Width="50" Height="50" Fill="Cyan"/>
            <Rectangle Width="50" Height="50" Fill="Blue"/>
            <Rectangle Width="50" Height="50" Fill="Magenta"/>
            <Rectangle Width="50" Height="50" Fill="Purple"/>
        </StackPanel>
    </Viewbox>
</Grid>
```

This **XAML** features a **`Grid`** with two **Rows**, the first **Row** is for a **`ComboBox`** which contains the name of the **System Backdrops** and *None* that will be used to apply the selected **System Backdrop**. The second **Row** is a **`ViewBox`** which is used to **Scale** elements and in this is a **`StackPanel`** that contains **`Rectangle`** elements.

Step 9

Then, within **Solution Explorer** for the **Solution** select the arrow next to **MainWindow.xaml** then double-click on **MainWindow.xaml.cs** to see the **Code** for the **Main Window**.



Step 10

In the **Code** for **MainWindow.xaml.cs** there be a **Method** of **`myButton_Click(...)`** this should be **Removed** by removing the following:

```
private void myButton_Click(object sender, RoutedEventArgs e)
{
    myButton.Content = "Clicked";
}
```

Step 11

Once **`myButton_Click(...)`** has been removed, type in the following **Code** below the end of the **Constructor** of **`public MainWindow() { ... }`**:

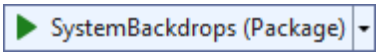
```
private readonly Library _library = new();

private void Options_SelectionChanged(object sender, SelectionChangedEventArgs e)
{
    _library.SetBackdrop(this, Options);
}
```

The **Method** of **`Options_SelectionChanged`** will call the **Method** within *Library.cs* of **`SetBackdrop`** from an **Instance** of **`Library`** called **`_library`** created with **`new()`** and will also pass in the current **`Window`** with the **Keyword** of **`this`** which will pass in the current **Instance** of the **`Window`**.

Step 12

That completes the **Windows App SDK** Application. In **Visual Studio 2022** from the **Toolbar** select **SystemBackdrops (Package)** to **Start** the Application.

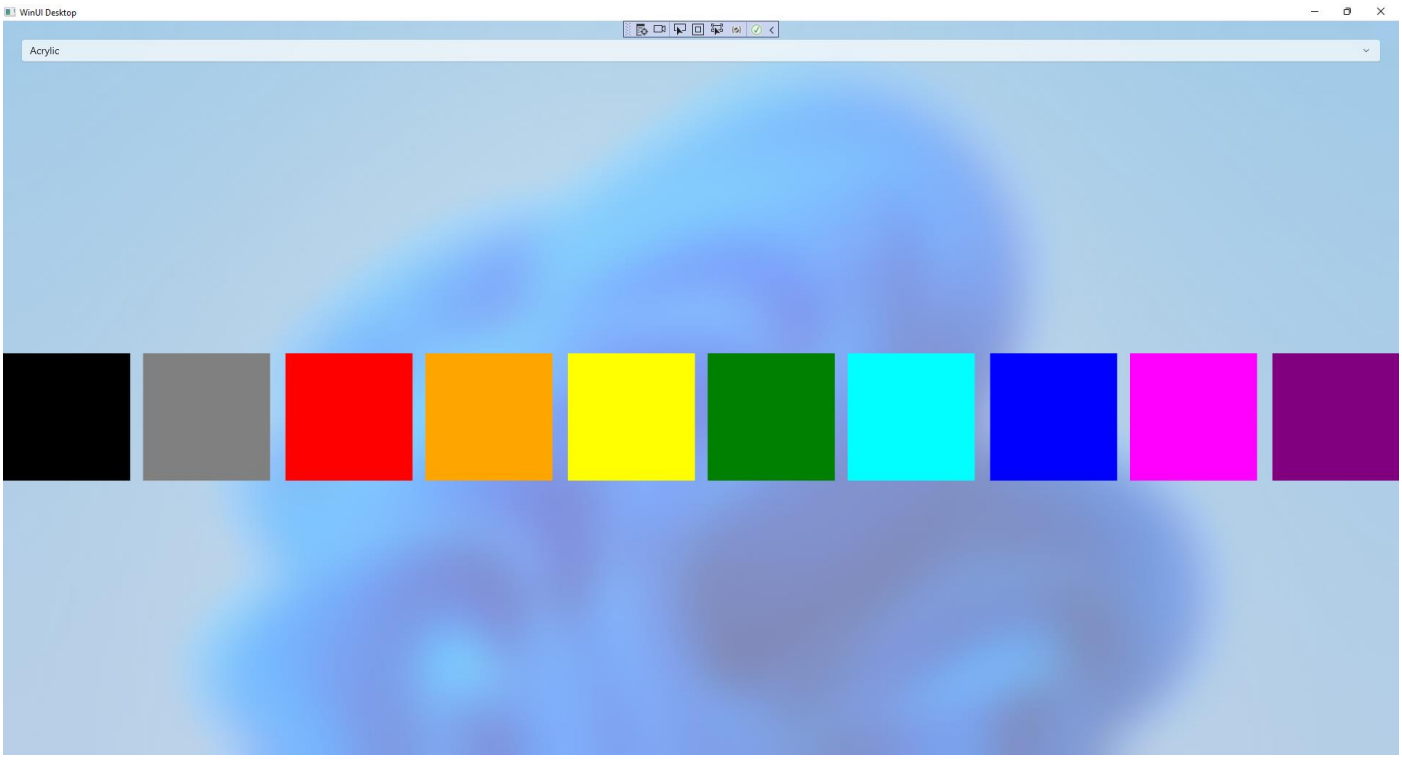


Step 13

Once running you should a **`Combobox`** with **System Backdrop** options and some **`Rectangle`** Elements.

Step 14

You can select one of the options of *Acrylic* or *Mica* to see the **System Backdrop** applied to the **`Window`** or you can select *None* to clear the **System Backdrop**.



Step 15

To **Exit** the **Windows App SDK** Application, select the **Close** button from the top right of the Application as that concludes this **Tutorial** for **Windows App SDK** from tutorialr.com!