



UNREAL
ENGINE

LECTURE 9

UMG 101

LECTURE GOALS AND OUTCOMES

Goals

The goals of this lecture are to

- Present Unreal Motion Graphics (UMG)
- Explain the Widget Blueprint
- Show how to create a Title screen using UMG
- Show how to create a HUD using UMG

Outcomes

By the end of this lecture you will be able to

- Create a simple Title screen
- Make the transition from the Title screen to a game Level
- Create a simple HUD
- Access variables from the Player Character Blueprint to use in the HUD Widget Blueprint



UMG CONCEPTS

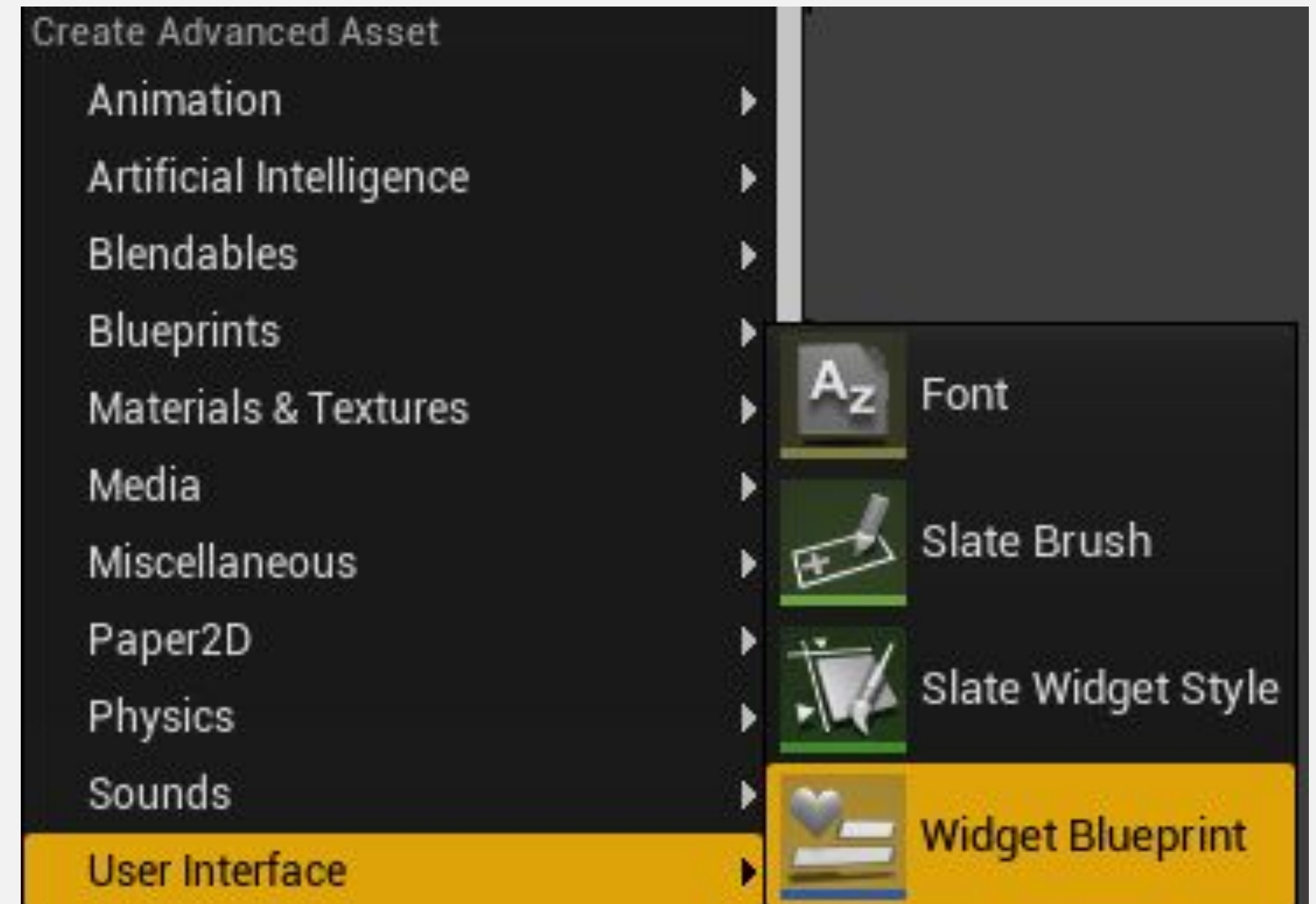


UMG

The **Unreal Motion Graphics (UMG) UI Designer** is used to create user interface elements such as Title screens and HUDs in Unreal Engine 4.

To work with UMG, it is necessary to create a **Widget Blueprint**, which is a specialized type of Blueprint that contains widgets and the Designer panel.

To create a Widget Blueprint, click the green **Add New** button in the **Content Browser**, and in the **User Interface** submenu select “**Widget Blueprint**”.





DESIGNER PANEL

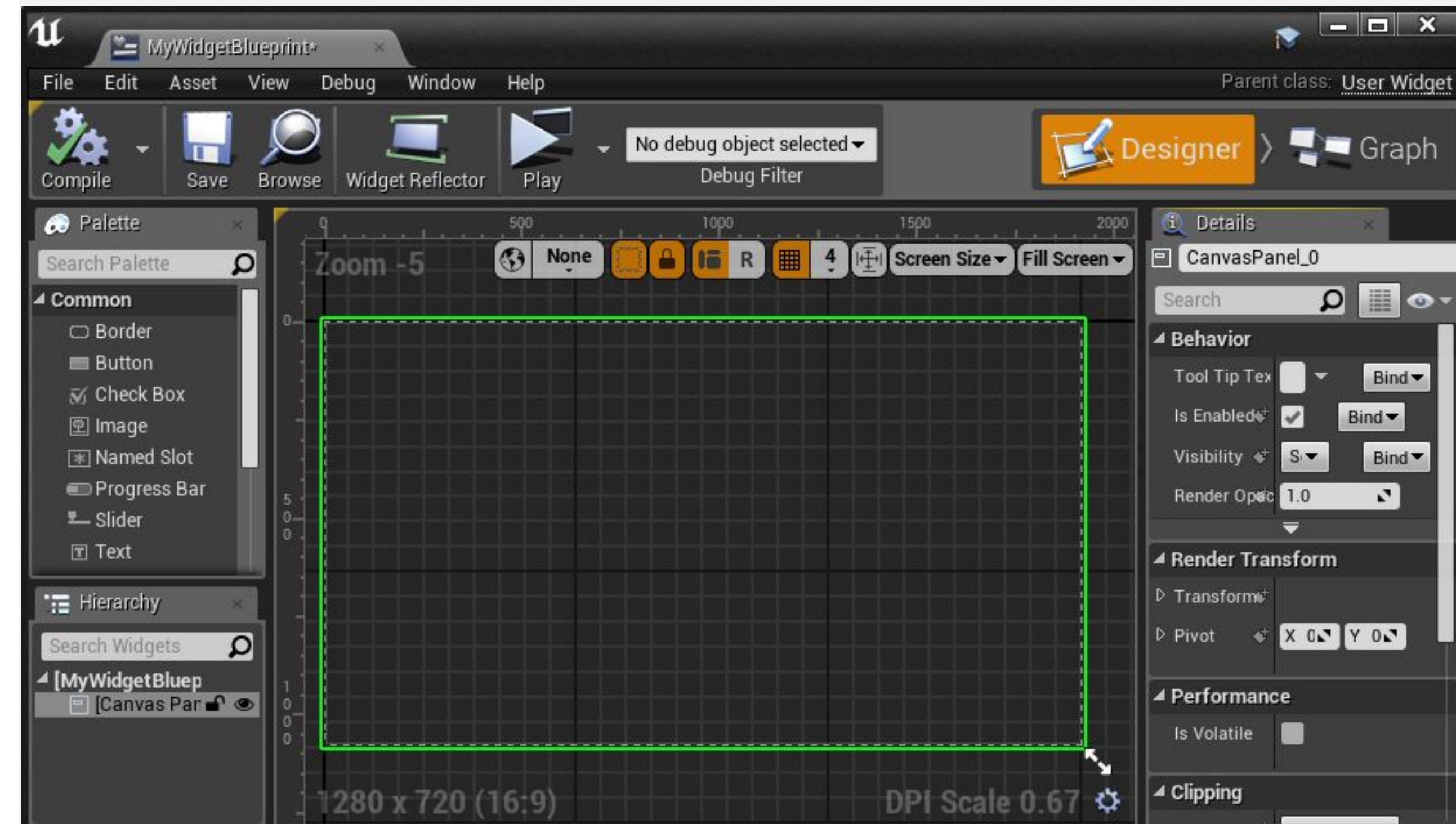
A Widget Blueprint has two modes:

- The **Designer** mode allows the creation of the visual layout using the Designer panel.
- The **Graph** mode is where the logic of the widgets is created.

Widgets from the Palette panel can be dragged and dropped into the Designer panel.

A widget can be placed inside another widget.

The hierarchy of the widgets is displayed in the Hierarchy panel.

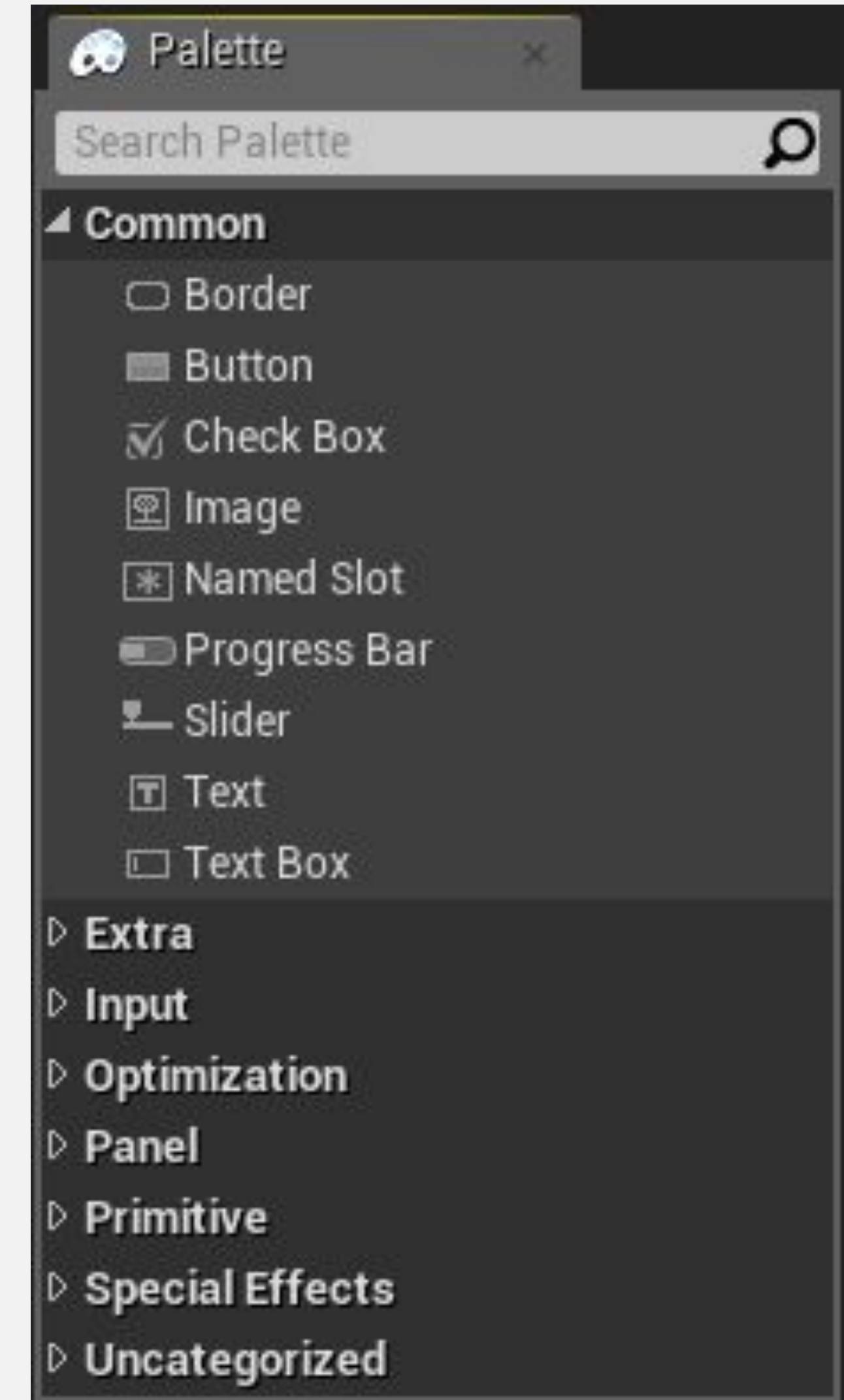




WIDGETS

Widgets are interface components. They are added to a Canvas panel and edited in a Widget Blueprint.

The image on the right shows some common widgets found in the Designer mode's Palette panel.



TITLE SCREEN



SIMPLE TITLE SCREEN

It is easy to create a simple Title screen using only Image and Button widgets.

The example seen on the right has two buttons, one for starting the game and the other for exiting the game.



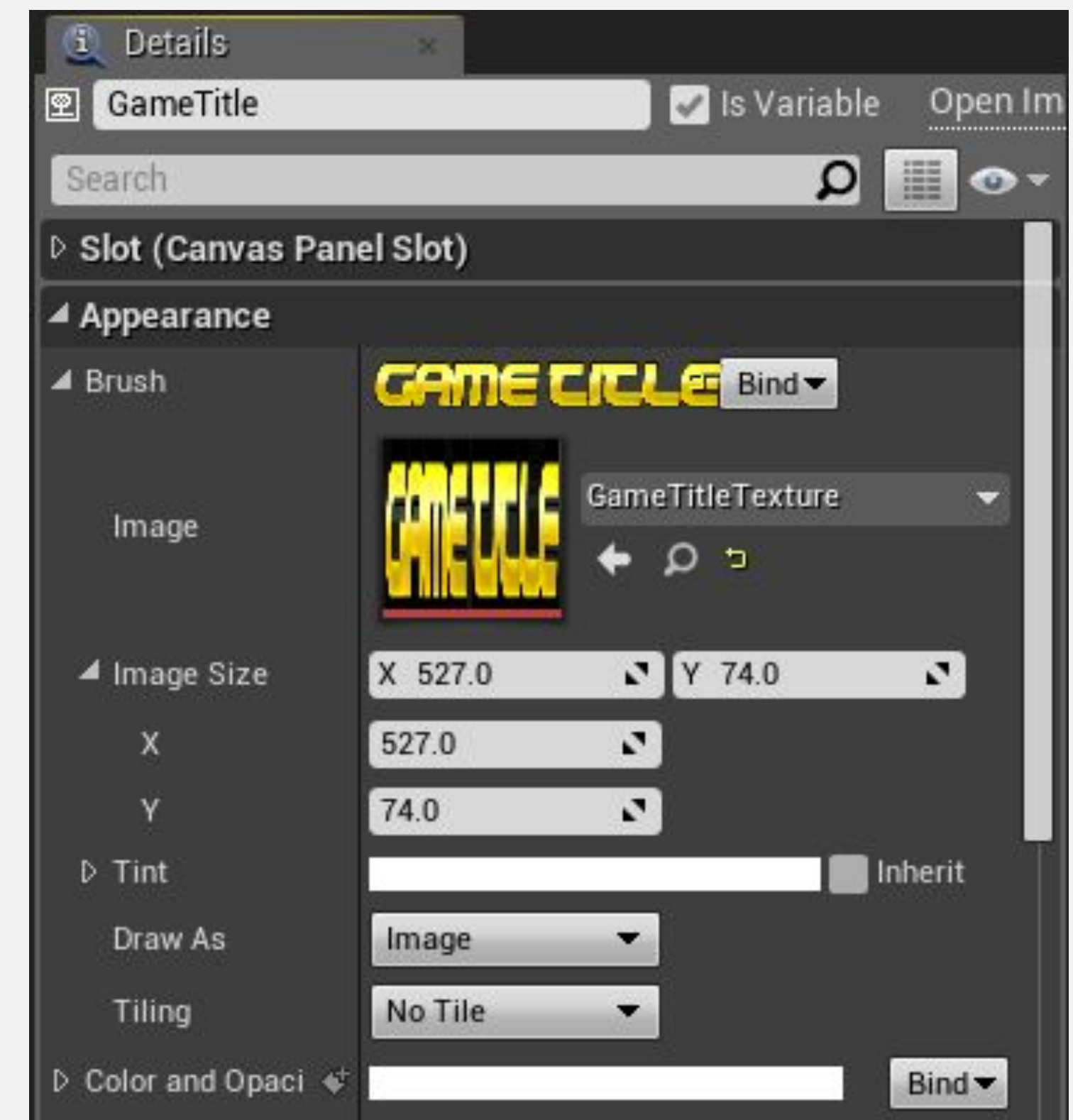


GAME TITLE IMAGE

To create the sample Title screen, first import the textures that will be used. Then create a **Widget Blueprint** and name it “**TitleScreenUMG**”. Double-click it to open the **UMG Editor**.

Drag an **Image** widget from the **Palette** panel and drop it into the **Designer** panel. Name it “**GameTitle**”. In the **Details** panel for the widget, expand the **Brush** property in the **Appearance** category, click the **Image** drop-down, and select the **Texture** that will be used.

Resize and position the **GameTitle** widget in the **Designer** panel until it’s centered and looks good.





BUTTONS WITH IMAGE

Drag a **Button** widget from the **Palette** panel and drop it into the **Designer** panel. Name it “**Btn_Start**”. Next drag an **Image** widget onto the **Btn_Start** widget. Name the **Image** widget “**Img_Start**”.

Select the **Img_Start** widget, and in the **Details** panel expand the **Brush** property in the **Appearance** category, click the **Image** drop-down, and select the **Texture** that will be used.

Create another **Button** widget and **Image** widget for the **Exit** button. Name the **Button** widget “**Btn_Exit**” and the **Image** widget “**Img_Exit**”. Place the **Exit** button widgets below the **Start** button widget in the **Designer** panel.

Resize and position the buttons in the **Details** panel. Set **Size X** to “**250**” and **Size Y** to “**84**” for both buttons.

The image on the right shows the Hierarchy panel with the widgets that were added.





ON CLICKED EVENT

Select one of the buttons, and in the **Details** panel expand the **Events** category and add an **OnClicked** event.

Do the same for the other button.



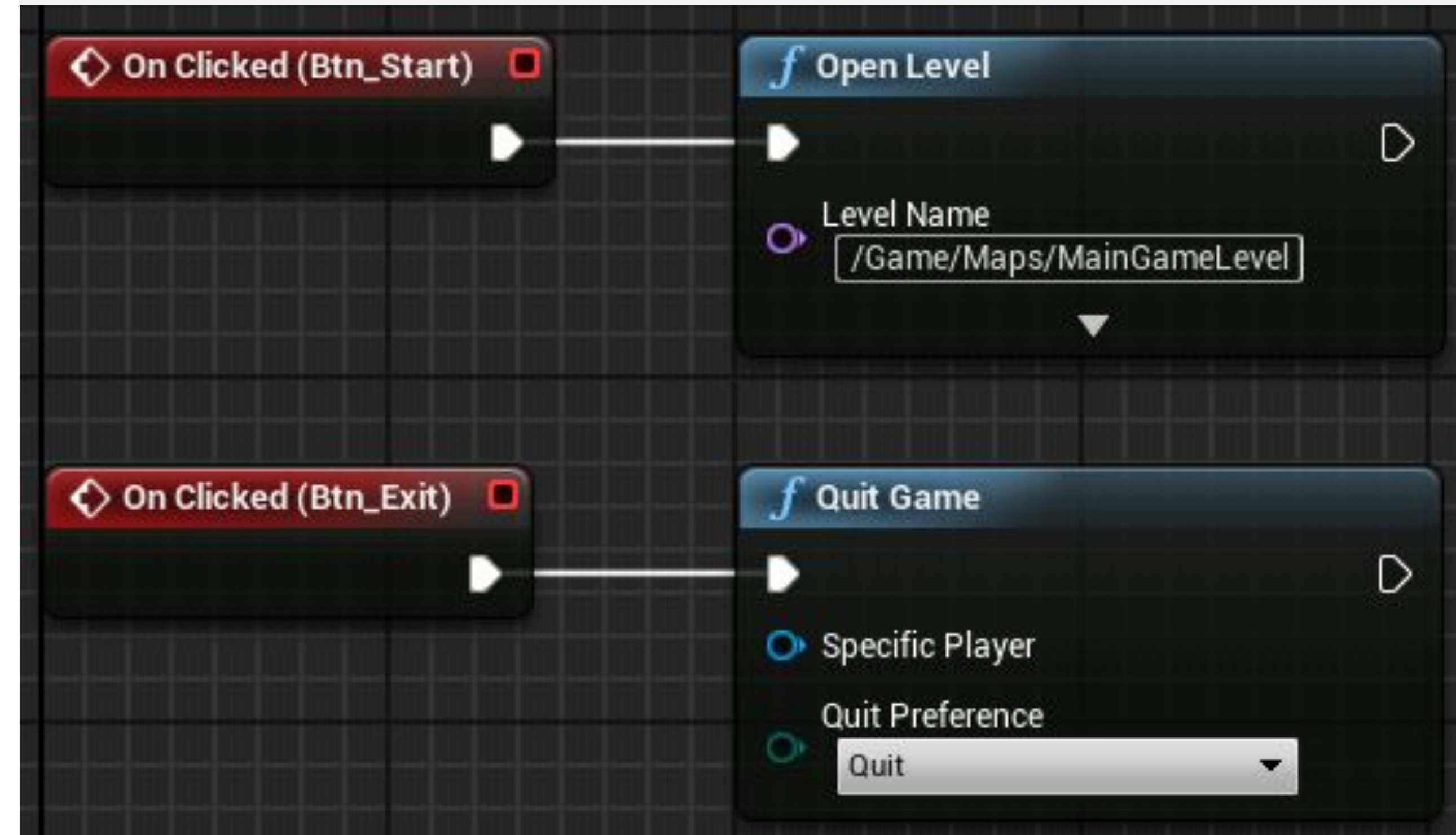


BUTTON ACTIONS

The **On Clicked** events for the buttons are added to the Event Graph of the Widget Blueprint.

The **Start** button opens the main game Level to start the game.

The **Exit** button calls the **Quit Game** function.

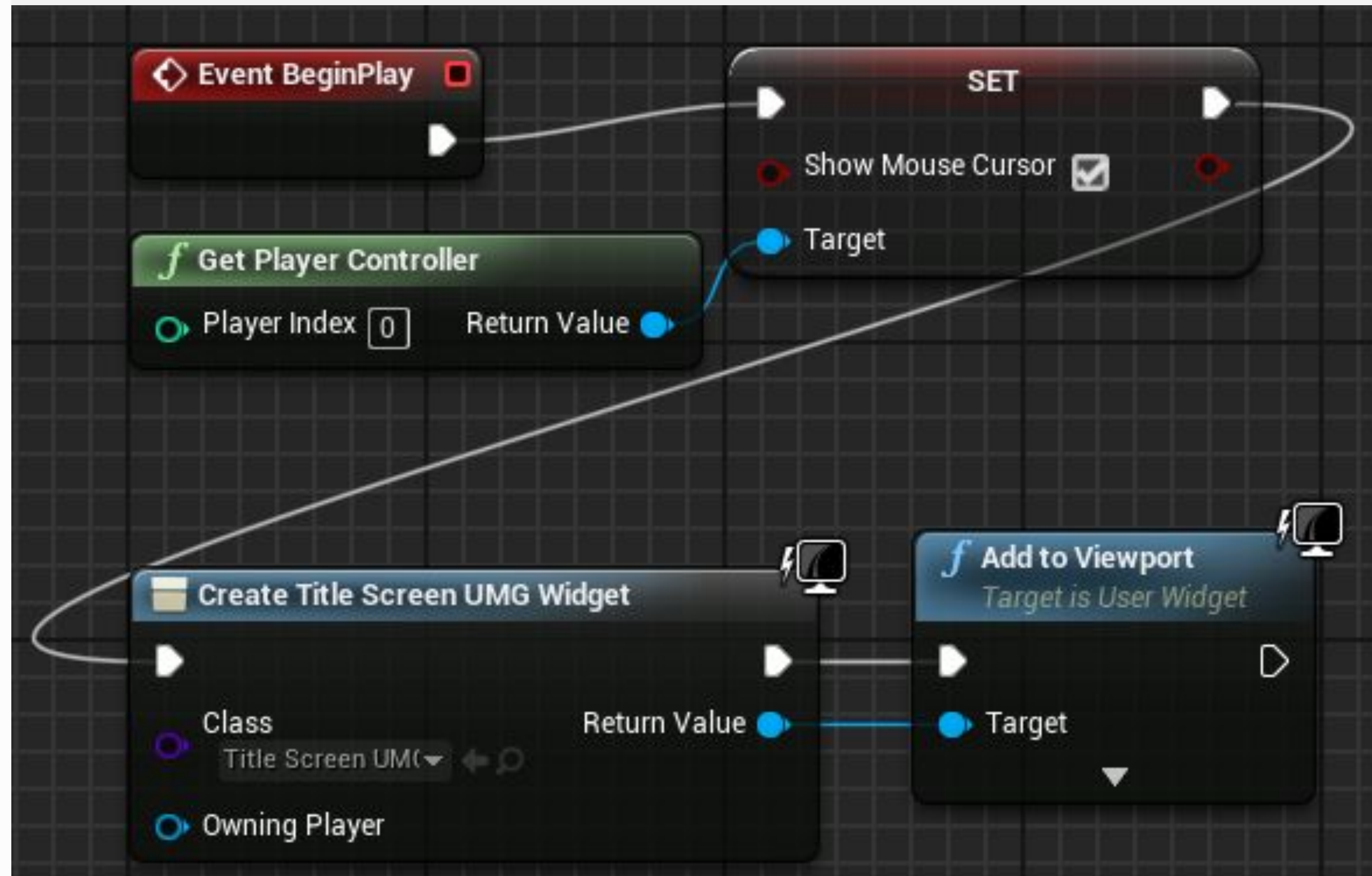


USING THE TITLE SCREEN

To use the Widget Blueprint for the Title screen, create a new **Level** and set it as the **default map**.

In the **Level Blueprint**, duplicate the node graph shown in the image on the right.

The graph enables the mouse cursor, creates the Widget Blueprint object, and then adds the Widget Blueprint object to the Viewport.



HUD



HUD WIDGET BLUEPRINT

UMG can also be used to create **HUDs** (heads-up displays). A HUD is used to visually relay information to the player during gameplay.

In the example on the right, a HUD displays the **Score** value as text and the **Health** value as a progress bar.

Score and **Health** are variables that need to be created in the Player Character Blueprint.

Create a **Widget Blueprint** and rename it “**HUD_UMG**”. Double-click it to open the **UMG Editor**.

Score: 850

Health:





HUD TEXT

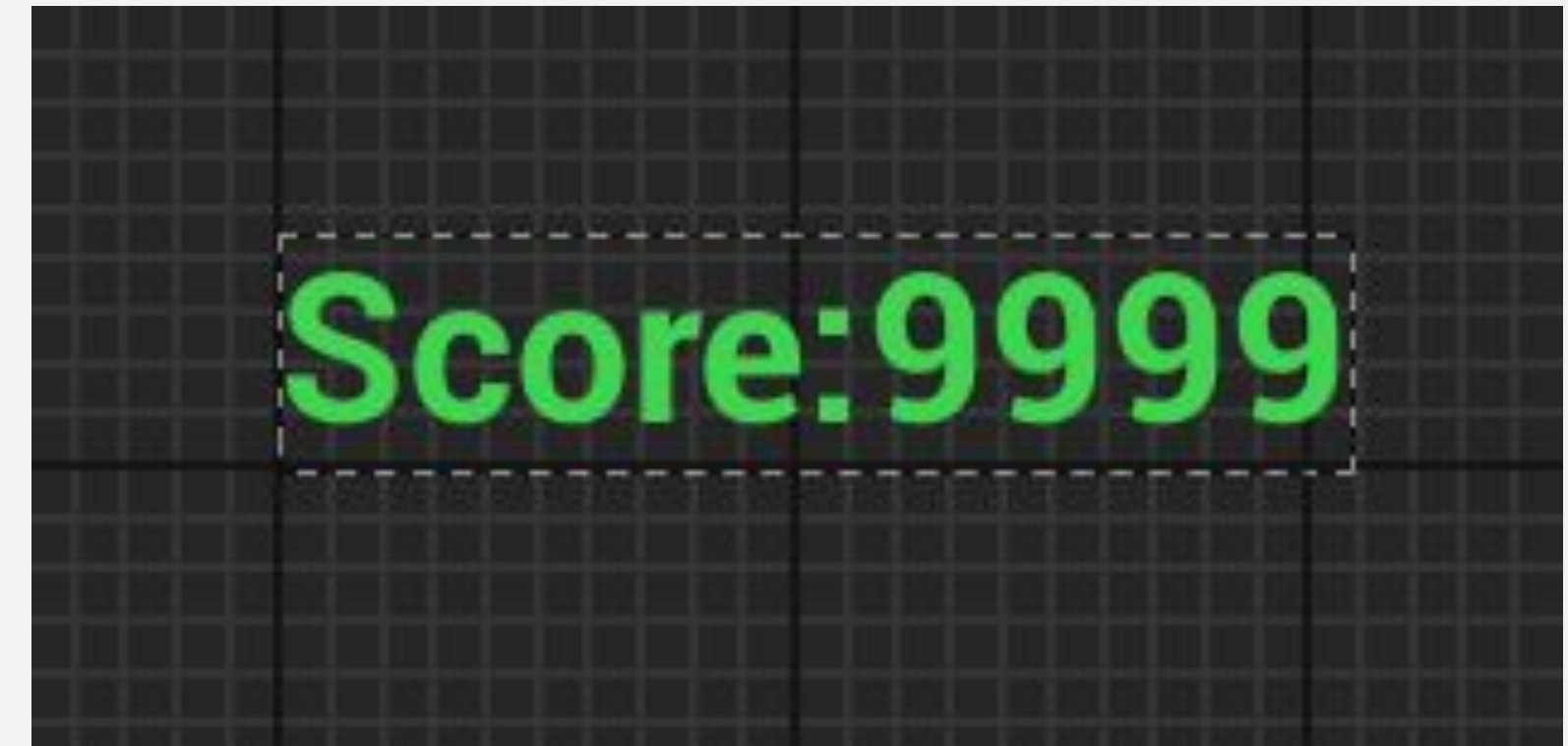
Let's start with the **Score** value. Drag a **Horizontal Box** widget from the **Panel** category of the **Palette** panel and drop it near the upper left corner of the **Designer** panel.

Next, drag two **Text** widgets onto the **Horizontal Box** widget.

Select the first **Text** widget, and in the **Details** panel set the value of the **Text** property to "**Score:**".

Select the second **Text** widget and set the value of the **Text** property to "**9999**".

Choose a **green color** and set the **font size** to "**48**" for both **Text** widgets.



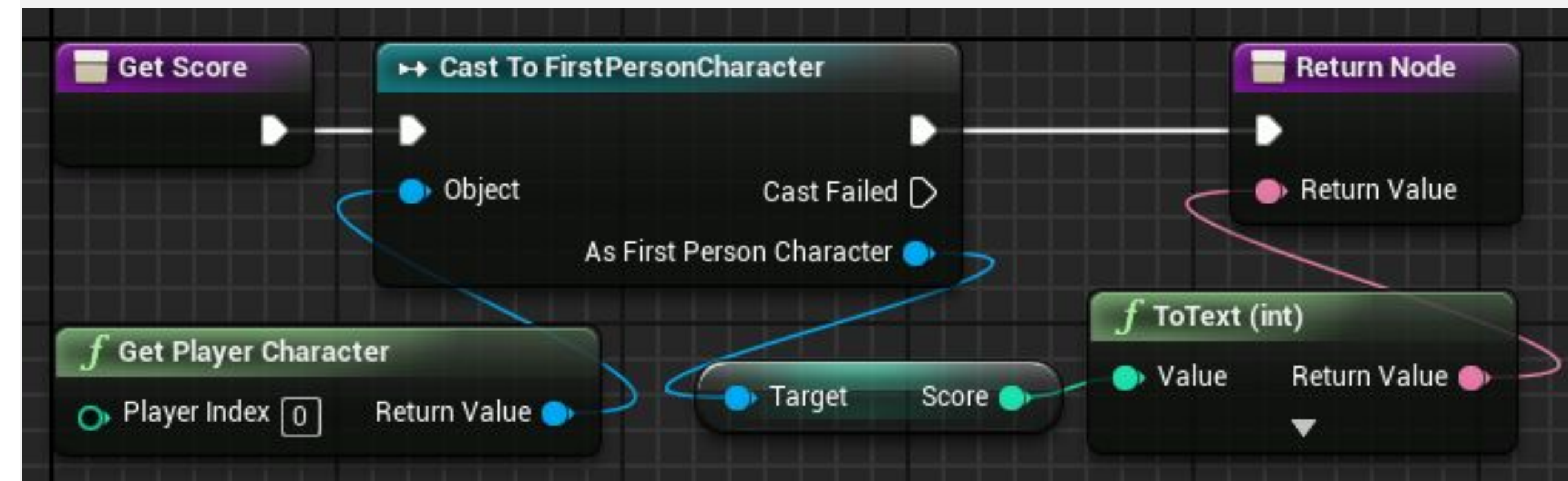


GET SCORE FUNCTION

Select the **Text** widget with the value “9999”. In the **Details** panel, click the **Text** property’s **Bind** drop-down and select “**Create Binding**” to create a new function.

The value of the **Text** widget’s **Text** property will be bound to the return value of the new function. Rename the function “**GetScore**” and duplicate the graph seen in the image on the right.

This example uses the **FirstPersonCharacter** class of the **First Person** template. The **Score** variable was added to the **FirstPersonCharacter** class.





HUD PROGRESS BAR

A progress bar will be used to display the status of the **Health** variable.

Drag a **Horizontal Box** widget from the **Panel** category of the **Palette** panel and drop it near the top center of the **Designer** panel.

Next, drag a **Text** widget onto the **Horizontal Box** widget. Set the **Text** widget's **Text** property to "**Health:**", choose a **green color**, and set the **font size** to "**48**".

Drag a **Progress Bar** widget onto the same **Horizontal Box** widget. Change the **fill color** to **red**. The **Percent** property value ranges from "**0.0**" to "**1.0**" and sets the current value of the progress bar.



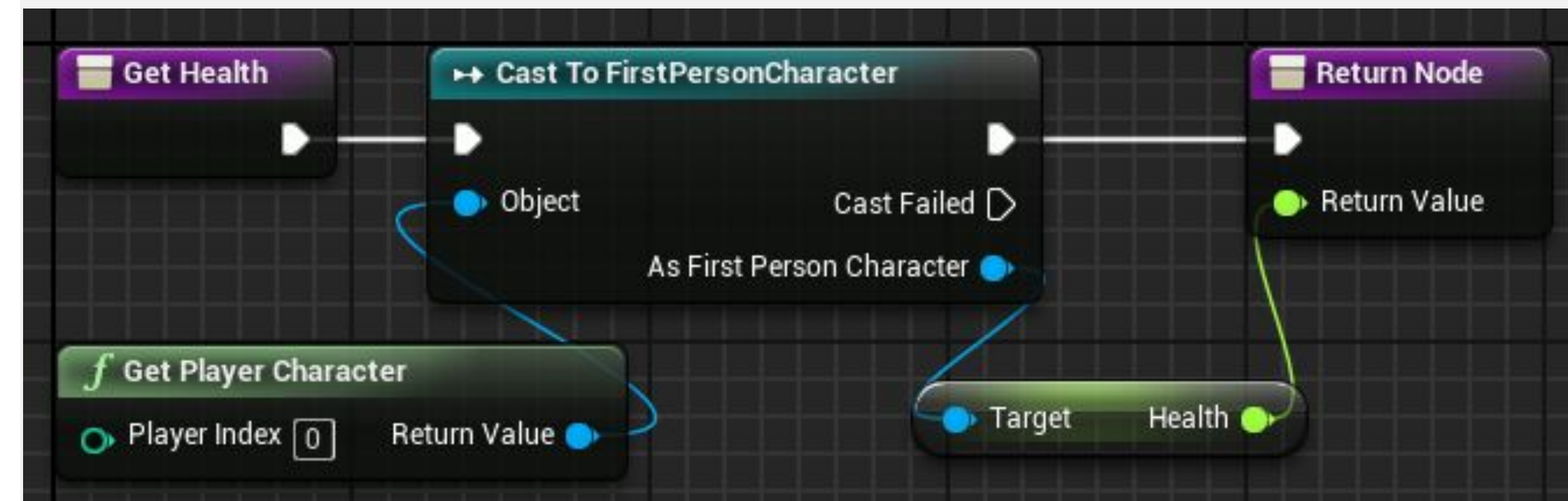


GET HEALTH FUNCTION

Select the **Progress Bar** widget. In the **Details** panel, click the **Percent** property's **Bind** drop-down and select “**Create Binding**” to create a new function.

The value of the **Progress Bar** widget's **Percent** property will be bound to the return value of the new function. Rename the function “**GetHealth**” and duplicate the graph seen in the image on the right.

The **Health** variable was added to the **FirstPersonCharacter** class.



USING THE HUD

To use the HUD Widget Blueprint, open the **Level Blueprint** for the game **Level** and duplicate the node graph shown in the image on the right.

The graph creates the Widget Blueprint object and then adds it to the Viewport.



SUMMARY

This lecture presented Unreal Motion Graphics (UMG) and the Widget Blueprint.

It showed how to create a Title screen and a HUD using UMG.

