Games Programming Taster

Hide and Seek

An Introduction to Unity Development

University of Sunderland

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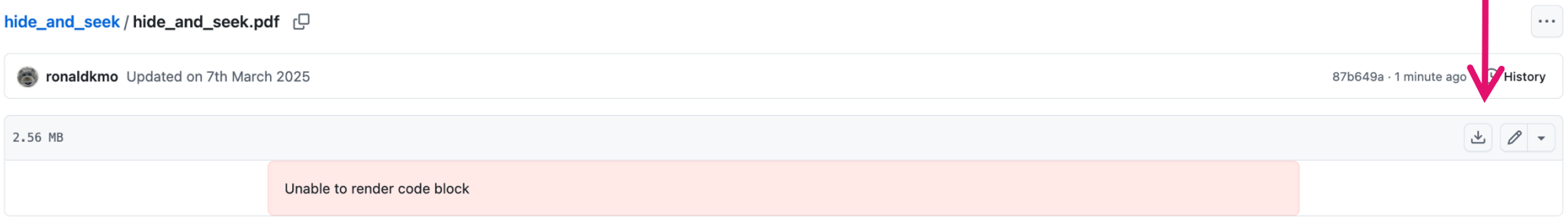
Download this PowerPoint

- Go to
  - https://github.com/ronaldkmo/hide_and_seek/blob/main/hide_and_seek.pdf
- Click this



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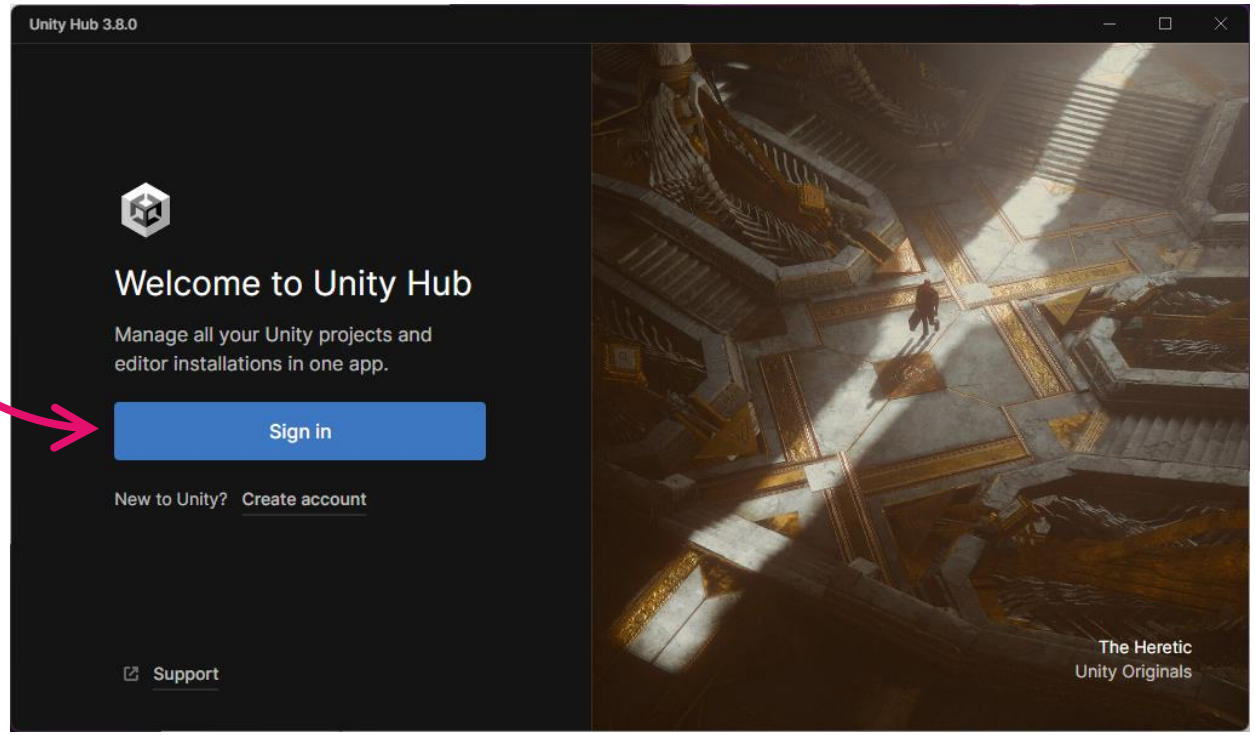
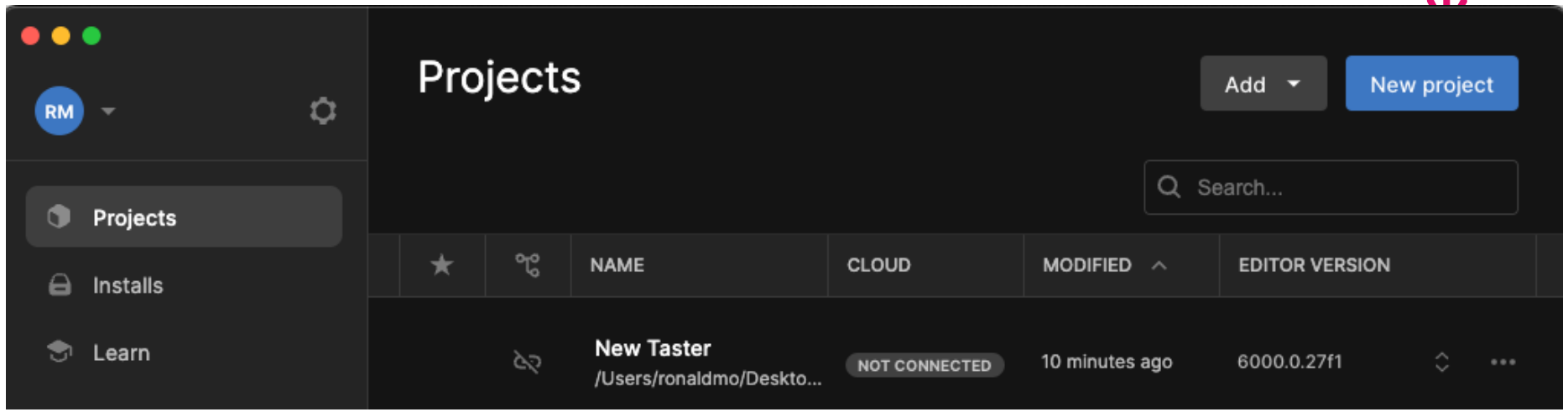
Create a Unity Account

- Open Unity Hub
- Create an account…
- …and Sign in ☺



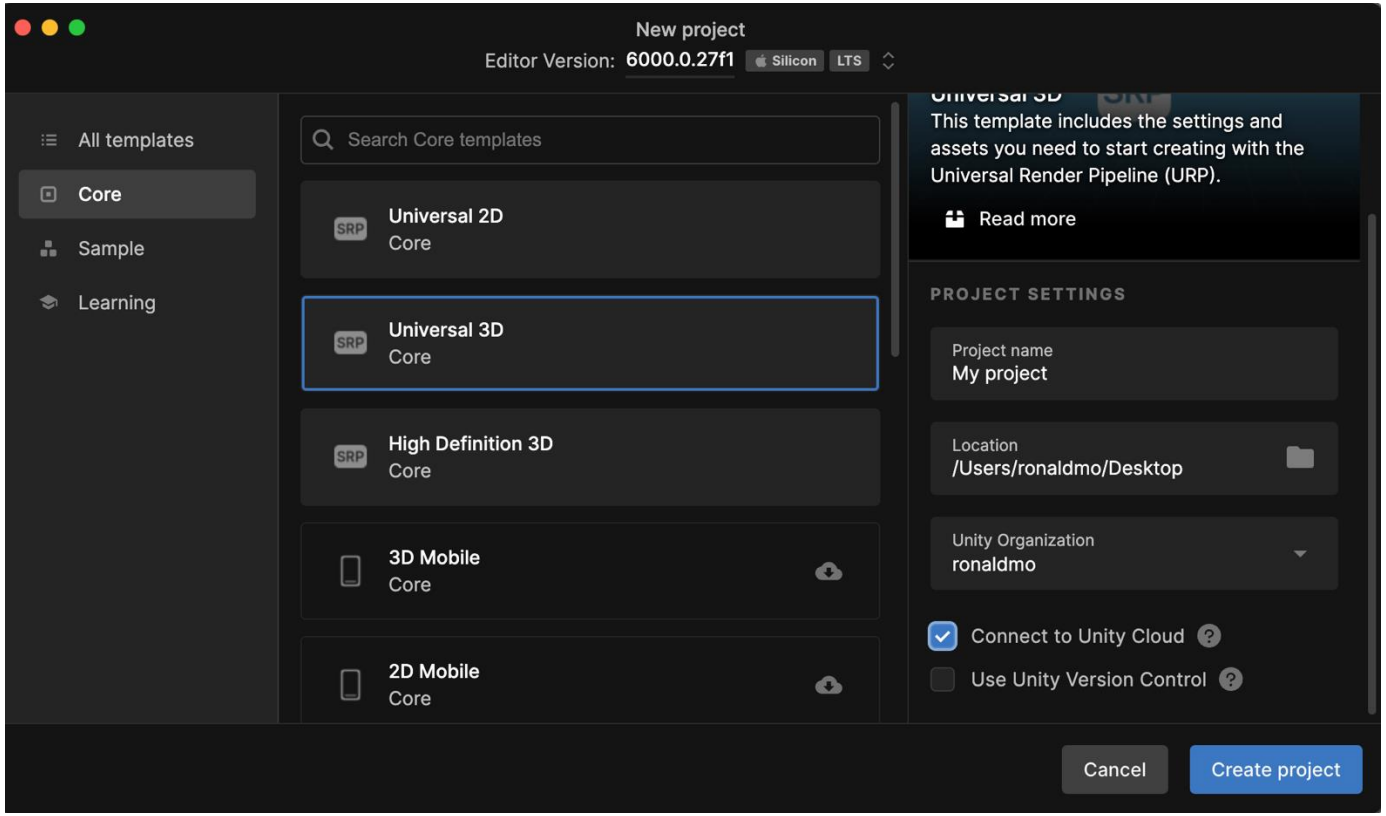
Create a New Project

- Create a new project by clicking this button



Create a New Project

- Select **Universal 3D**
- Give your project a name
- Click *Create project*



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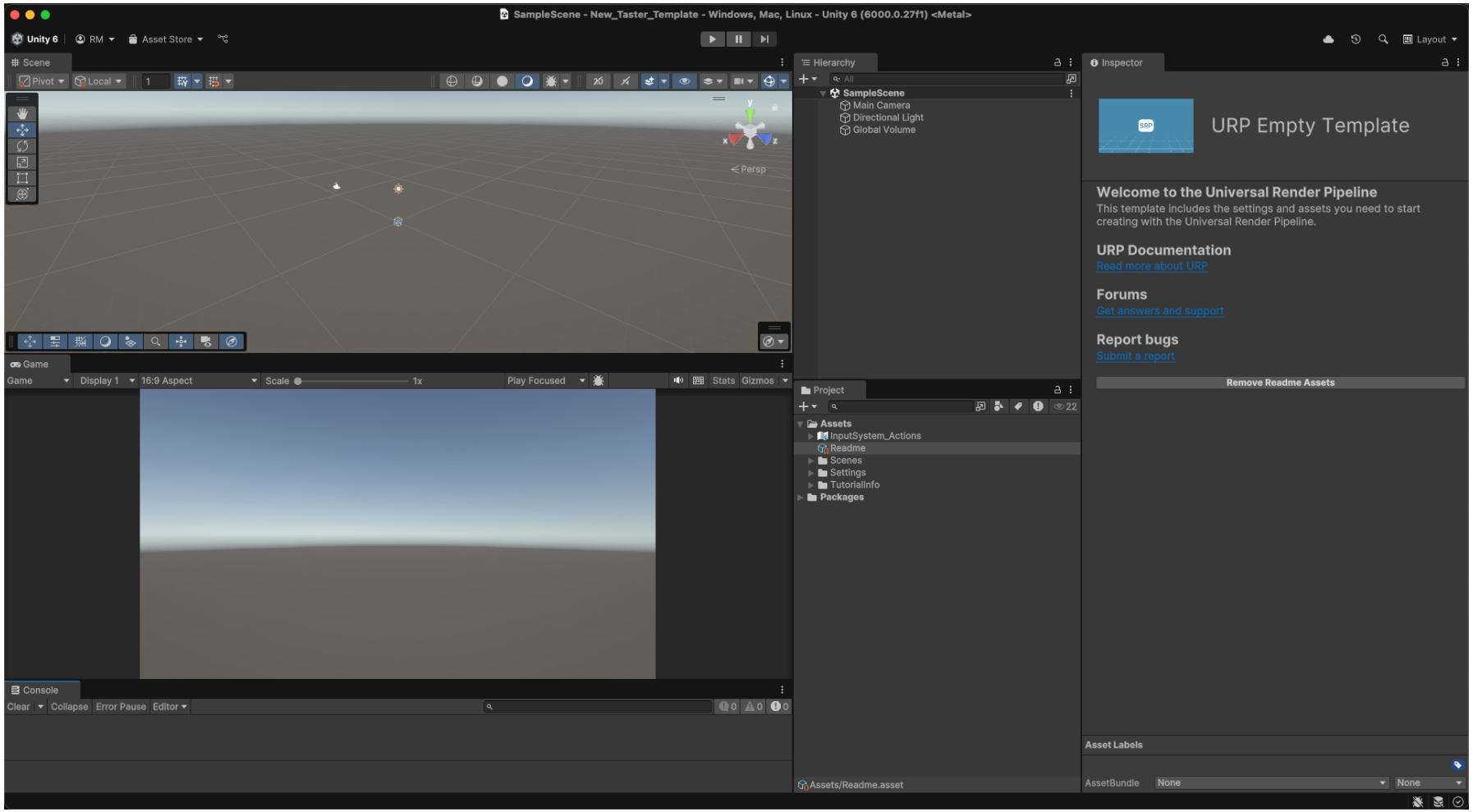
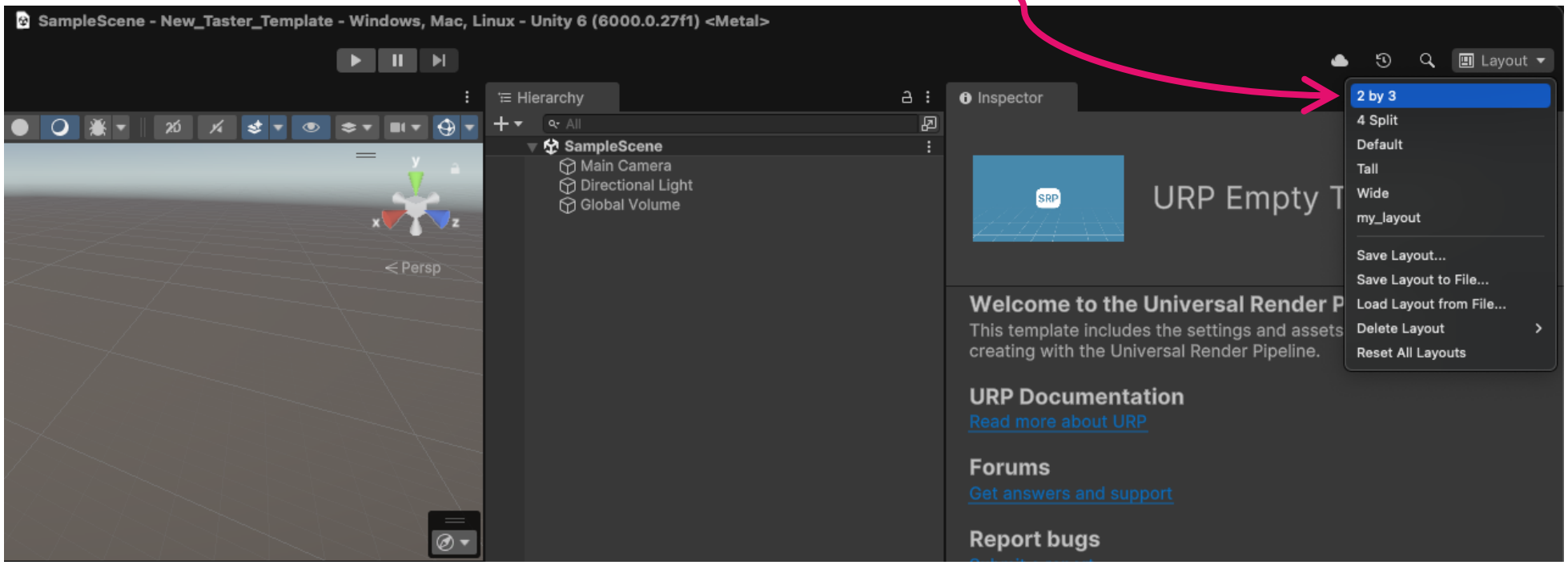
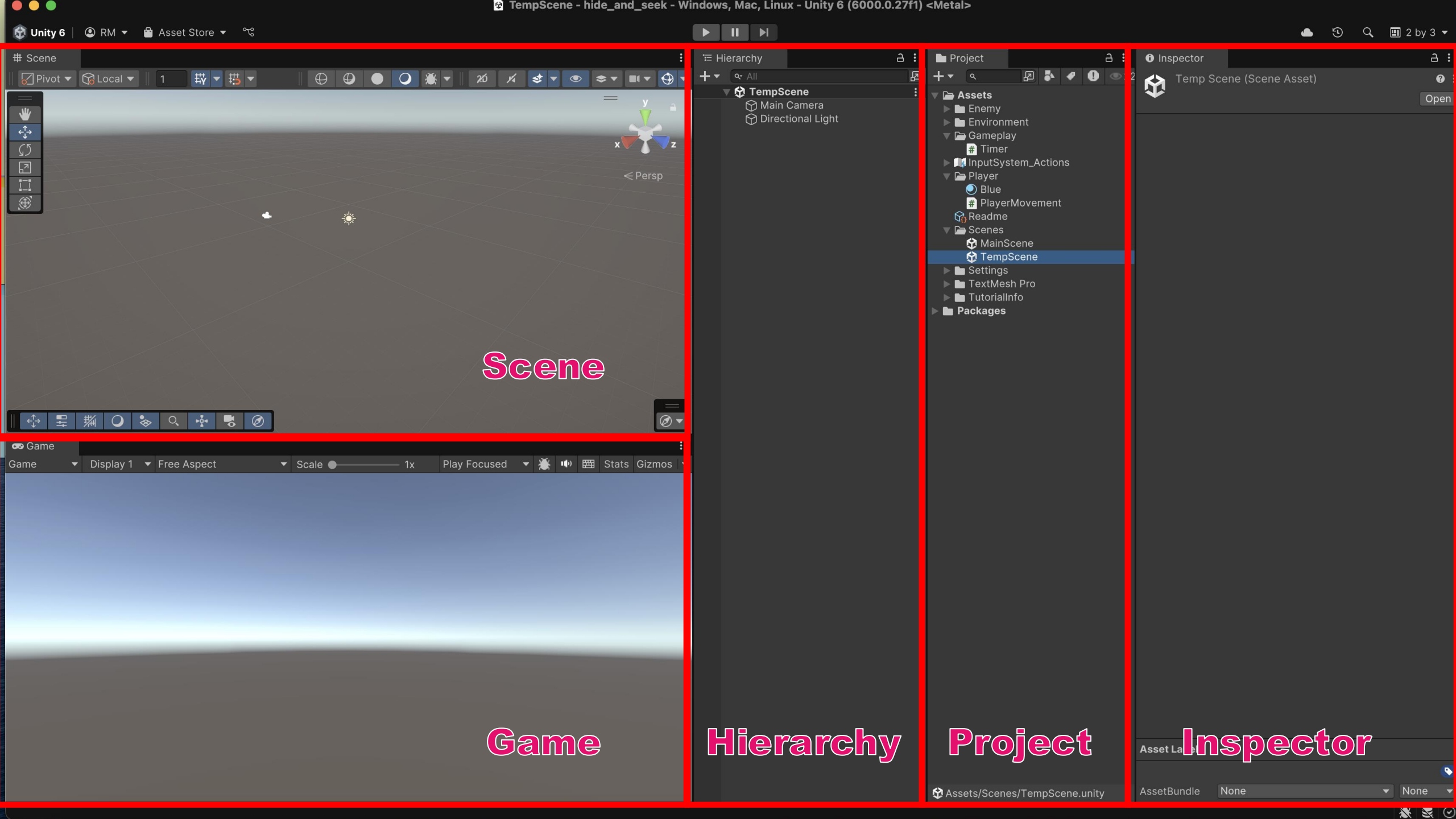
Unity 6



Change the Layout

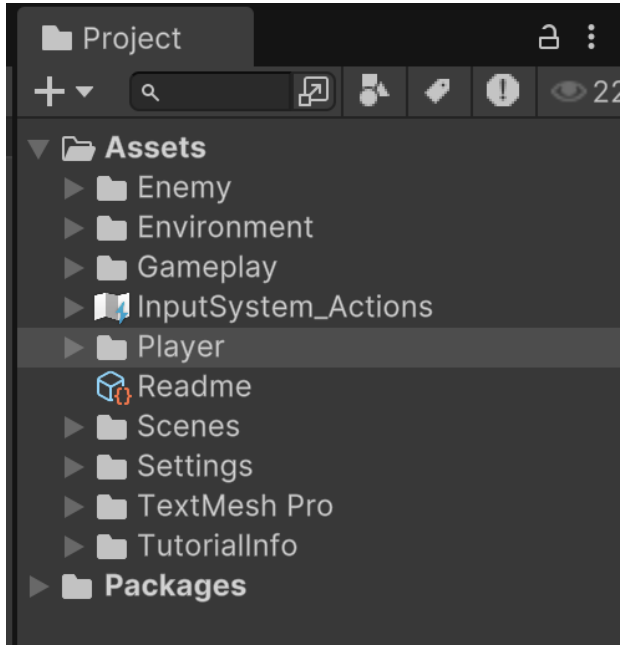
- Let's change the layout to 2 by 3



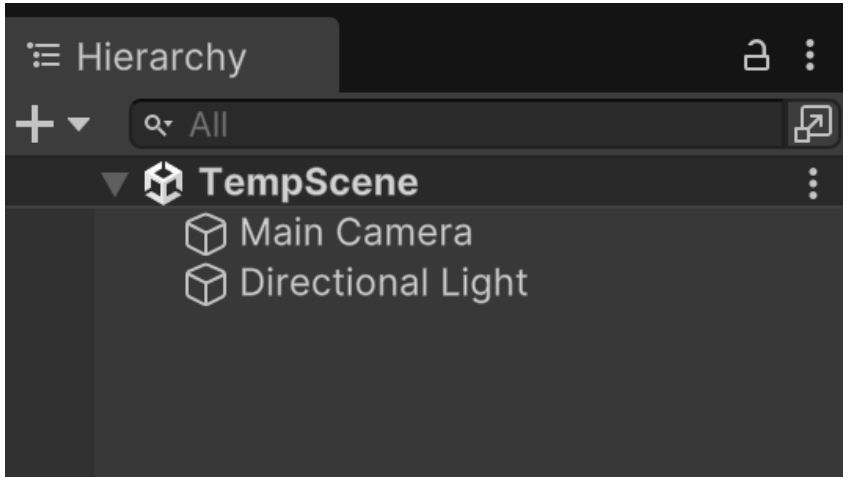

TempScene - hide_and_seek - Windows, Mac, Linux - Unity 6 (6000.0.27f1) <Metal>
Unity 6
RM
Asset Store
2 by 3
Scene
Pivot
Local
Persp
Scene
Hierarchy
All
TempScene
Main Camera
Directional Light
Project
Assets
Enemy
Environment
Gameplay
Timer
InputSystem_Actions
Player
Blue
PlayerMovement
Readme
Scenes
MainScene
TempScene
Settings
TextMesh Pro
TutorialInfo
Packages
Assets/Scenes/TempScene.unity
Inspector
Temp Scene (Scene Asset)
Open
Asset La
AssetBundle
None
None
Game
Game
Display 1
Free Aspect
Scale
1x
Play Focused
Stats
Gizmos
Game
Hierarchy
Project
Inspector

Where is Everything?

- **Project** pane contains all the elements we can use to develop our game

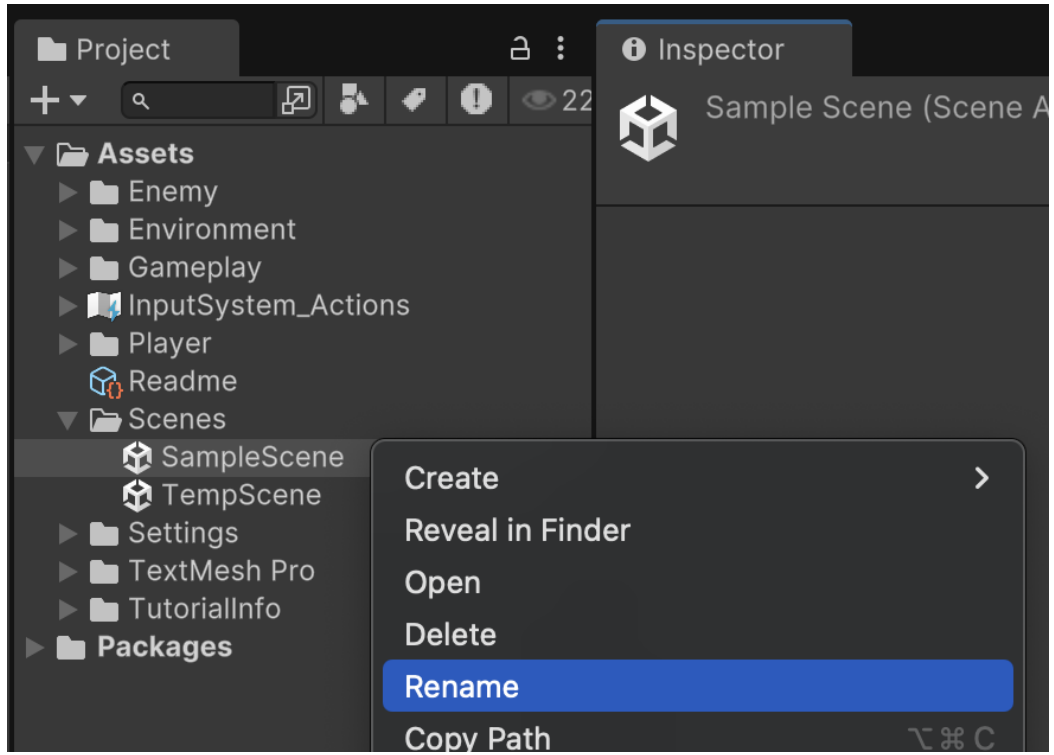


- **Hierarchy** pane contains all the elements in the game



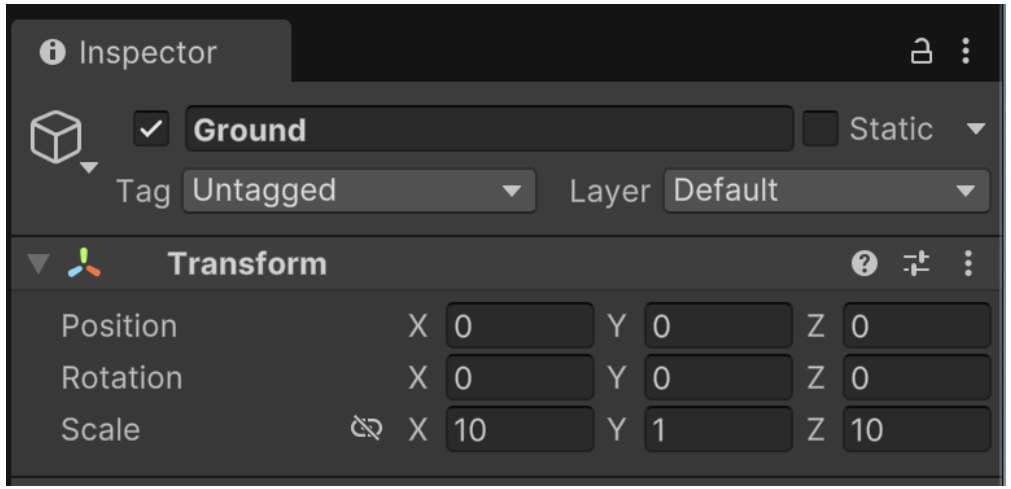
Set Up the Game Environment

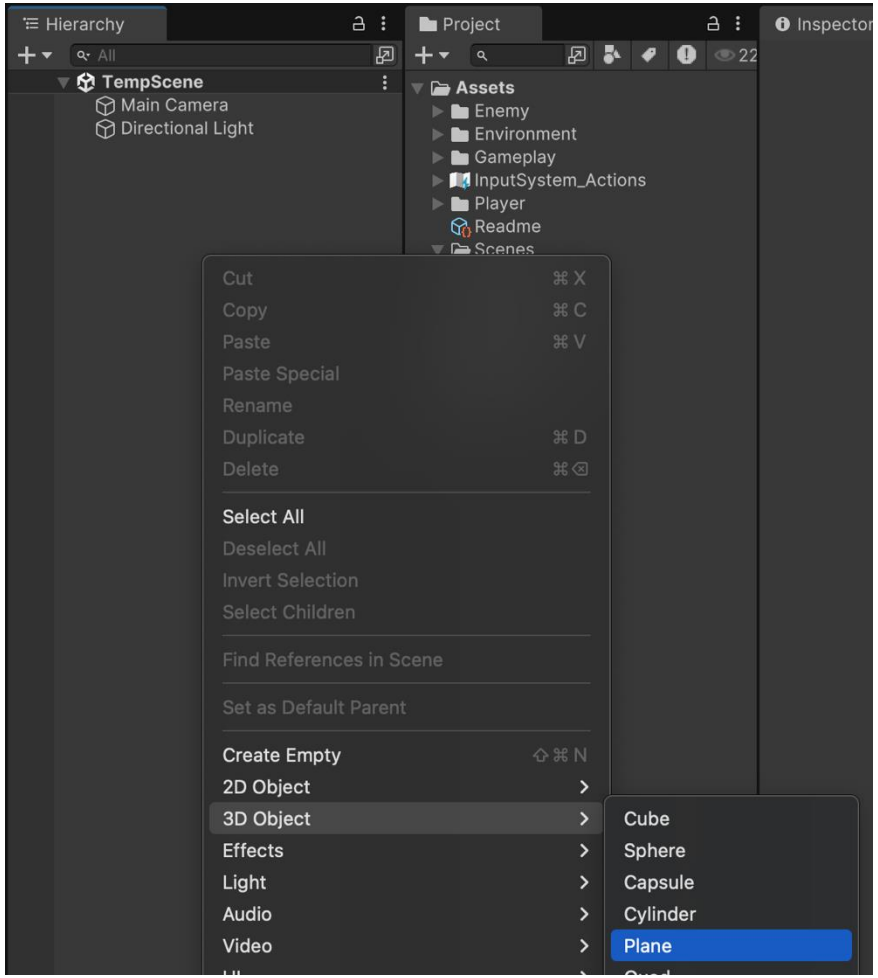
- Rename the current scene to something more meaningful (e.g., MainScene)
  - Assets/Scenes
  - Right-click on SampleScene and choose *Rename*



Set Up the Game Environment

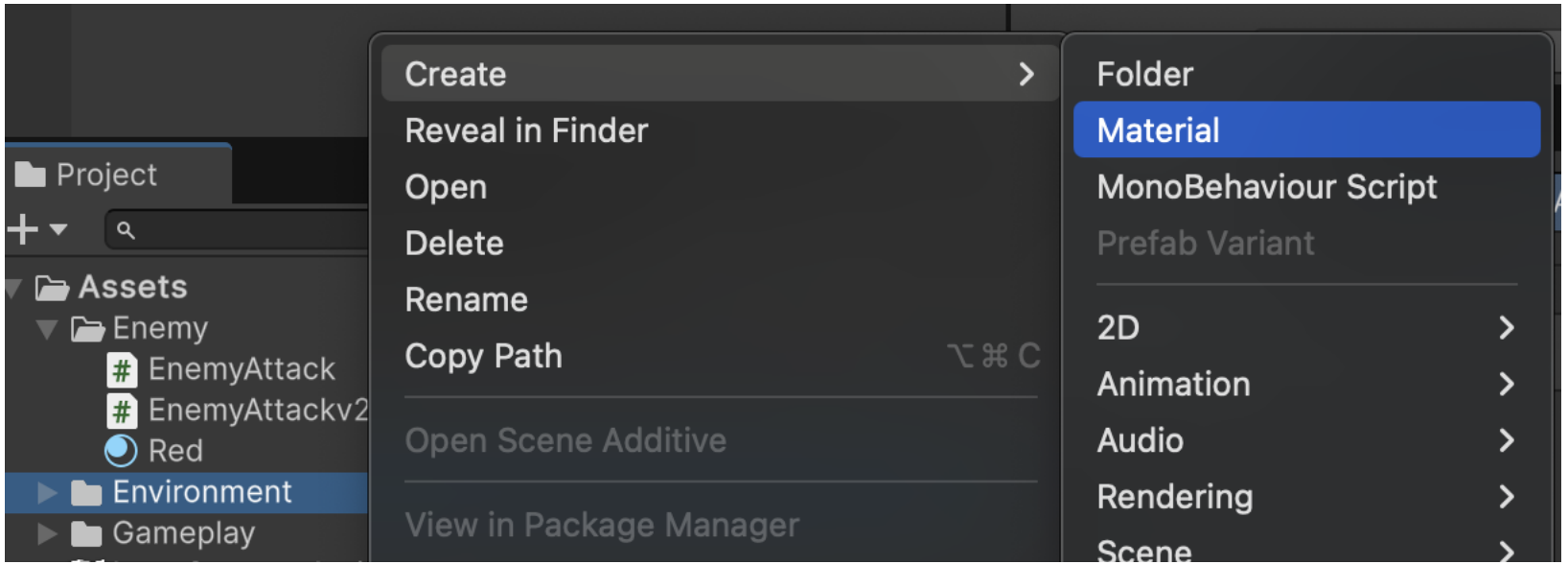
- In the **Hierarchy** pane, add a new plane, and name it *Ground*
  - Right-click -> 3D Object -> Plane
- Go to the **Inspector** pane and follow the below setting





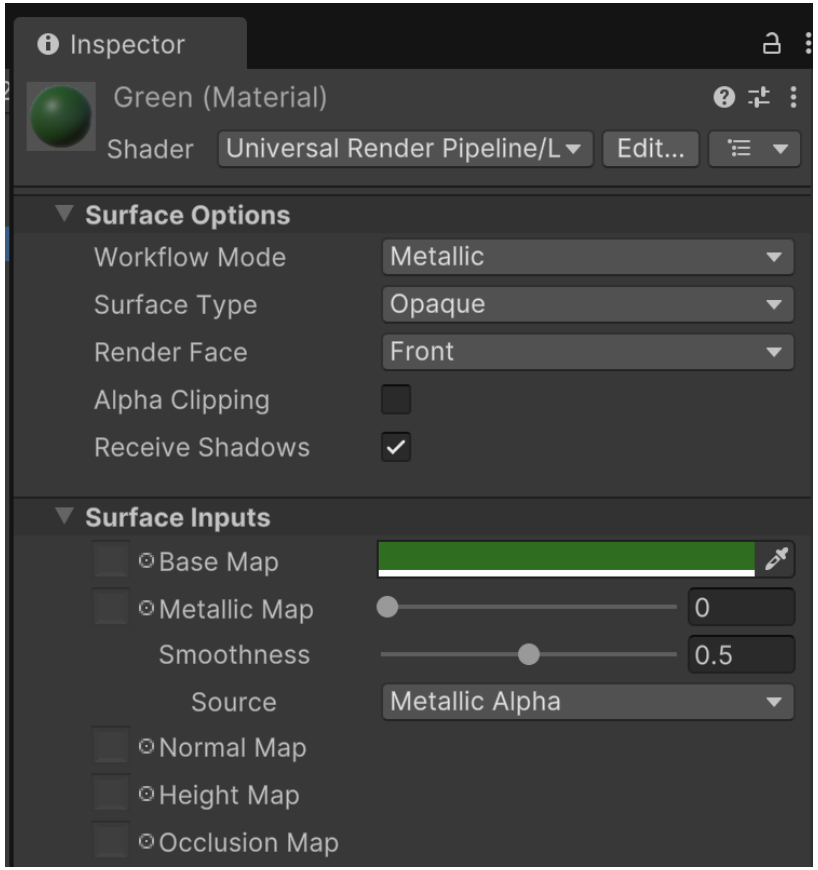
Set Up the Game Environment

- In the **Project** pane, create a folder called *Environment* under the *Assets* folder
- Inside *Environment*, create a material and call it *Green*



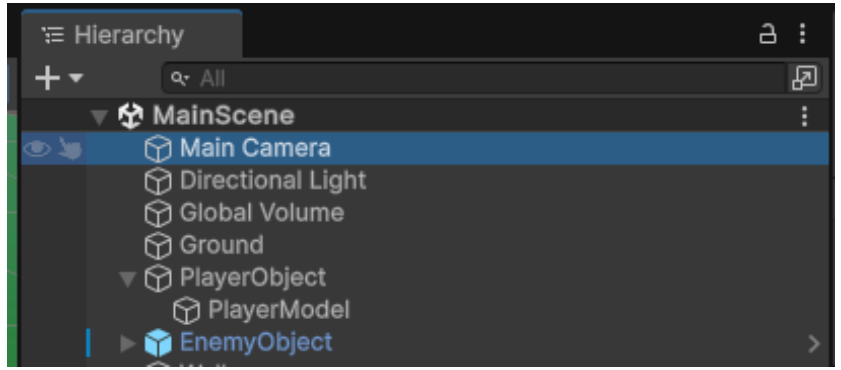
Set Up the Game Environment

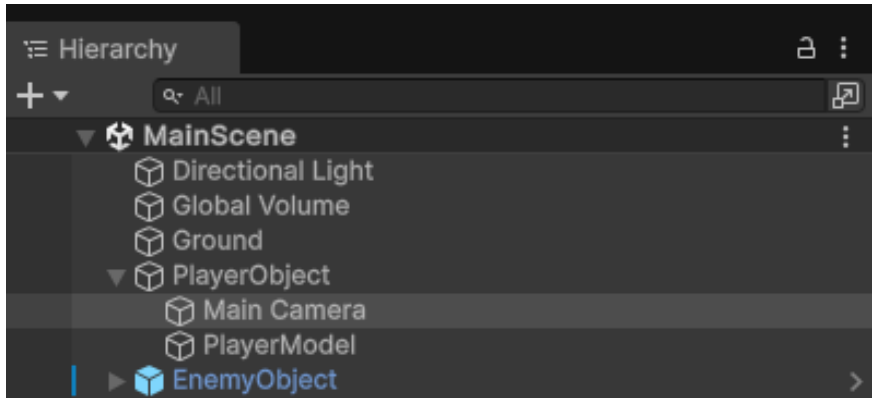
- While selecting the created *Green* material, inside the **Inspector** pane, change its Base Map to Green
- Drag the *Green* material to the ground in the **Scene** pane



Create the Player

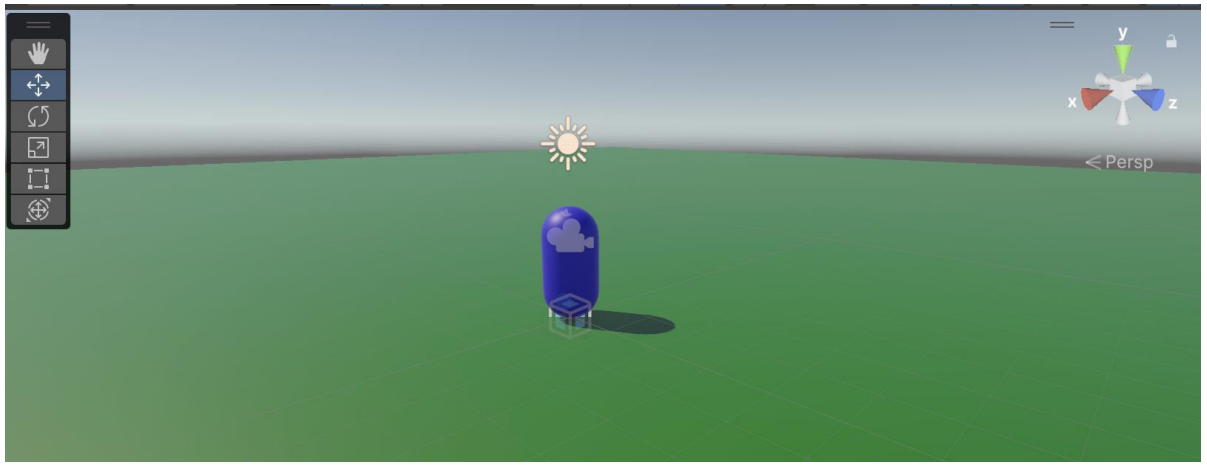
- Inside the **Hierarchy** pane, create an empty object called *PlayerObject*
  - Position: x=0, y=0, z=0
- Create a 3D Capsule object under *PlayerObject* and call it *PlayerModel*
  - Position: x=0, y=1, z=0
- Move the Main Camera into *PlayerObject*
  - Position: x=0, y=1.5, z=0

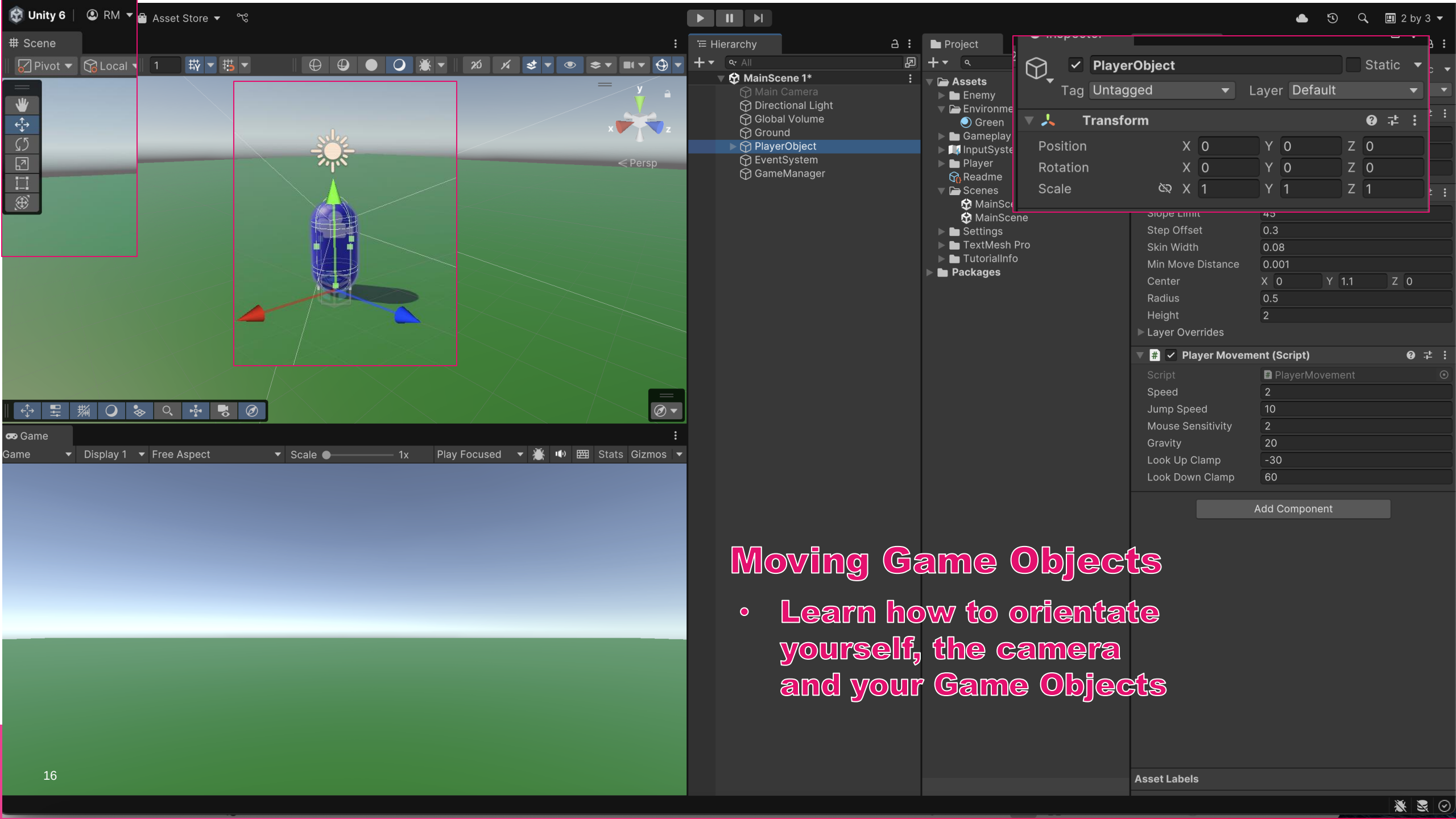




Create the Player

- Let’s assign a color to the player
- In the **Project** pane, create a folder called *Player* under the *Assets* folder
- Create a material and call it *Blue* under *Player*
- Inside the **Inspector** pane, change its Base Map to blue
- Drag the *Blue* material to the player in the **Scene** pane





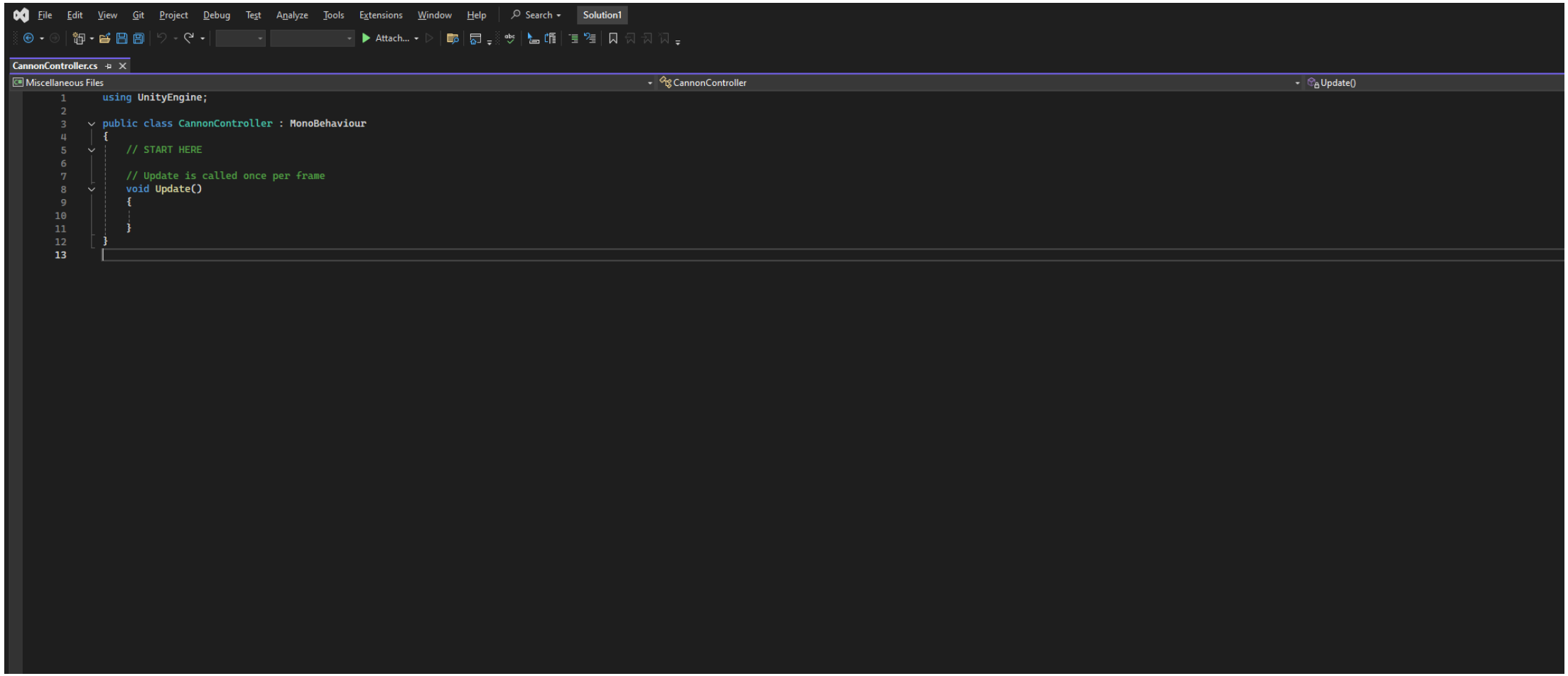
Moving Game Objects

- Learn how to orientate yourself, the camera and your Game Objects

Move the Player

- Let’s add some code to the player so that we can move it
- In the **Project** pane, create a MonoBehaviour called *PlayerMovement* under the *Assets/Player* folder
- Double-click *PlayerMovement* to open it in **Visual Studio**

Visual Studio 2022



Move the Player

- Copy this and paste it into **Visual Studio**
  - https://github.com/ronaldkmo/hide_and_seek/blob/main/Assets/Player/PlayerMovement.cs
- Make sure ***you commit your changes*** and go back to **Unity**
  - Ctrl + S to save your script, for example

Inside the Script

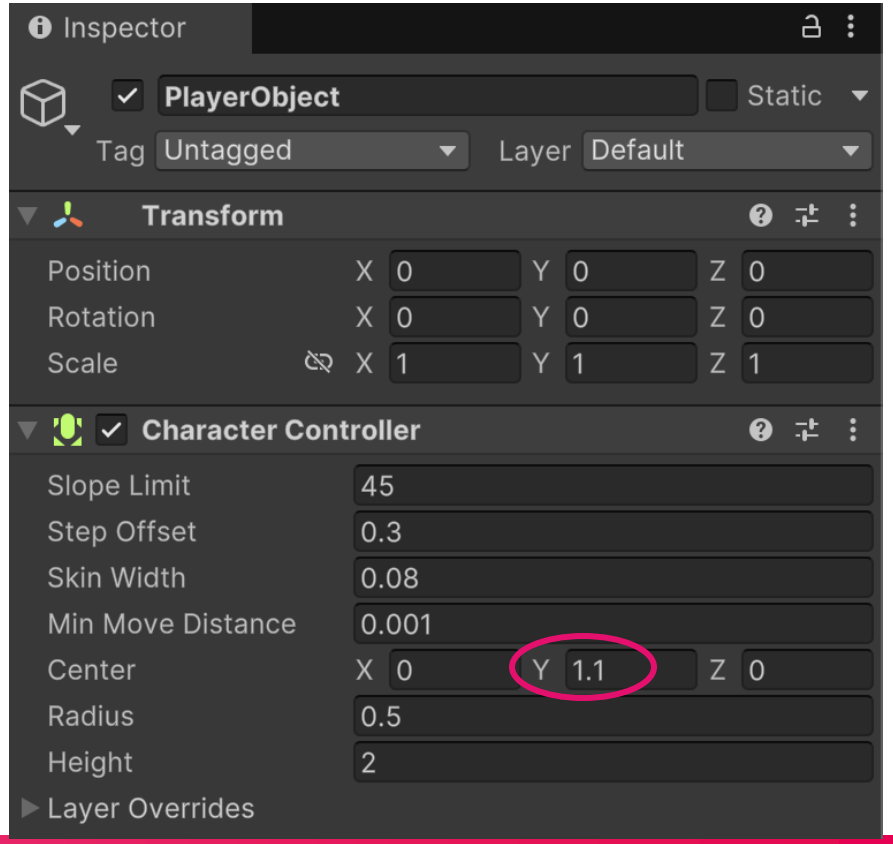
- `void Start()`
  - Executes when the game starts
  - Hides the cursor and deals with player control
- `void Update()`
  - Executes every frame
  - Call the Movement() and RotateAndLook() methods

Inside the Script

- `void Movement()`
  - Move the player by the keypresses
  - Make a jump
  - Something more ☺
- `void RotateAndLook()`
  - Rotate the camera

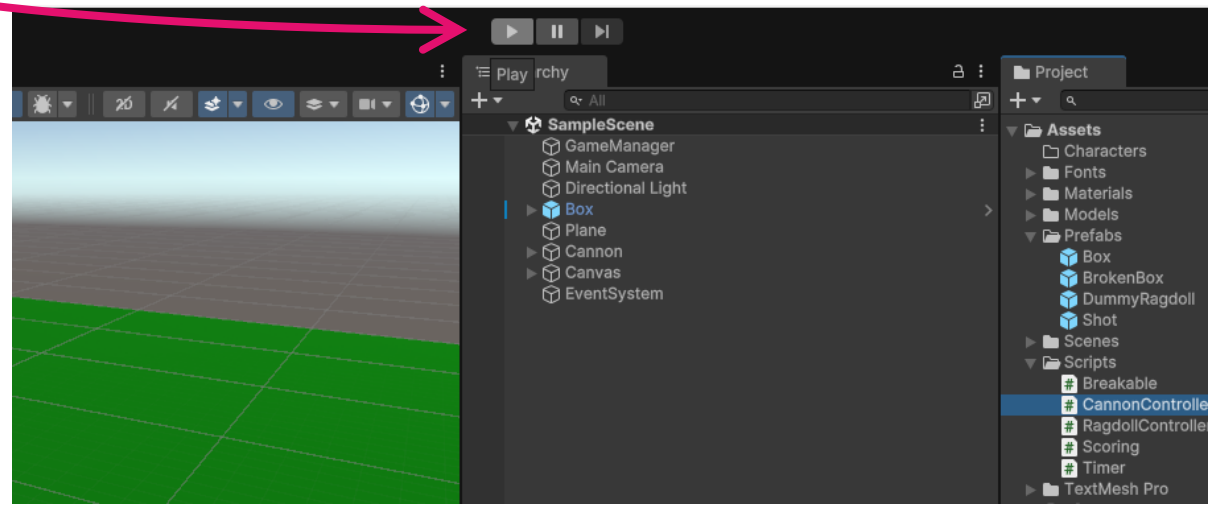
Move the Player

- Select *PlayerObject* in the **Hierarchy** pane
- Drag the *PlayerMovement* script into the **Inspector** plan
- Change the center of y in CharacterController to 1.1



Run the Game

- Click the *run* button to run the game



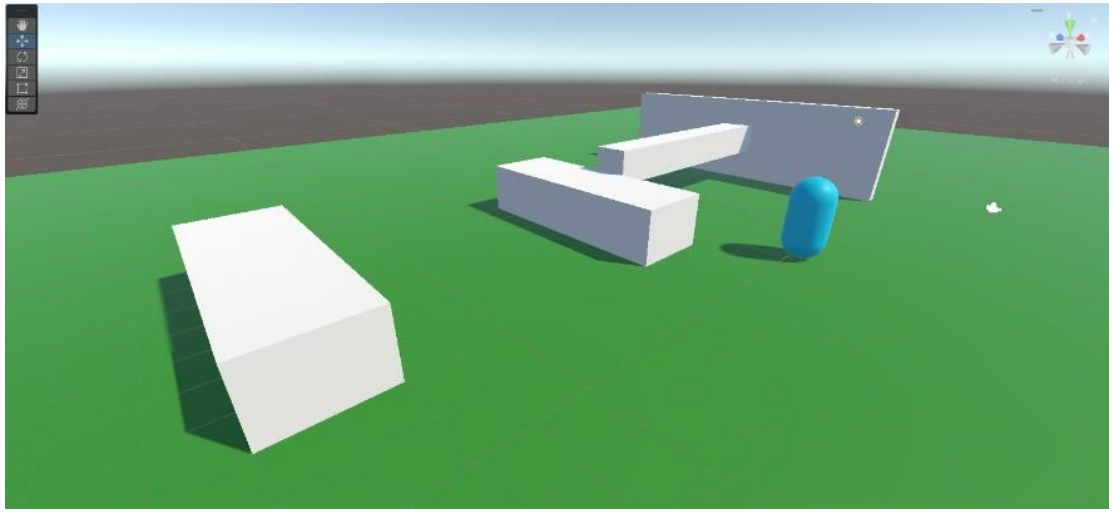
- You should be able to move the player by the arrow keys on your keyboard
- You can also jump using the space bar and change the camera angle with your mouse

What's Wrong?

- Even though you can move the player, it moves very slowly
- It can barely jump, too ☹
- There are two workarounds
  - Change the code which could be tedious
  - Change the settings in the Inspector which is a lot more intuitive
- See which settings you should modify

Next Up…

- Moving around on empty ground can be boring
- Why don’t we put together some obstacles?
- You may right-click on the Hierarchy pane and add some 3D Game Objects (e.g., cube, sphere, capsule)
- Use your imagination to create your game environment ☺

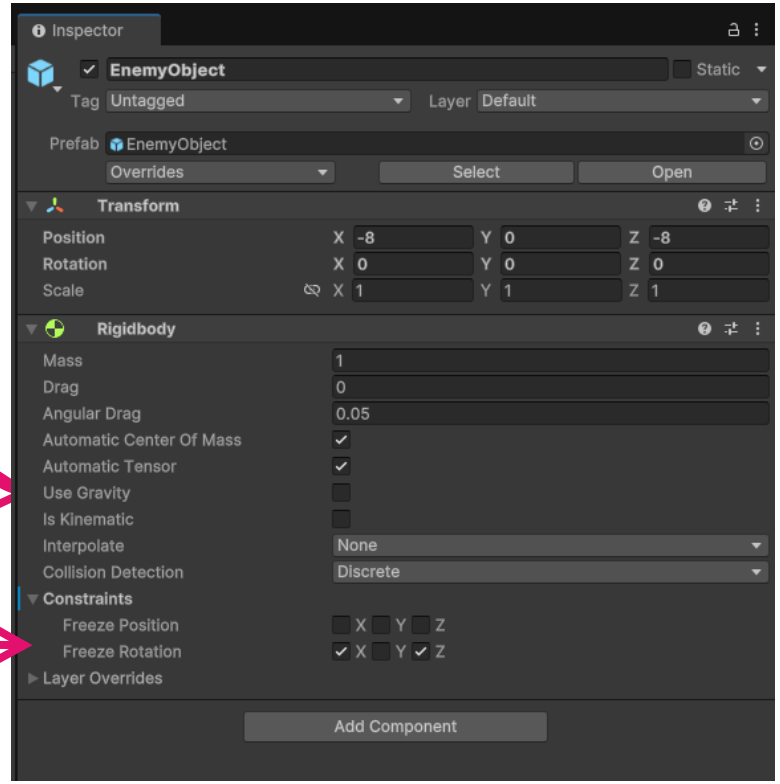


Enemies

- It’s time to create some enemies
- Inside the **Hierarchy** pane, create an empty object called *EnemyObject,* and keep it far from the player
  - e.g., Position: x=-5, y=0, z=-5
- Create a 3D Capsule object under *EnemyObject* and call it *EnemyModel*
  - Position: x=0, y=1, z=0

Enemies

- While keeping *EnemyObject* selected, add a Rigidbody component in the **Inspector** pane
- Deselect Use Gravity
- In **Freeze Rotation, c**heck X and Y



Enemies

- In the **Project** pane, create a folder called *Enemy* under the *Assets* folder
- Create a material and call it *Red* under *Enemy*
- Inside the **Inspector** pane, change its Base Map to red
- Drag the *Red* material to the enemy in the **Scene** pane

Move the Enemy

- The enemy will chase the player upon spotting them
- In the **Project** pane, create a MonoBehaviour called *EnemyAttack* under the *Assets/Enemy* folder
- Double-click *PlayerMovement* to open it in **Visual Studio**
- Copy this code and paste it into **Visual Studio**
  - https://github.com/ronaldkmo/hide_and_seek/blob/main/Assets/Enemy/EnemyAttack.cs
- Make sure ***you commit your changes*** and go back to **Unity**
  - Ctrl + S to save your script, for example

Inside the Script

- `void Start()`
  - Executes when the game starts
  - Set the time and obtain the enemy game object
- `void Update()`
  - Executes every frame
  - Call the Attack() method

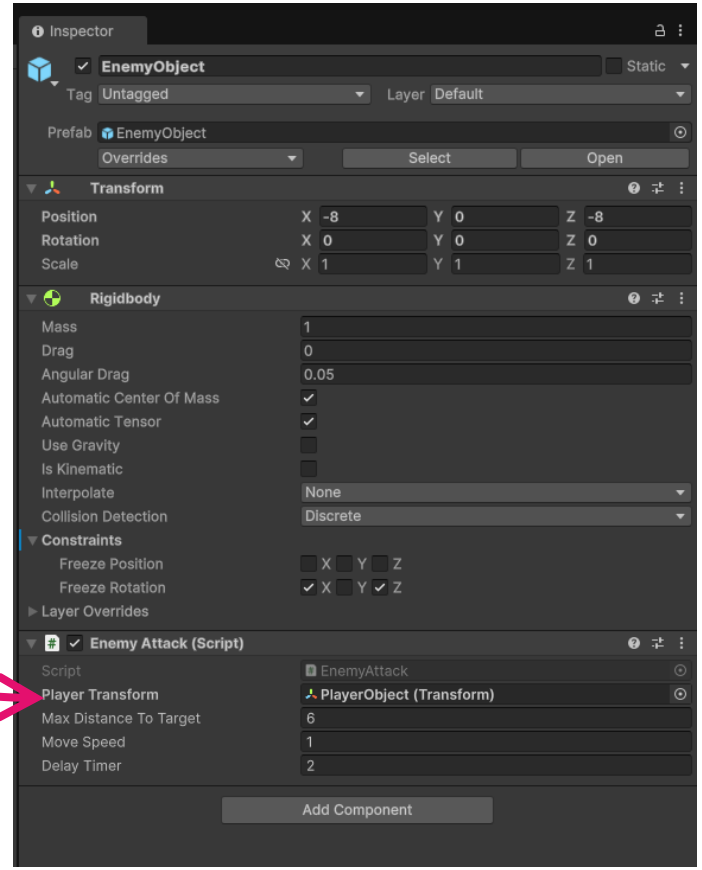
Inside the Script

- `void IsReadyToAttack()`
  - Check if the enemy is ready to attack
- `void Attack()`
  - Attack the player if the enemy sees them
  - The enemy will approach the player
- `void OnCollisionEnter()`
  - Check if the enemy has caught the player and terminate the game appropriately

Move the Enemy

- Select *EnemyObject* in the **Hierarchy** pane
- Drag the *EnemyAttack* script into the **Inspector** plan

- Drag *PlayerObject* in **Hierarchy** into the Player Transform field in **Inspector**

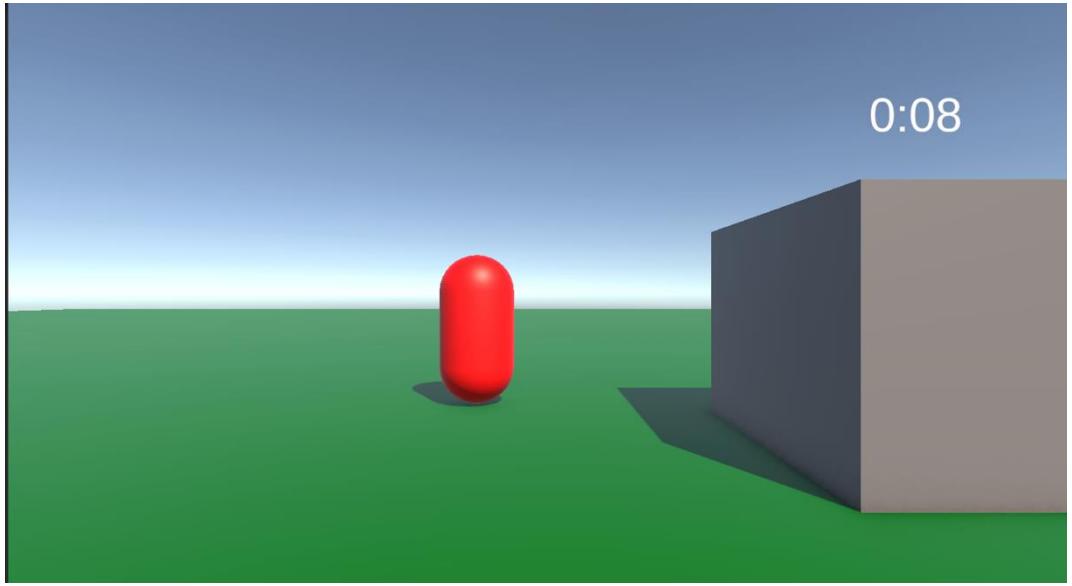


Run the Game (Again)

- Click the *run* button to run the game
- The enemy will chase you if you get too close
- However, they will stop if you move out of their sight
- The game ends if they catch you ☹

What's More?

- To enhance the gameplay, you may
  - Add more enemies by copying and pasting *EnemyObject*
  - Change the setting in the script EnemyAttack
  - Play around with the settings in Rigidbody of *EnemyObject*
- Some potential improvements
  - Add a timer
  - Make the enemy jump perhaps



Thank you

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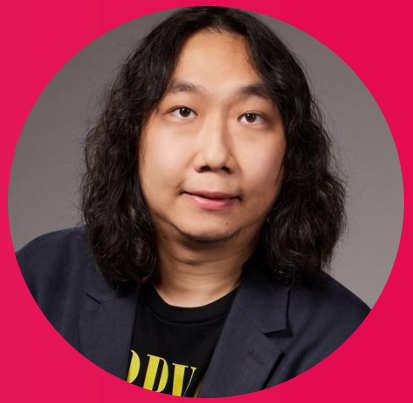

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