Games Programming Taster

Hide and Seek

An Introduction to Unity Development

University of Sunderland

Dr. Ronald Mo

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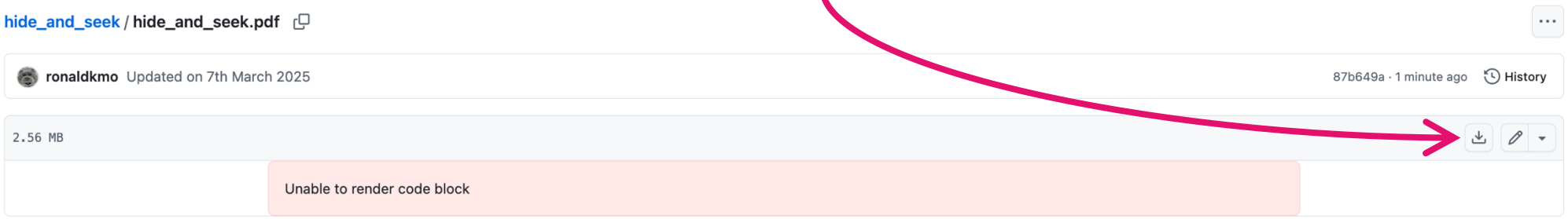
Download this PowerPoint

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



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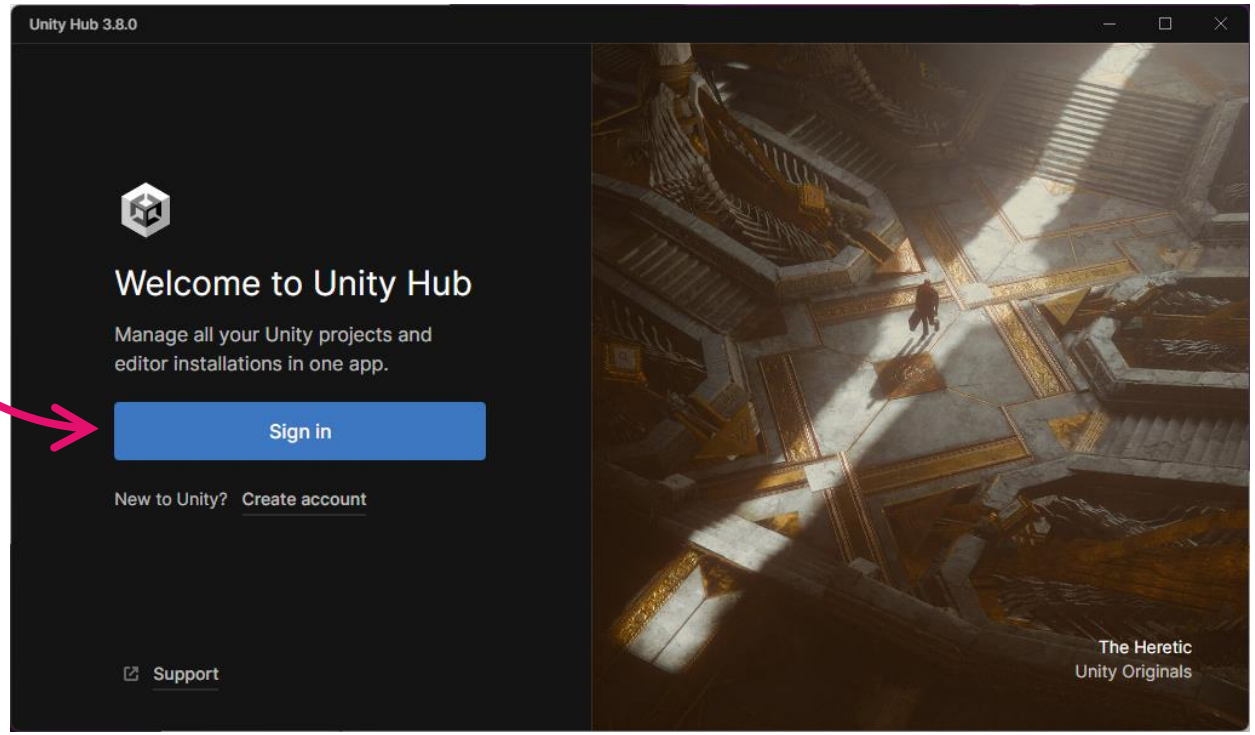
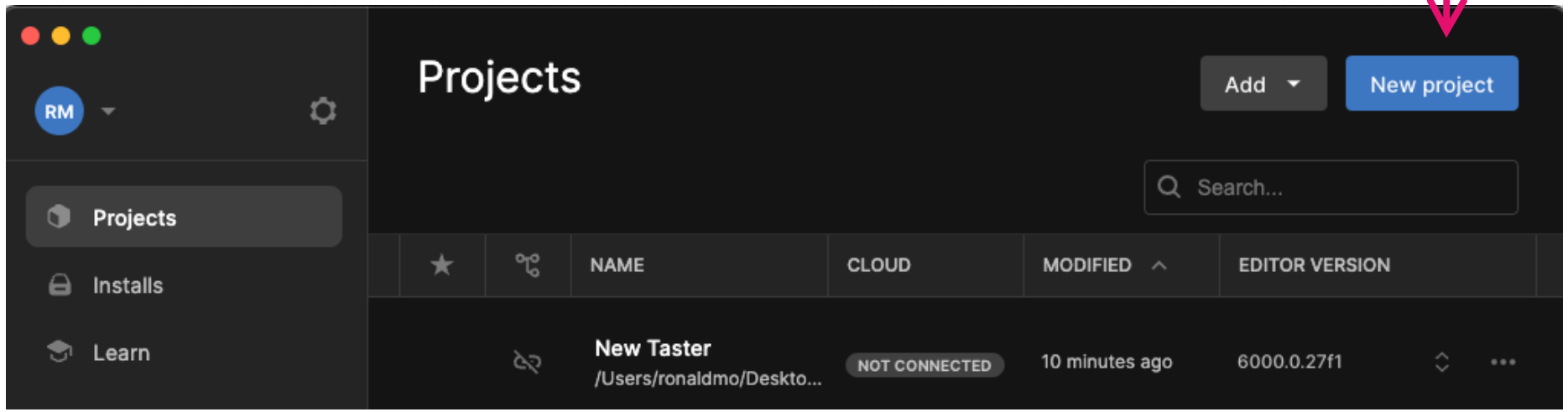
Create a Unity Account

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



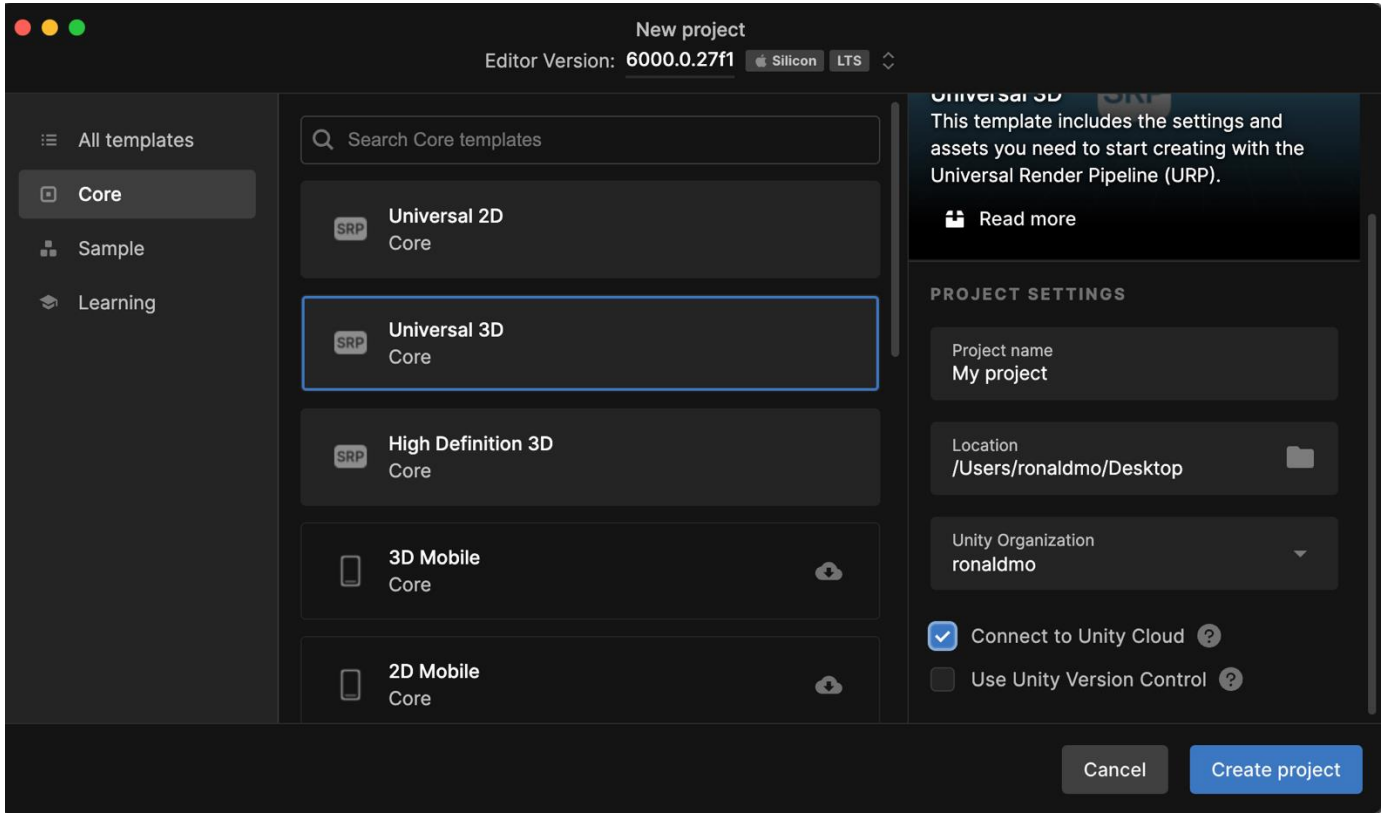
Create a New Project

- 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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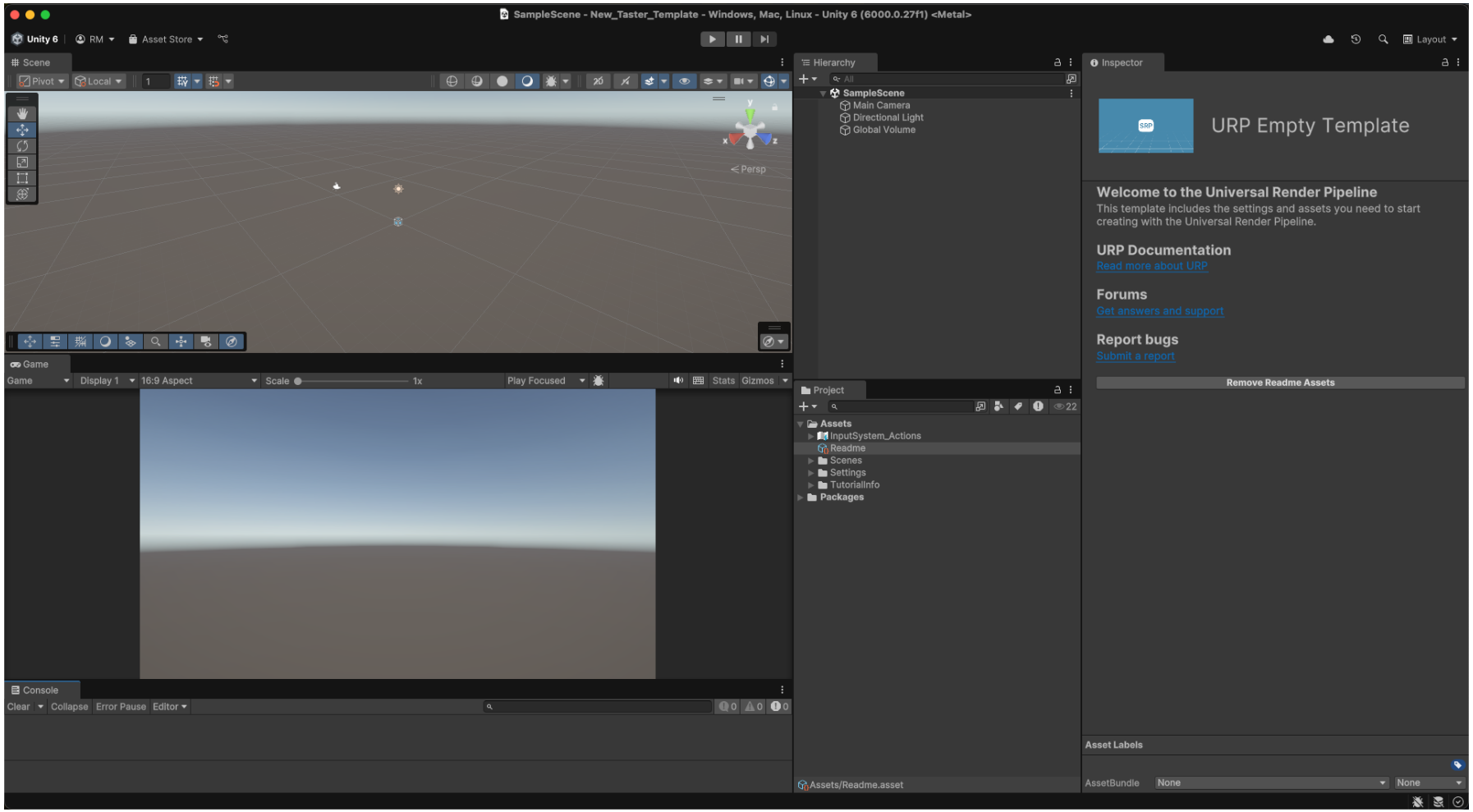
Unity 6



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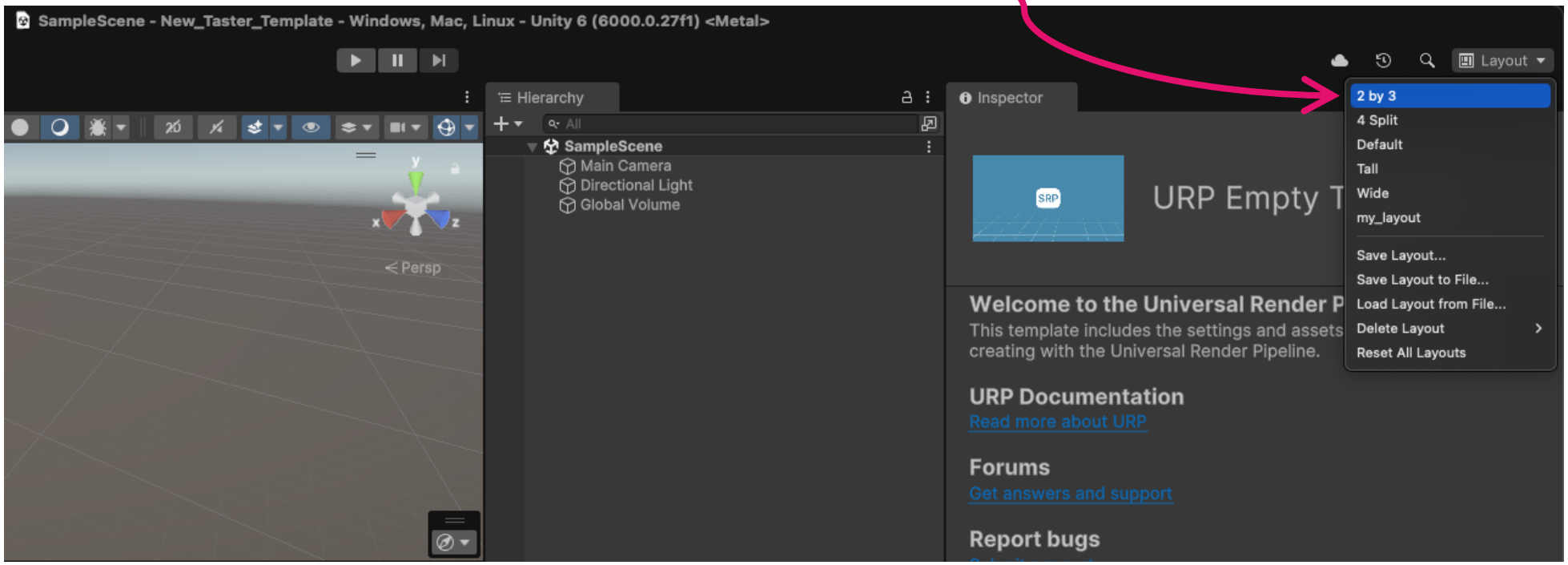
Change the Layout

- Let's change the layout to 2 by 3



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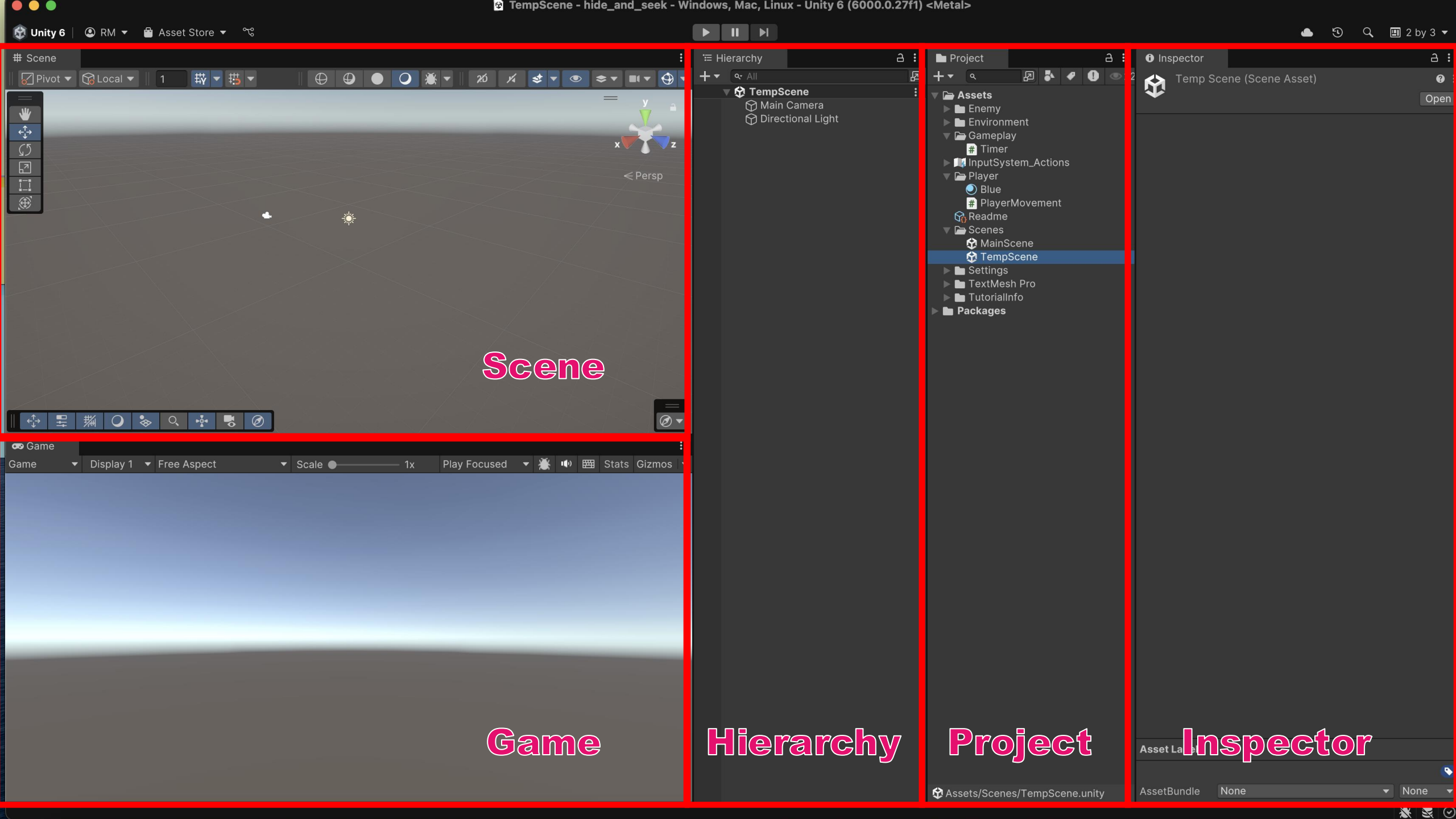
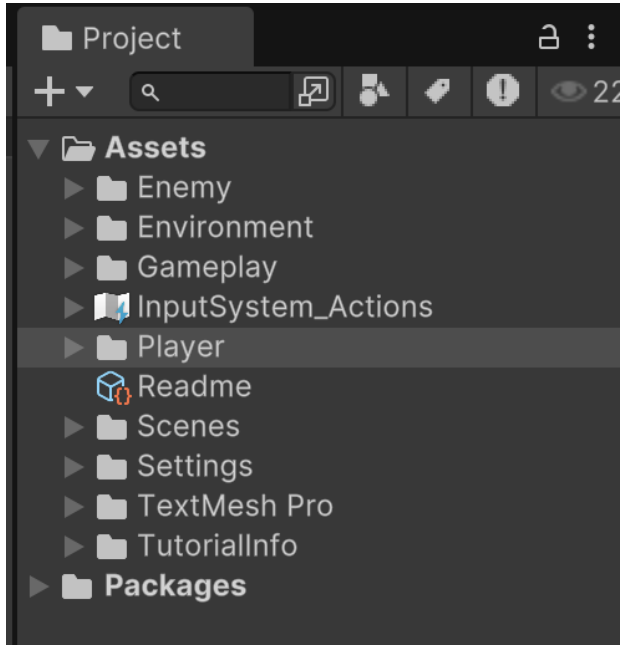
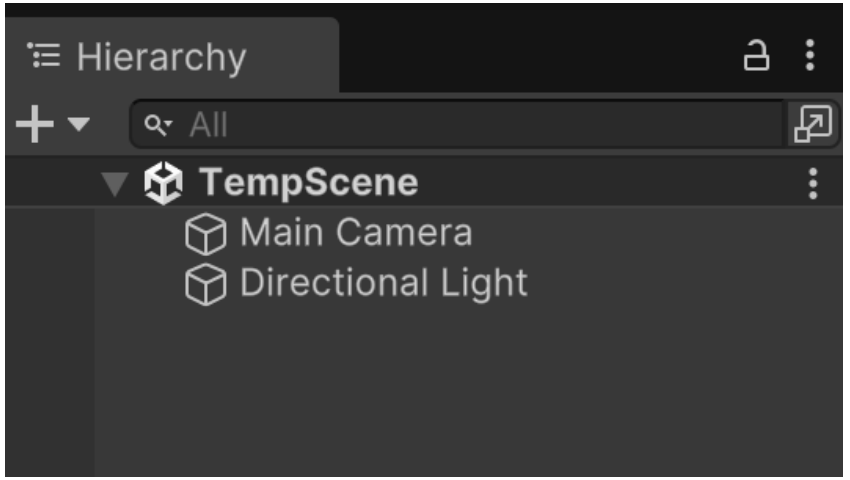

TempScene - hide_and_seek - Windows, Mac, Linux - Unity 6 (6000.0.27f1) <Metal>
Unity 6
RM
Asset Store
2 by 3
Scene
Pivot
Local
Persp
Scene
Hierarchy
All
TempScene
Main Camera
Directional Light
Project
Assets
Enemy
Environment
Gameplay
Timer
InputSystem_Actions
Player
Blue
PlayerMovement
Readme
Scenes
MainScene
TempScene
Settings
TextMesh Pro
TutorialInfo
Packages
Assets/Scenes/TempScene.unity
Inspector
Temp Scene (Scene Asset)
Open
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



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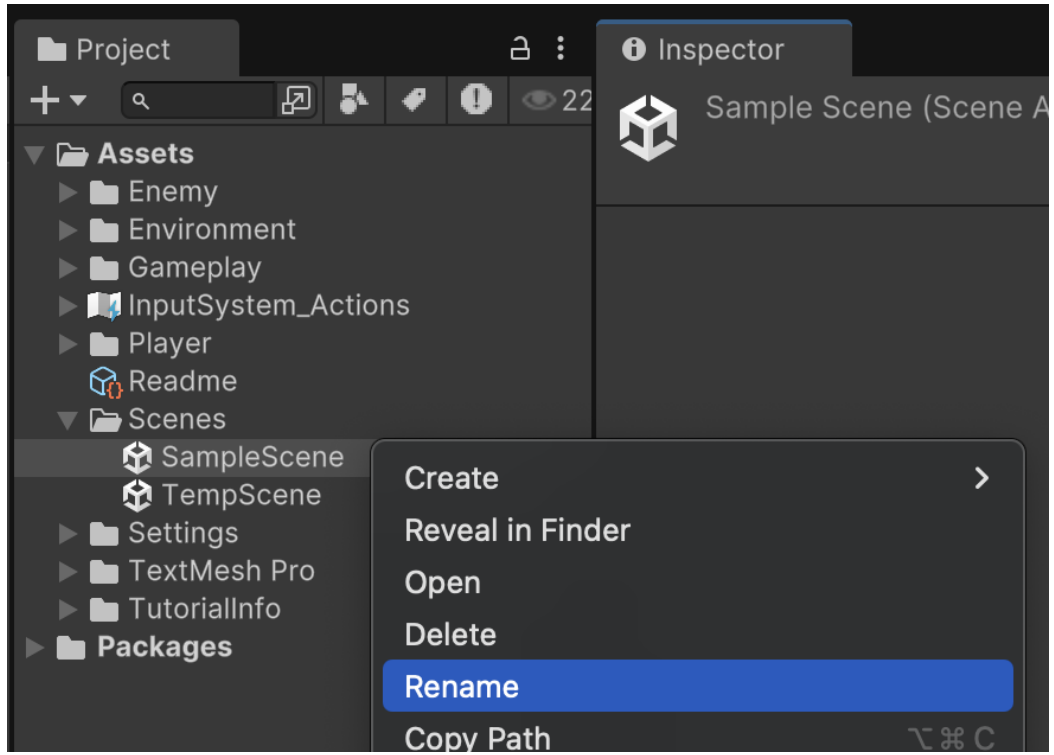
Set Up the Game Environment

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



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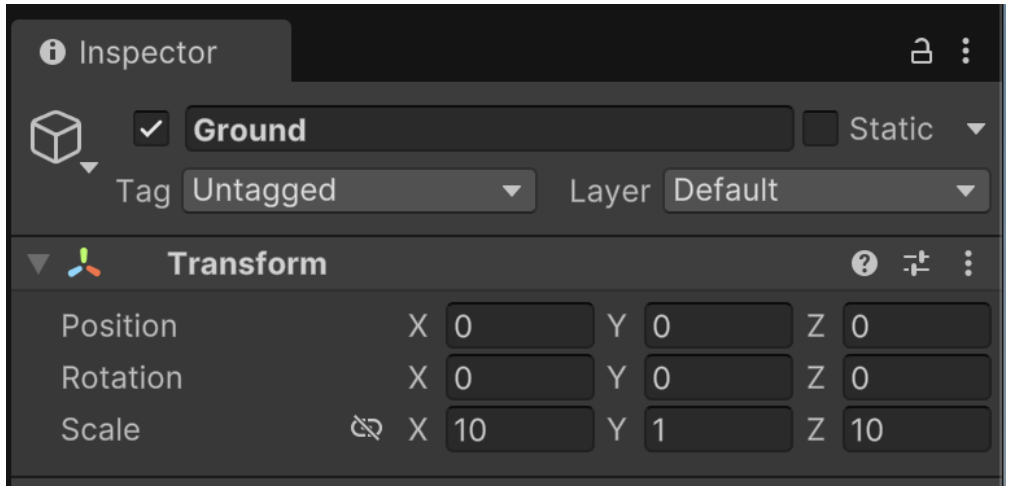
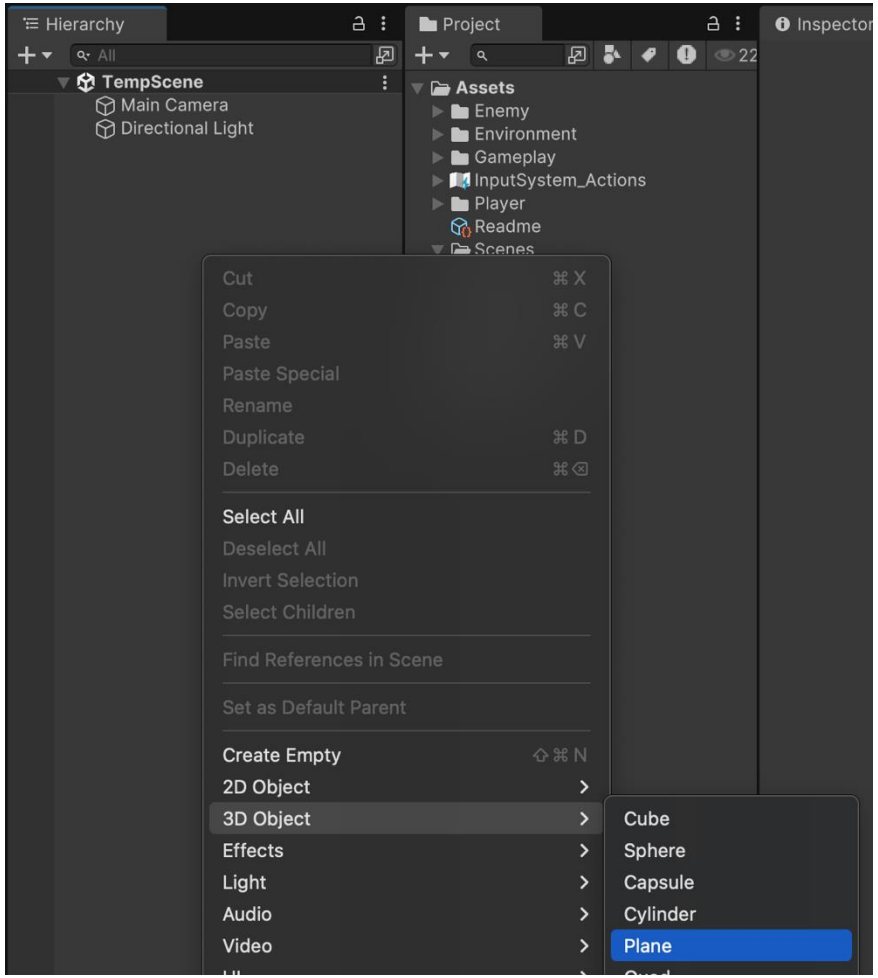
Set Up the Game Environment

- 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





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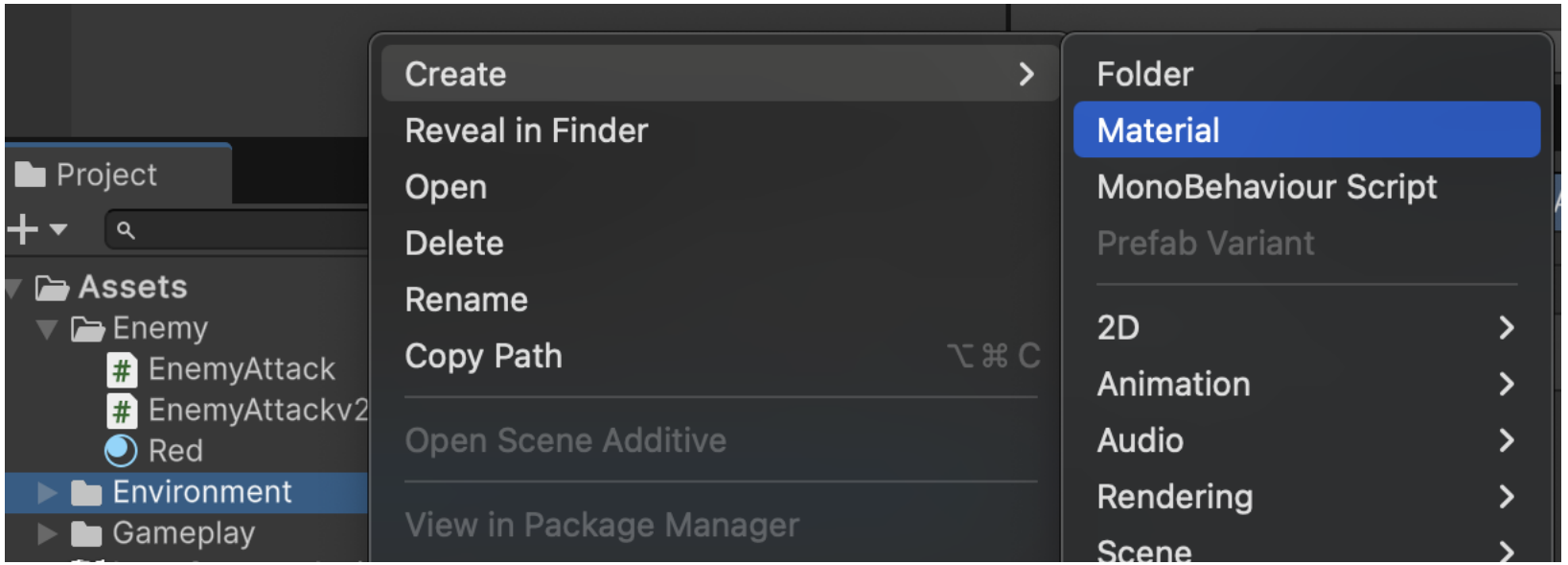
Set Up the Game Environment

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



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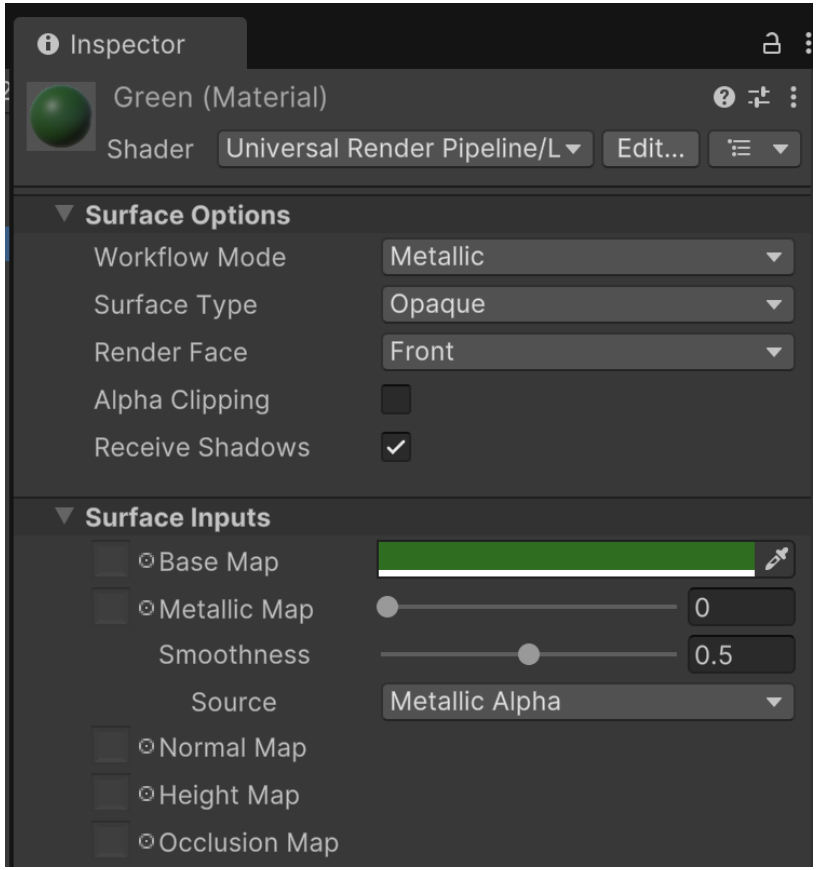
Set Up the Game Environment

- 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



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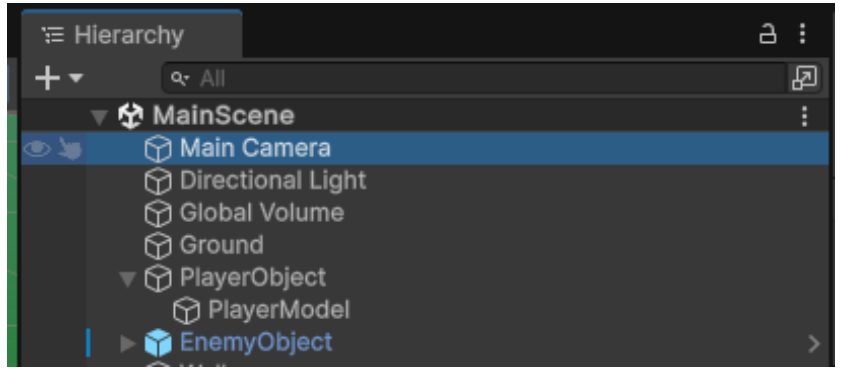
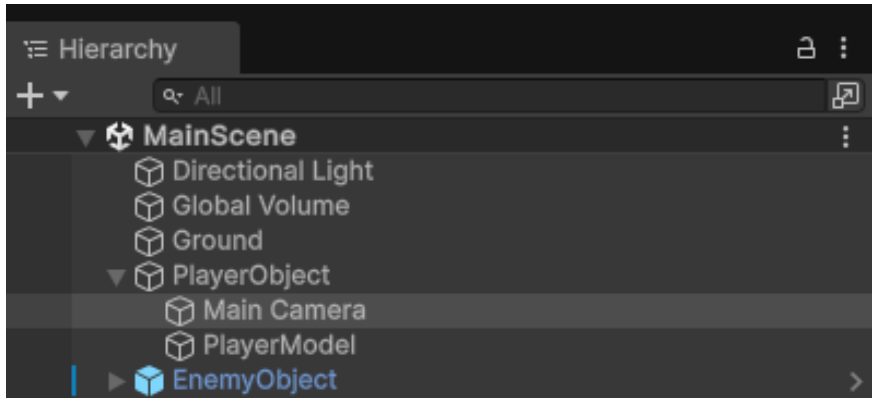
Create the Player

- Inside the **Hierarchy** pane, create an empty object called *PlayerObject*
  - Position: x=0, y=1, z=0
- Create a 3D Capsule object under *PlayerObject* and call it *PlayerModel*
  - Position: x=0, y=0, z=0
- Move the Main Camera into *PlayerObject*
  - Position: x=0, y=0.5, z=0





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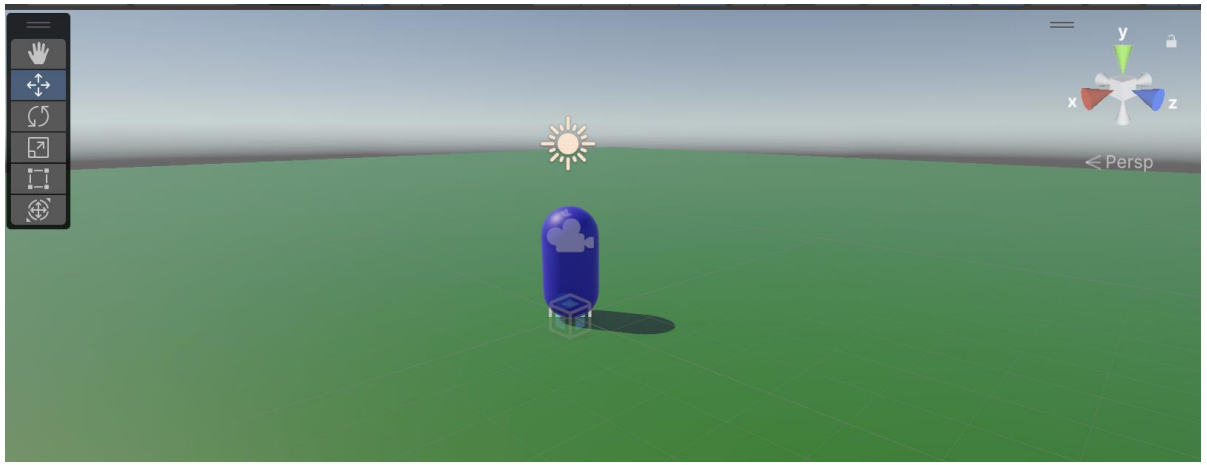
Create the Player

- 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



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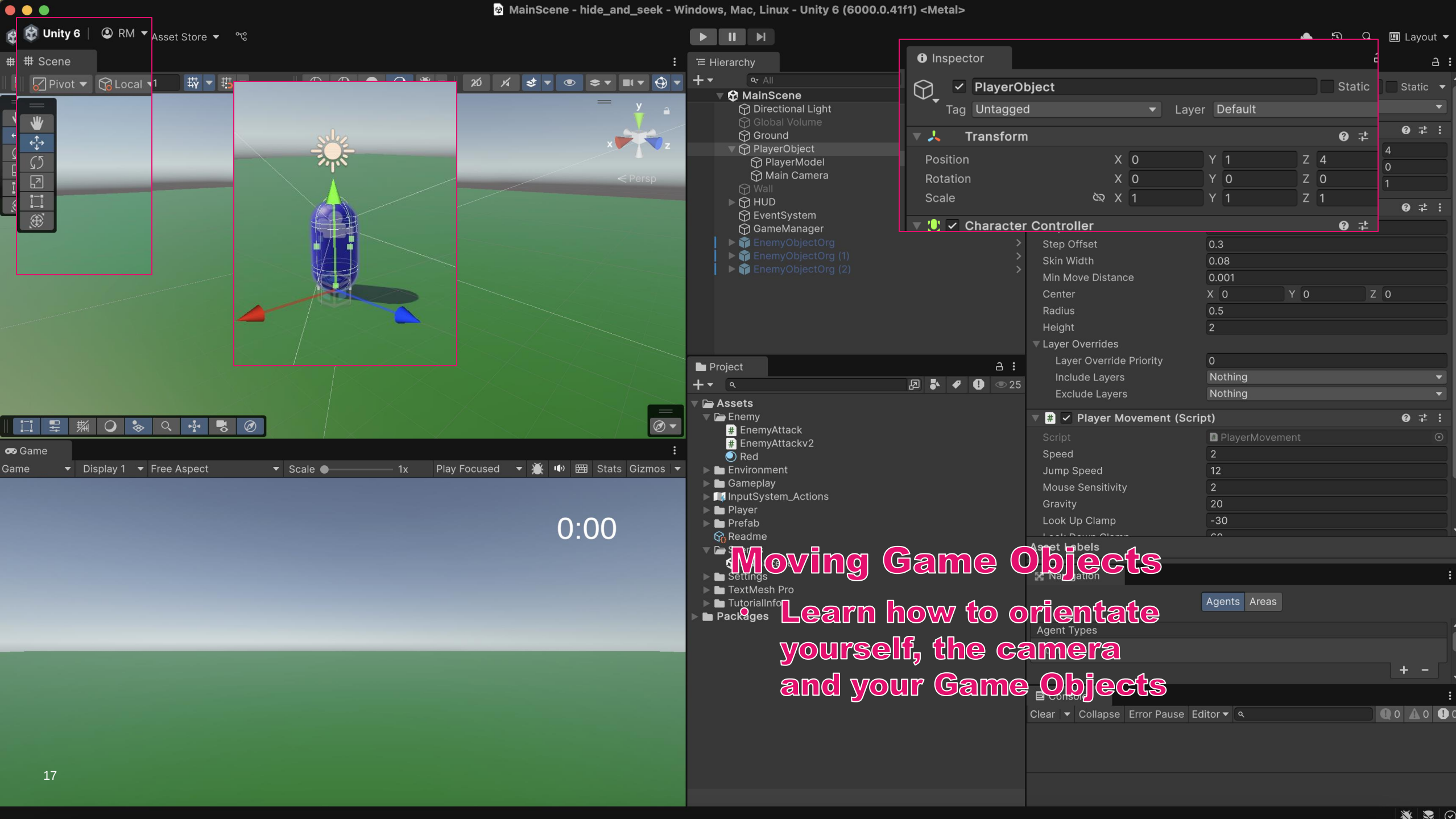
MainScene - hide_and_seek - Windows, Mac, Linux - Unity 6 (6000.0.41f1) <Metal>
Unity 6
RM
Asset Store
Layout
Scene
Pivot
Local
Persp
Hierarchy
MainScene
Directional Light
Global Volume
Ground
PlayerObject
PlayerModel
Main Camera
Wall
HUD
EventSystem
GameManager
EnemyObjectOrg
EnemyObjectOrg (1)
EnemyObjectOrg (2)
Inspector
PlayerObject
Static
Tag
Untagged
Layer
Default
Transform
Position
Rotation
Scale
Character Controller
Step Offset
0.3
Skin Width
0.08
Min Move Distance
0.001
Center
Radius
0.5
Height
2
Layer Overrides
Layer Override Priority
Include Layers
Nothing
Exclude Layers
Nothing
Player Movement (Script)
Script
PlayerMovement
Speed
2
Jump Speed
12
Mouse Sensitivity
2
Gravity
20
Look Up Clamp
-30
Project
Assets
Enemy
EnemyAttack
EnemyAttackv2
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Player
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TextMesh Pro
TutorialInfo
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Game
Display 1
Free Aspect
Scale
1x
Play Focused
Stats
Gizmos
0:00
Moving Game Objects
Learn how to orientate yourself, the camera and your Game Objects
Agents
Areas
Agent Types
Clear
Collapse
Error Pause
Editor
17

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**

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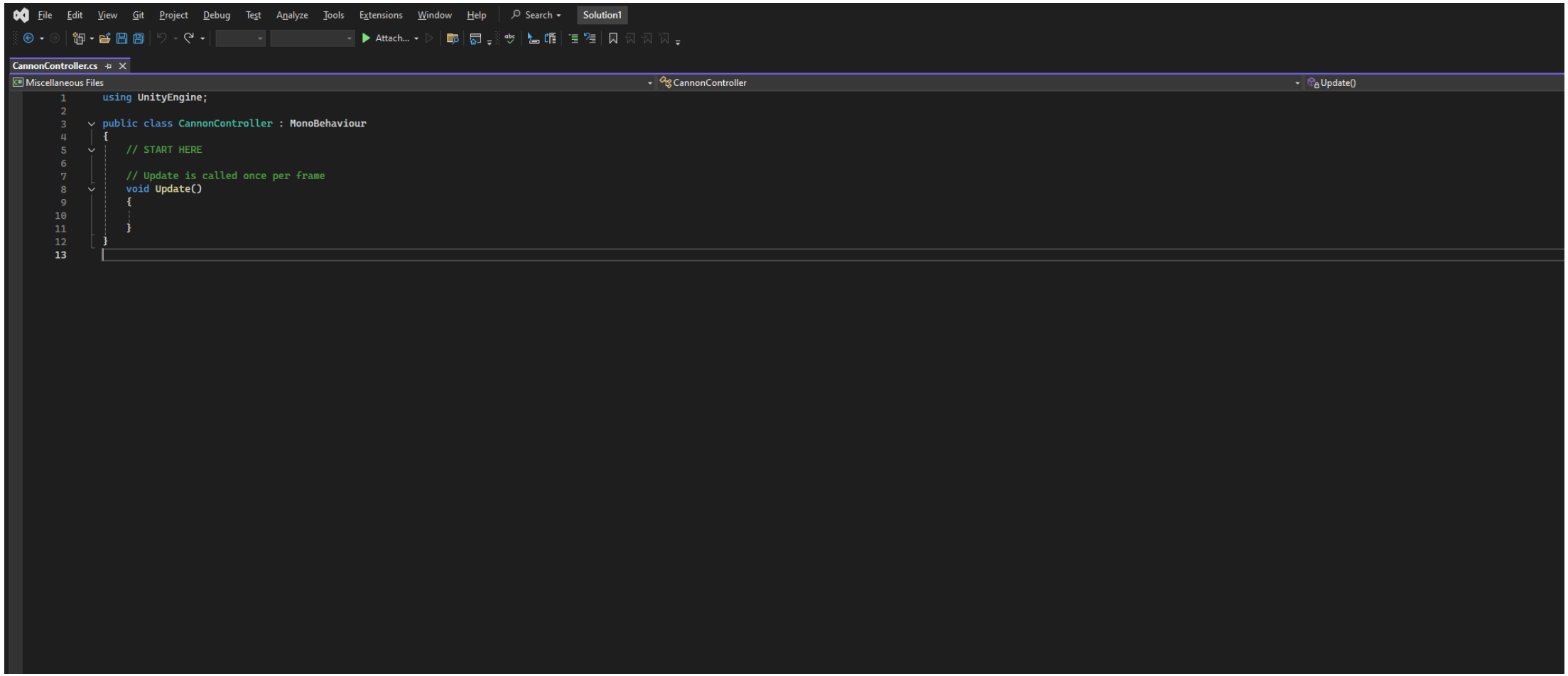
Visual Studio 2022



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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

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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

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Inside the Script

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

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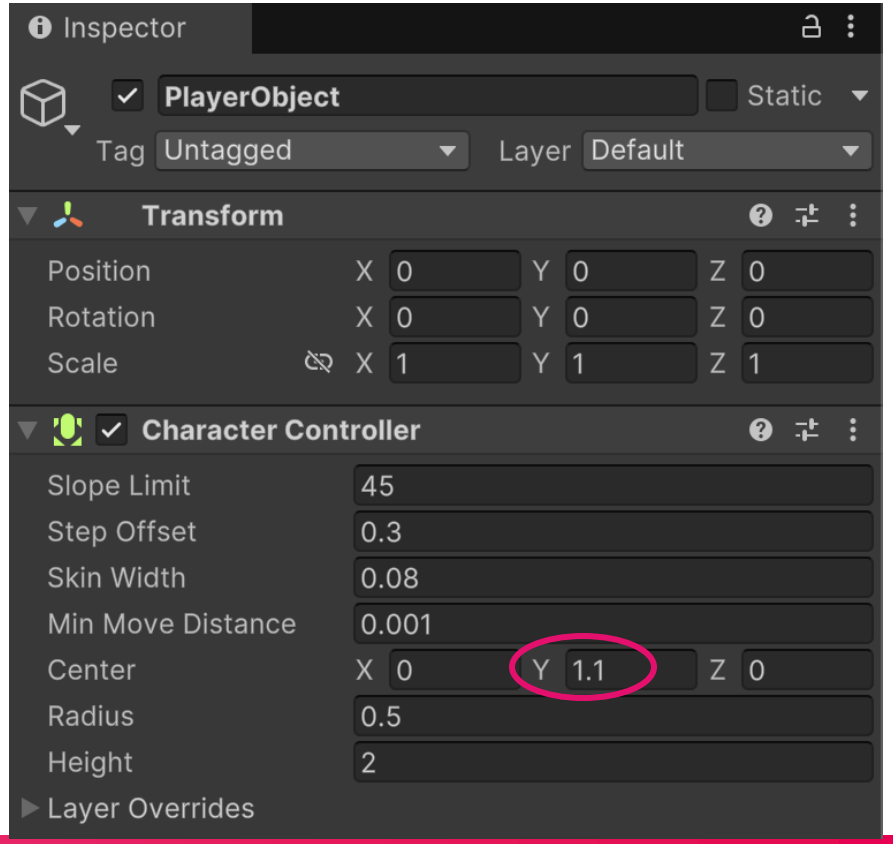
Move the Player

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



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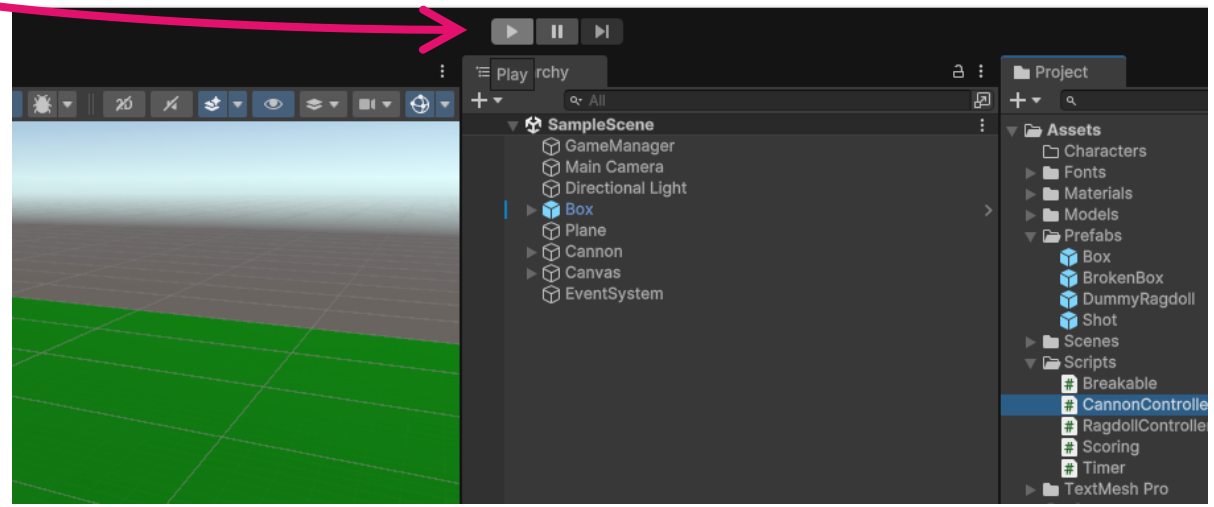
Run the Game

- 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

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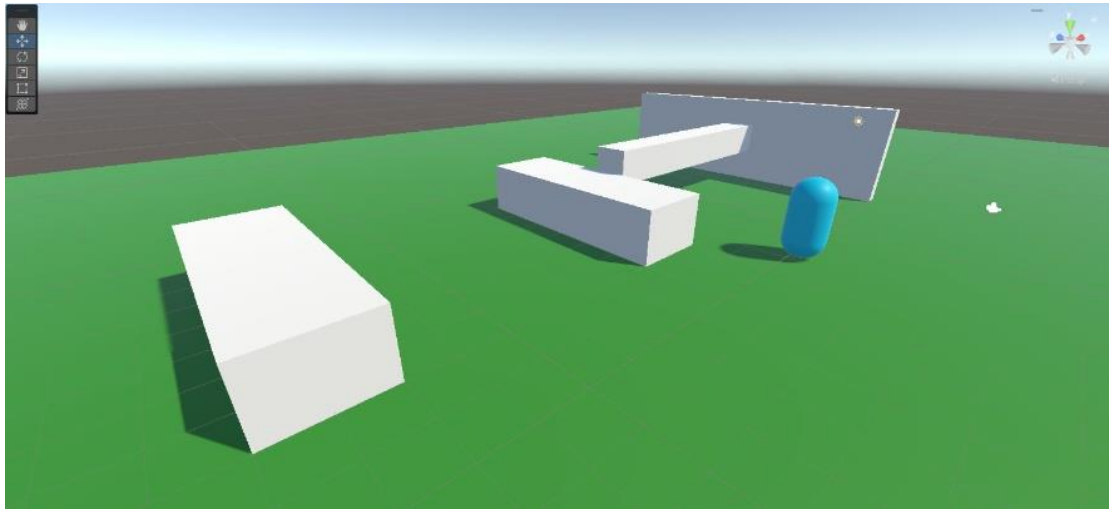
What's Wrong?

- 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

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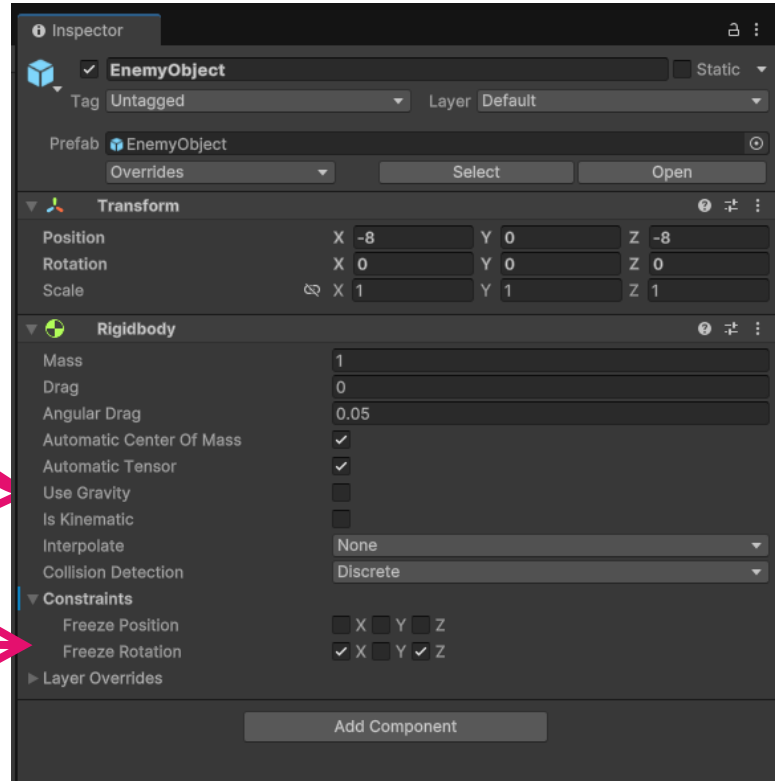
Enemies

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



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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

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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

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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

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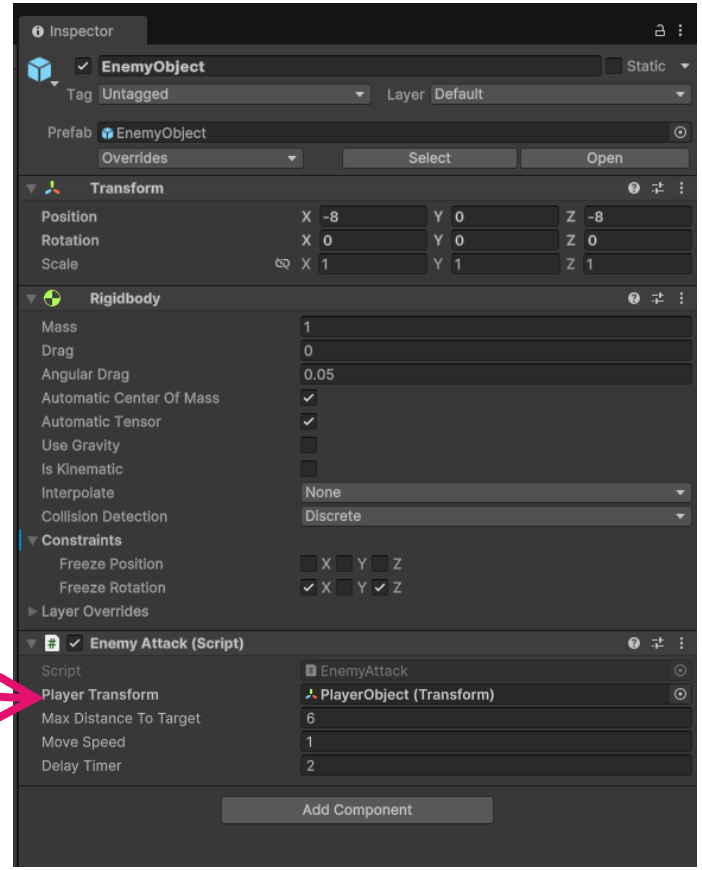
Move the Enemy

- 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**



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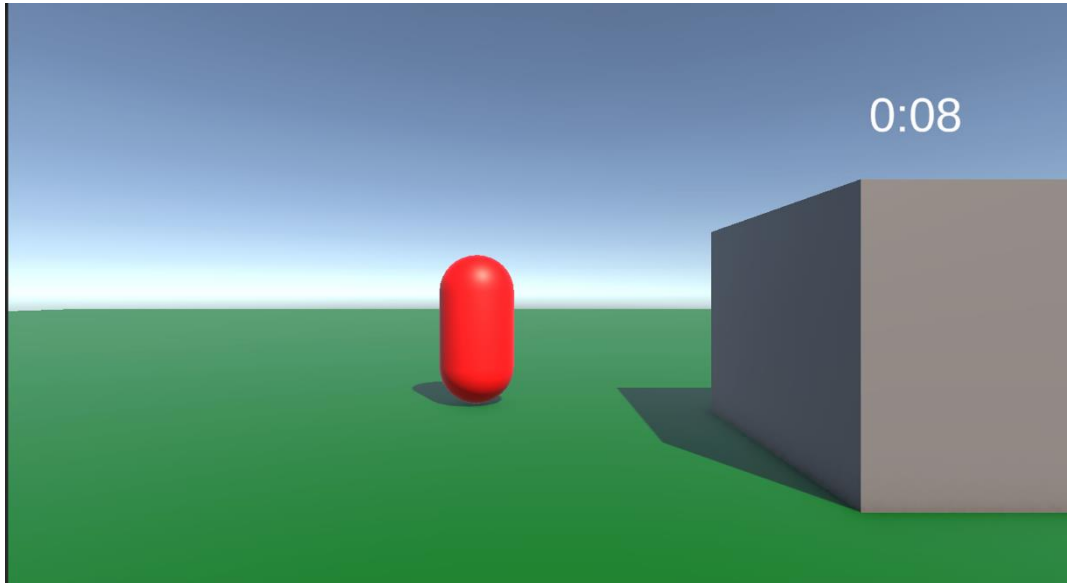
Run the Game (Again)

- 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
  - Allow player movement while jumping
  - Make the enemy jump perhaps



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Thank you

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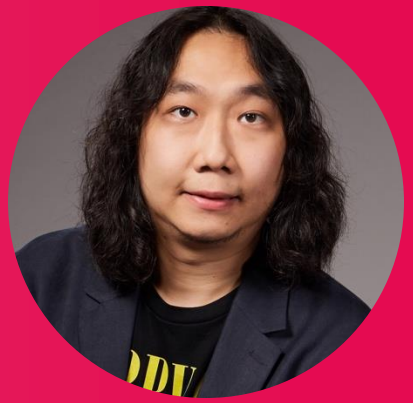

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