CSE3122 Game Programming Lab Fat

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SET – 2

Create **a 3D game** using UNITY game engine by incorporating the game rules and building the game mechanics as mentioned.

Game Play: Player needs to survive by avoiding colliding with the auto-movable obstacles and should able to reach the goal point.

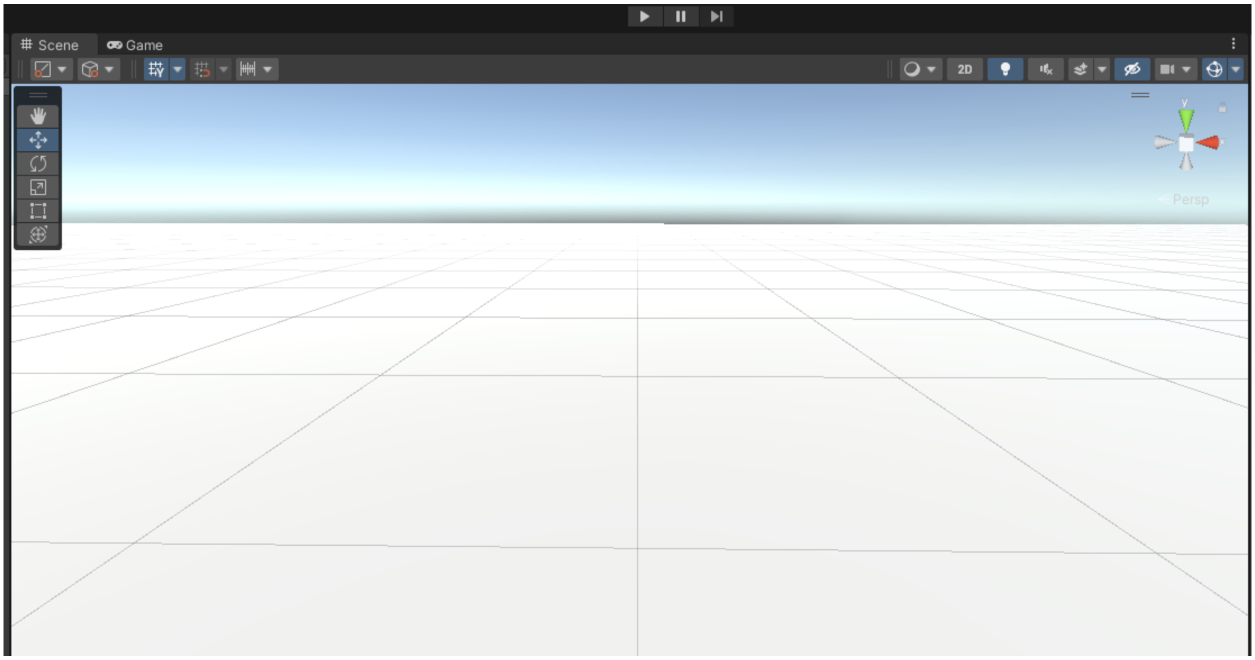
Rule:

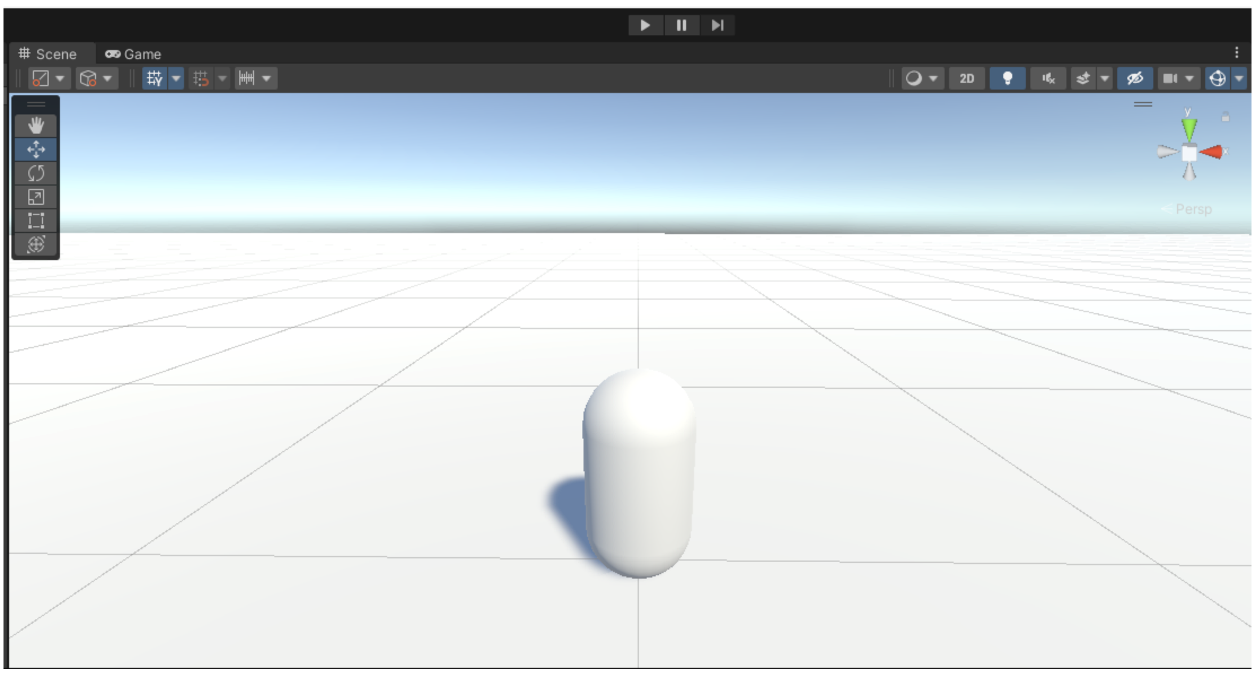
- Player should be within a fixed game environment; otherwise he should lose his life.
- Only 3 lives should be permitted, after that display "Game Over"

Mechanics:

- Player should be able to move left, right and up
- Minimum one obstacle is needed.
- Two levels should be provided
- Variation in obstacles should be in 2nd level
- Once player completes the game, Player won caption should be provided
- Proper light effects which suits the game environment
- Proper audio/music/sound effects which suits the game environment

Development Screenshots:





Creating PlayerMovement Script

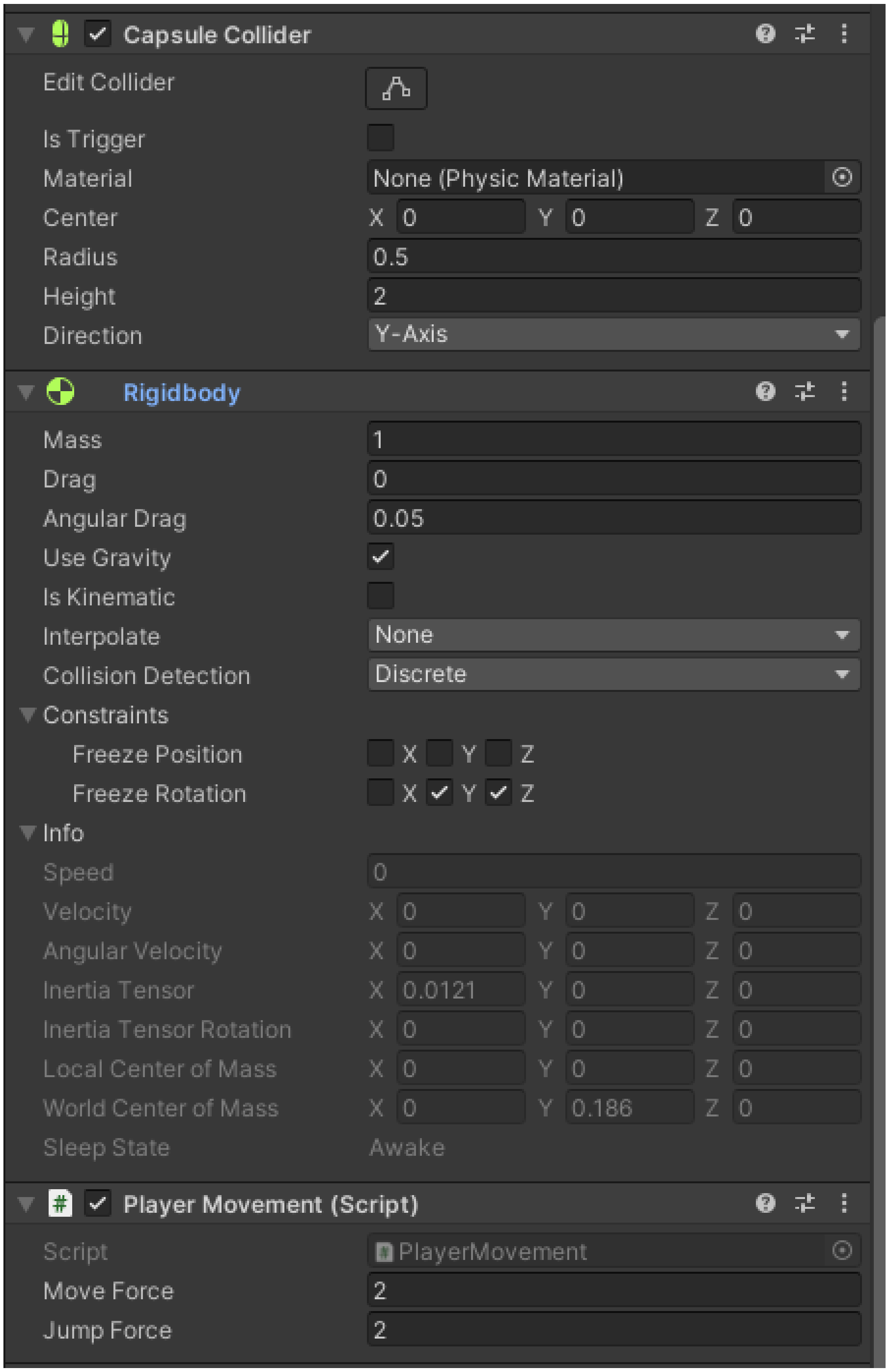
PlayerMovement.cs

C: > Users > admin > 20BAI1156_LabFat > Assets > Scripts > PlayerMovement.cs

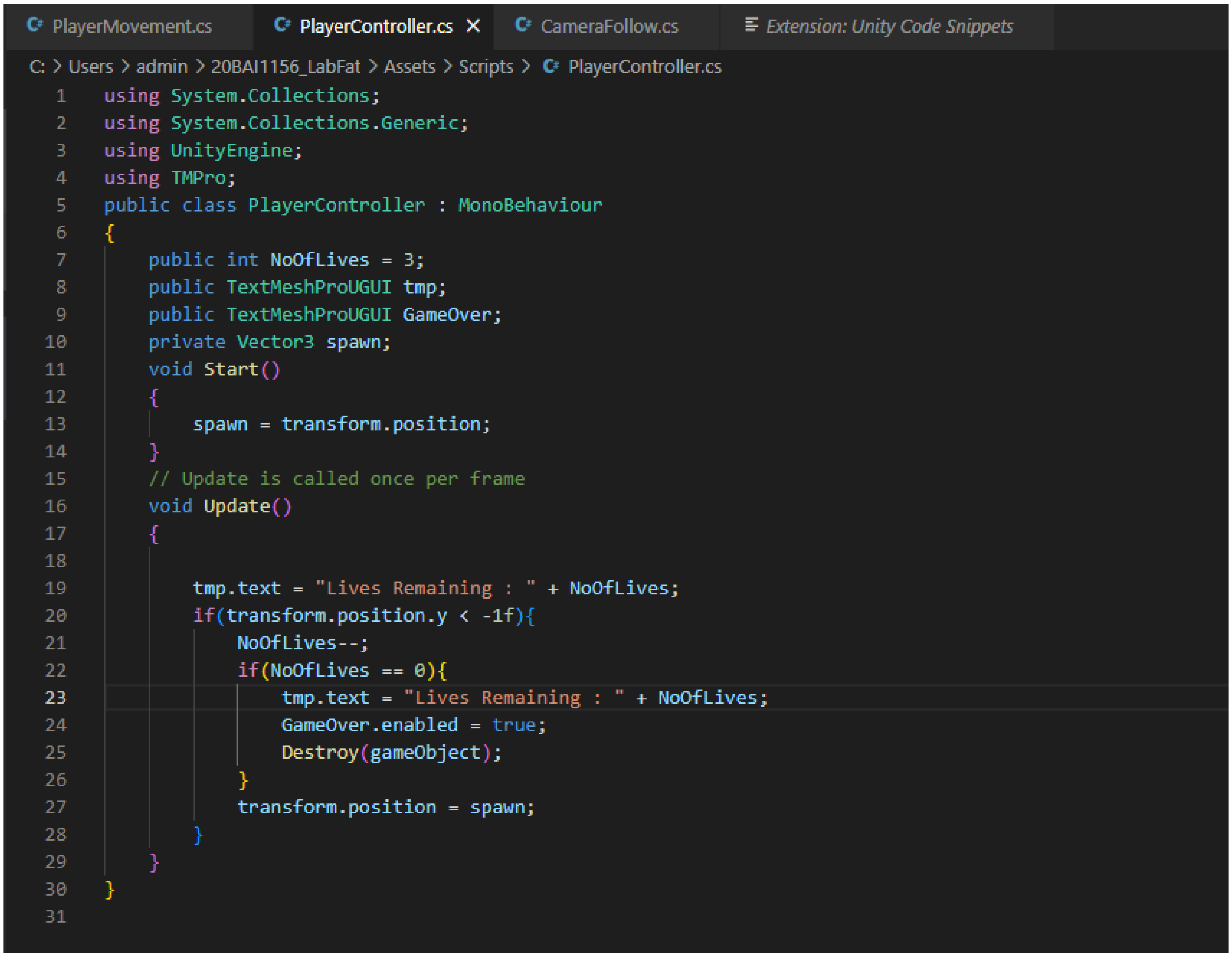
```csharp
using System.Collections;
using System.Collections.Generic;
using UnityEngine;

public class PlayerMovement : MonoBehaviour
{
    public float moveForce = 2;
    public float jumpForce = 2;
    void Update()
    {
        if(Input.GetKeyDown(KeyCode.Space)){
            GetComponent<Rigidbody>().AddForce(new Vector3(0f, 1f, 0f) * jumpForce * 100f);
        }
        if(Input.GetKeyDown(KeyCode.A)){
            GetComponent<Rigidbody>().AddForce(new Vector3(-1f, 0f, 0f) * moveForce * 100f);
        }
        if(Input.GetKeyDown(KeyCode.D)){
            GetComponent<Rigidbody>().AddForce(new Vector3(1f, 0f, 0f) * moveForce * 100f);
        }
        if(Input.GetKeyDown(KeyCode.W)){
            GetComponent<Rigidbody>().AddForce(new Vector3(0f, 0f, 1f) * moveForce * 100f);
        }
        if(Input.GetKeyDown(KeyCode.S)){
            GetComponent<Rigidbody>().AddForce(new Vector3(0f, 0f, -1f) * moveForce * 100f);
        }
    }
}
```

Adding Rigidbody, capsuleCollider and playermovement script to player



Creating PlayerController Script and incorporating, Game Boundaries



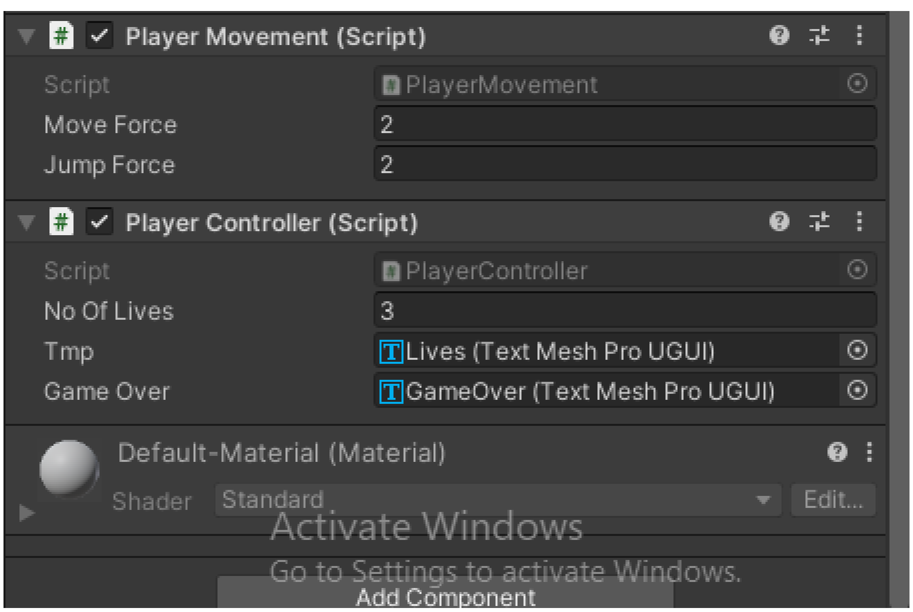
PlayerMovement.cs | PlayerController.cs | CameraFollow.cs | Extension: Unity Code Snippets

C: > Users > admin > 20BAI1156_LabFat > Assets > Scripts > PlayerController.cs

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
using TMPro;
public class PlayerController : MonoBehaviour
{
    public int NoOfLives = 3;
    public TextMeshProUGUI tmp;
    public TextMeshProUGUI GameOver;
    private Vector3 spawn;
    void Start()
    {
        spawn = transform.position;
    }
    // Update is called once per frame
    void Update()
    {

        tmp.text = "Lives Remaining : " + NoOfLives;
        if(transform.position.y < -1f){
            NoOfLives--;
            if(NoOfLives == 0){
                tmp.text = "Lives Remaining : " + NoOfLives;
                GameOver.enabled = true;
                Destroy(gameObject);
            }
            transform.position = spawn;
        }
    }
}

```



Creating and Adding Camera follow script

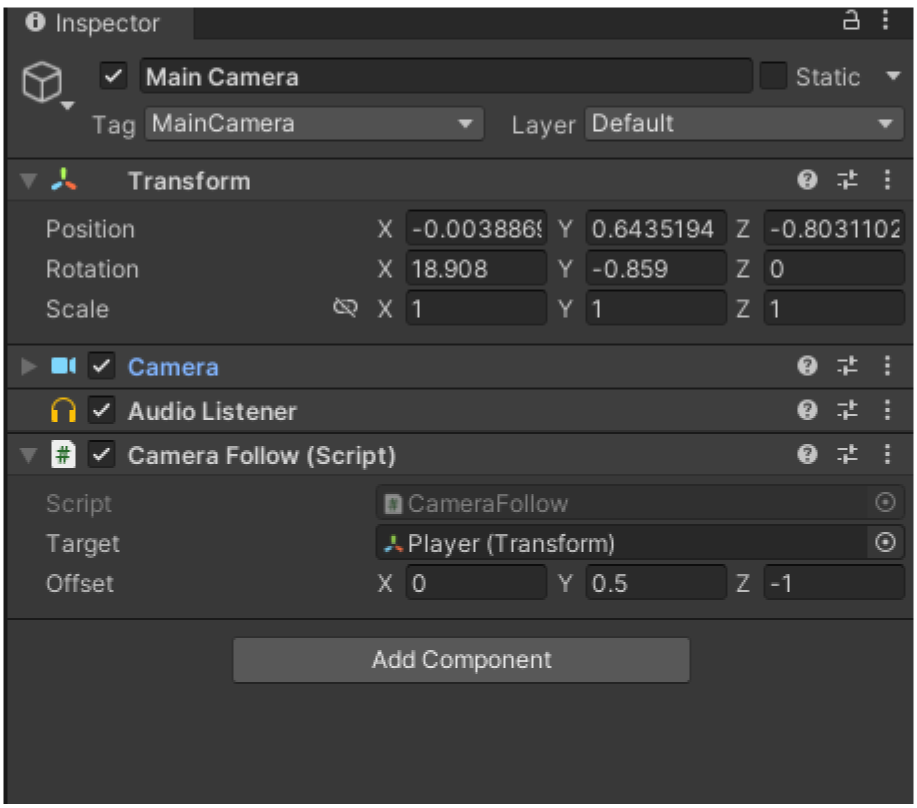
PlayerMovement.cs | PlayerController.cs | CameraFollow.cs | Extension: Unity Code Snippets

C: > Users > admin > 20BAI1156_LabFat > Assets > Scripts > CameraFollow.cs

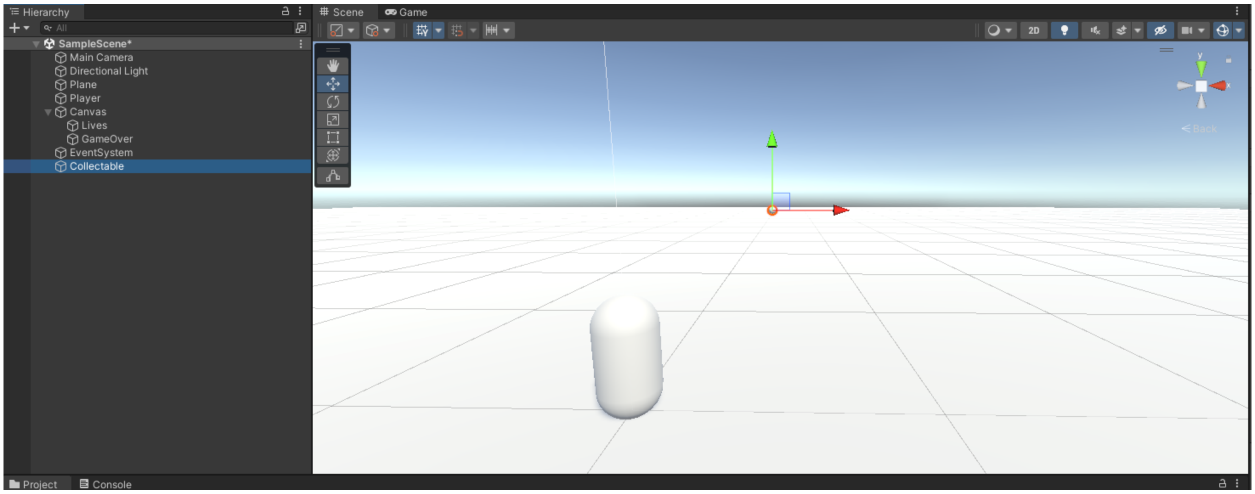
```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;

public class CameraFollow : MonoBehaviour
{
    public Transform target;
    public Vector3 offset;
    // Update is called once per frame
    void Update()
    {
        transform.position = target.position + offset;
    }
}

```



Creating the Collectable Object which will be the end point of first Level



We will use the Collectable as a point to reach Level 2

Creating a Level1End script and adding it to this collectable

PlayerMovement.cs | PlayerController.cs | FollowPath.cs | CameraFollow.cs | Level1End.cs

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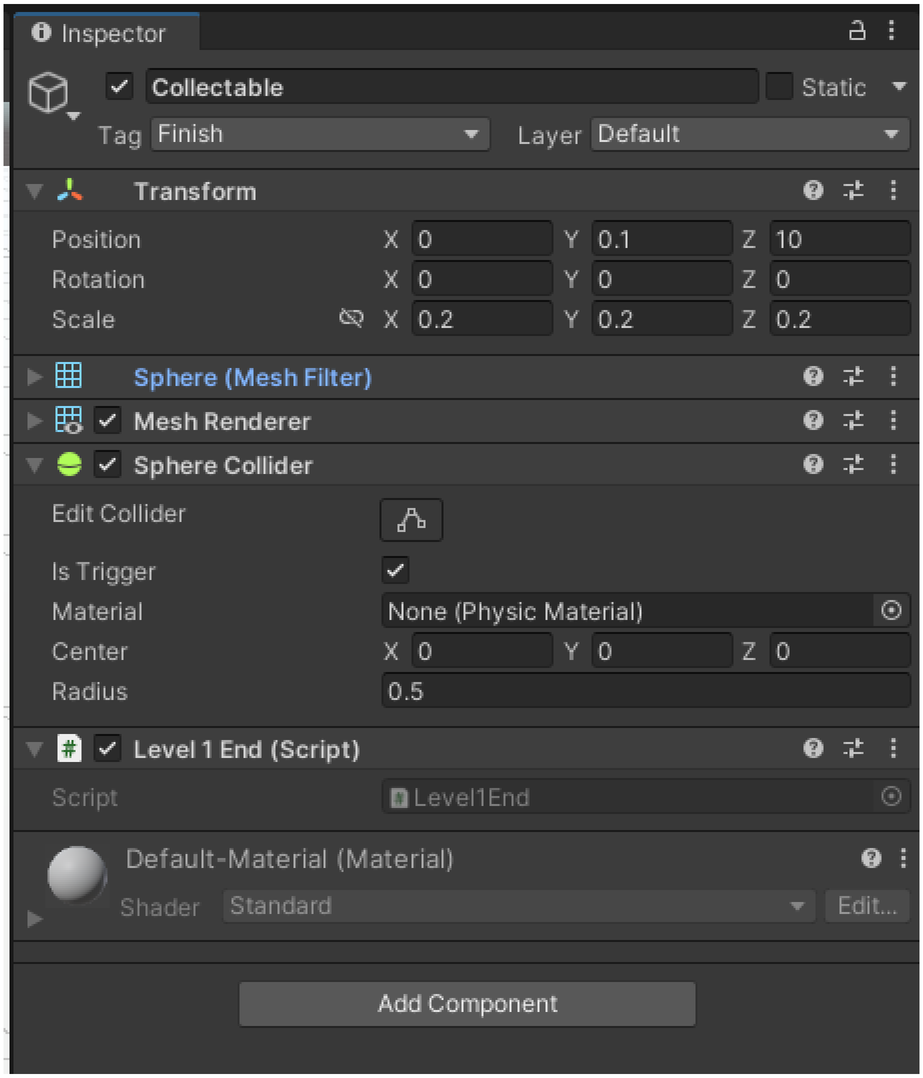
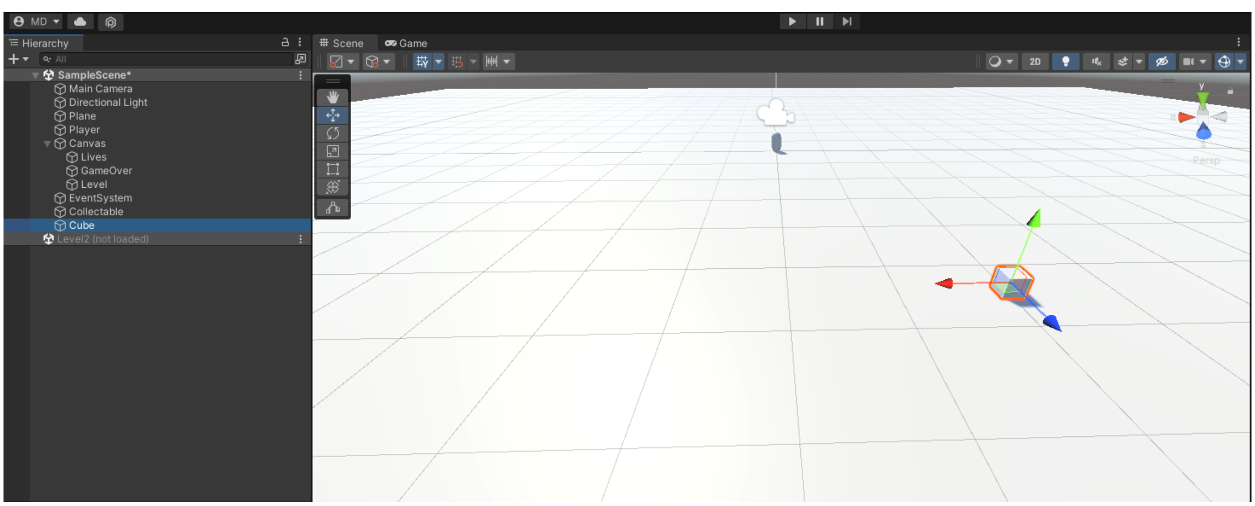
```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
using UnityEngine.SceneManagement;
public class Level1End : MonoBehaviour
{

    public void OnTriggerEnter(Collider other) {
        if(other.tag == "Player"){
            SceneManager.LoadScene("Level2");
        }
    }
}
```



Adding a cube as a obstacle in the game



Creating FollowPath Script for the cube and adding it to it

PlayerMovement.cs PlayerController.cs FollowPath.cs CameraFollow.cs Level1End.cs

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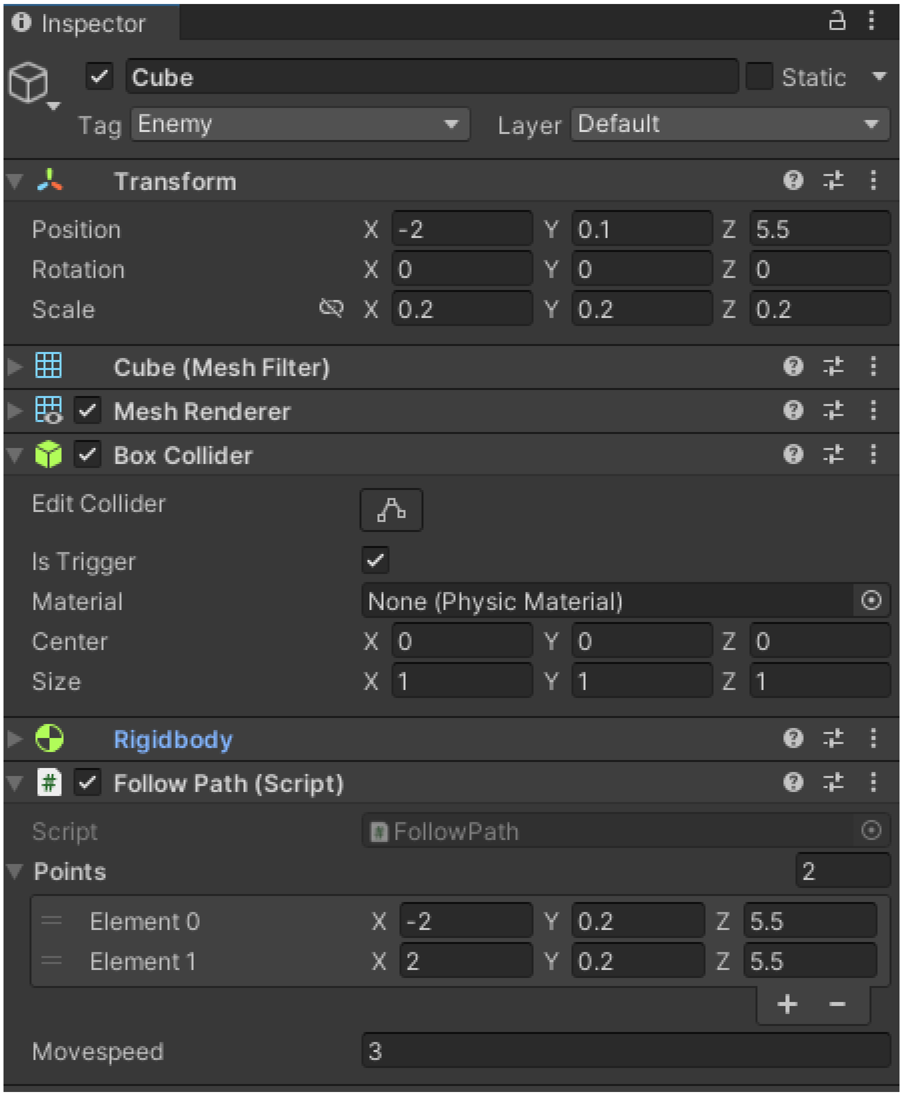
```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;

public class FollowPath : MonoBehaviour
{
    public Vector3[] points;
    public float movespeed = 3f;
    private int counter = 0;
    void Update()
    {
        Vector3 direction = points[(counter + 1) % points.Length] - points[counter % points.Length];
        // Debug.Log(direction);
        GetComponent<Rigidbody>().velocity = direction.normalized;
        if(Vector3.Distance(transform.position, points[(counter + 1) % points.Length]) <= 0.3f){
            counter++;
            GetComponent<Rigidbody>().velocity = new Vector3(0f, 0f, 0f);
        }
    }
}
```

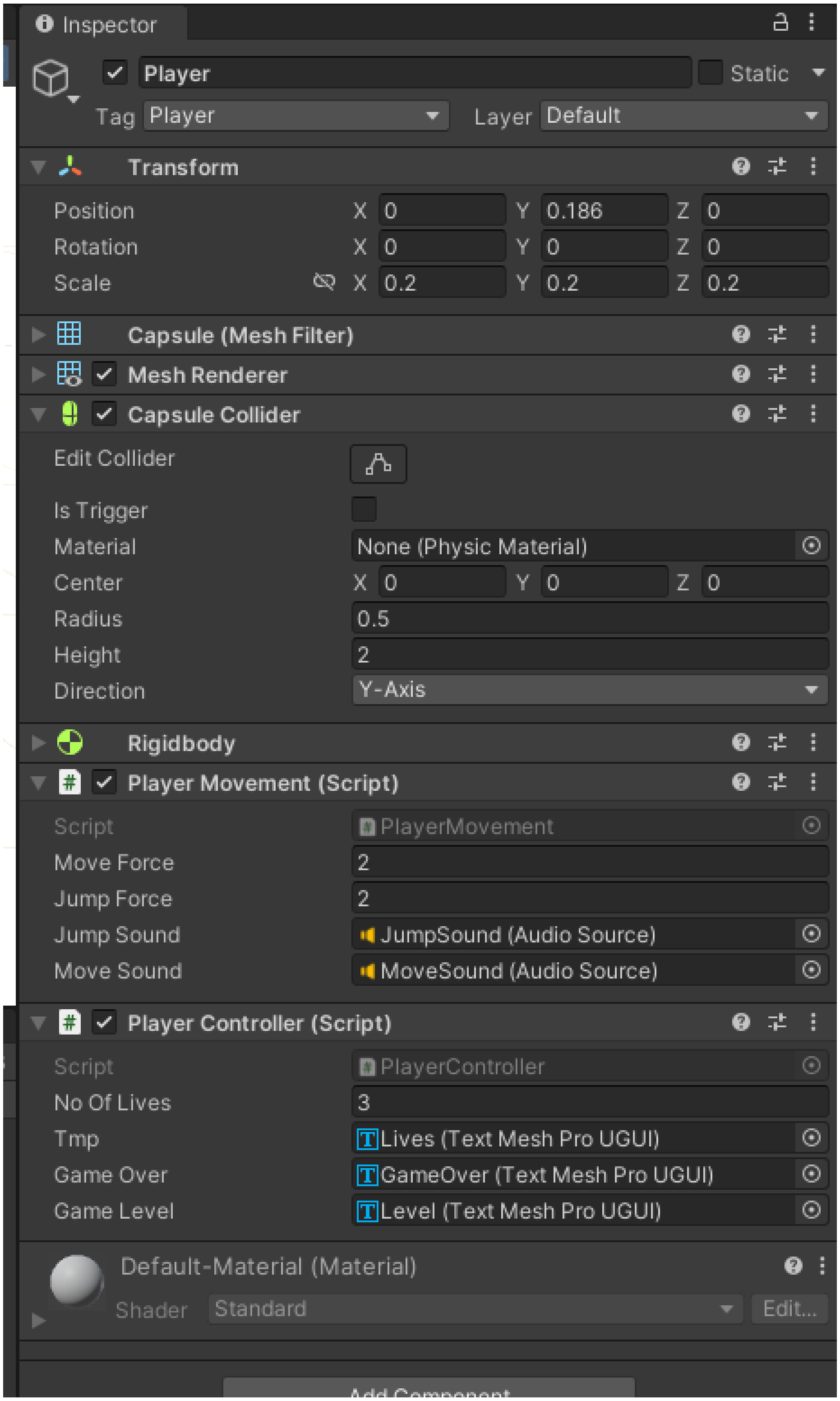


Adding Jump Sounds and Background sounds to Movement Scripts

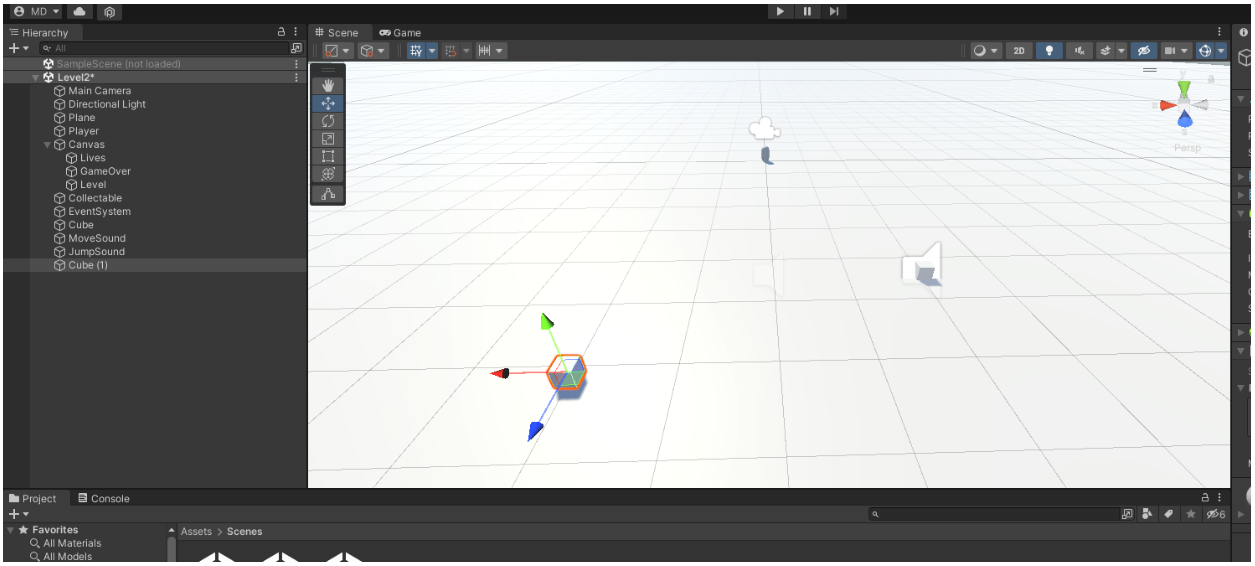
PlayerMovement.cs × | PlayerController.cs | FollowPath.cs | CameraFollow.cs | Level1End.cs

C: > Users > admin > 20BAI1156_LabFat > Assets > Scripts > PlayerMovement.cs

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;

public class PlayerMovement : MonoBehaviour
{
    public float moveForce = 2;
    public float jumpForce = 2;
    public AudioSource jumpSound;
    public AudioSource moveSound;
    void Update()
    {
        if(Input.GetKeyDown(KeyCode.Space)){
            GetComponent<Rigidbody>().AddForce(new Vector3(0f, 1f, 0f) * jumpForce * 100f);
            jumpSound.Play();
        }
        if(Input.GetKeyDown(KeyCode.A)){
            GetComponent<Rigidbody>().AddForce(new Vector3(-1f, 0f, 0f) * moveForce * 100f);
            moveSound.Play();
        }
        if(Input.GetKeyDown(KeyCode.D)){
            GetComponent<Rigidbody>().AddForce(new Vector3(1f, 0f, 0f) * moveForce * 100f);
            moveSound.Play();
        }
        if(Input.GetKeyDown(KeyCode.W)){
            GetComponent<Rigidbody>().AddForce(new Vector3(0f, 0f, 1f) * moveForce * 100f);
            moveSound.Play();
        }
        if(Input.GetKeyDown(KeyCode.S)){
            GetComponent<Rigidbody>().AddForce(new Vector3(0f, 0f, -1f) * moveForce * 100f);
            moveSound.Play();
        }
    }
}
```



Duplicate the Scene and Name it Level2

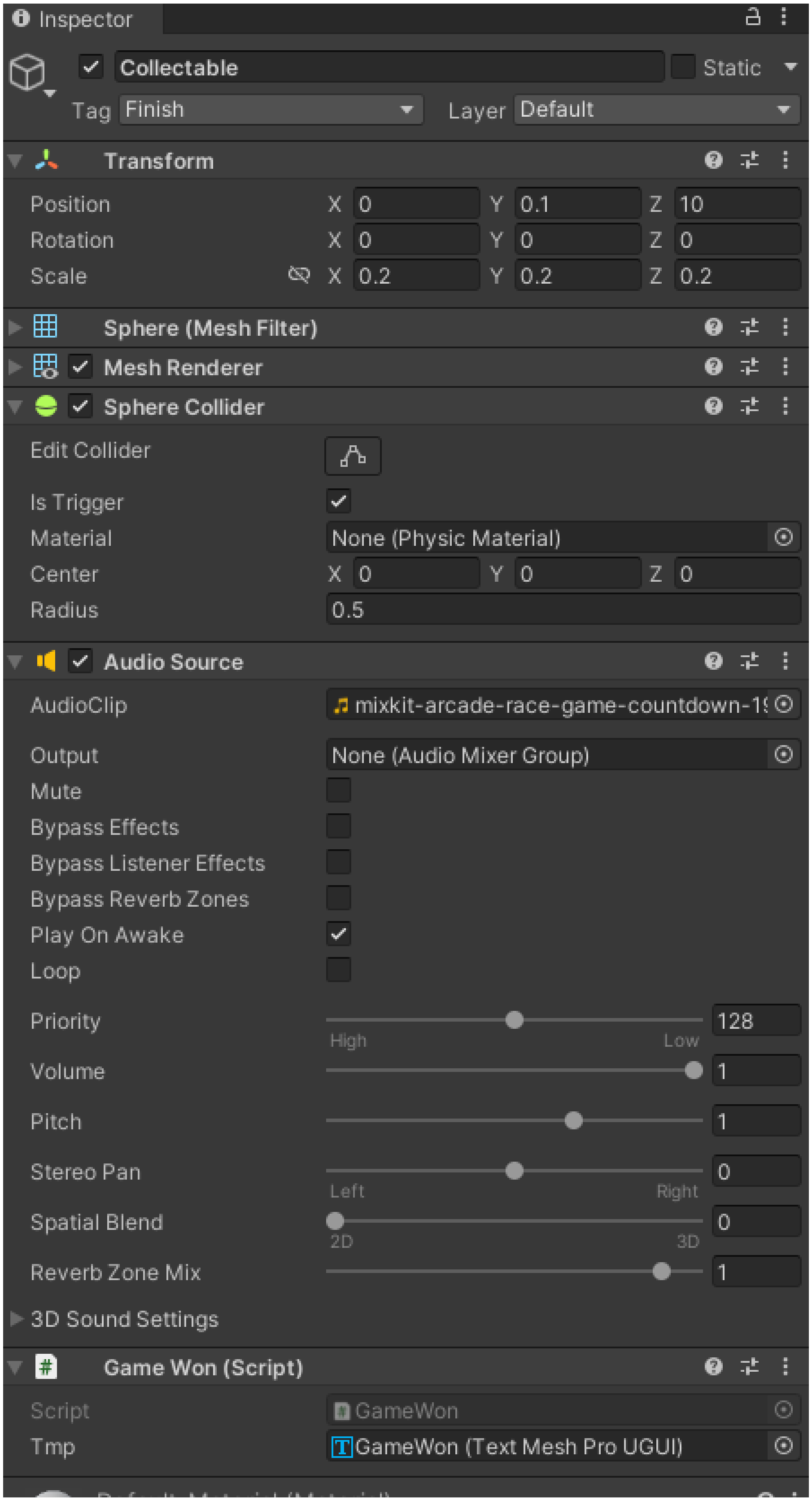


Creating Game Won script and Adding it to the collectable in Level2

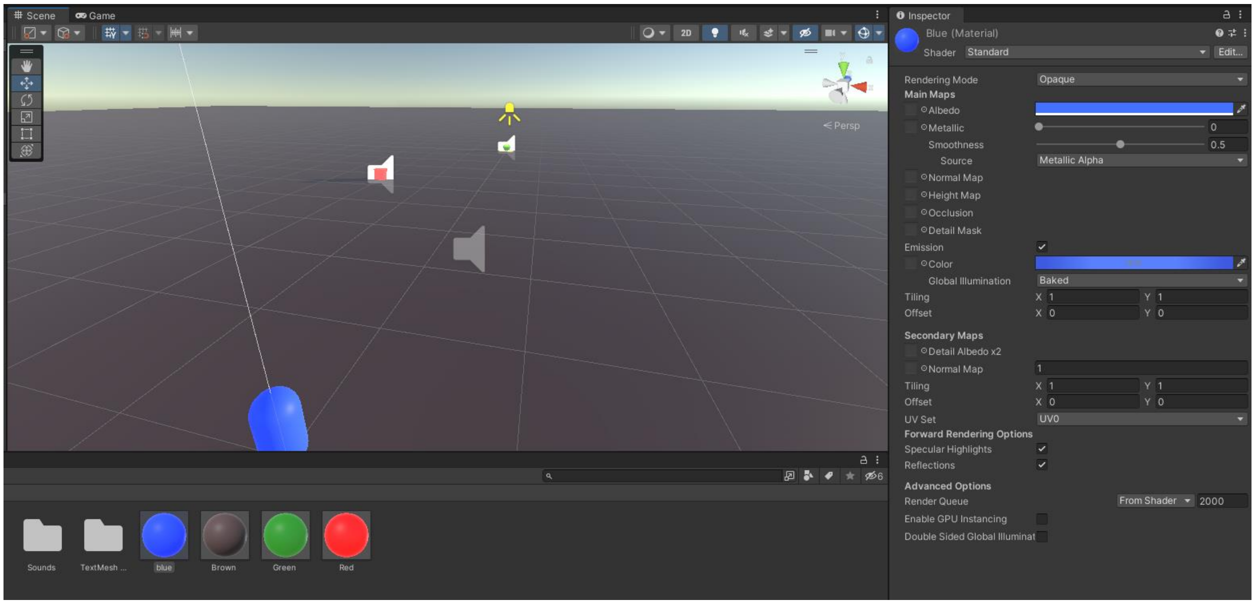
PlayerMovement.cs PlayerController.cs FollowPath.cs GameWon.cs CameraFollow.cs Level1End.cs

C: > Users > admin > 20BAI1156_LabFat > Assets > Scripts > GameWon.cs

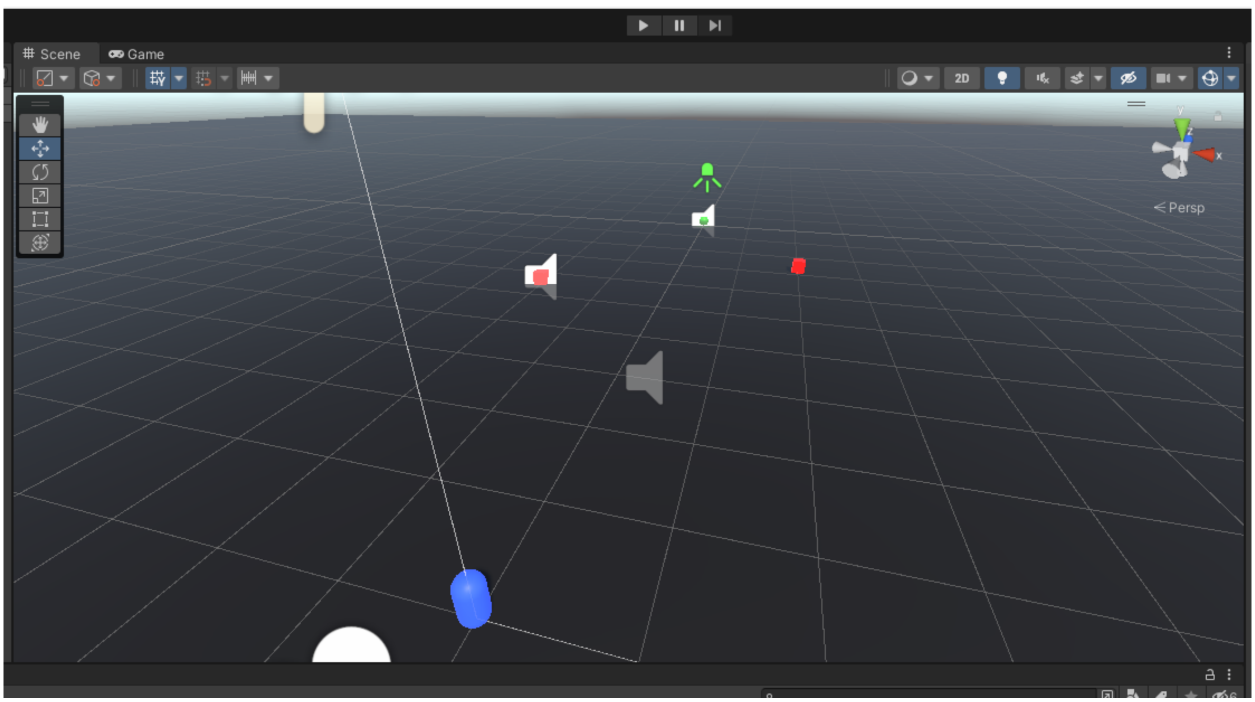
```csharp
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
using TMPro;
public class GameWon : MonoBehaviour
{
    public TextMeshProUGUI tmp;
    public void OnTriggerEnter(Collider col){
        tmp.text = "Game Won";
        Destroy(gameObject);
    }
}

```


Inspector
Collectable
Static
Tag Finish
Layer Default
Transform
Position X 0 Y 0.1 Z 10
Rotation X 0 Y 0 Z 0
Scale X 0.2 Y 0.2 Z 0.2
Sphere (Mesh Filter)
Mesh Renderer
Sphere Collider
Edit Collider
Is Trigger
Material None (Physic Material)
Center X 0 Y 0 Z 0
Radius 0.5
Audio Source
AudioClip mixkit-arcade-race-game-countdown-1
Output None (Audio Mixer Group)
Mute
Bypass Effects
Bypass Listener Effects
Bypass Reverb Zones
Play On Awake
Loop
Priority 128
High Low
Volume 1
Pitch 1
Stereo Pan 0
Left Right
Spatial Blend 0
2D 3D
Reverb Zone Mix 1
3D Sound Settings
Game Won (Script)
Script GameWon
Tmp GameWon (Text Mesh Pro UGUI)

Adding Colors to Scene



Adding Color to Scene 2 and a spot light over End Collectible



Game Design Completed