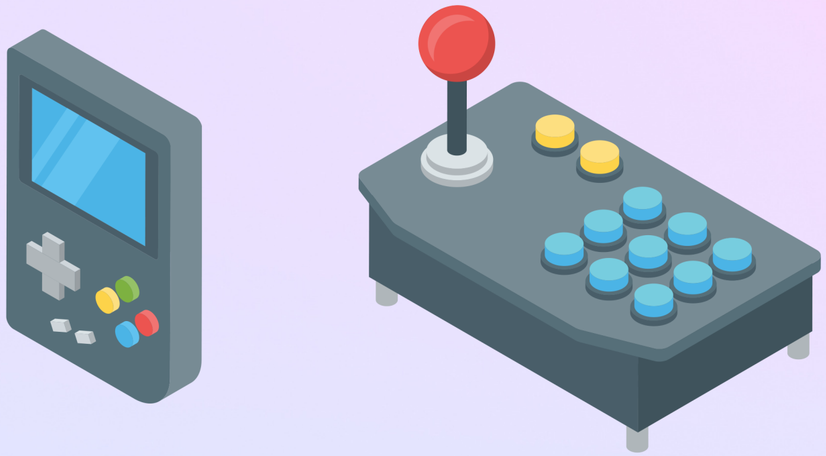


WOLVEDEN ACADEMY

NETWORKING AND MULTIPLAYER ONLINE GAMES

MULTIPLAYER NEW ERA

BY PONGSATHORN KIATTICHAROENPORN (MEW)

WEEK 10 : GAMEPLAY ADDITIONS 2

Presentation Update 2

(Present your Progress Update Multiplayer Final Project)

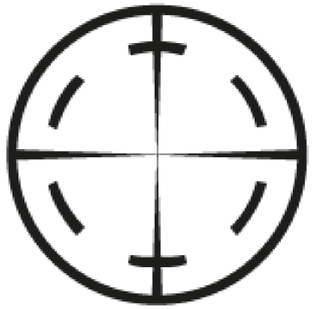
Gameplay Additions 2

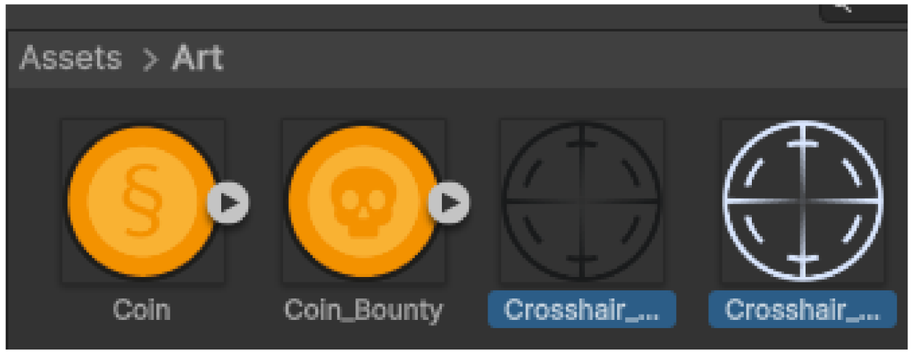
Topic in this week

Workshop

- Crosshair
- Leaderboard Setup
- Custom Data Types
- Leaderboard Spawning
- Making Trails

Crosshair




Assets > Art
Coin
Coin_Bounty
Crosshair_...
Crosshair_...

MainMenu.cs

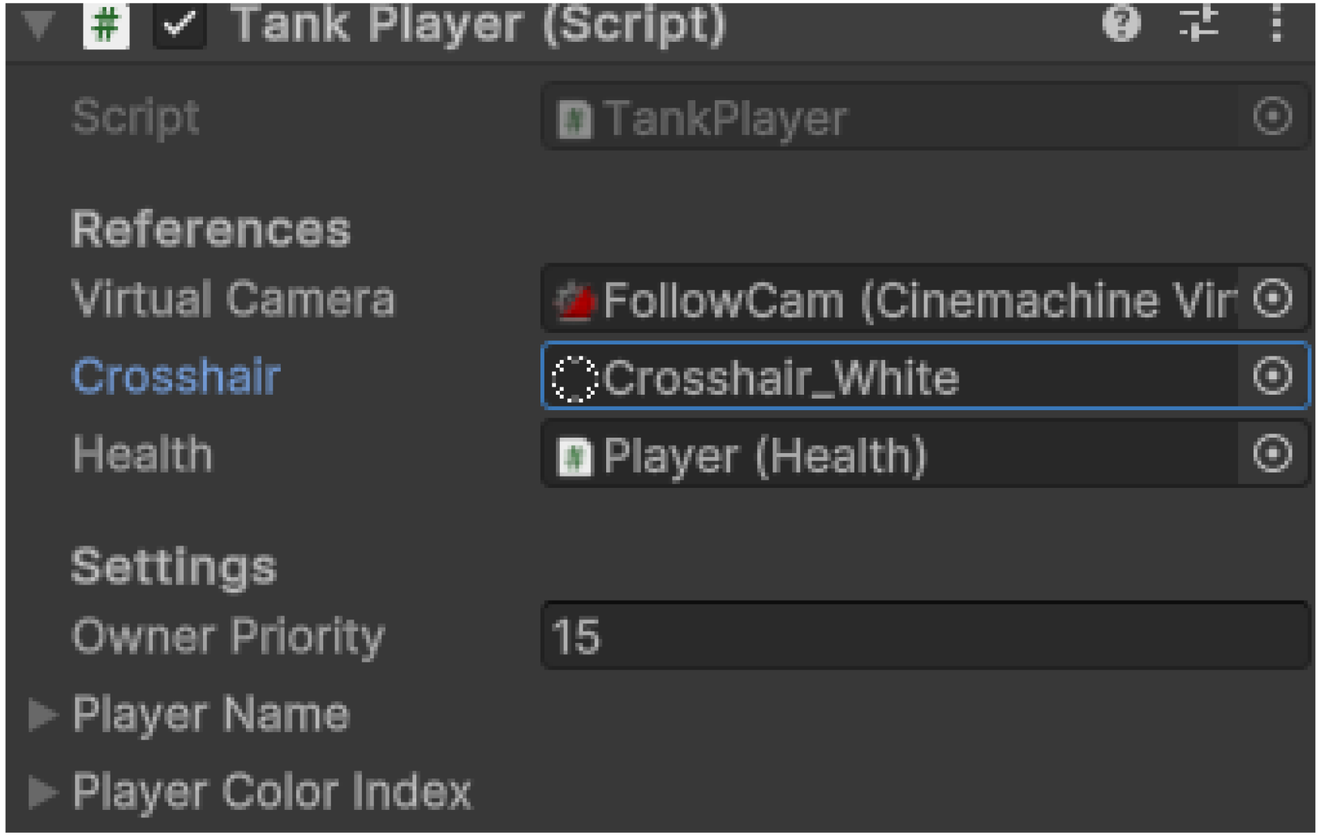
```
1   using System.Collections;
2   using System.Collections.Generic;
3   using TMPro;
4   using UnityEngine;
5
        Unity Script (1 asset reference) | 0 references
6   public class MainMenu : MonoBehaviour
7   {
8       [SerializeField] private TMP_InputField joinCodeField;
9
            Unity Message | 0 references
10      private void Start()
11      {
12          if(ClientSingleton.Instance == null) { return; }
13
14          Cursor.SetCursor(null, Vector2.zero, CursorMode.Auto);
15      }
            0 references
16      public async void StartHost()
17      {
18          await HostSingleton.Instance.GameManager.StartHostAsync();
19      }
20
            0 references
21      public async void StartClient()
22      {
23          await ClientSingleton.Instance.GameManager.StartClientAsync(joinCodeField.text);
24      }
25  }
```

TankPlayer.cs

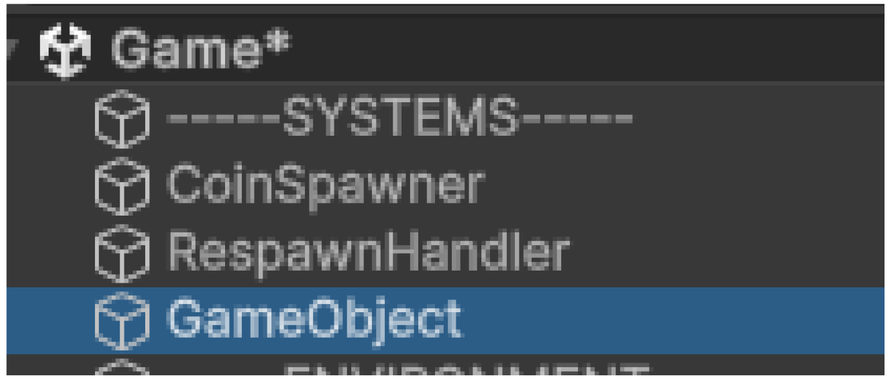
```
Unity Script (1 asset reference) | 14 references
public class TankPlayer : NetworkBehaviour
{
    [Header("References")]
    [SerializeField] private CinemachineVirtualCamera virtualCamera;

    [SerializeField] private Texture2D crosshair;
    2 references
    [field:SerializeField] public Health Health {  get; private set; }
```

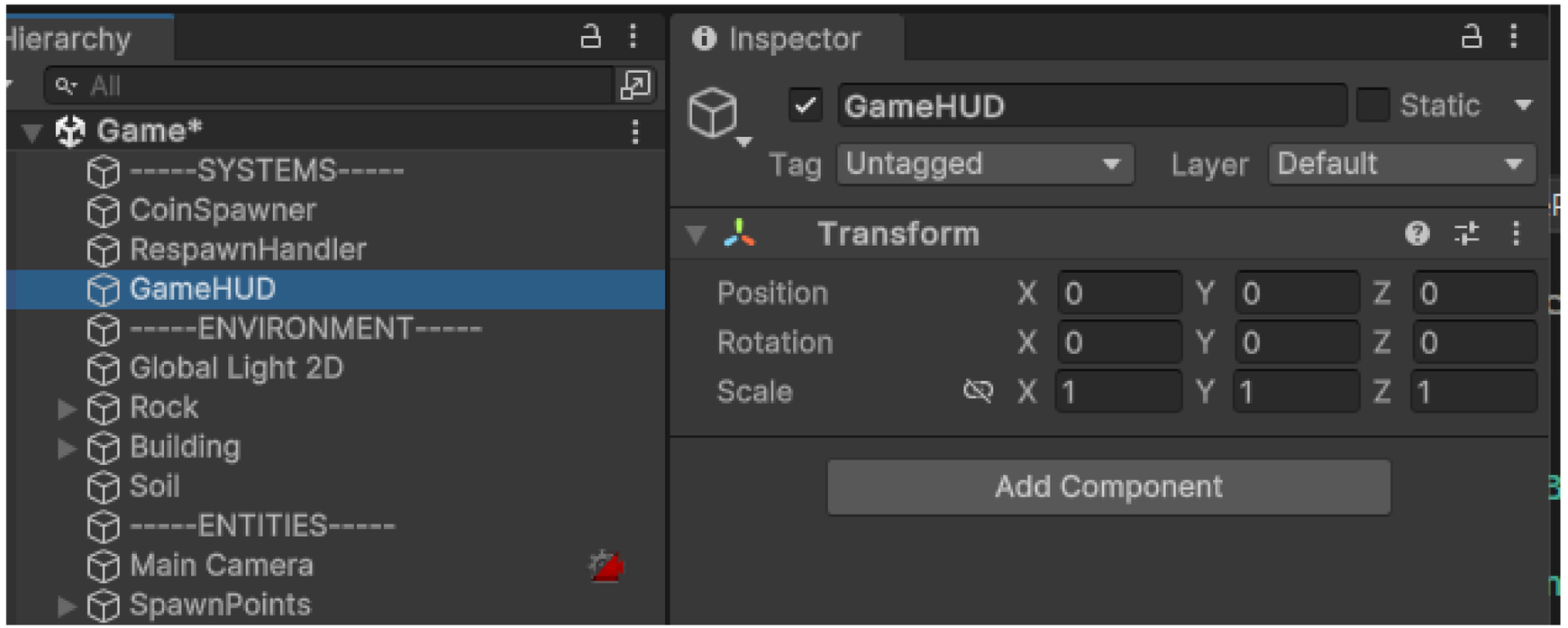
```
public override void OnNetworkSpawn()
{
    if (IsServer)
    {
        UserData userData =
            HostSingleton.Instance.GameManager.NetworkServer.GetUserDataByClientId(OwnerClientId);

        PlayerName.Value = userData.userName;
        PlayerColorIndex.Value = userData.userColorIndex;

        OnPlayerSpawned?.Invoke(this);
    }

    if (IsOwner)
    {
        virtualCamera.Priority = ownerPriority;

        Cursor.SetCursor(crosshair,new Vector2(crosshair.width/2, crosshair.height/2),CursorMode.Auto);
    }
}
```


Player
Player

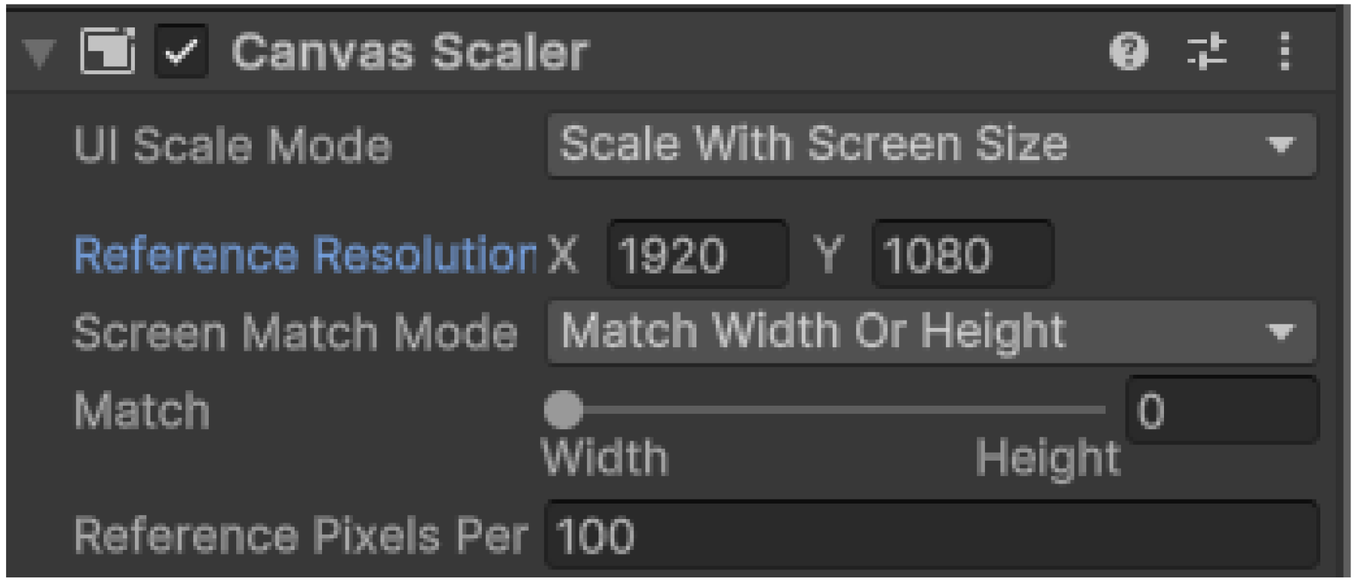

Tank Player (Script)
Script
TankPlayer
References
Virtual Camera
FollowCam (Cinemachine Vir
Crosshair
Crosshair_White
Health
Player (Health)
Settings
Owner Priority
15
Player Name
Player Color Index

Leaderboard Setup

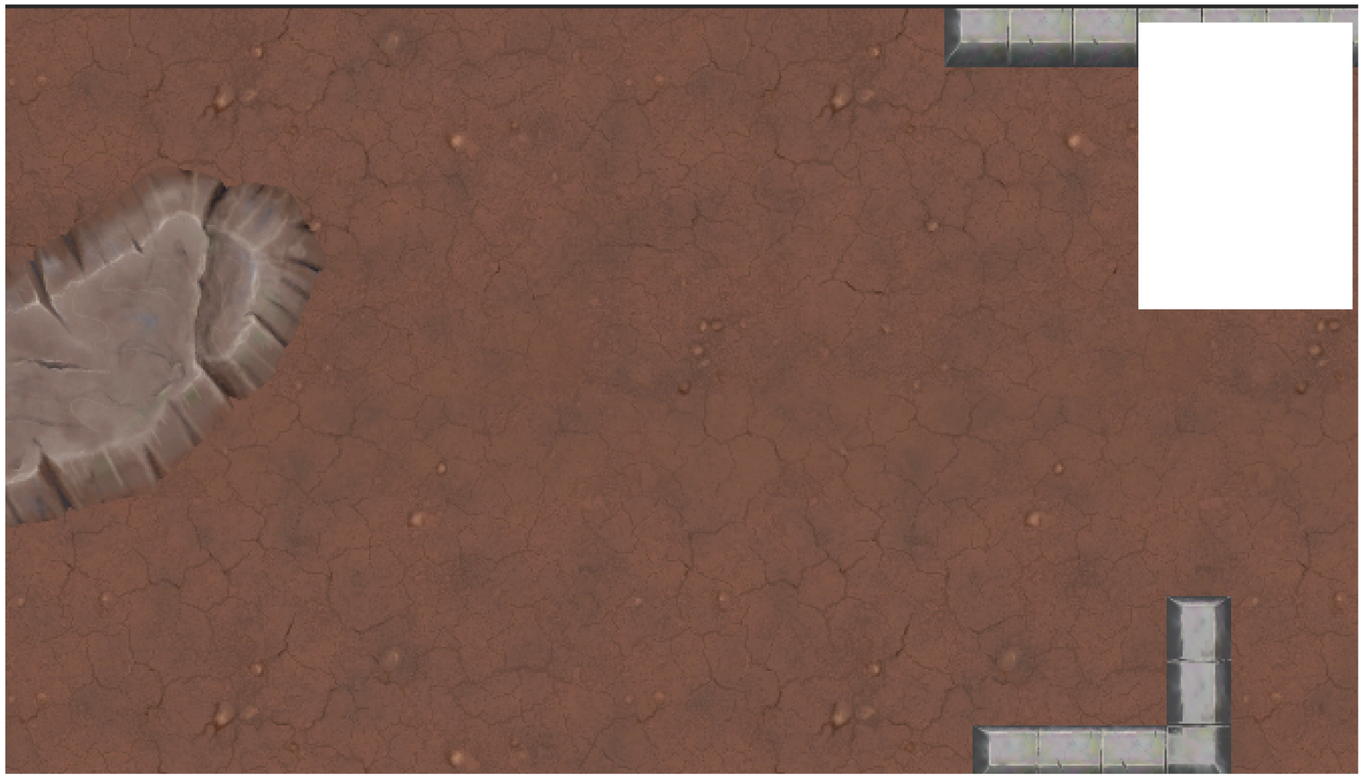

Game*
-----SYSTEMS-----
CoinSpawner
RespawnHandler
GameObject

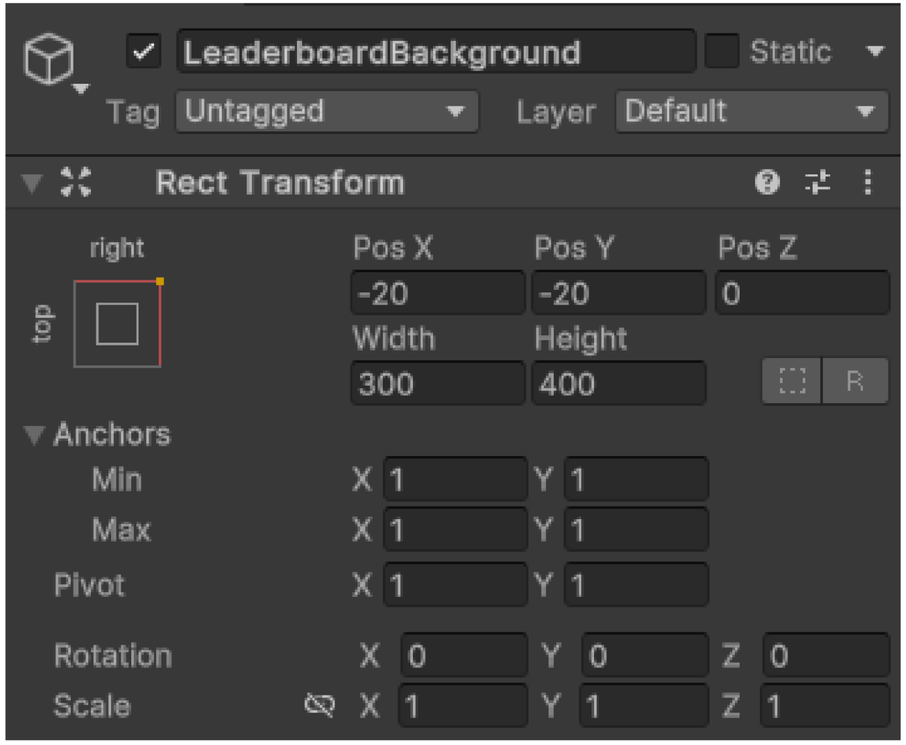

Hierarchy
All
Game*
-----SYSTEMS-----
CoinSpawner
RespawnHandler
GameHUD
-----ENVIRONMENT-----
Global Light 2D
Rock
Building
Soil
-----ENTITIES-----
Main Camera
SpawnPoints
Inspector
GameHUD
Static
Tag
Untagged
Layer
Default
Transform
Position
Rotation
Scale
X 0
Y 0
Z 0
X 0
Y 0
Z 0
X 1
Y 1
Z 1
Add Component


GameHUD
Canvas


Canvas Scaler
UI Scale Mode
Scale With Screen Size
Reference Resolution
X
1920
Y
1080
Screen Match Mode
Match Width Or Height
Match
0
Width
Height
Reference Pixels Per
100


GameHUD
Canvas
Image
LeaderboardBackground




LeaderboardBackground
Static
Tag
Untagged
Layer
Default
Rect Transform
right
top
Pos X
Pos Y
Pos Z
-20
-20
0
Width
Height
300
400
R
Anchors
Min
X 1
Y 1
Max
X 1
Y 1
Pivot
X 1
Y 1
Rotation
X 0
Y 0
Z 0
Scale
X 1
Y 1
Z 1

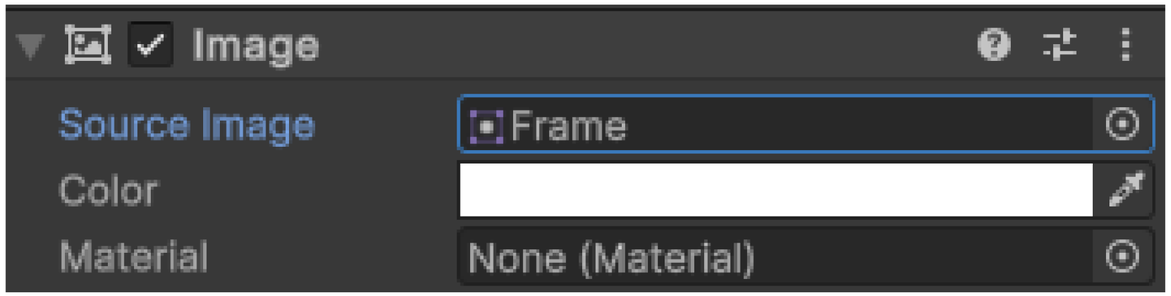
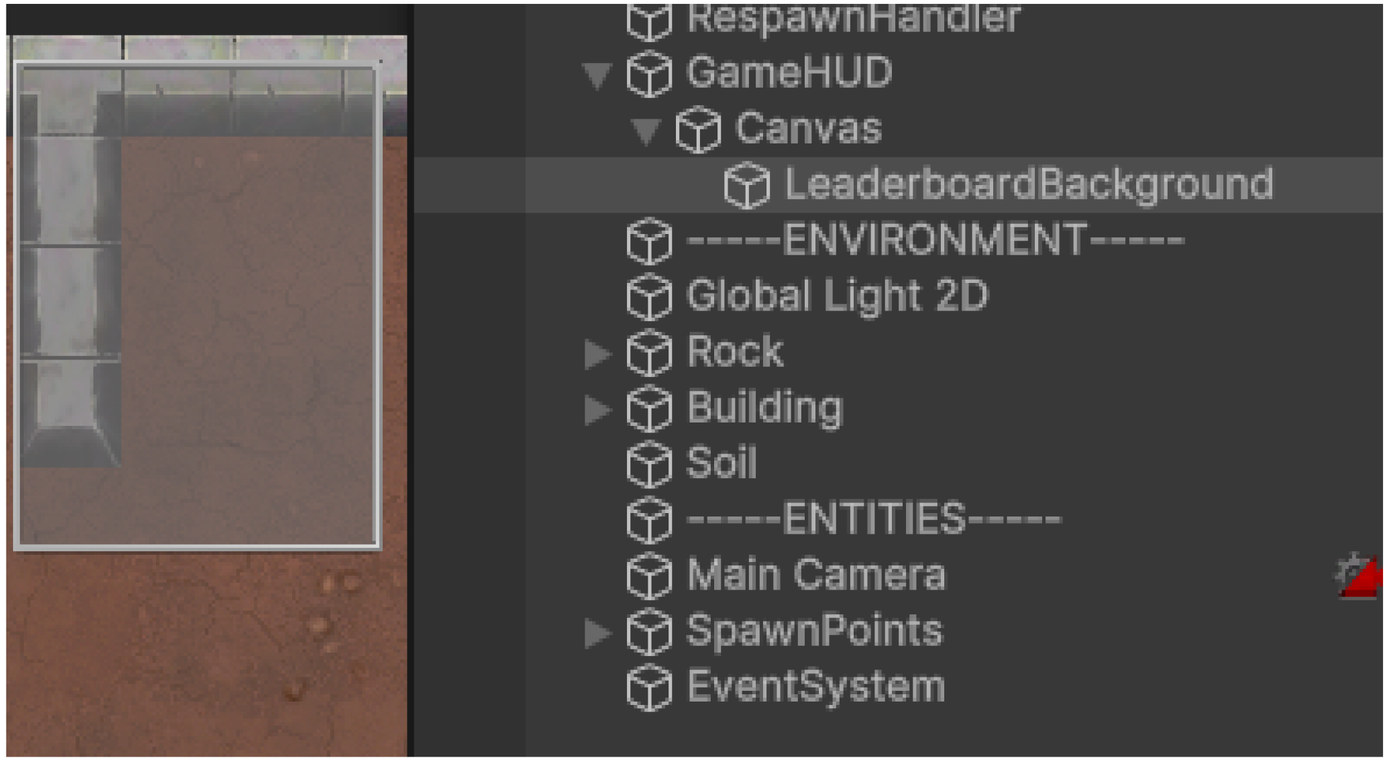
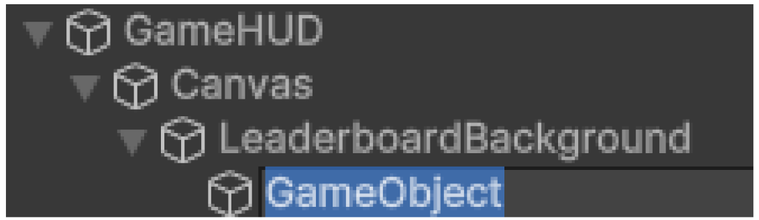
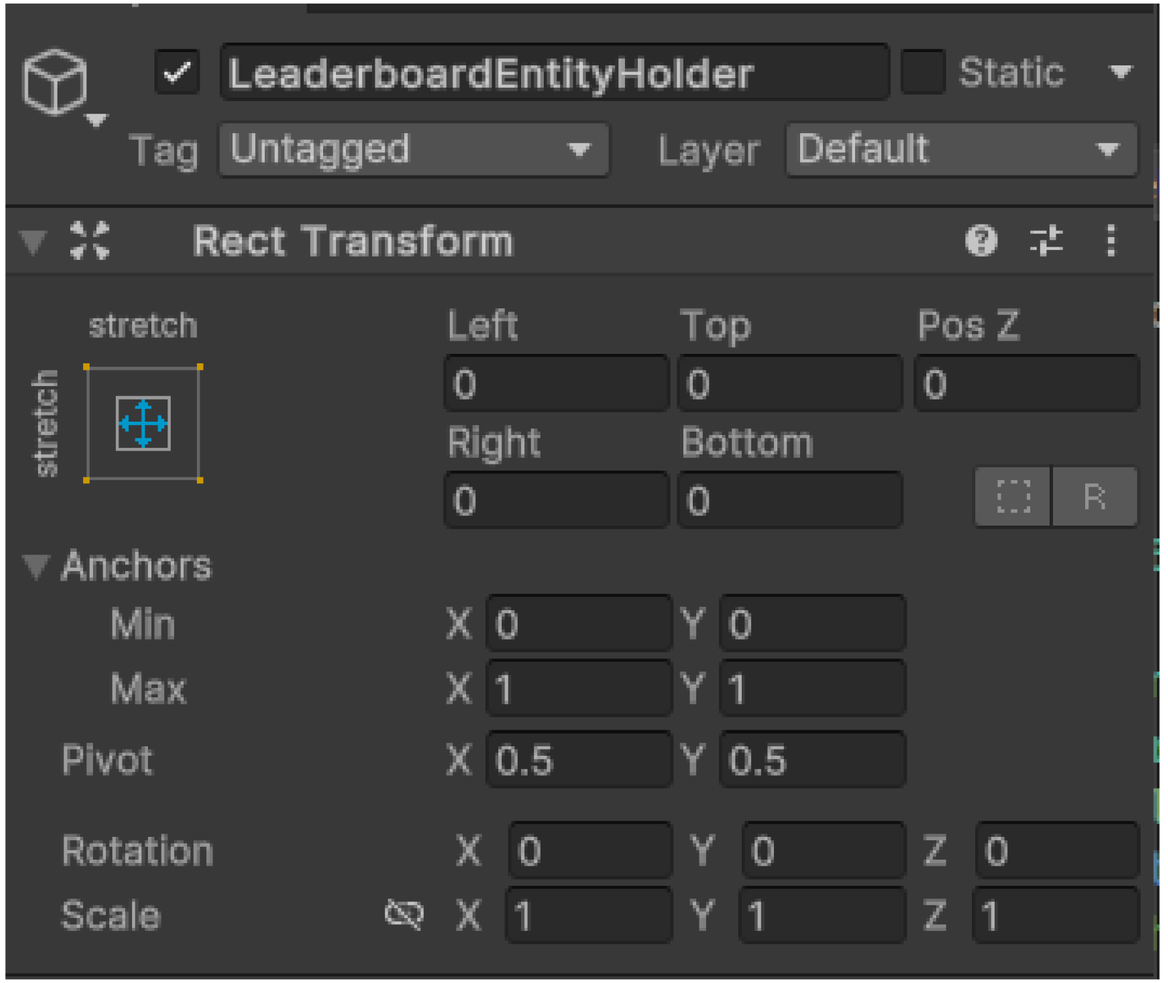


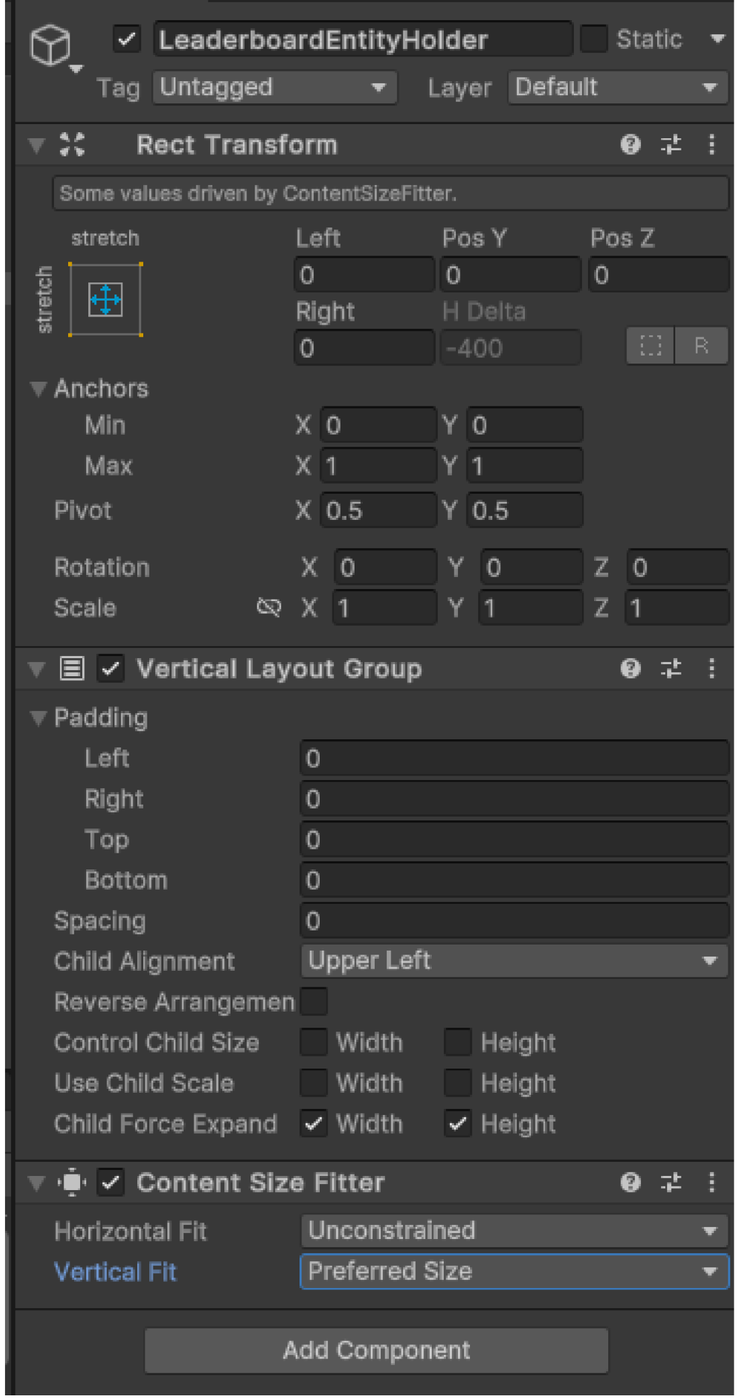
Image
Source Image
Frame
Color
Material
None (Material)

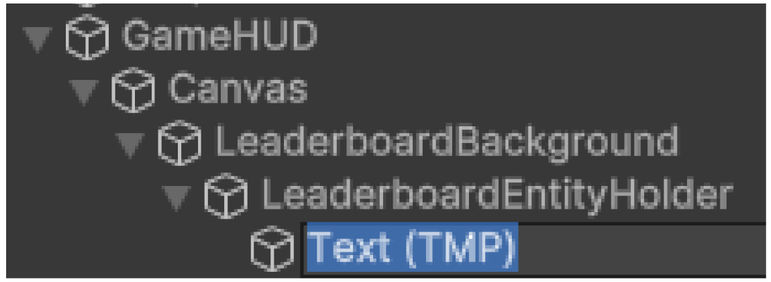

RespawnHandler
GameHUD
Canvas
LeaderboardBackground
-----ENVIRONMENT-----
Global Light 2D
Rock
Building
Soil
-----ENTITIES-----
Main Camera
SpawnPoints
EventSystem

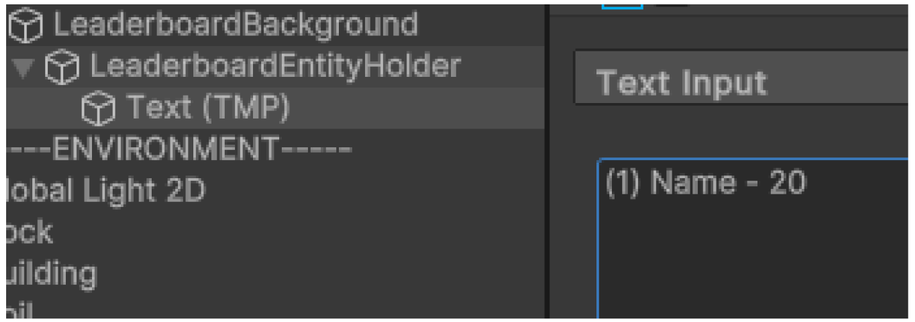

GameHUD
Canvas
LeaderboardBackground
GameObject

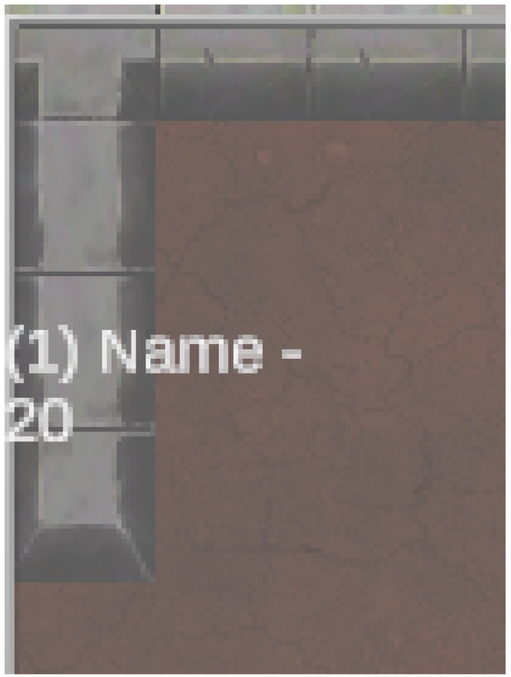

GameHUD
Canvas
LeaderboardBackground
LeaderboardEntityHolder

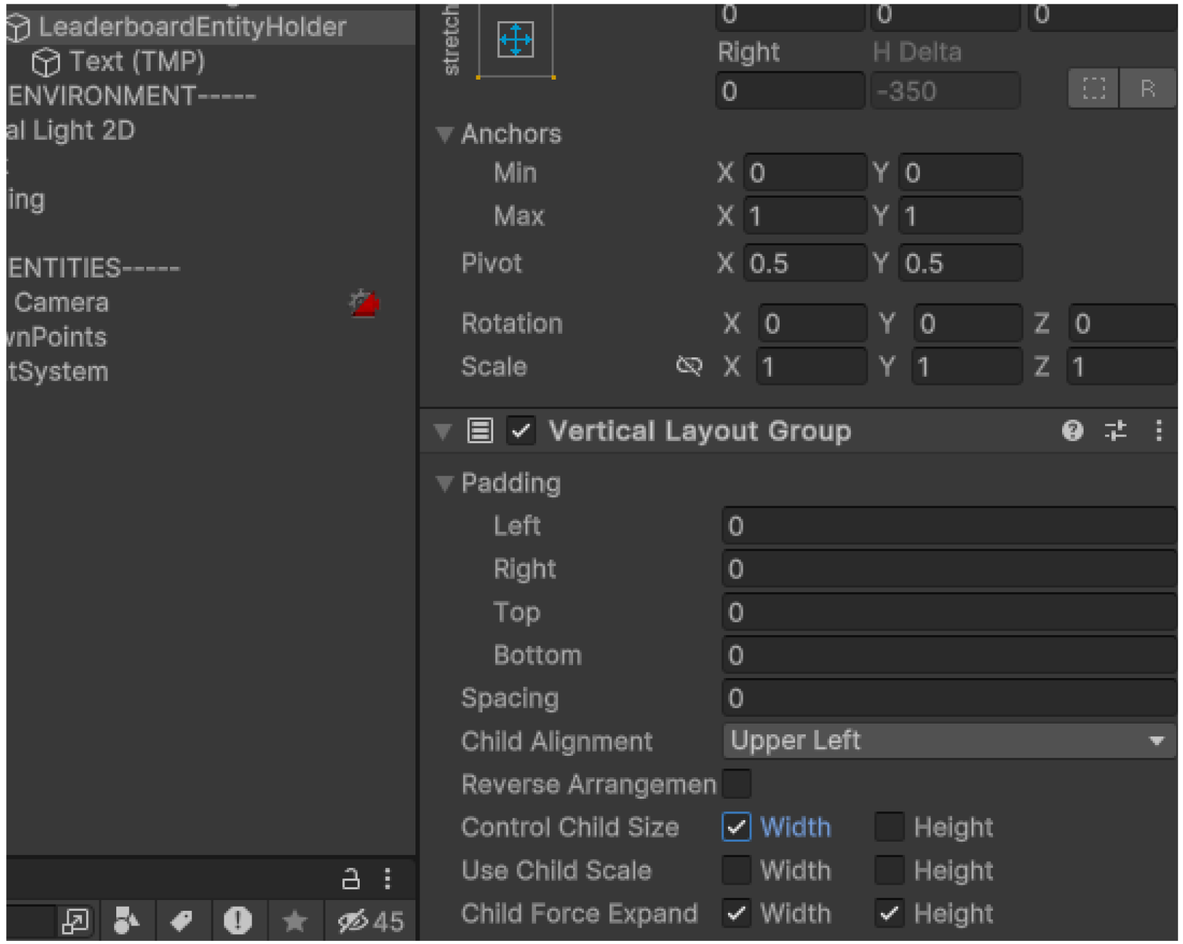

LeaderboardEntityHolder
Static
Tag
Untagged
Layer
Default
Rect Transform
stretch
stretch
Left
Top
Pos Z
0
0
0
Right
Bottom
0
0
R
Anchors
Min
X 0
Y 0
Max
X 1
Y 1
Pivot
X 0.5
Y 0.5
Rotation
X 0
Y 0
Z 0
Scale
X 1
Y 1
Z 1

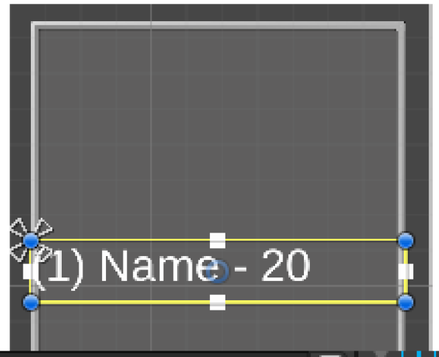

LeaderboardEntityHolder
Static
Tag Untagged
Layer Default
Rect Transform
Some values driven by ContentSizeFitter.
stretch
stretch
Left
Pos Y
Pos Z
0
0
0
Right
H Delta
0
-400
Anchors
Min X 0 Y 0
Max X 1 Y 1
Pivot X 0.5 Y 0.5
Rotation X 0 Y 0 Z 0
Scale X 1 Y 1 Z 1
Vertical Layout Group
Padding
Left 0
Right 0
Top 0
Bottom 0
Spacing 0
Child Alignment Upper Left
Reverse Arrangemen
Control Child Size Width Height
Use Child Scale Width Height
Child Force Expand Width Height
Content Size Fitter
Horizontal Fit Unconstrained
Vertical Fit Preferred Size
Add Component

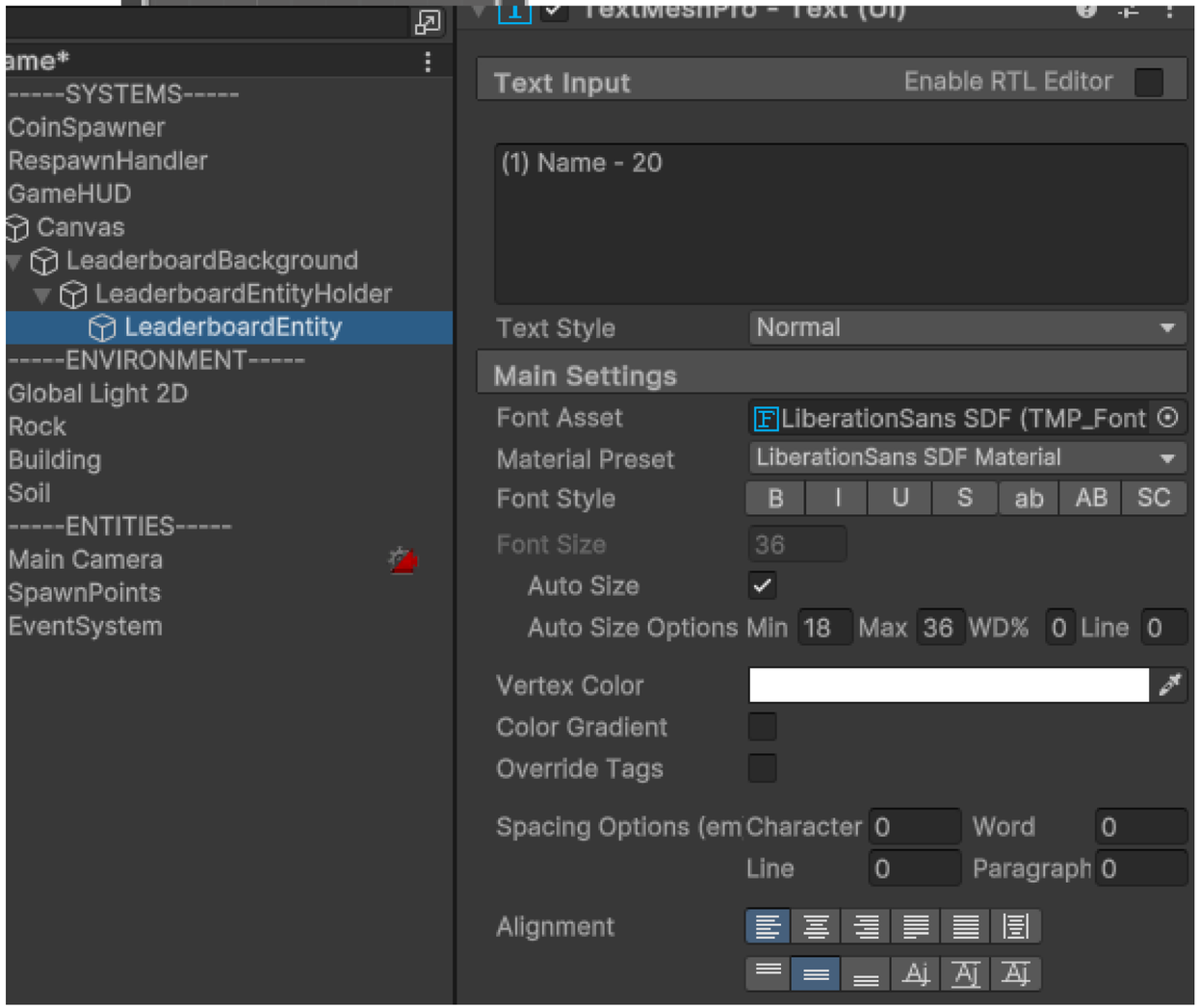

GameHUD
Canvas
LeaderboardBackground
LeaderboardEntityHolder
Text (TMP)

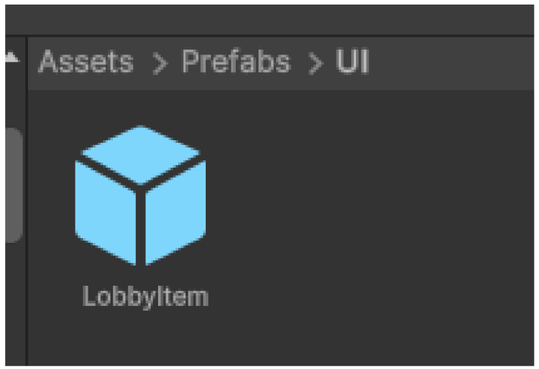

LeaderboardBackground
LeaderboardEntityHolder
Text (TMP)
---ENVIRONMENT-----
obal Light 2D
ck
ilding
Text Input
(1) Name - 20

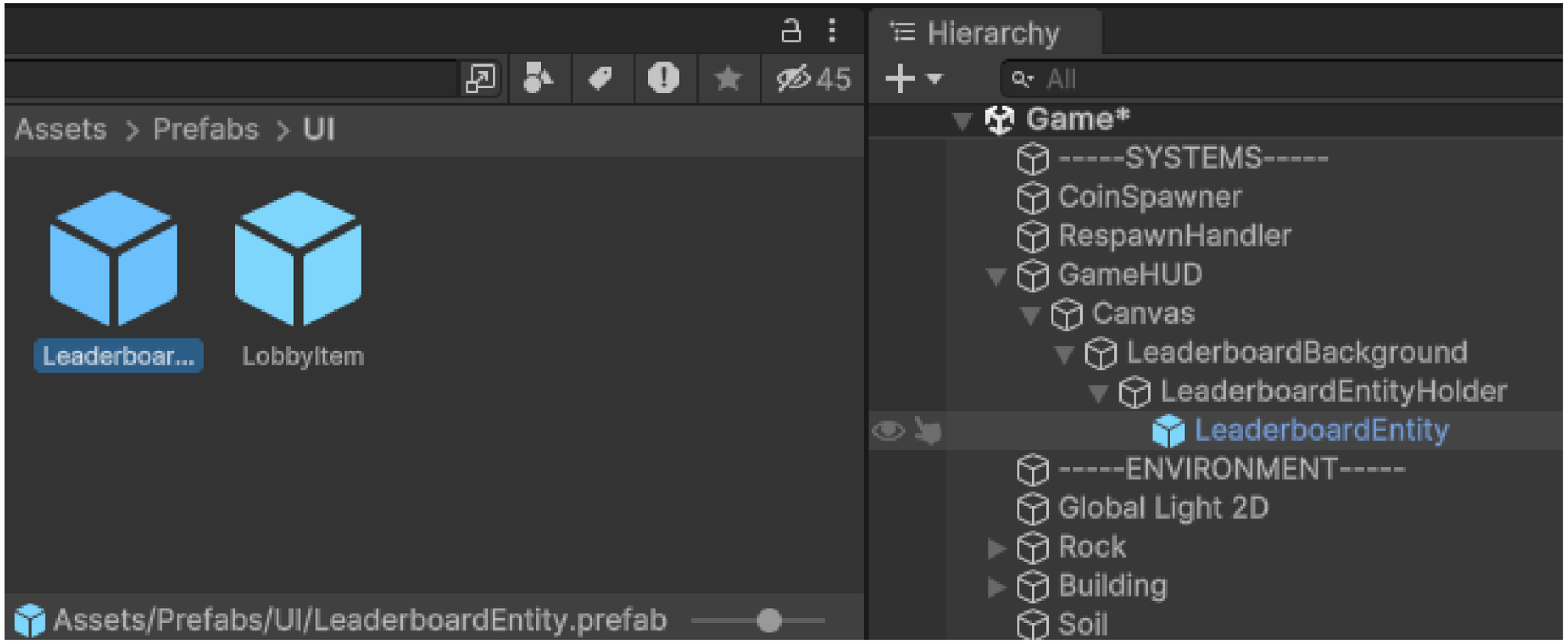

(1) Name -
20

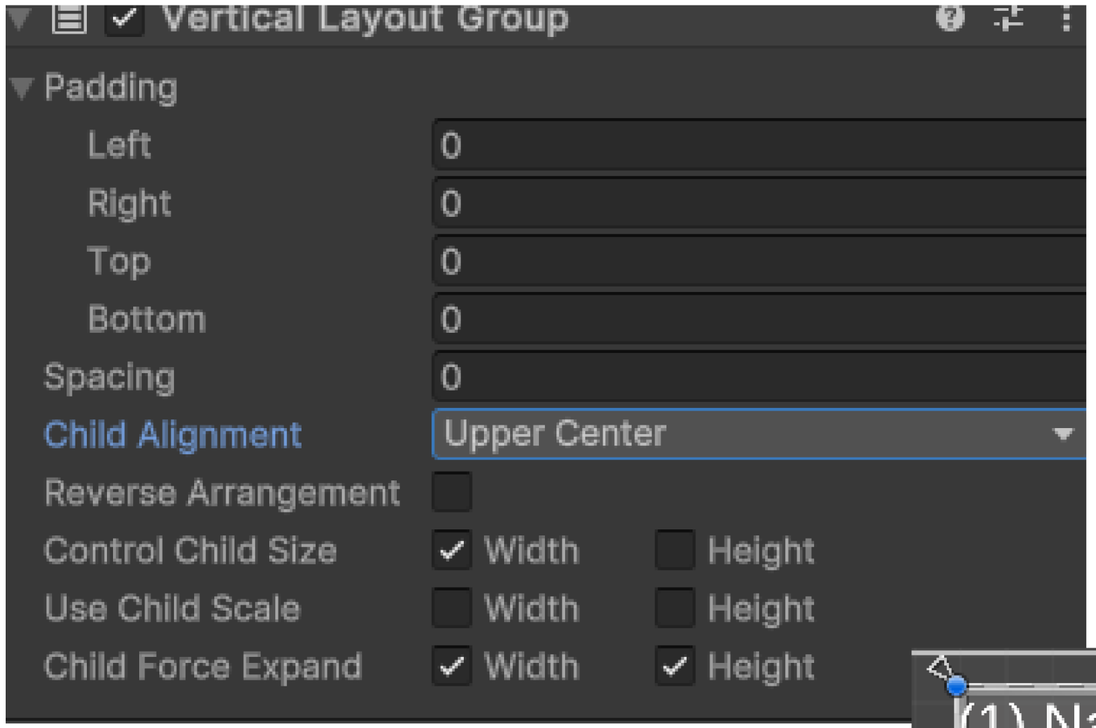

LeaderboardEntityHolder
Text (TMP)
ENVIRONMENT-----
al Light 2D
ing
ENTITIES-----
Camera
vnPoints
tSystem
stretch
Right
H Delta
0
-350
Anchors
Min X 0 Y 0
Max X 1 Y 1
Pivot X 0.5 Y 0.5
Rotation X 0 Y 0 Z 0
Scale X 1 Y 1 Z 1
Vertical Layout Group
Padding
Left 0
Right 0
Top 0
Bottom 0
Spacing 0
Child Alignment Upper Left
Reverse Arrangemen
Control Child Size Width Height
Use Child Scale Width Height
Child Force Expand Width Height
45

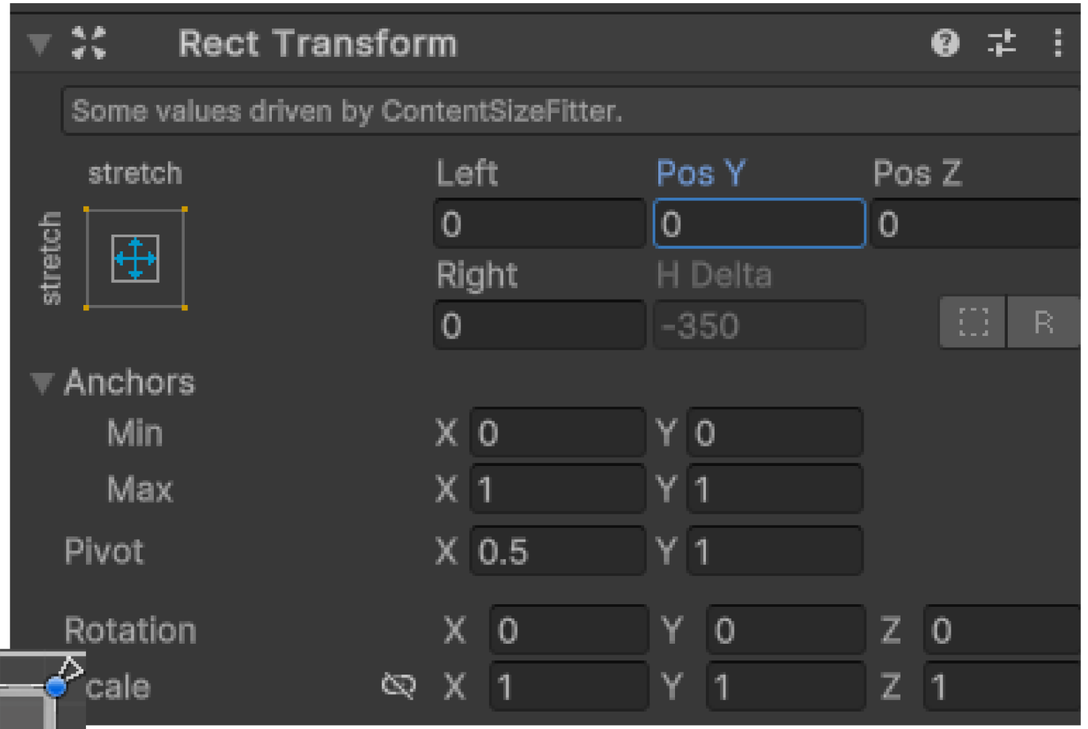

(1) Name - 20

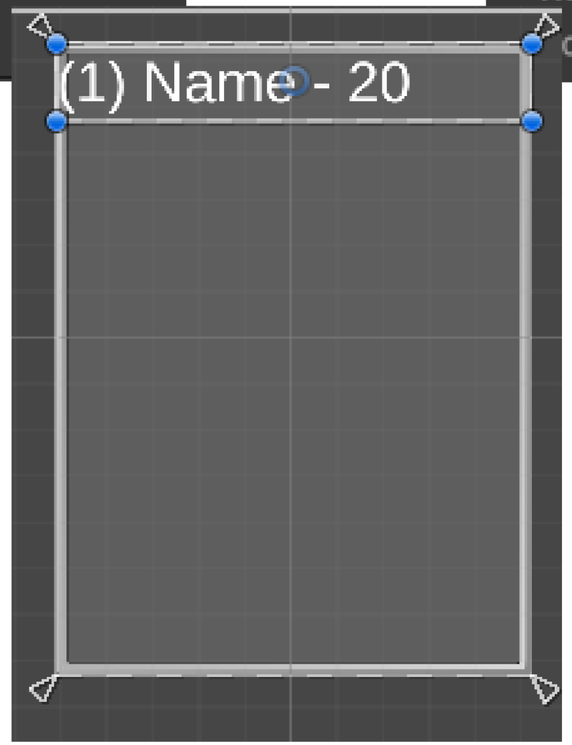

ame*
-----SYSTEMS-----
CoinSpawner
RespawnHandler
GameHUD
Canvas
LeaderboardBackground
LeaderboardEntityHolder
LeaderboardEntity
-----ENVIRONMENT-----
Global Light 2D
Rock
Building
Soil
-----ENTITIES-----
Main Camera
SpawnPoints
EventSystem
Text Input
Enable RTL Editor
(1) Name - 20
Text Style Normal
Main Settings
Font Asset LiberationSans SDF (TMP_Font
Material Preset LiberationSans SDF Material
Font Style B I U S ab AB SC
Font Size 36
Auto Size
Auto Size Options Min 18 Max 36 WD% 0 Line 0
Vertex Color
Color Gradient
Override Tags
Spacing Options (em Character 0 Word 0
Line 0 Paragraph 0
Alignment

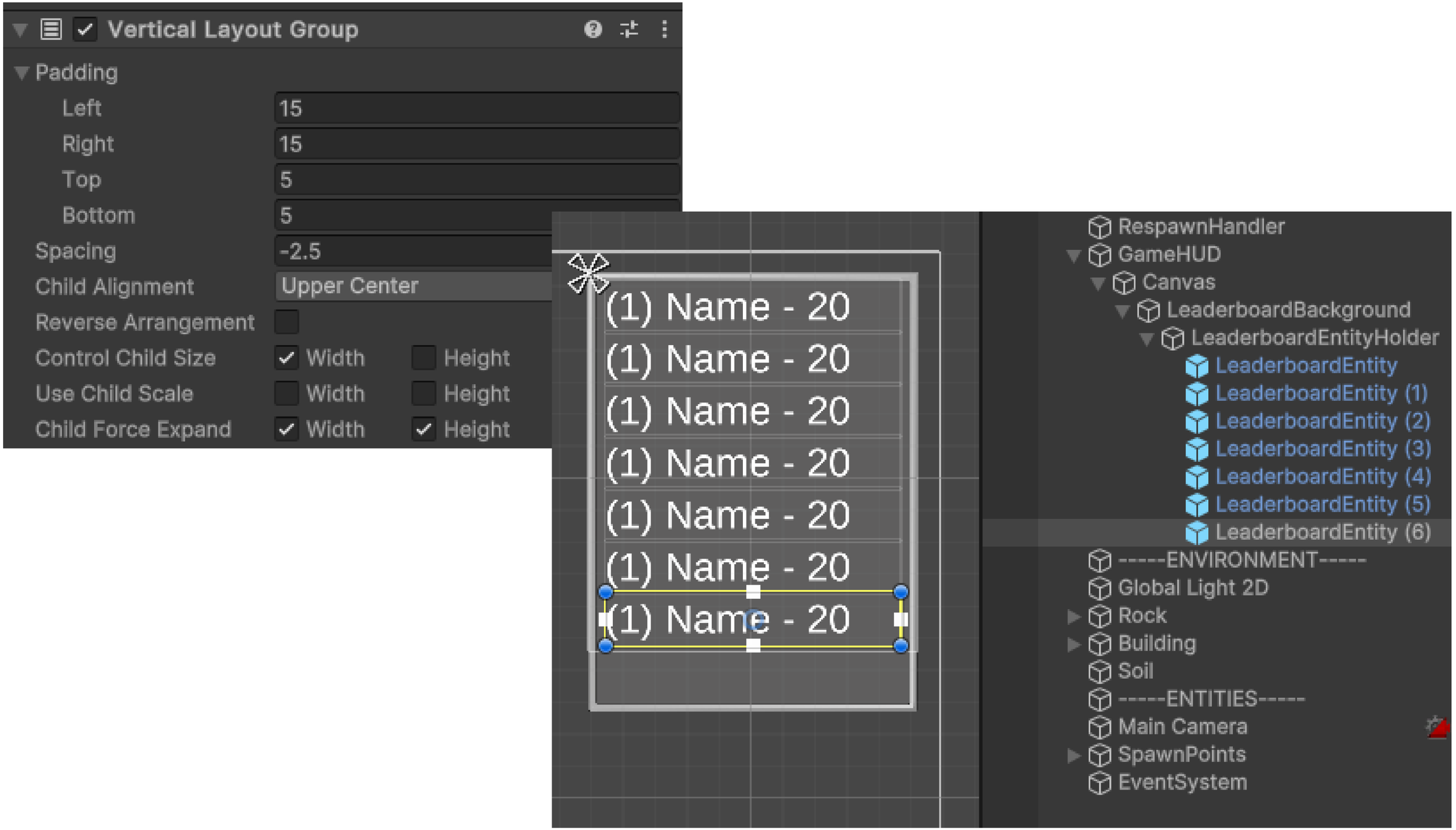

Assets > Prefabs > UI
LobbyItem

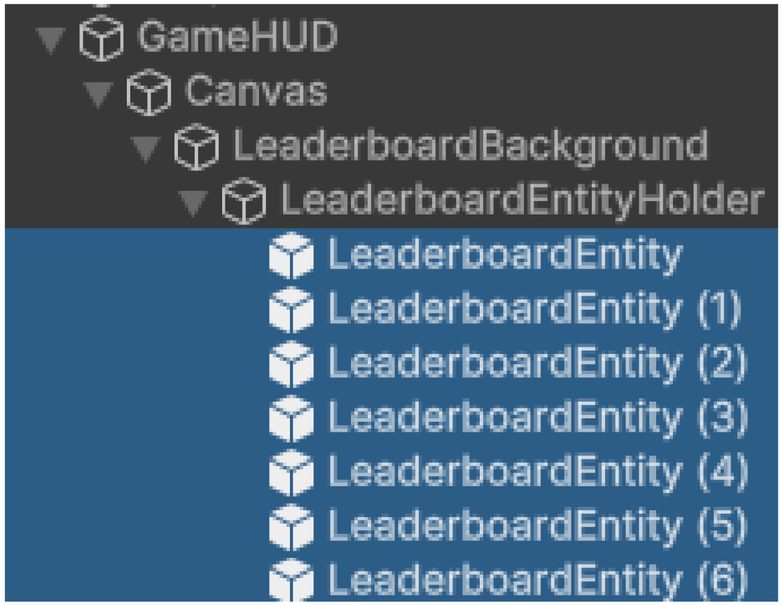

45
Assets > Prefabs > UI
Leaderboar...
LobbyItem
Assets/Prefabs/UI/LeaderboardEntity.prefab
Hierarchy
All
Game*
-----SYSTEMS-----
CoinSpawner
RespawnHandler
GameHUD
Canvas
LeaderboardBackground
LeaderboardEntityHolder
LeaderboardEntity
-----ENVIRONMENT-----
Global Light 2D
Rock
Building
Soil


Vertical Layout Group
Padding
Left 0
Right 0
Top 0
Bottom 0
Spacing 0
Child Alignment Upper Center
Reverse Arrangement
Control Child Size Width Height
Use Child Scale Width Height
Child Force Expand Width Height

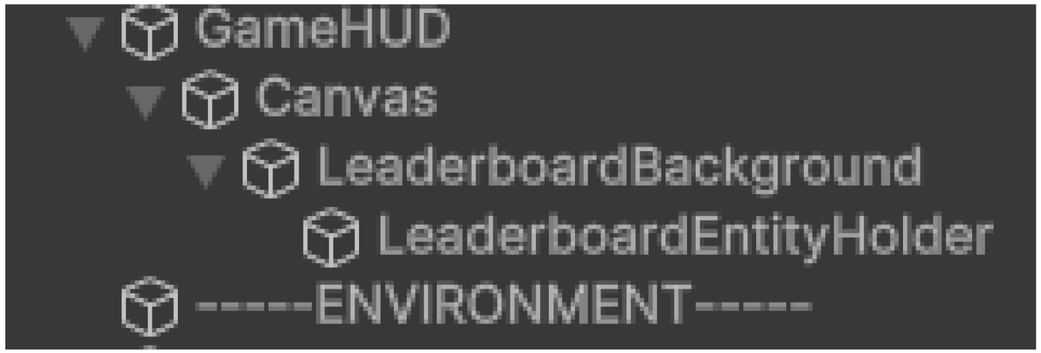

Rect Transform
Some values driven by ContentSizeFitter.
stretch
stretch
Left
Pos Y
Pos Z
0
0
0
Right
H Delta
0
-350
R
Anchors
Min X 0 Y 0
Max X 1 Y 1
Pivot X 0.5 Y 1
Rotation X 0 Y 0 Z 0
cale X 1 Y 1 Z 1

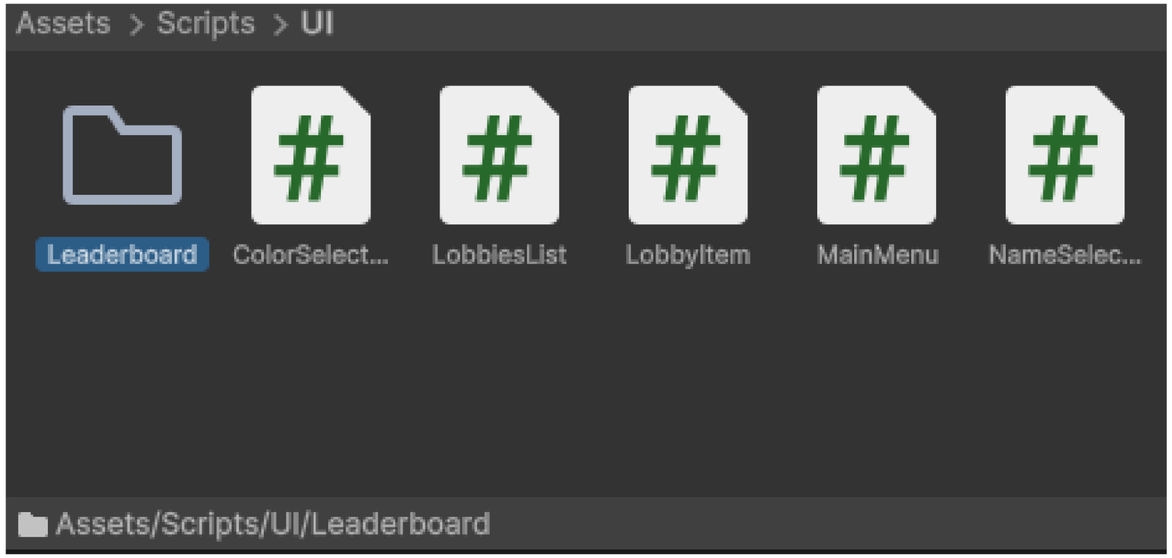

(1) Name - 20


Vertical Layout Group
Padding
Left 15
Right 15
Top 5
Bottom 5
Spacing -2.5
Child Alignment Upper Center
Reverse Arrangement
Control Child Size Width Height
Use Child Scale Width Height
Child Force Expand Width Height
(1) Name - 20
(1) Name - 20
(1) Name - 20
(1) Name - 20
(1) Name - 20
(1) Name - 20
(1) Name - 20
RespawnHandler
GameHUD
Canvas
LeaderboardBackground
LeaderboardEntityHolder
LeaderboardEntity
LeaderboardEntity (1)
LeaderboardEntity (2)
LeaderboardEntity (3)
LeaderboardEntity (4)
LeaderboardEntity (5)
LeaderboardEntity (6)
-----ENVIRONMENT-----
Global Light 2D
Rock
Building
Soil
-----ENTITIES-----
Main Camera
SpawnPoints
EventSystem

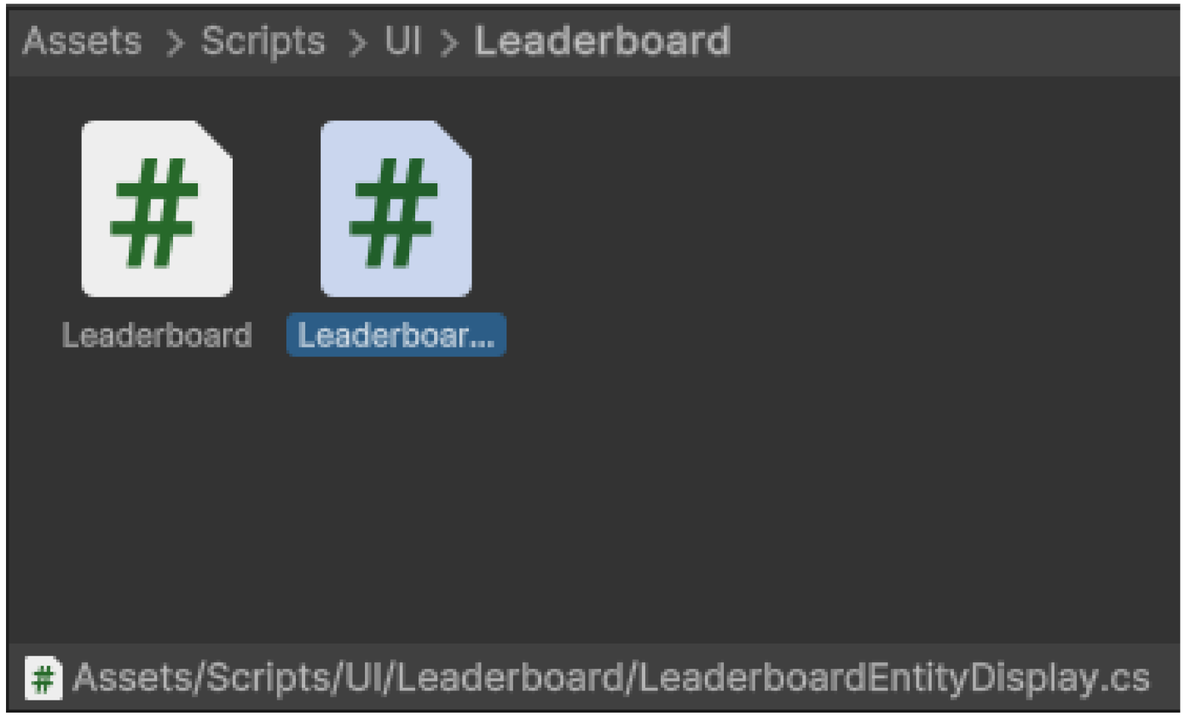

GameHUD
Canvas
LeaderboardBackground
LeaderboardEntityHolder
LeaderboardEntity
LeaderboardEntity (1)
LeaderboardEntity (2)
LeaderboardEntity (3)
LeaderboardEntity (4)
LeaderboardEntity (5)
LeaderboardEntity (6)

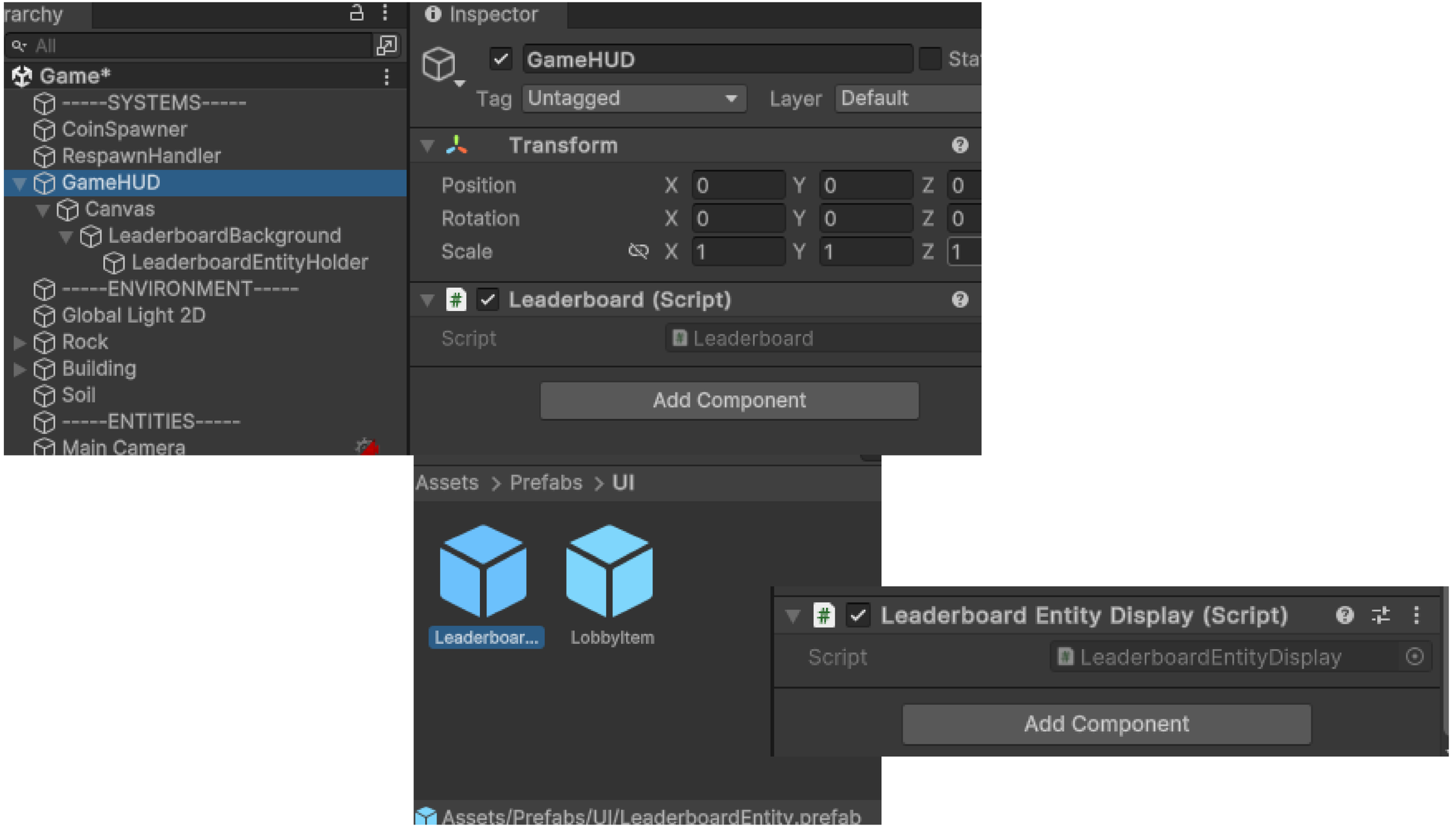

DELETE

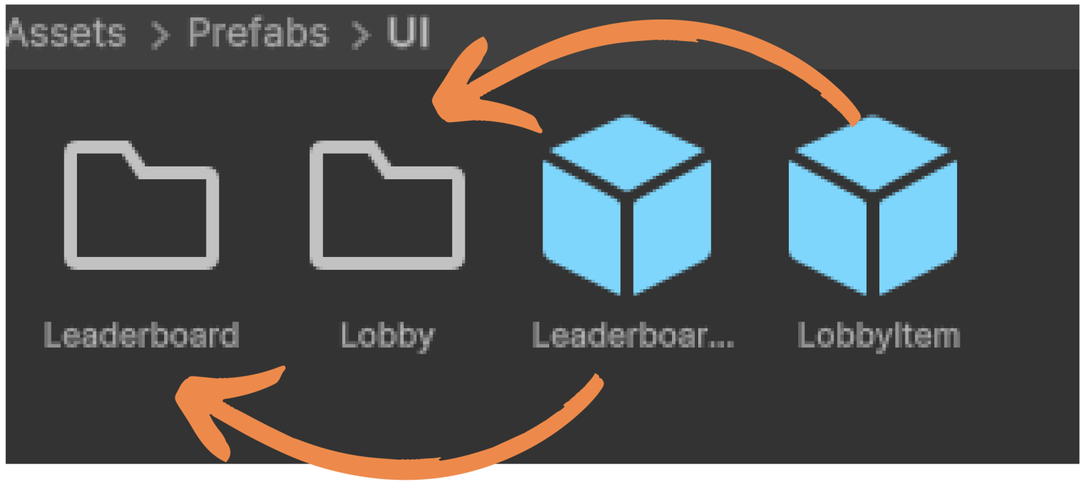

GameHUD
Canvas
LeaderboardBackground
LeaderboardEntityHolder
-----ENVIRONMENT-----


Assets > Scripts > UI
Leaderboard
ColorSelect...
LobbiesList
LobbyItem
MainMenu
NameSelec...
Assets/Scripts/UI/Leaderboard

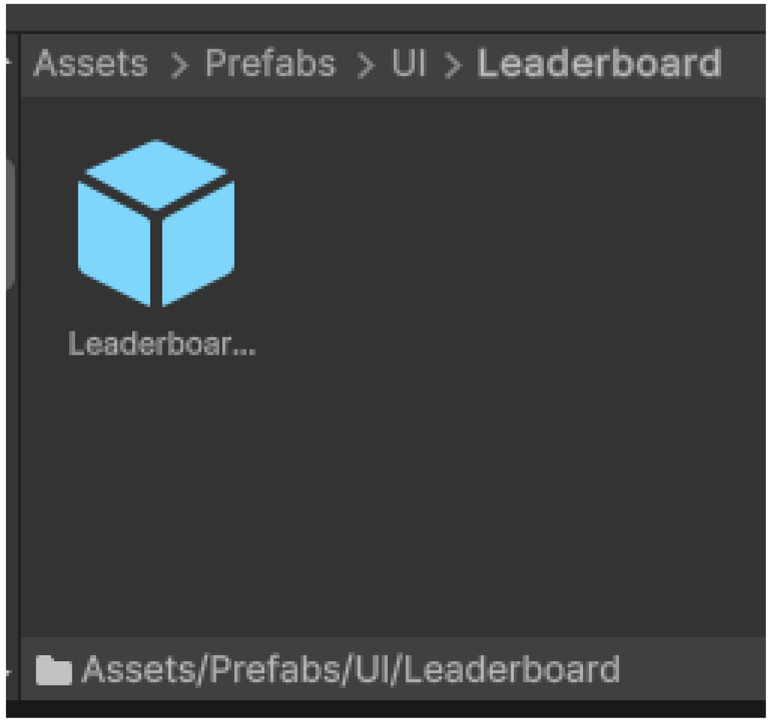

Assets > Scripts > UI > Leaderboard
Leaderboard
Assets/Scripts/UI/Leaderboard/Leaderboard.cs

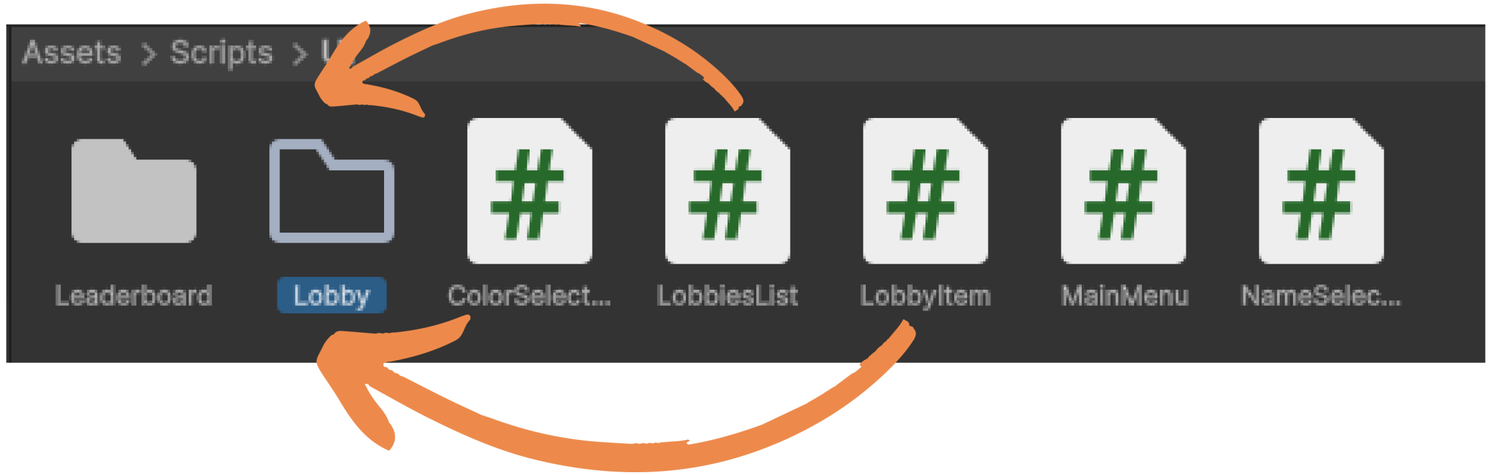

Assets > Scripts > UI > Leaderboard
Leaderboard
Leaderboar...
Assets/Scripts/UI/Leaderboard/LeaderboardEntityDisplay.cs


rarchy
All
Game*
-----SYSTEMS-----
CoinSpawner
RespawnHandler
GameHUD
Canvas
LeaderboardBackground
LeaderboardEntityHolder
-----ENVIRONMENT-----
Global Light 2D
Rock
Building
Soil
-----ENTITIES-----
Main Camera
Inspector
GameHUD
Tag
Untagged
Layer
Default
Transform
Position
Rotation
Scale
X 0
Y 0
Z 0
X 1
Y 1
Z 1
Leaderboard (Script)
Script
Leaderboard
Add Component
Assets > Prefabs > UI
Leaderboar...
LobbyItem
Assets/Prefabs/UI/LeaderboardEntity.prefab
Leaderboard Entity Display (Script)
Script
LeaderboardEntityDisplay
Add Component

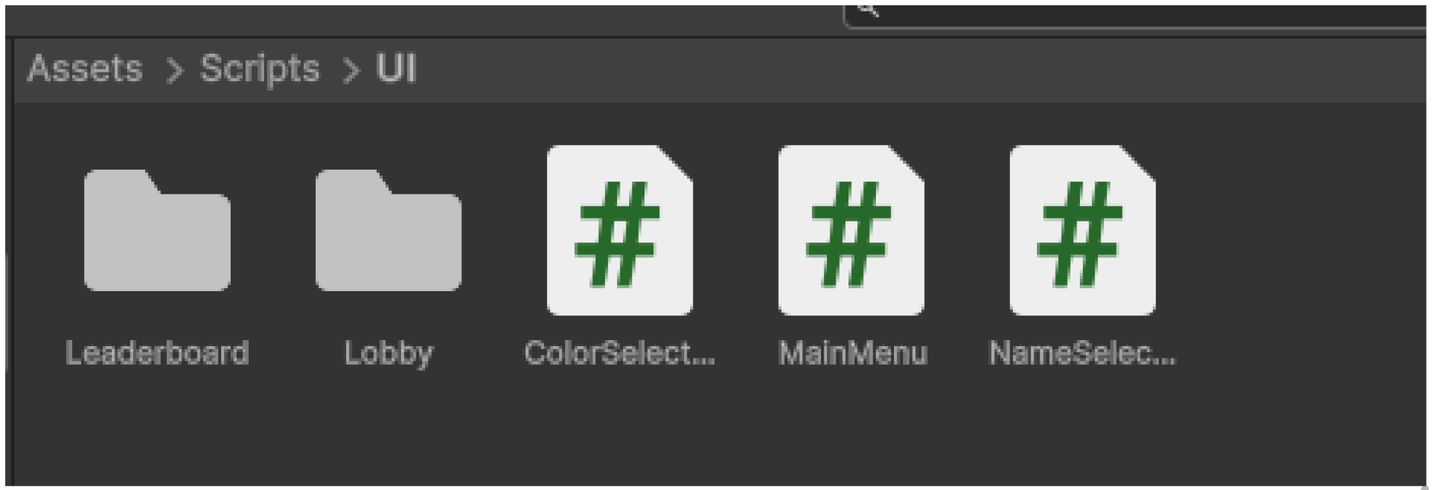

Assets > Prefabs > UI
Leaderboard
Lobby
Leaderboar...
LobbyItem


Assets > Prefabs > UI > Lobby
LobbyItem
Assets/Prefabs/UI/Lobby

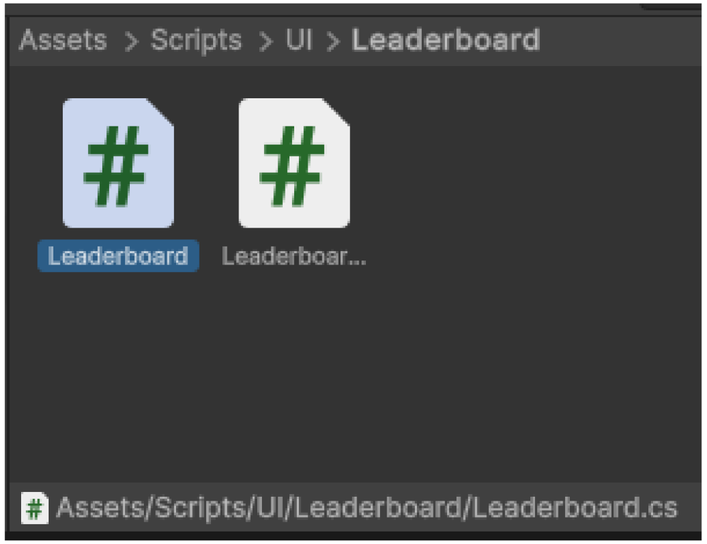

Assets > Prefabs > UI > Leaderboard
Leaderboar...
Assets/Prefabs/UI/Leaderboard


Assets > Scripts > U
Leaderboard
Lobby
ColorSelect...
LobbiesList
LobbyItem
MainMenu
NameSelec...

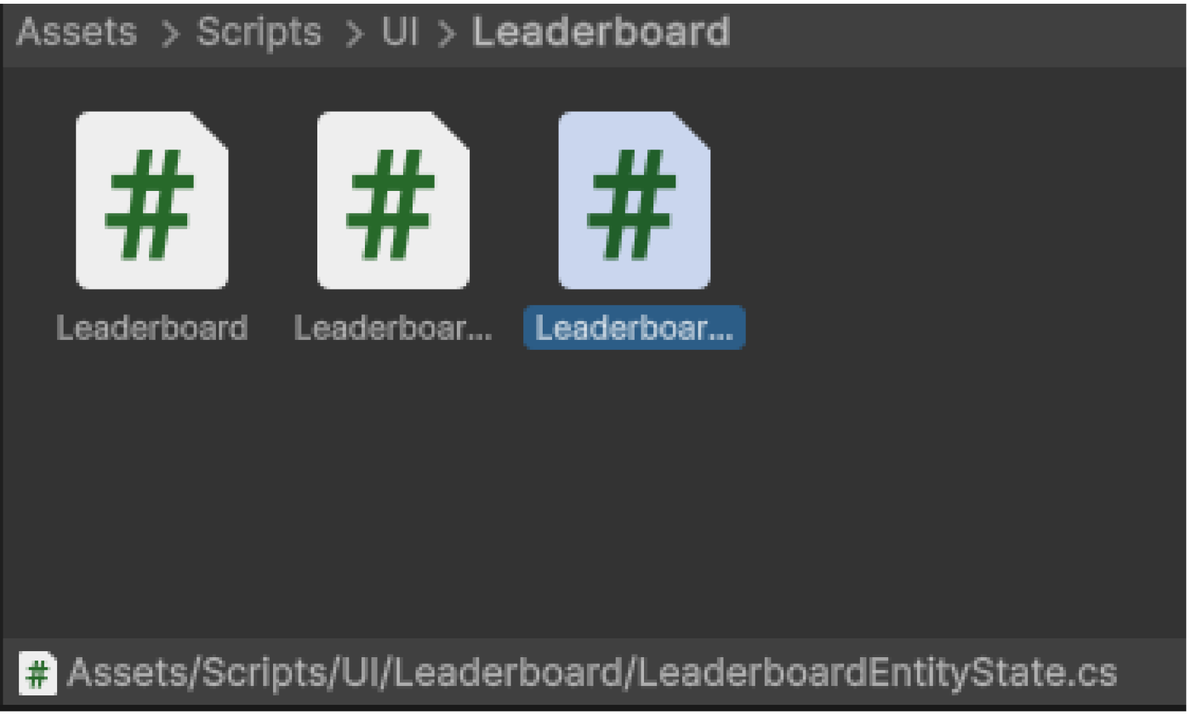

Assets > Scripts > UI > Lobby
LobbiesList
LobbyItem
Assets/Scripts/UI/Lobby


Assets > Scripts > UI
Leaderboard
Lobby
ColorSelect...
MainMenu
NameSelec...

Custom Data Types




```
1   using System.Collections;
2   using System.Collections.Generic;
3   using Unity.Netcode;
4   using UnityEngine;
5
        Unity Script | 0 references
6   public class Leaderboard : NetworkBehaviour
7   {
8       [SerializeField] private Transform leaderboardEntityHolder;
9       [SerializeField] private LeaderboardEntityDisplay leaderboardEntityPrefab;
10
11      NetworkList<
12  }
13
```



LeaderboardEntityState

```
using Unity.Collections;

0 references
public struct LeaderboardEntityState
{
    public ulong ClientId;
    public FixedString32Bytes PlayerName;
    public int Coins;
}
```

```
using Unity.Collections;
using Unity.Netcode;

0 references
public struct LeaderboardEntityState : INetworkSerializable
{
    public ulong ClientId;
    public FixedString32Bytes PlayerName;
    public int Coins;

    0 references
    public void NetworkSerialize<T>(BufferSerializer<T> serializer) where T : IReaderWriter
    {
        throw new System.NotImplementedException();
    }
}
```

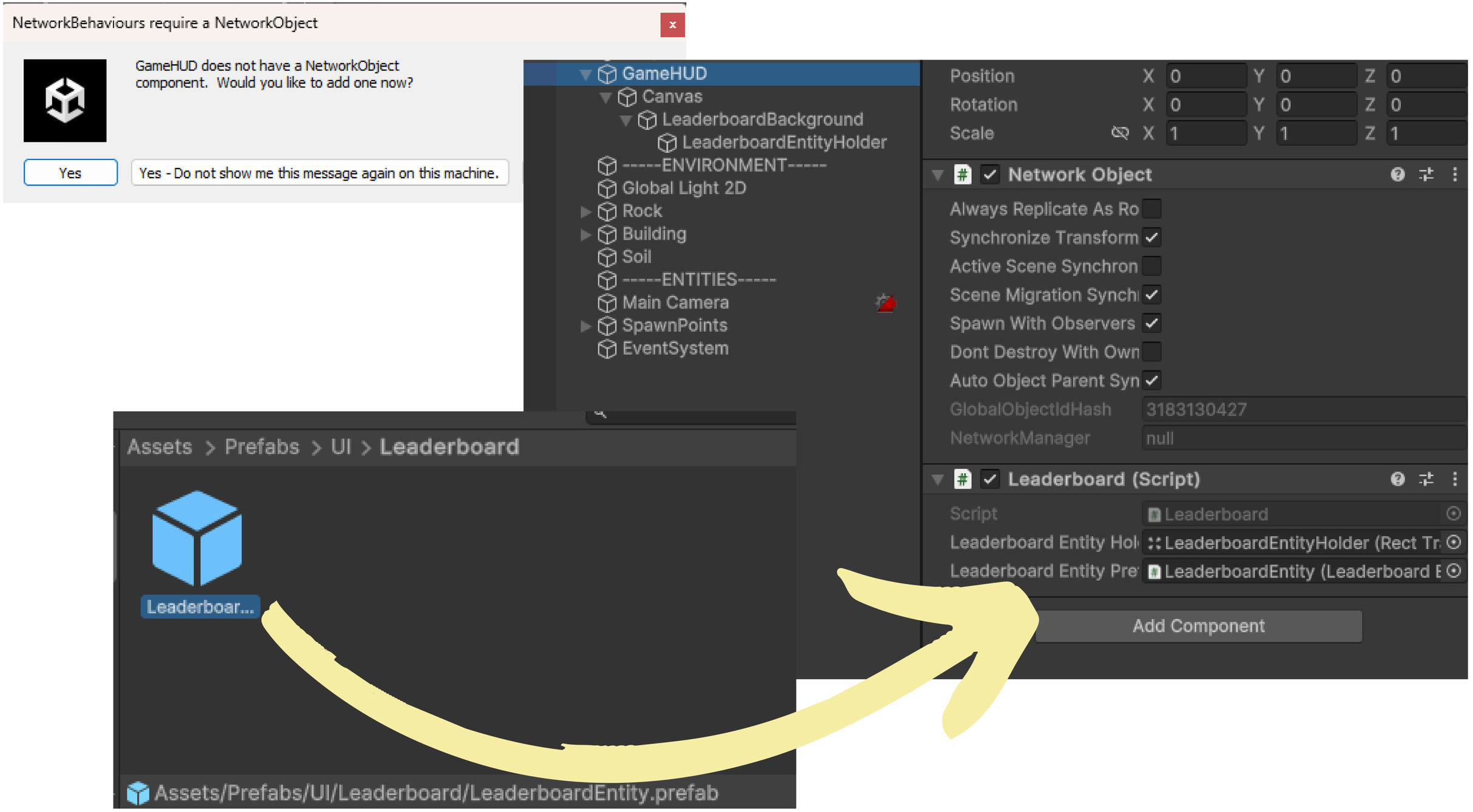
```
1  using Unity.Collections;
2  using Unity.Netcode;
3
   0 references
4  public struct LeaderboardEntityState : INetworkSerializable
5  {
6      public ulong ClientId;
7      public FixedString32Bytes PlayerName;
8      public int Coins;
9
       0 references
10     public void NetworkSerialize<T>(BufferSerializer<T> serializer) where T : IReaderWriter
11     {
12         serializer.SerializeValue(ref ClientId);
13         serializer.SerializeValue(ref PlayerName);
14         serializer.SerializeValue(ref Coins);
15     }
16 }
```

```
1   using System;
2   using Unity.Collections;
3   using Unity.Netcode;
4
    1 reference
5   public struct LeaderboardEntityState : INetworkSerializable , IEquatable<LeaderboardEntityState>
6   {
7       public ulong ClientId;
8       public FixedString32Bytes PlayerName;
9       public int Coins;
10
        0 references
11      public bool Equals(LeaderboardEntityState other)
12      {
13          throw new NotImplementedException();
14      }
15
16      public void NetworkSerialize<T>(BufferSerializer<T> serializer) where T : IReaderWriter
17      {
18          serializer.SerializeValue(ref ClientId);
19          serializer.SerializeValue(ref PlayerName);
20          serializer.SerializeValue(ref Coins);
21      }
22  }
23
```

```
using System;
using Unity.Collections;
using Unity.Netcode;

2 references
public struct LeaderboardEntityState : INetworkSerializable , IEquatable<LeaderboardEntityState>
{
    public ulong ClientId;
    public FixedString32Bytes PlayerName;
    public int Coins;

    0 references
    public bool Equals(LeaderboardEntityState other)
    {
        return ClientId == other.ClientId &&
               PlayerName.Equals(other.PlayerName) &&
               Coins == other.Coins;
    }

    0 references
    public void NetworkSerialize<T>(BufferSerializer<T> serializer) where T : IReaderWriter
    {
        serializer.SerializeValue(ref ClientId);
        serializer.SerializeValue(ref PlayerName);
        serializer.SerializeValue(ref Coins);
    }
}
```

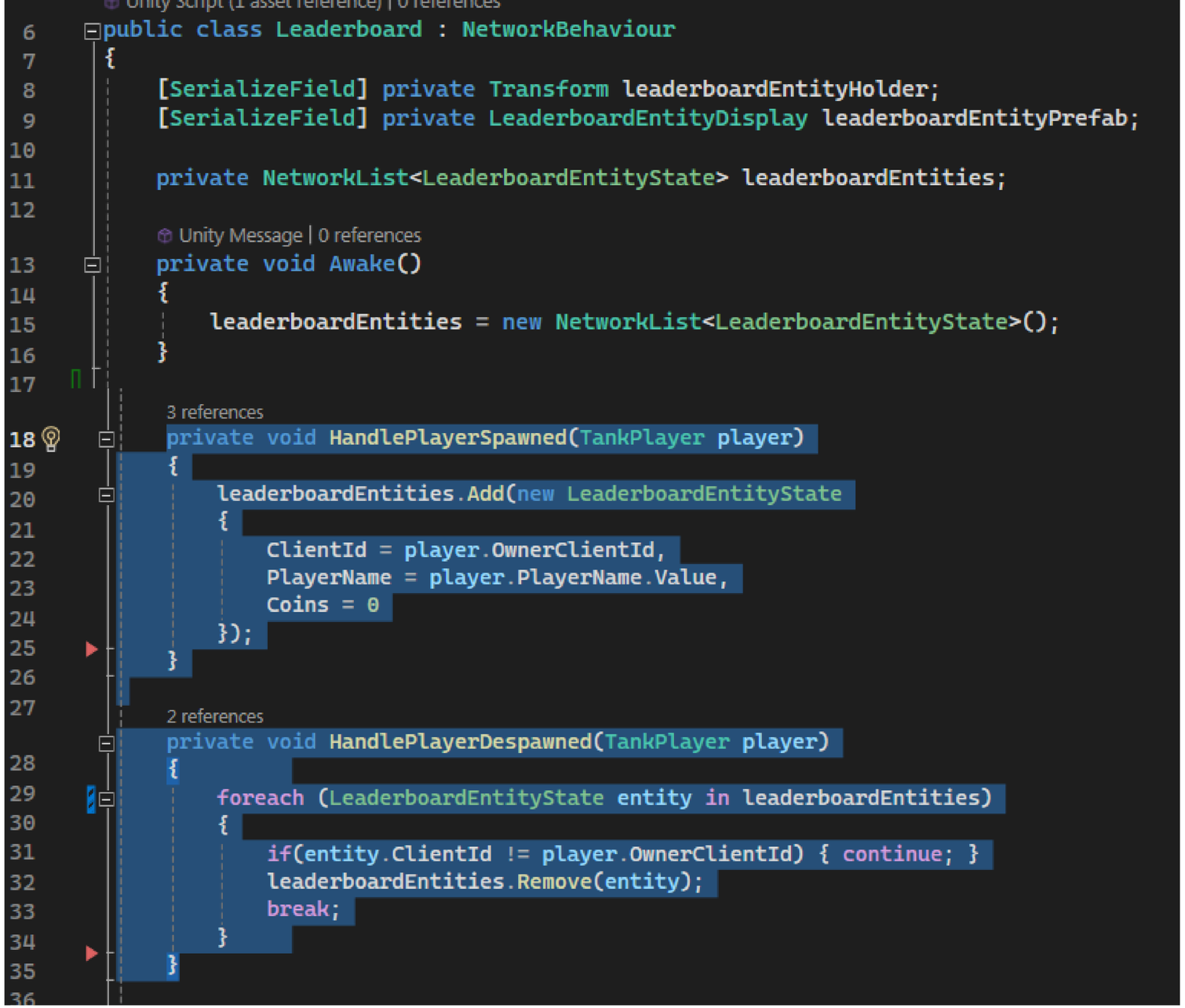
Leaderboard.cs

```
1   using System.Collections;
2   using System.Collections.Generic;
3   using Unity.Netcode;
4   using UnityEngine;
5
    Unity Script | 0 references
6   public class Leaderboard : NetworkBehaviour
7   {
8       [SerializeField] private Transform leaderboardEntityHolder;
9       [SerializeField] private LeaderboardEntityDisplay leaderboardEntityPrefab;
10
11      private NetworkList<LeaderboardEntityState> leaderboardEntities;
12
        Unity Message | 0 references
13      private void Awake()
14      {
15          leaderboardEntities = new NetworkList<LeaderboardEntityState>();
16      }
17  }
18
```


NetworkBehaviours require a NetworkObject
GameHUD does not have a NetworkObject component. Would you like to add one now?
Yes
Yes - Do not show me this message again on this machine.
GameHUD
Canvas
LeaderboardBackground
LeaderboardEntityHolder
-----ENVIRONMENT-----
Global Light 2D
Rock
Building
Soil
-----ENTITIES-----
Main Camera
SpawnPoints
EventSystem
Position X 0 Y 0 Z 0
Rotation X 0 Y 0 Z 0
Scale X 1 Y 1 Z 1
Network Object
Always Replicate As Ro
Synchronize Transform
Active Scene Synchron
Scene Migration Synchi
Spawn With Observers
Dont Destroy With Own
Auto Object Parent Syn
GlobalObjectIdHash 3183130427
NetworkManager null
Leaderboard (Script)
Script Leaderboard
Leaderboard Entity Hol LeaderboardEntityHolder (Rect Tr
Leaderboard Entity Pre LeaderboardEntity (Leaderboard E
Add Component
Assets > Prefabs > UI > Leaderboard
Leaderboar...
Assets/Prefabs/UI/Leaderboard/LeaderboardEntity.prefab

Leaderboard Spawning

Leaderboard.cs



```
Unity Script (1 asset reference) | 0 references
public class Leaderboard : NetworkBehaviour
{
    [SerializeField] private Transform leaderboardEntityHolder;
    [SerializeField] private LeaderboardEntityDisplay leaderboardEntityPrefab;

    private NetworkList<LeaderboardEntityState> leaderboardEntities;

    Unity Message | 0 references
    private void Awake()
    {
        leaderboardEntities = new NetworkList<LeaderboardEntityState>();
    }

    3 references
    private void HandlePlayerSpawned(TankPlayer player)
    {
        leaderboardEntities.Add(new LeaderboardEntityState
        {
            ClientId = player.OwnerClientId,
            PlayerName = player.PlayerName.Value,
            Coins = 0
        });
    }

    2 references
    private void HandlePlayerDespawned(TankPlayer player)
    {
        foreach (LeaderboardEntityState entity in leaderboardEntities)
        {
            if(entity.ClientId != player.OwnerClientId) { continue; }
            leaderboardEntities.Remove(entity);
            break;
        }
    }
```

Player Spawning

- Get all **TankPlayer** objects already in the scene
- Call **HandlePlayerSpawned** for each of those players
- Subscribe to **TankPlayer.OnPlayerSpawned** and **TankPlayer.OnPlayerDespawned**
- Unsubscribe from those events in **OnNetworkDespawn**

Leaderboard.cs

```
public override void OnNetworkSpawn()
{
    if (IsServer)
    {
        TankPlayer[] players = FindObjectsByType<TankPlayer>(FindObjectsSortMode.None);
        foreach (TankPlayer player in players)
        {
            HandlePlayerSpawned(player);
        }
        TankPlayer.OnPlayerSpawned += HandlePlayerSpawned;
        TankPlayer.OnPlayerDespawned += HandlePlayerDespawned;
    }
}
```

```
public override void OnNetworkDespawn()
{
    if (IsServer)
    {
        TankPlayer.OnPlayerSpawned -= HandlePlayerSpawned;
        TankPlayer.OnPlayerDespawned -= HandlePlayerDespawned;
    }
}
```

Leaderboard.cs

```
public override void OnNetworkSpawn()
{
    if (IsClient)
    {
        leaderboardEntities.OnListChanged += HandleLeaderboardEntitiesChanged;
    }

    if (IsServer)
    {
        TankPlayer[] players = FindObjectsByType<TankPlayer>(FindObjectsSortMode.None);
        foreach (TankPlayer player in players)
        {
            HandlePlayerSpawned(player);
        }
        TankPlayer.OnPlayerSpawned += HandlePlayerSpawned;
        TankPlayer.OnPlayerDespawned += HandlePlayerDespawned;
    }
}
```

```
public override void OnNetworkDespawn()
{
    if (IsClient)
    {
        leaderboardEntities.OnListChanged -= HandleLeaderboardEntitiesChanged;
    }

    if (IsServer)
    {
        TankPlayer.OnPlayerSpawned -= HandlePlayerSpawned;
        TankPlayer.OnPlayerDespawned -= HandlePlayerDespawned;
    }
}
```

```
1 reference
private void HandleLeaderboardEntitiesChanged(NetworkListEvent<LeaderboardEntityState> changeEvent)
{
    throw new NotImplementedException();
}
```

Leaderboard.cs

```
private void HandleLeaderboardEntitiesChanged(NetworkListEvent<LeaderboardEntityState> changeEvent)
{
    switch (changeEvent.Type)
    {
        case NetworkListEvent<LeaderboardEntityState>.EventType.Add:
            Instantiate(leaderboardEntityPrefab, leaderboardEntityHolder);
            break;
        case NetworkListEvent<LeaderboardEntityState>.EventType.Remove:
            break;
    }
}
```

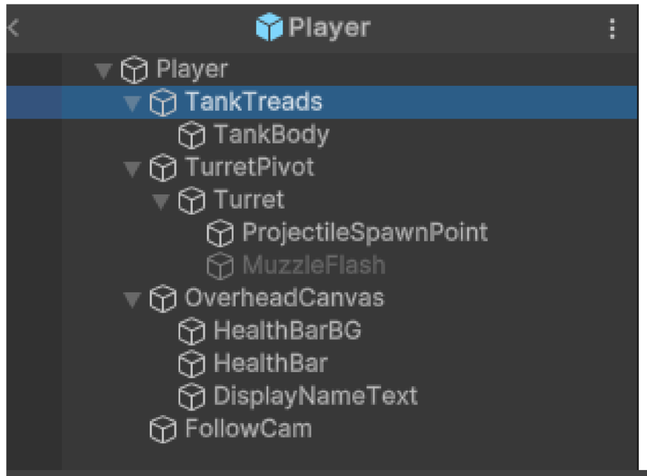
ตอนนี้ถ้าทดสอบจะเห็นว่าจะเห็นเพิ่มขึ้นมาแค่เฉพาะฝั่ง Host ที่อัพเดทใน List ของ Leaderboard

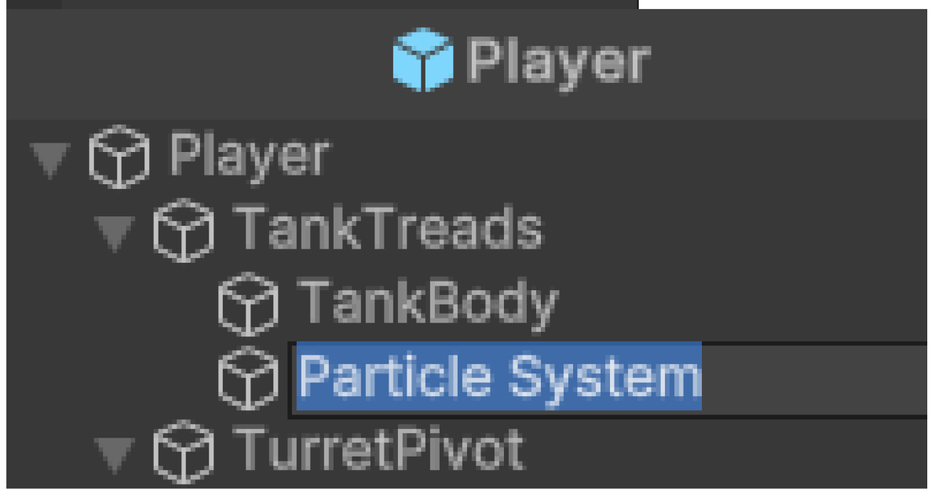
ดังนั้นแล้วเราต้องเพิ่มมาโค้ดมาอีกส่วนหนึ่งเพื่อให้มีการ Instantiate leaderboardEntityPrefab ขึ้นมา

```
public override void OnNetworkSpawn()
{
    if (IsClient)
    {
        leaderboardEntities.OnListChanged += HandleLeaderboardEntitiesChanged;
        foreach(LeaderboardEntityState entity in leaderboardEntities)
        {
            HandleLeaderboardEntitiesChanged(new NetworkListEvent<LeaderboardEntityState>
            {
                Type = NetworkListEvent<LeaderboardEntityState>.EventType.Add,
                Value = entity
            });
        }
    }

    if (IsServer)
    {
        TankPlayer[] players = FindObjectsByType<TankPlayer>(FindObjectsSortMode.None);
        foreach (TankPlayer player in players)
        {
            HandlePlayerSpawned(player);
        }
        TankPlayer.OnPlayerSpawned += HandlePlayerSpawned;
        TankPlayer.OnPlayerDespawned += HandlePlayerDespawned;
    }
}
```

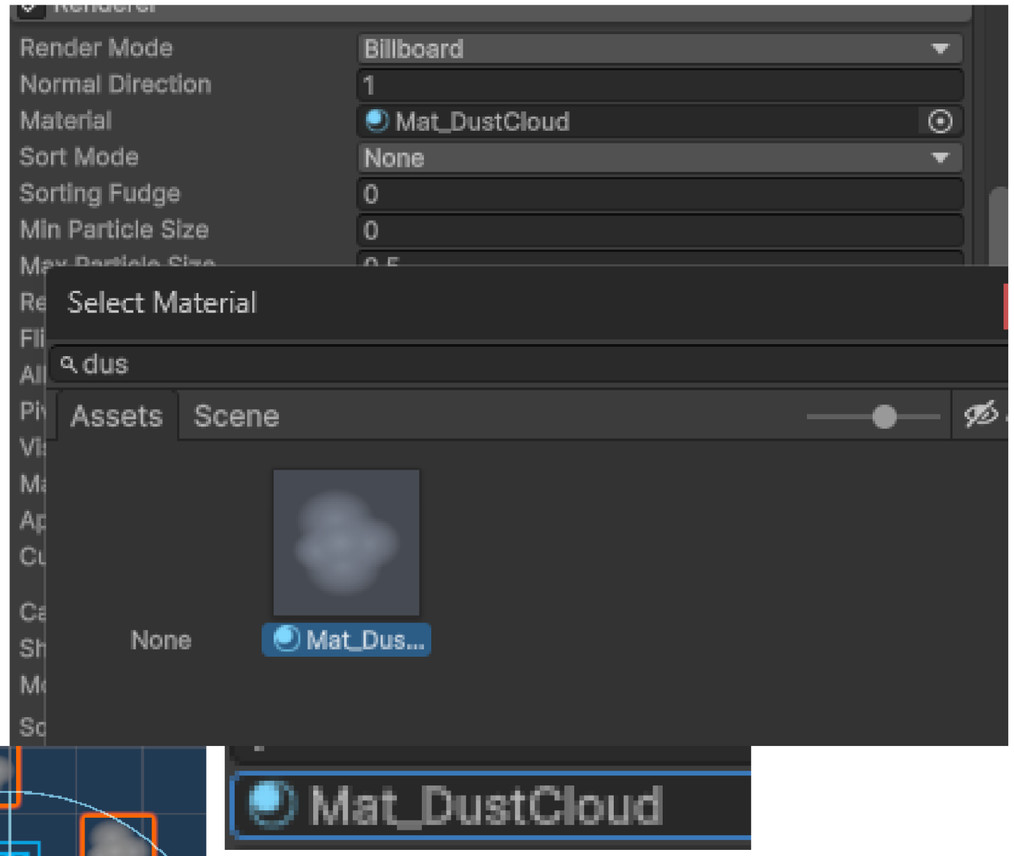
จากนั้นก็ทำการ Build เพื่อทดสอบ
เราจะเห็นว่า Host จะแสดงออกมาครบทั้ง 2 คน
ส่วน Client จะเห็นว่าการ Duplicate คนเกินมา
ซึ่งเดี๋ยวเราจะทำมาต่อในบทถัดไป

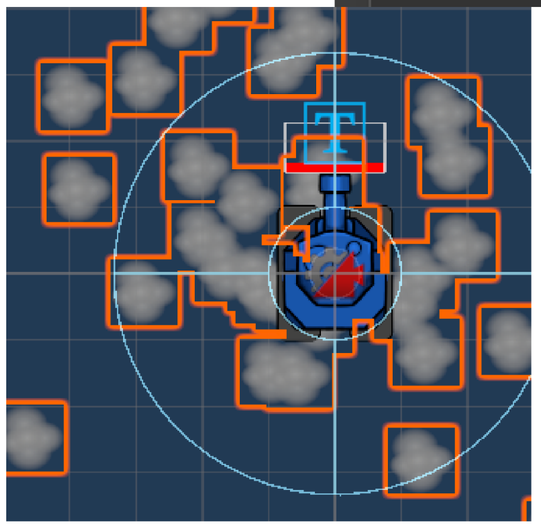
Making Trails


Player
Player
TankTreads
TankBody
TurretPivot
Turret
ProjectileSpawnPoint
MuzzleFlash
OverheadCanvas
HealthBarBG
HealthBar
DisplayNameText
FollowCam

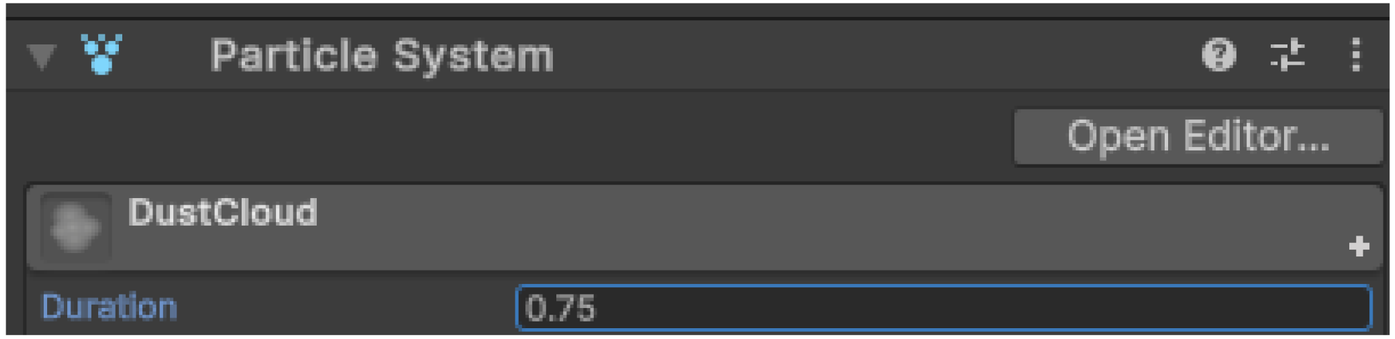

Player
Player
TankTreads
TankBody
Particle System
TurretPivot


Player
TankTreads
TankBody
DustCloud


Render Mode
Billboard
Normal Direction
1
Material
Mat_DustCloud
Sort Mode
None
Sorting Fudge
0
Min Particle Size
0
Select Material
dus
Assets
Scene
None
Mat_Dus...
Mat_DustCloud

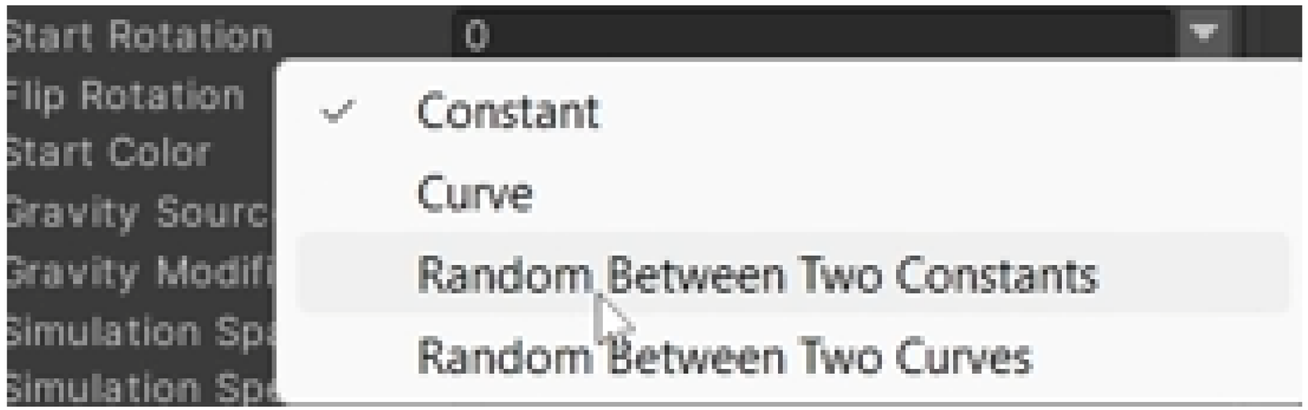



Sorting Layer ID
Default
Order in Layer
700
Light Probes
Off
Rendering Layer Mask
Default


Particle System
Open Editor...
DustCloud
Duration
0.75

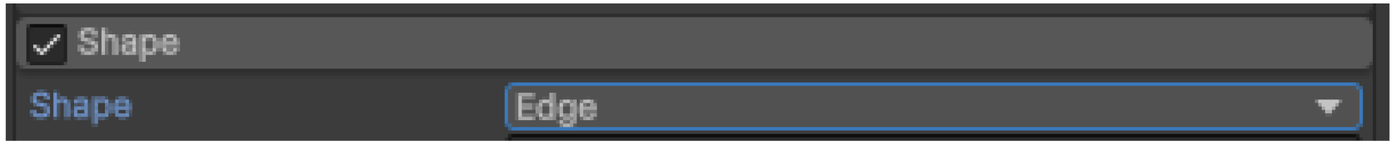

Start Lifetime
0.75

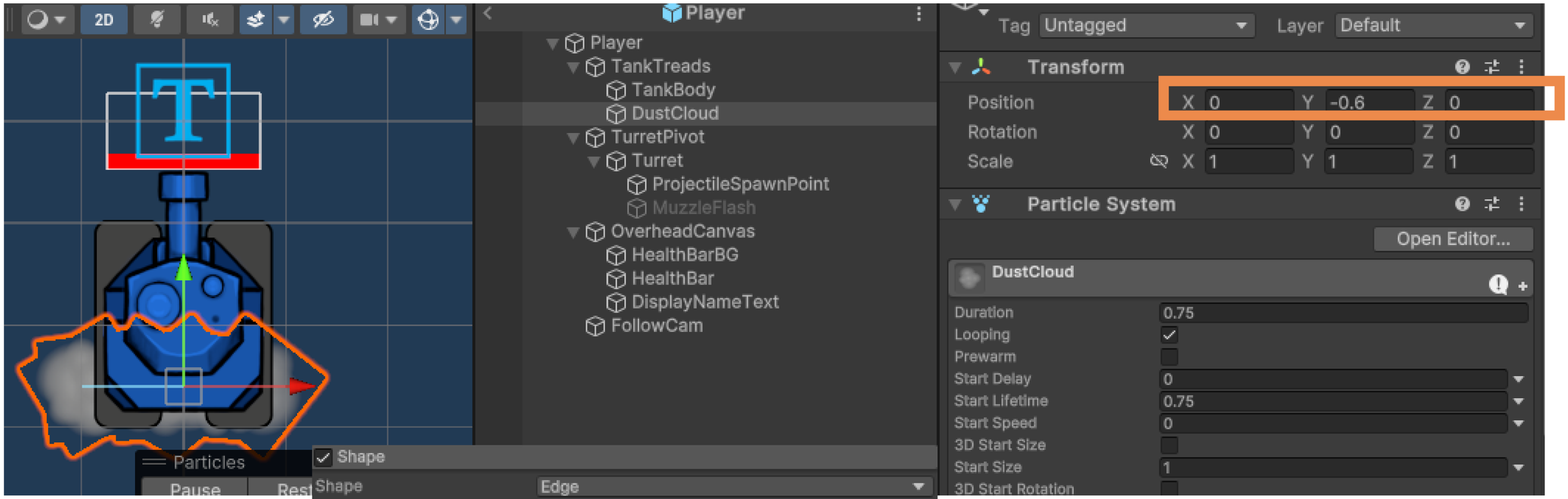

Start Speed
0


Start Rotation
0
Flip Rotation
Start Color
Gravity Sourc
Gravity Modifi
Simulation Spa
Simulation Spe
Constant
Curve
Random Between Two Constants
Random Between Two Curves

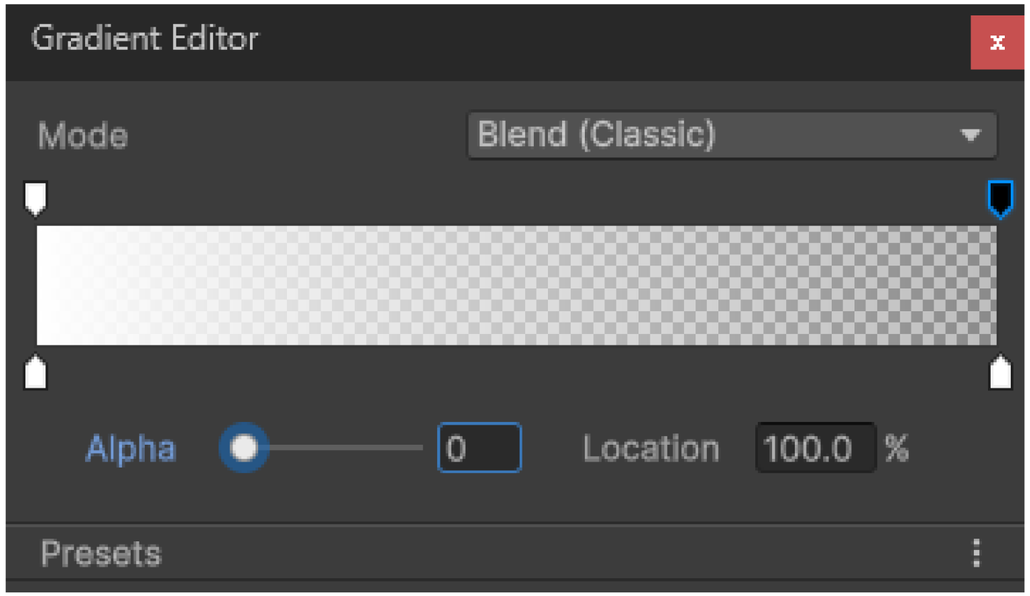

Start Rotation
-180
180

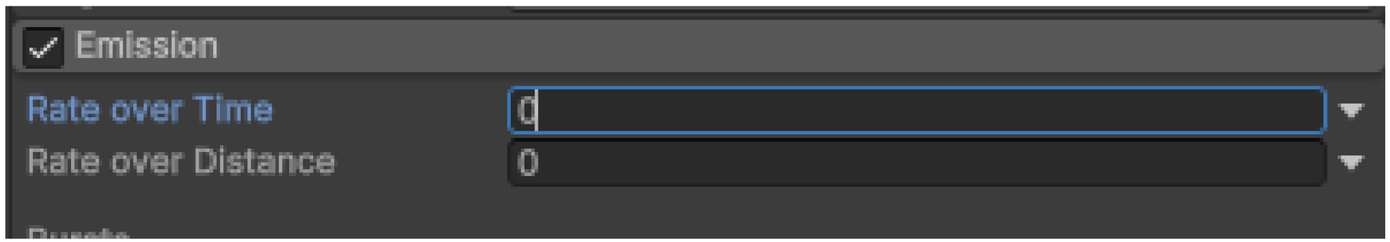

Simulation Space
World

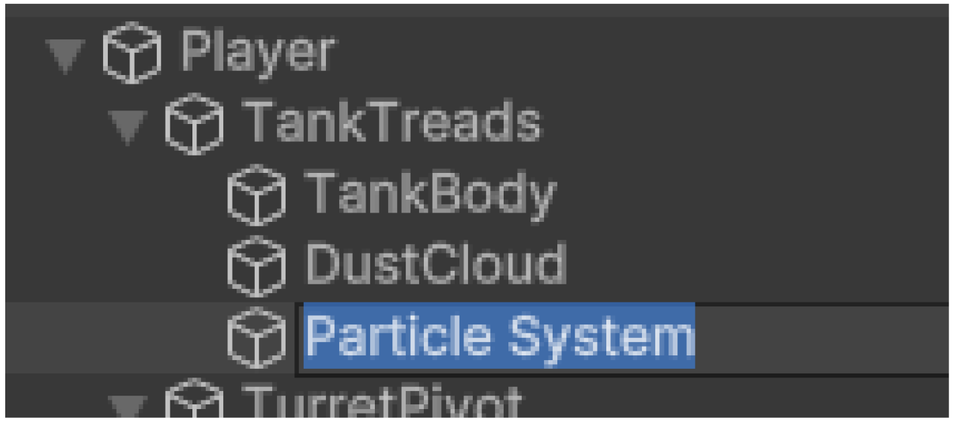

Shape
Shape
Edge

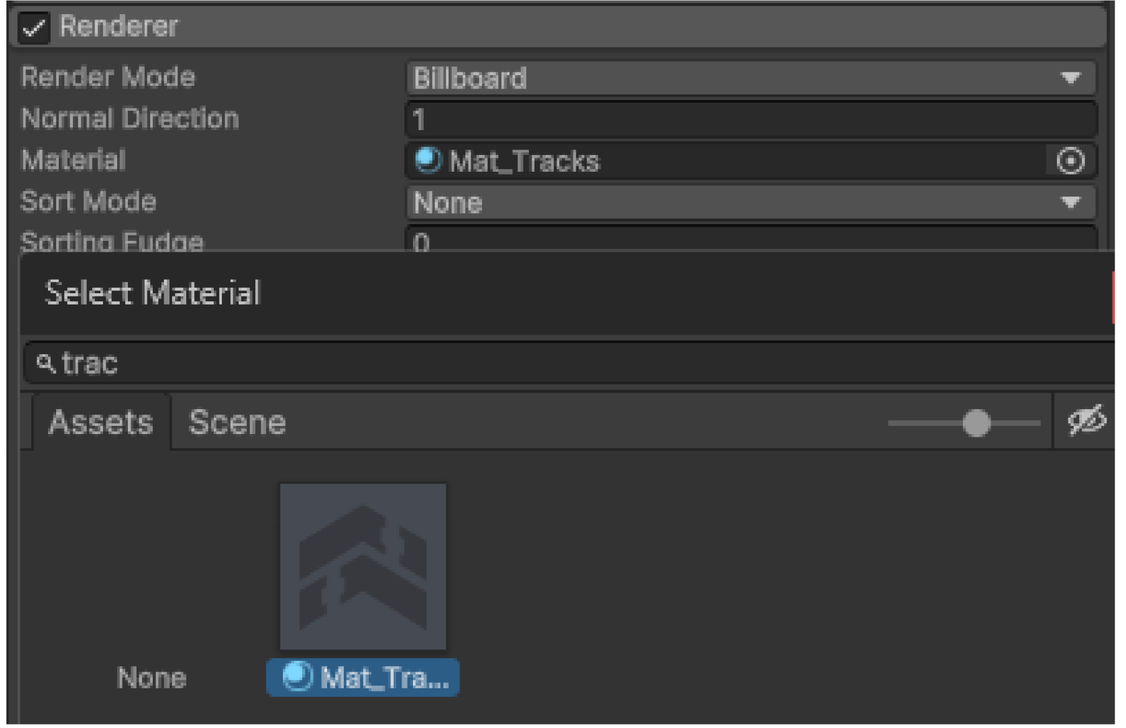

2D
Player
Player
TankTreads
TankBody
DustCloud
TurretPivot
Turret
ProjectileSpawnPoint
MuzzleFlash
OverheadCanvas
HealthBarBG
HealthBar
DisplayNameText
FollowCam
Tag
Untagged
Layer
Default
Transform
Position
X 0
Y -0.6
Z 0
Rotation
X 0
Y 0
Z 0
Scale
X 1
Y 1
Z 1
Particle System
Open Editor...
DustCloud
Duration
0.75
Looping
Prewarm
Start Delay
0
Start Lifetime
0.75
Start Speed
0
3D Start Size
Start Size
1
3D Start Rotation
Particles
Pause
Shape
Shape
Edge
Radius
0.5
Mode
Random
Spread
0
Texture
None (Texture 2D)
Position
X 0
Y 0
Z 0
Rotation
X 0
Y 0
Z 0
Scale
X 1
Y 1
Z 1
Align To Direction
Randomize Direction
0
Spherize Direction
0
Randomize Position
0


Color over Lifetime
Color

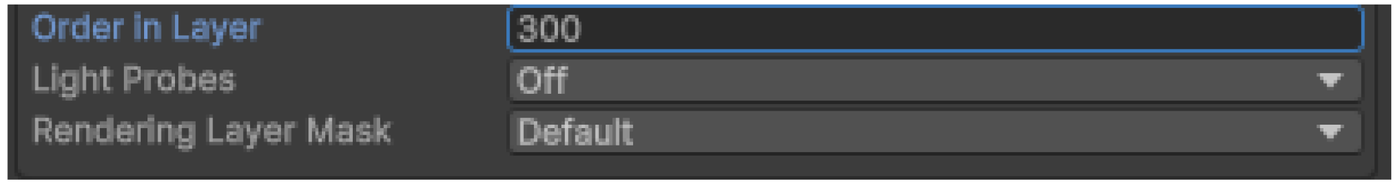

Gradient Editor
Mode
Blend (Classic)
Alpha
0
Location
100.0
%
Presets

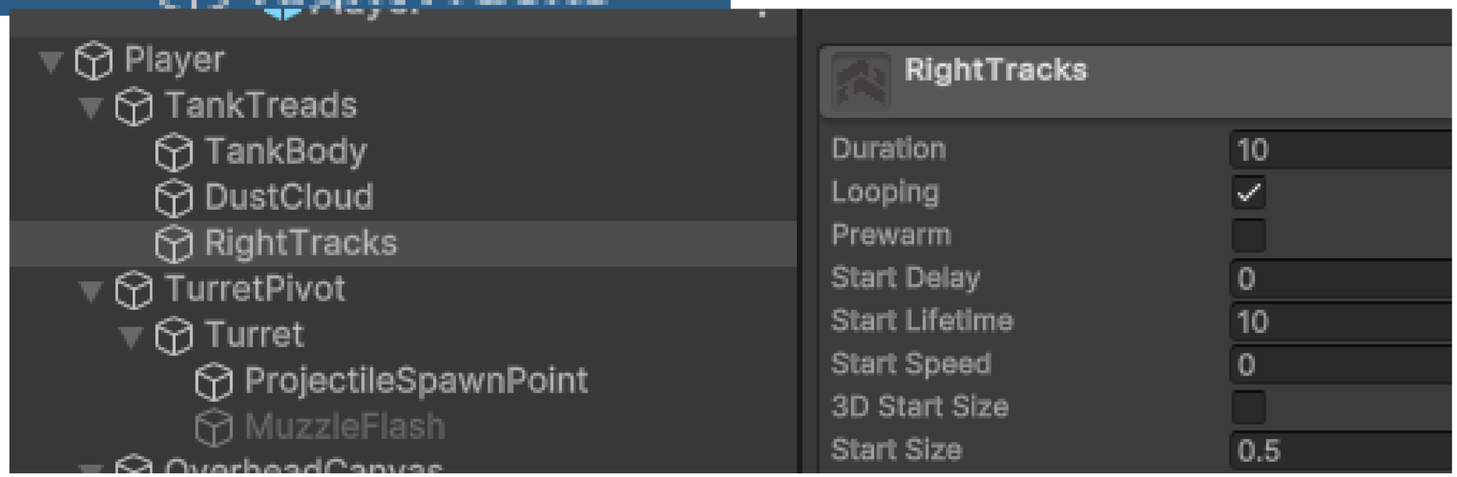

Emission
Rate over Time
0
Rate over Distance
0


Player
TankTreads
TankBody
DustCloud
Particle System

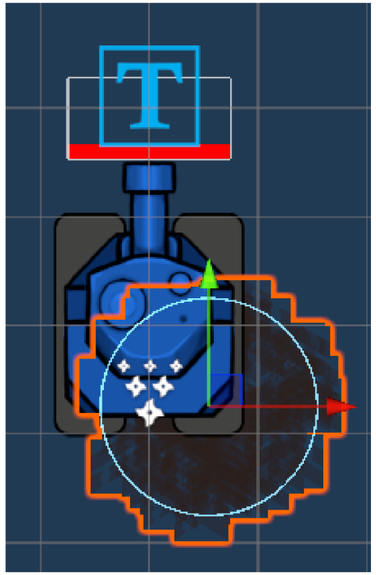

Renderer
Render Mode
Billboard
Normal Direction
1
Material
Mat_Tracks
Sort Mode
None
Select Material
trac
Assets
Scene
None
Mat_Tra...


Player
TankTreads
TankBody
DustCloud
RightTracks

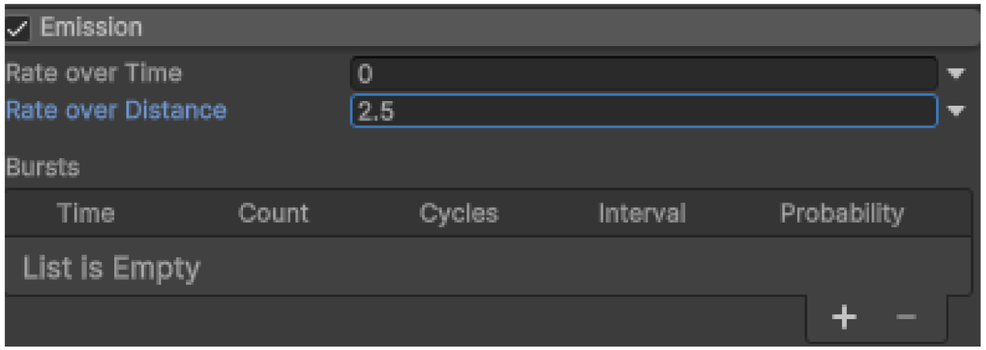

Order in Layer
300
Light Probes
Off
Rendering Layer Mask
Default

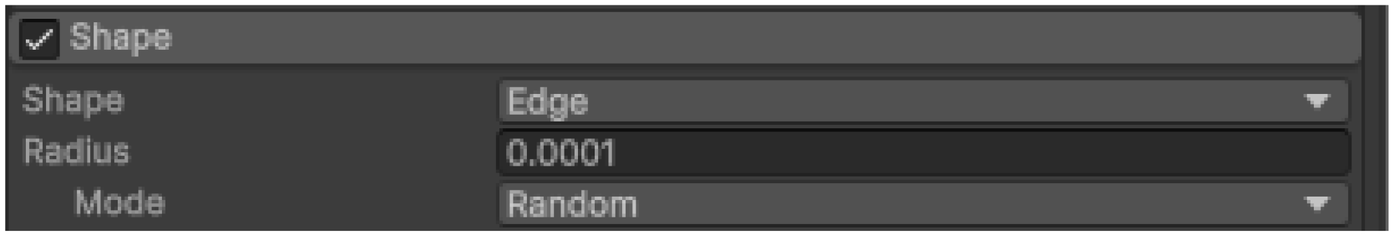

Player
TankTreads
TankBody
DustCloud
RightTracks
TurretPivot
Turret
ProjectileSpawnPoint
MuzzleFlash
RightTracks
Duration
10
Looping
Prewarm
Start Delay
0
Start Lifetime
10
Start Speed
0
3D Start Size
Start Size
0.5

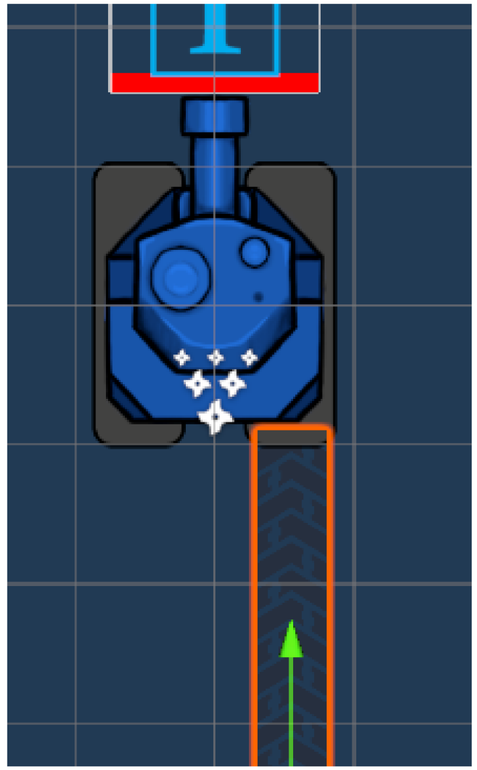

TankTreads
TankBody
DustCloud
RightTracks
TurretPivot
Transform
Position X 0.55 Y -0.75 Z 0
Rotation X 0 Y 0 Z 0
Scale X 1 Y 1 Z 1



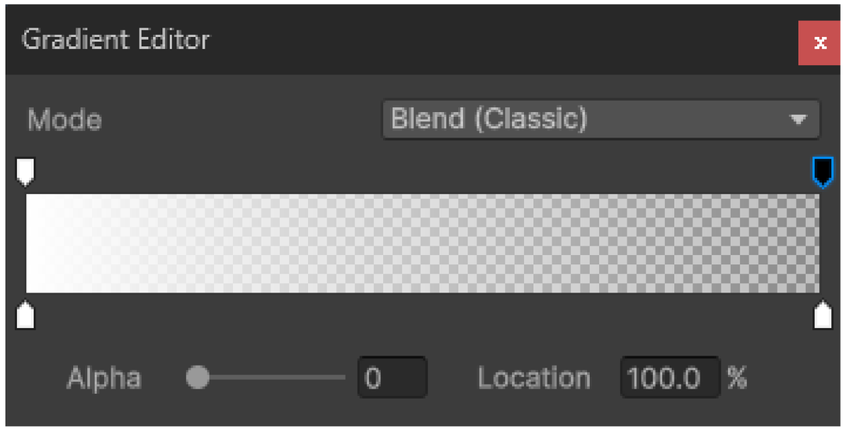

Simulation Space
World
Simulation Speed
1

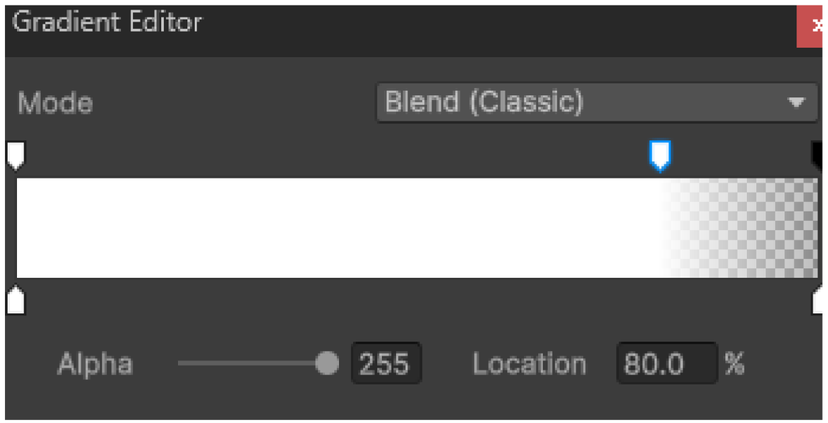

Emission
Rate over Time 0
Rate over Distance 2.5
Bursts
Time Count Cycles Interval Probability
List is Empty


Shape
Shape Edge
Radius 0.0001
Mode Random



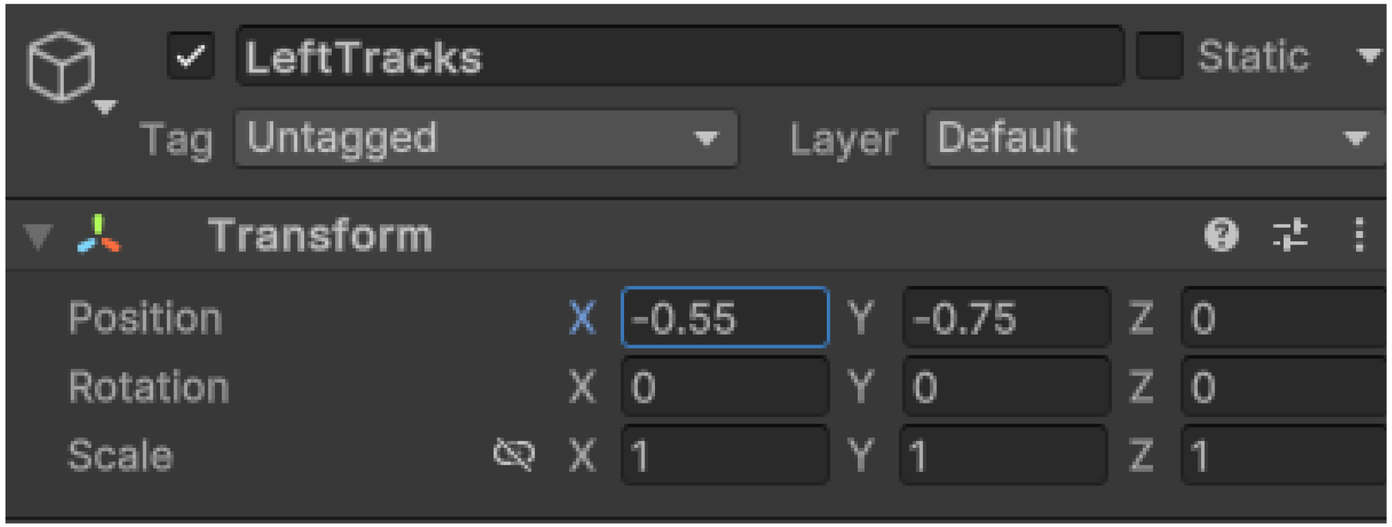

Color over Lifetime
Color


Gradient Editor
Mode
Blend (Classic)
Alpha
0
Location
100.0
%


Gradient Editor
Mode
Blend (Classic)
Alpha
255
Location
80.0
%


RightTracks
RightTracks (1)

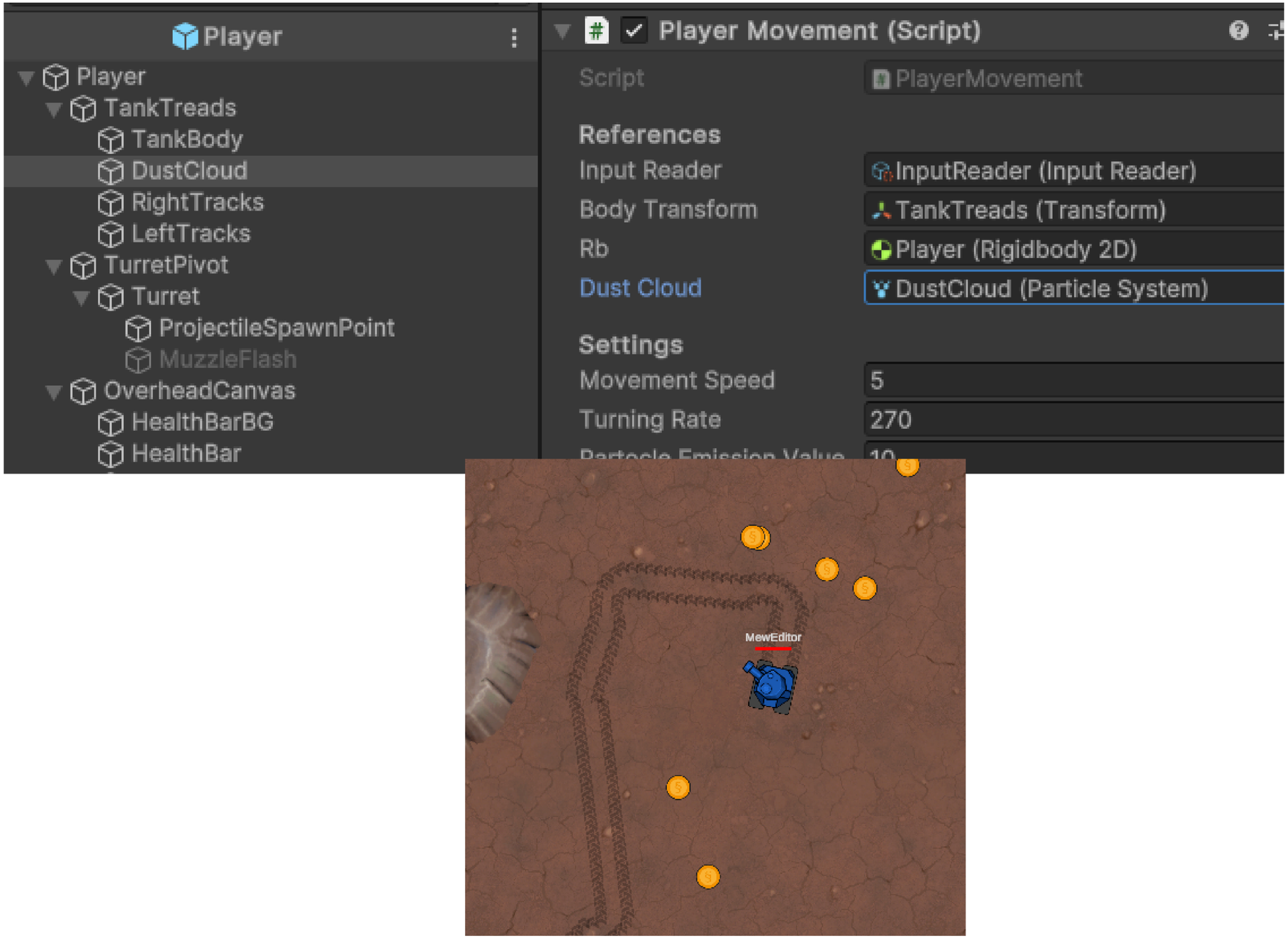

RightTracks
LeftTracks

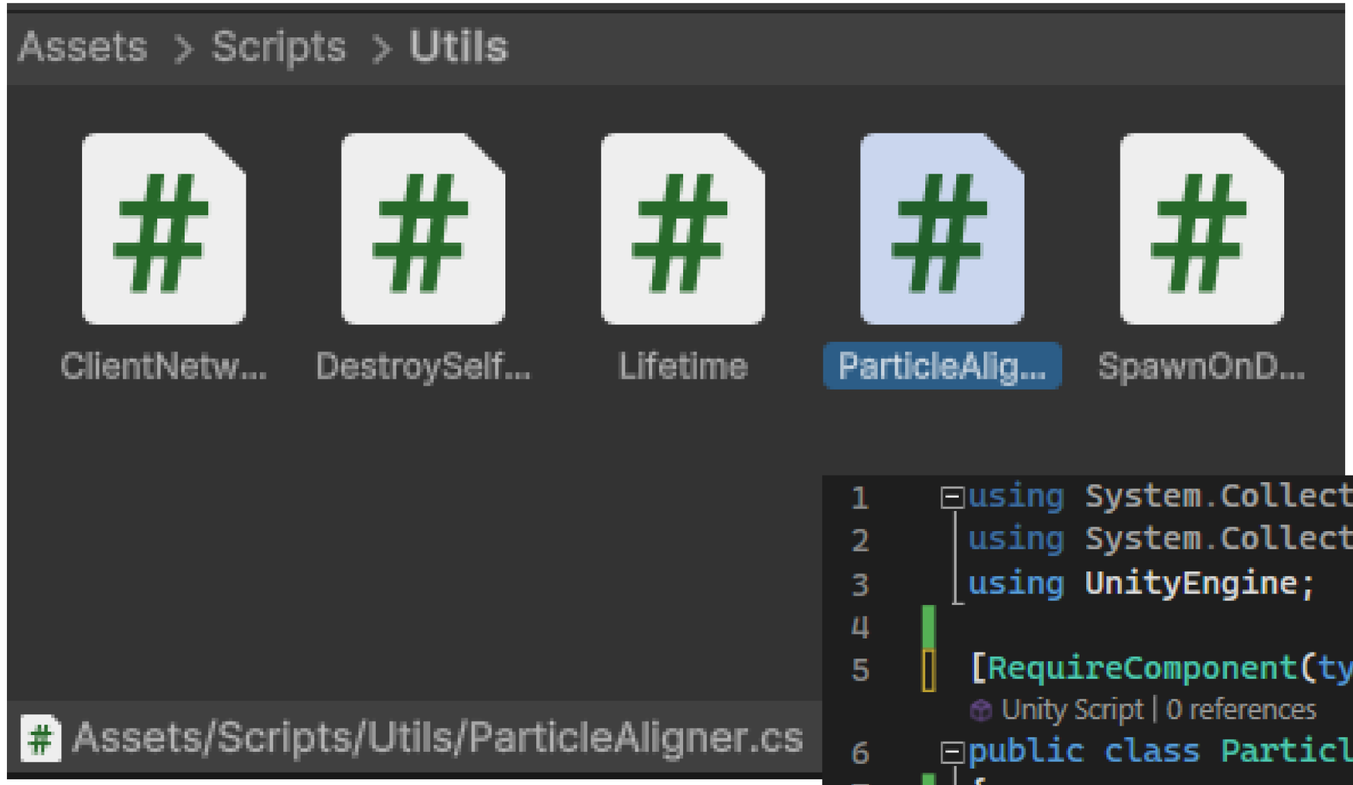

LeftTracks
Static
Tag
Untagged
Layer
Default
Transform
Position
X -0.55
Y -0.75
Z 0
Rotation
X 0
Y 0
Z 0
Scale
X 1
Y 1
Z 1

PlayerMovement.cs

```
1   using System.Collections;
2   using System.Collections.Generic;
3   using Unity.Netcode;
4   using UnityEngine;
5
    Unity Script (1 asset reference) | 0 references
6   public class PlayerMovement : NetworkBehaviour
7   {
8       [Header("References")]
9       [SerializeField] private InputReader inputReader;
10      [SerializeField] private Transform bodyTransform;
11      [SerializeField] private Rigidbody2D rb;
12      [SerializeField] private ParticleSystem dustCloud;
13
14      [Header("Settings")]
15      [SerializeField] private float movementSpeed = 4f;
16      [SerializeField] private float turningRate = 30f;
17      [SerializeField] private float particleEmissionValue = 10f;
18      private ParticleSystem.EmissionModule emissionModule;
19
20      private Vector2 previousMovementInput;
21      private Vector3 previousPos;
22
23      private const float ParticleStopThreshold = 0.005f;
        Unity Message | 0 references
        private void Awake()
        {
            emissionModule = dustCloud.emission;
        }
```

```
private void FixedUpdate()
{
    if ((transform.position - previousPos).sqrMagnitude > ParticleStopThreshold)
    {
        emissionModule.rateOverTime = particleEmissionValue;
    }
    else
    {
        emissionModule.rateOverTime = 0;
    }
    previousPos = transform.position;

    if (!IsOwner) { return ; }

    rb.velocity = (Vector2)bodyTransform.up * previousMovementInput.y * movementSpeed;
}
```


Player
Player
TankTreads
TankBody
DustCloud
RightTracks
LeftTracks
TurretPivot
Turret
ProjectileSpawnPoint
MuzzleFlash
OverheadCanvas
HealthBarBG
HealthBar
Player Movement (Script)
Script
PlayerMovement
References
Input Reader
InputReader (Input Reader)
Body Transform
TankTreads (Transform)
Rb
Player (Rigidbody 2D)
Dust Cloud
DustCloud (Particle System)
Settings
Movement Speed
5
Turning Rate
270
MewEditor




```
1   using System.Collections;
2   using System.Collections.Generic;
3   using UnityEngine;
4
5   [RequireComponent(typeof(ParticleSystem))]
        Unity Script | 0 references
6   public class ParticleAligner : MonoBehaviour
7   {
8       private ParticleSystem.MainModule psMain;
            Unity Message | 0 references
9       private void Start()
10      {
11          psMain = GetComponent<ParticleSystem>().main;
12      }
13
            Unity Message | 0 references
14      private void Update()
15      {
16          psMain.startRotation = -transform.rotation.eulerAngles.z * Mathf.Deg2Rad;
17      }
18  }
```

RightTracks
LeftTracks
TurretPivot
Turret
ProjectileSpawnPoint
MuzzleFlash
OverheadCanvas
HealthBarBG
HealthBar
DisplayNameText
FollowCam

Collision
Triggers
Sub Emitters
Texture Sheet Animation
Lights
Trails
Custom Data
Renderer

Render Mode	Billboard
Normal Direction	1
Material	Mat_Tracks
Sort Mode	None
Sorting Fudge	0
Min Particle Size	0
Max Particle Size	0.5
Render Alignment	View
Flip	X 0 Y 0 Z 0
Allow Roll	✓
Pivot	X 0 Y 0 Z 0
Visualize Pivot	
Masking	No Masking
Apply Active Color Space	✓
Custom Vertex Streams	
Cast Shadows	Off
Shadow Bias	0
Motion Vectors	Per Object Motion
Sorting Layer ID	Default
Order in Layer	300
Light Probes	Off
Rendering Layer Mask	Default

Particle Aligner (Script)

Script: ParticleAligner

Mat_Tracks (Material)

Shader: Legacy Shaders/Particles/Alpha — Edit...

Assignment

ให้ทำการถ่ายคลิปผลลัพธ์ของการทำ Workshop ตามเนื้อหา Workshop ในแต่ละหัวข้อนี้พร้อมอธิบายประกอบ

- Crosshair
- Leaderboard Setup
- Custom Data Types
- Leaderboard Spawning
- Making Trails

https://discord.gg/24xmUFHfzR

WOLVEDEN ACADEMY

THANK YOU

facebook.com/GameDevMew