Assignment -1

Objective:

To create a basic virtual environment in Unity that includes a ground plane, a skybox, environmental objects, lighting, and simple VR interaction. The player should be able to grab and move the grabale objects in the environment

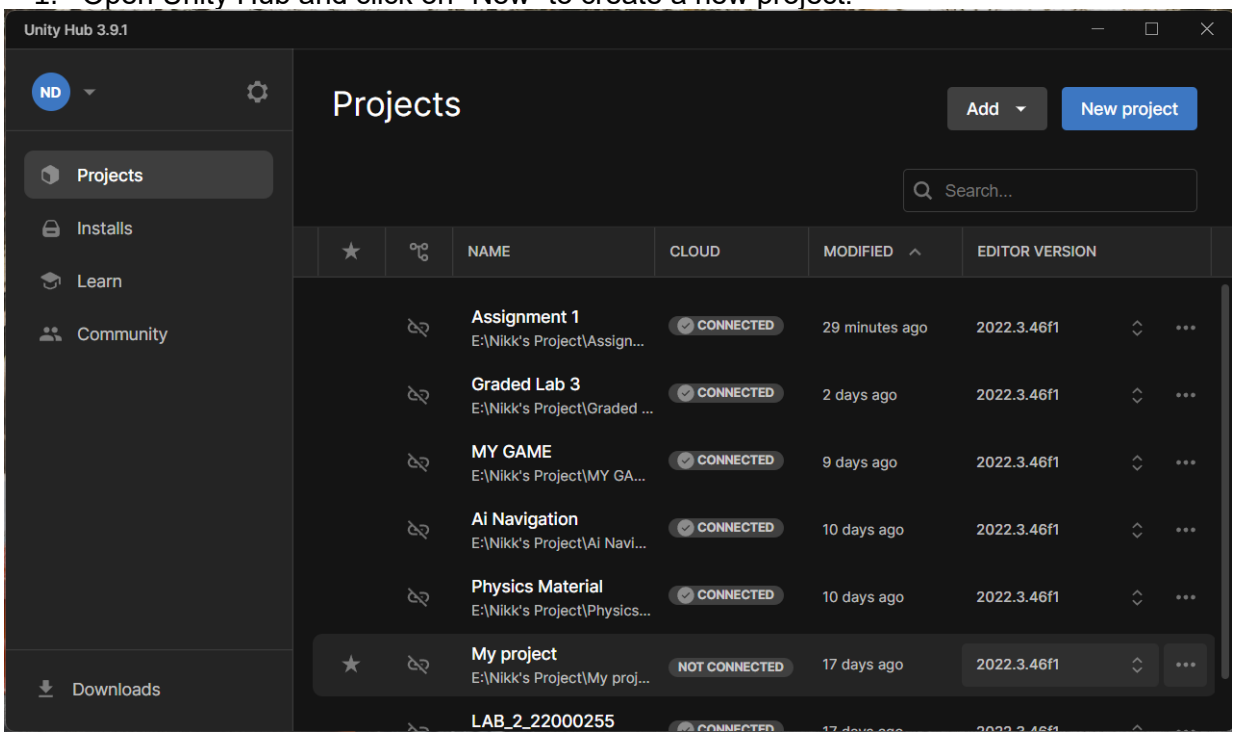
Guidelines:

- Try to complete as many tasks as possible.
- Each task will earn some points denoted in the corresponding brackets.
- Submit the final Project as a github repo.
- Create one document with screenshots and explanation of each task.
- Create a screen record to show the demo of the task completed.
- Modify your gamelogic in the given C# scripts.

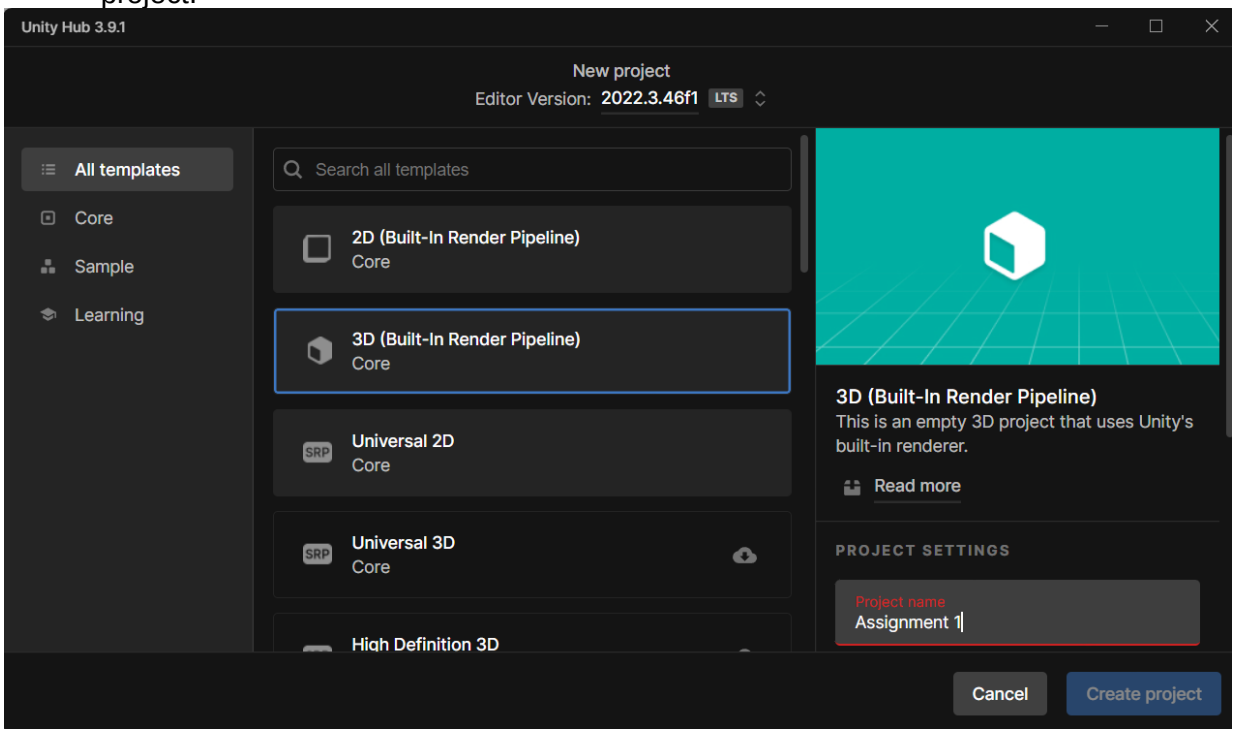
Task 1: Set Up Your Unity Project & Configure the VR Environment [5 marks]

Create a New Unity Project

1. Open Unity Hub and click on “New” to create a new project.



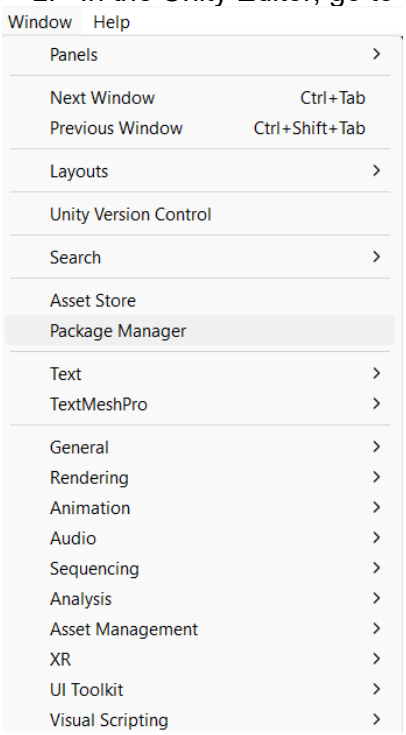
2. Choose a template or select “3D Build in Render Pipeline” to start with a basic 3D project.



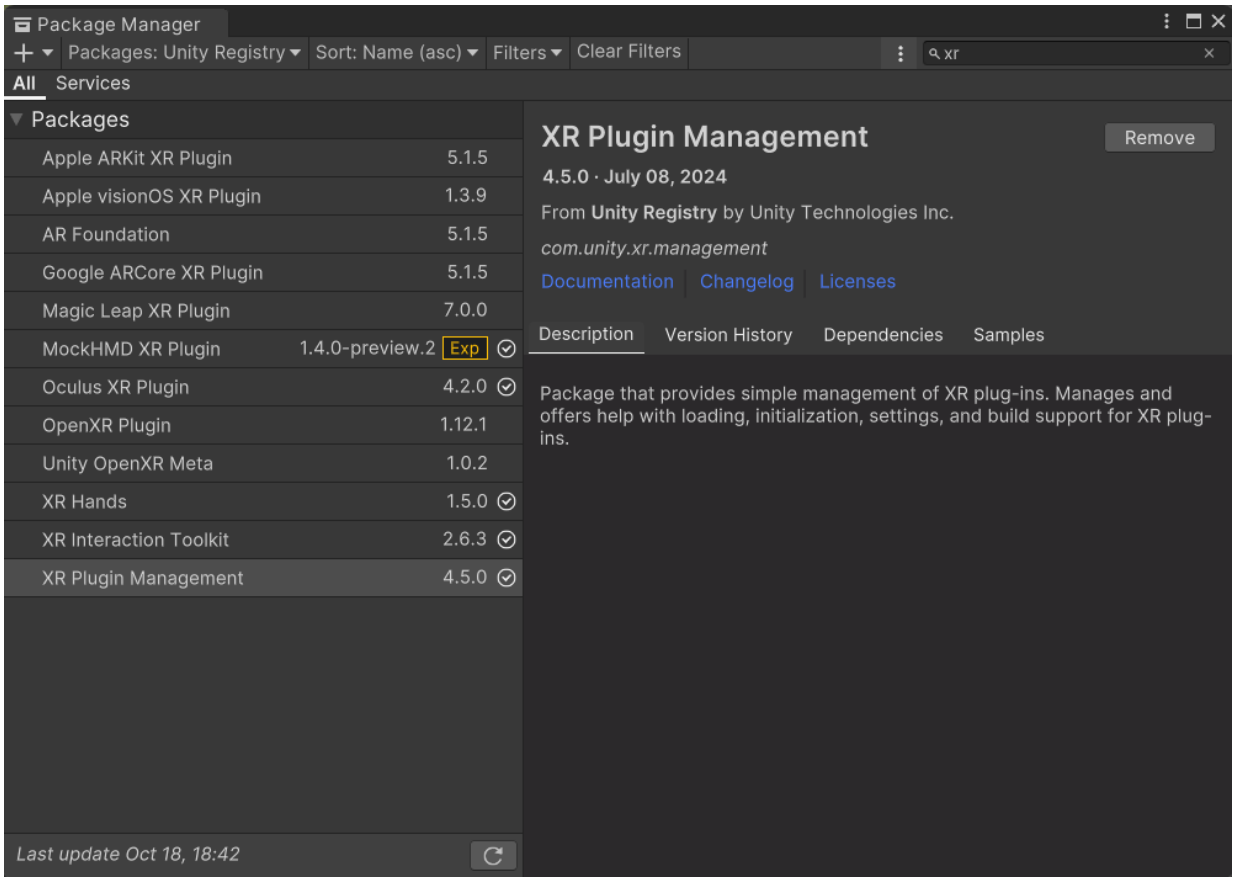
3. Set the project name and location, then click “Create Project.”

Configure the VR Environment

1. In the Unity Editor, go to “Window” > “Package Manager.”

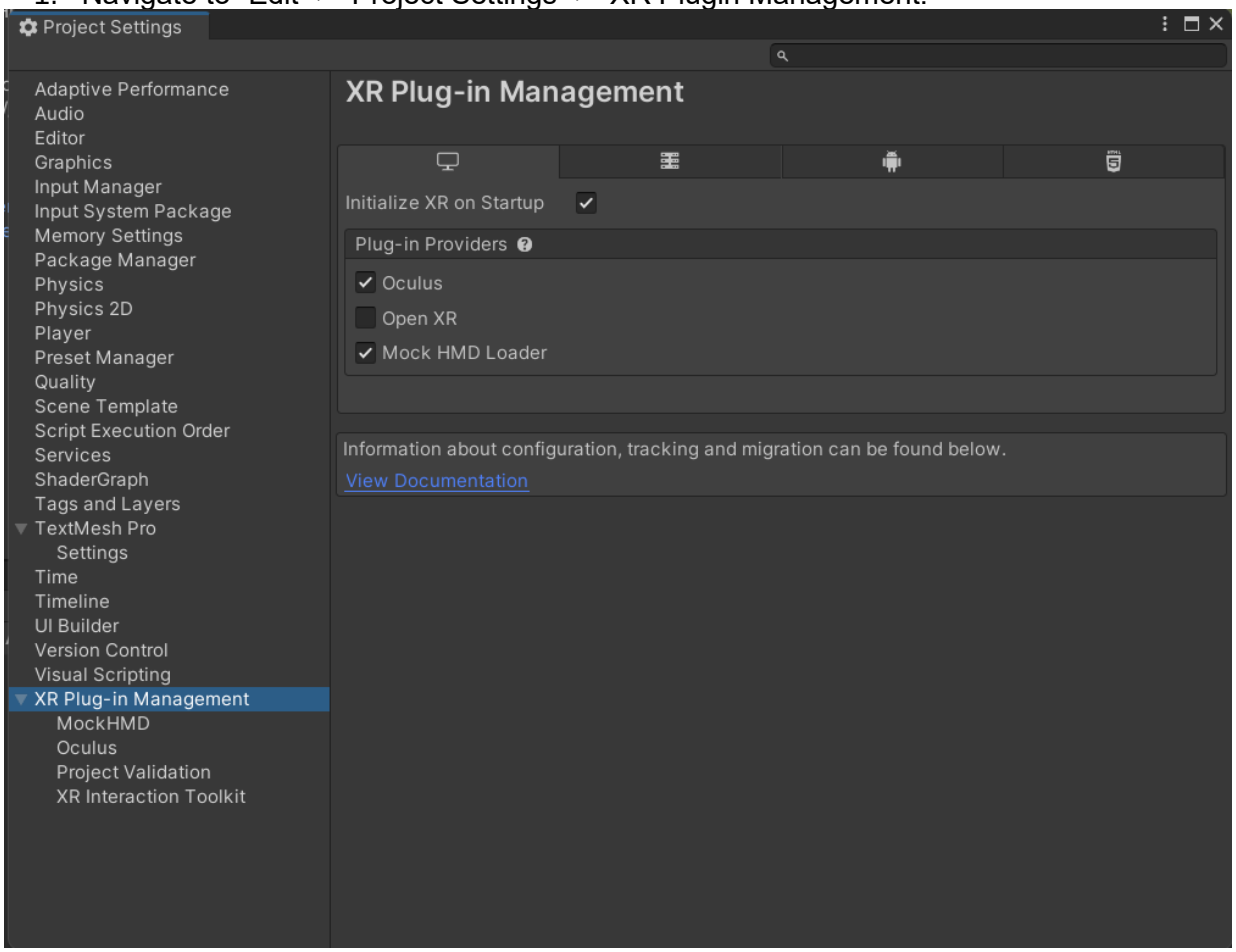


2. Select “Packages: Unity registry” from the top left drop-down menu.
3. Search for “XR Plugin Management” and install it.
4. Use the same steps described before to install the “Oculus XR Plugin”.



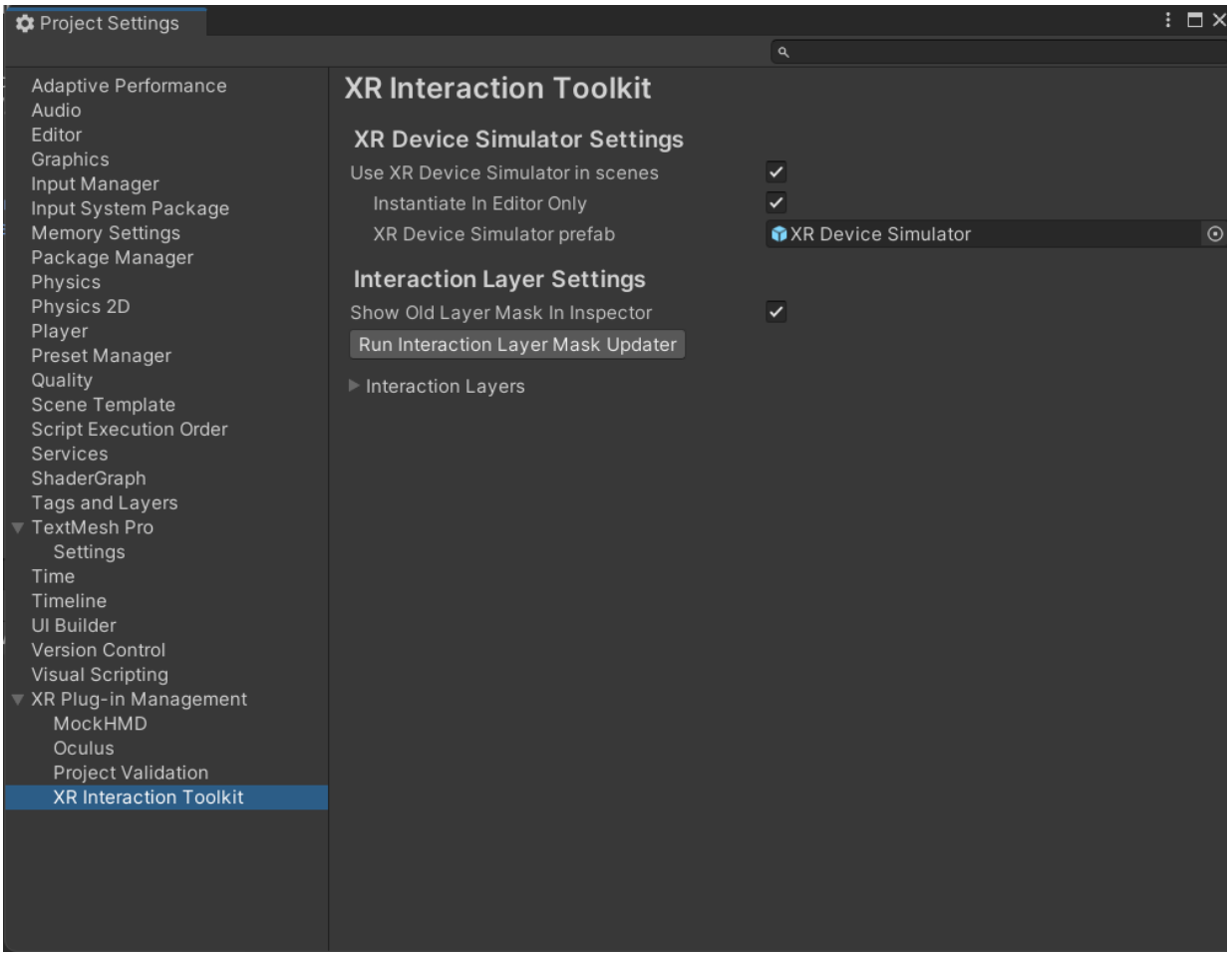
Configure XR Settings

1. Navigate to “Edit” > “Project Settings” > “XR Plugin Management.”



2. Make sure “Oculus” and “Mock HMD Loader” checked, and any other VR platforms are unchecked.

3. Use the same selection for the Android platform and select the option “Initialize XR on Startup”.



Task 2: Create the Ground Plane [5 marks]

- Create a larger ground area so player can move around
- You can use Terrain object for that

Took the Asset for this task from Asset Store: -

- https://assetstore.unity.com/packages/3d/environments/fantasy/fantasy-worlds-forest-free-stylized-3d-open-world-environment-282610

and loaded it in assignment 1 Project

Task 3: Add a Skybox [5 marks]

- You can use sky presets
- Try to make it more detailed and more interesting

1. Find or Create a Skybox

- You can either download a Skybox from the Unity Asset Store or use one of Unity's built-in sky presets.
- If you want something unique, you can create your own Skybox using custom textures

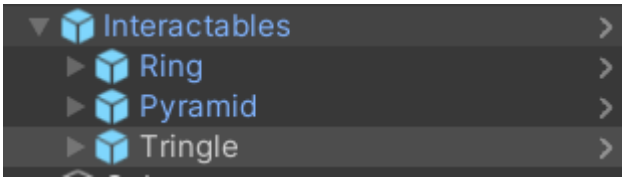
or download high-quality HDRI images.

2. Add the Skybox to Your Scene

- Open the Lighting window by going to Window > Rendering > Lighting.
- In the Environment tab, you'll see the Skybox Material section. Click on the little circle next to it, then pick the Skybox material you want to use from the list.

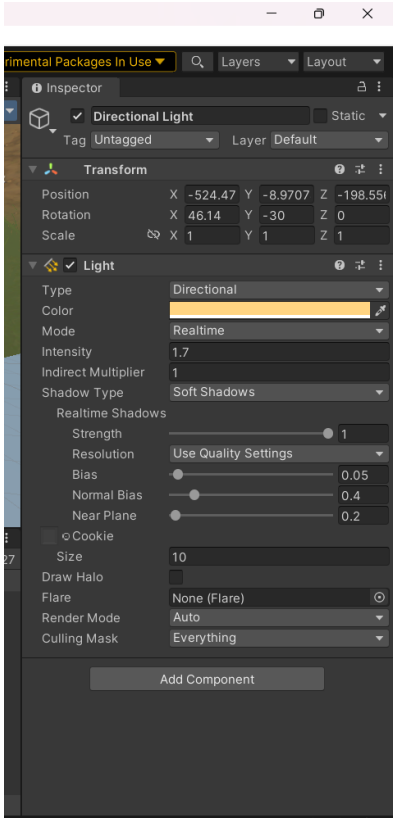
Task 4: Add Environment Objects [15 marks]

- You can use Assets to create an engaging Environment
- Create a grabbable objects spawning at random locations



Task 6: Configure Lighting and Shadows [5 marks]

1. Set Up Your Lighting
   - Directional Light: Think of this as your main light source, like the sun. You probably already have one in your scene, but if not, you can add it by going to GameObject > Light > Directional Light.
     - Adjust the Intensity to control how bright the light is.
     - Change the Color to set the mood of your scene—warm tones for a sunset vibe or cool tones for a night scene.
     - Rotate the light to set how and where shadows fall.
2. Turn on Shadows
   - Select the Directional Light and check that the Cast Shadows option is turned on in the Inspector.
   - Choose whether you want Soft Shadows (blurry and more realistic) or Hard Shadows (sharper edges, more defined).
     - Soft Shadows are ideal for natural, diffused lighting effects.
     - Hard Shadows give a more direct and clearer outline to your shadows.



Task 7: Add Audio [5 marks]

1. Import Your Audio Files

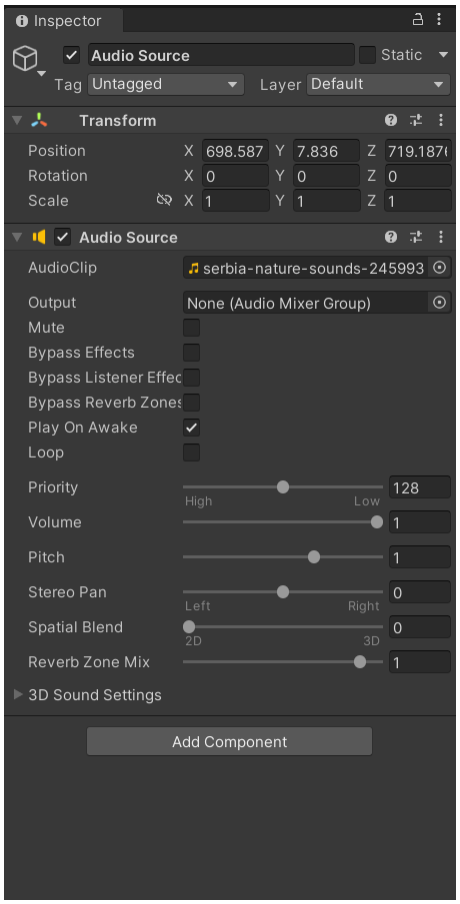
- Start by bringing your audio file (whether it's an MP3, WAV, or another format) into your Unity project. The easiest way is to just drag and drop the file right into your Assets folder. If you prefer, you can also go to Assets > Import New Asset and select your file from there.

2. Add an Audio Source:

- The Audio Source is what plays the sound in Unity, so you need to attach it to an object in your scene.
- Pick the GameObject where you want the sound to come from—this could be the main

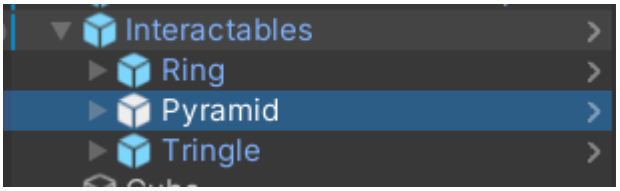
camera (for background music), a character, or even a tree or another object in the environment.

- After selecting your GameObject, go to Component > Audio > Audio Source.
- Now, in the Inspector, you'll see the Audio Source component. Take your imported audio file and drag it into the Audio Clip field.

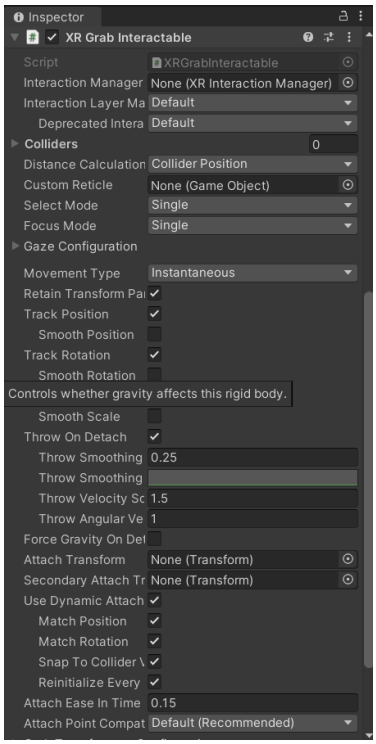


Task 8: Implement Basic VR Interaction [25 marks]

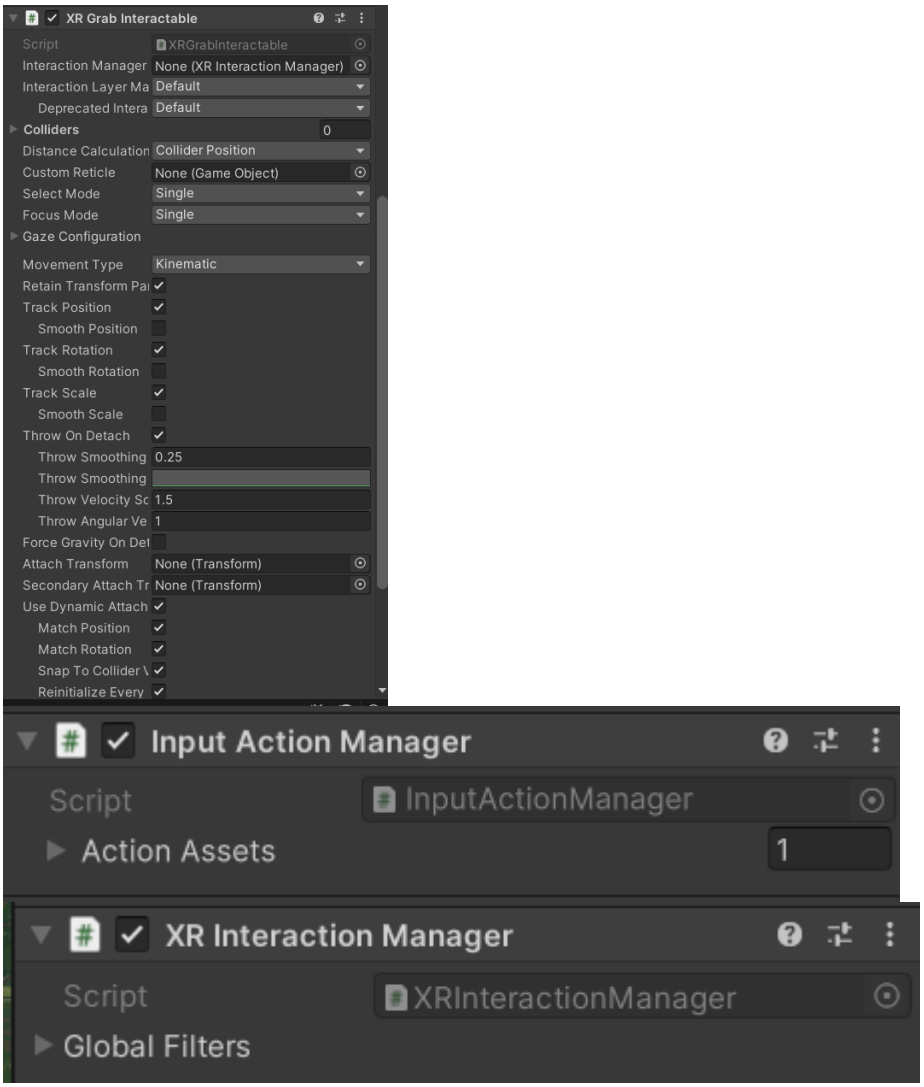
- Create a Grabbable Object

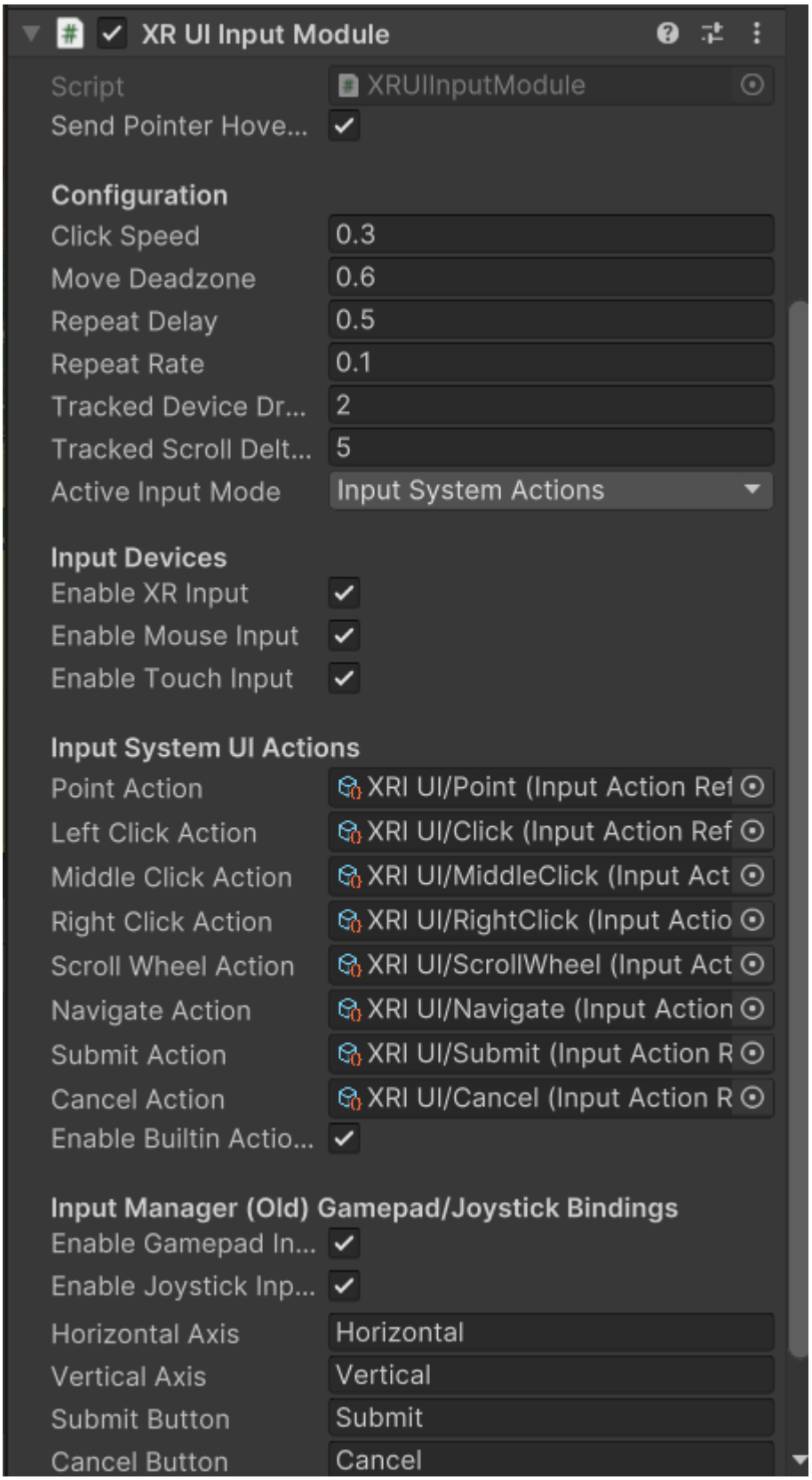


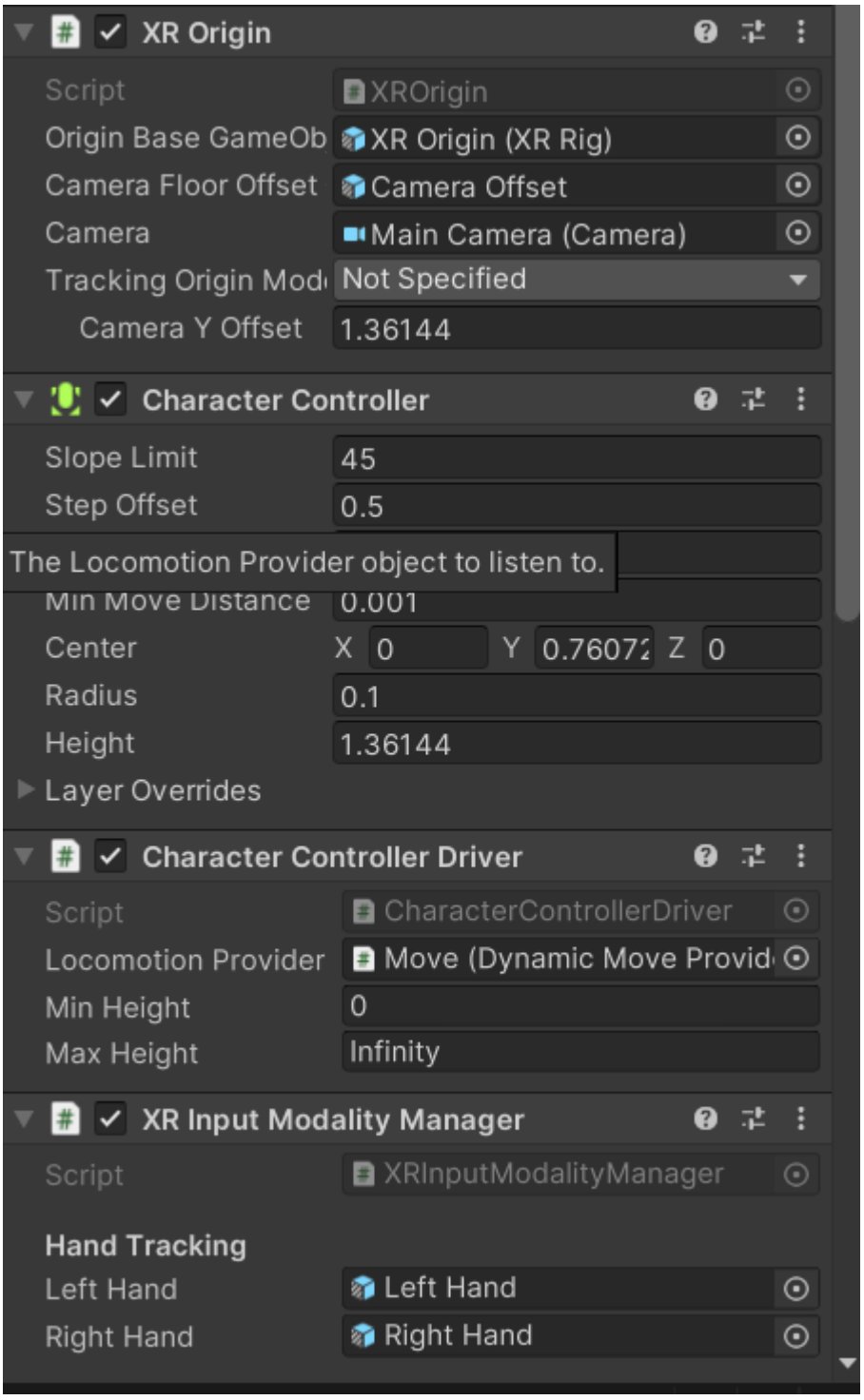
- Add Grabbable and Grabber Components



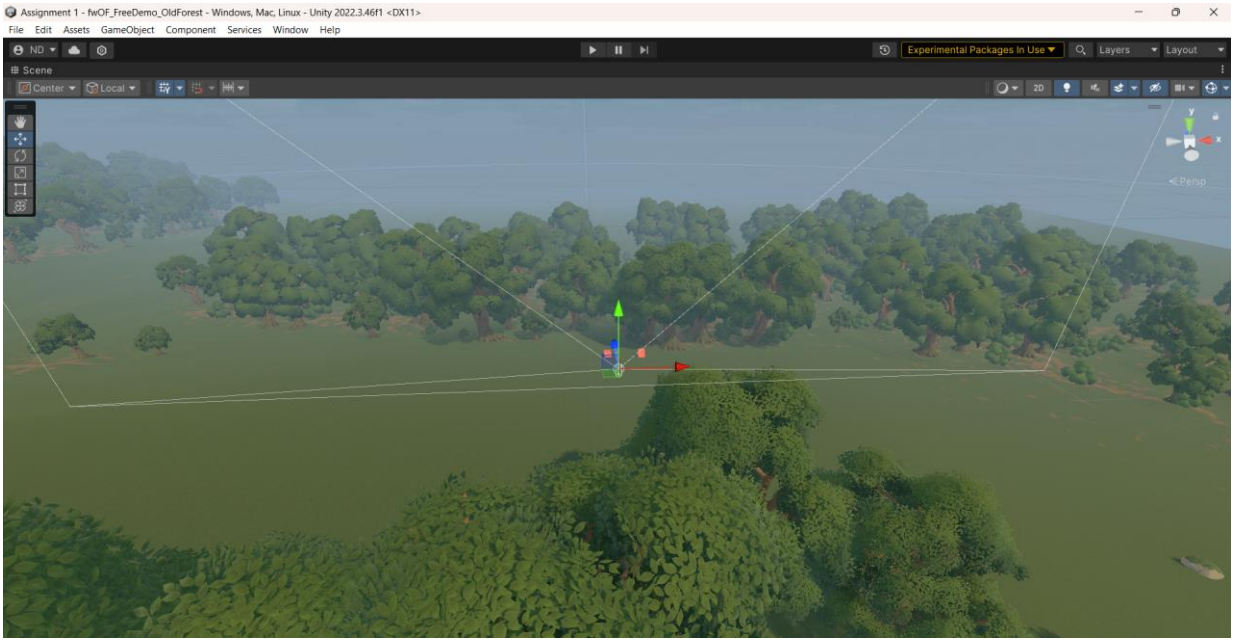
Task 9: Write the VR Interaction Script [25 marks]

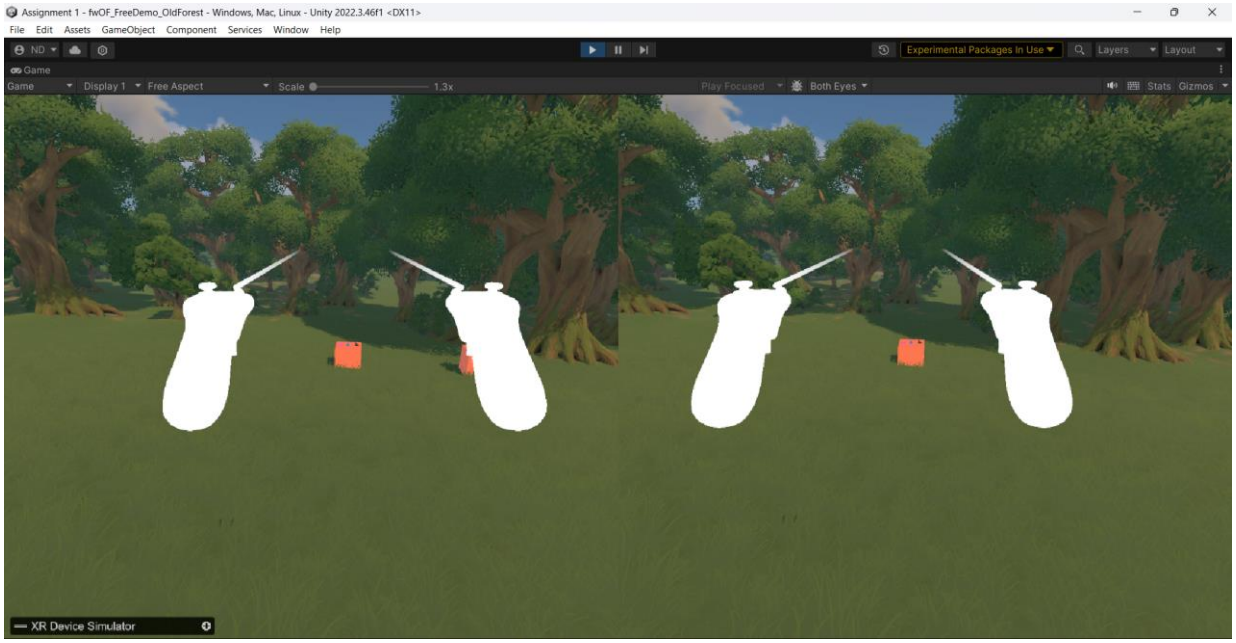



XR UI Input Module
Script
XRUIInputModule
Send Pointer Hove...
Configuration
Click Speed
0.3
Move Deadzone
0.6
Repeat Delay
0.5
Repeat Rate
0.1
Tracked Device Dr...
2
Tracked Scroll Delt...
5
Active Input Mode
Input System Actions
Input Devices
Enable XR Input
Enable Mouse Input
Enable Touch Input
Input System UI Actions
Point Action
XRI UI/Point (Input Action Ref
Left Click Action
XRI UI/Click (Input Action Ref
Middle Click Action
XRI UI/MiddleClick (Input Act
Right Click Action
XRI UI/RightClick (Input Actio
Scroll Wheel Action
XRI UI/ScrollWheel (Input Act
Navigate Action
XRI UI/Navigate (Input Action
Submit Action
XRI UI/Submit (Input Action R
Cancel Action
XRI UI/Cancel (Input Action R
Enable Builtin Actio...
Input Manager (Old) Gamepad/Joystick Bindings
Enable Gamepad In...
Enable Joystick Inp...
Horizontal Axis
Horizontal
Vertical Axis
Vertical
Submit Button
Submit
Cancel Button
Cancel


XR Origin
Script
XROrigin
Origin Base GameOb
XR Origin (XR Rig)
Camera Floor Offset
Camera Offset
Camera
Main Camera (Camera)
Tracking Origin Mod
Not Specified
Camera Y Offset
1.36144
Character Controller
Slope Limit
45
Step Offset
0.5
The Locomotion Provider object to listen to.
Min Move Distance
0.001
Center
X 0
Y 0.76072
Z 0
Radius
0.1
Height
1.36144
Layer Overrides
Character Controller Driver
Script
CharacterControllerDriver
Locomotion Provider
Move (Dynamic Move Provid
Min Height
0
Max Height
Infinity
XR Input Modality Manager
Script
XRInputModalityManager
Hand Tracking
Left Hand
Left Hand
Right Hand
Right Hand

Task 10: Demo application [5 marks]





Tips

- **Keep it Simple:** Start with basic interactions and gradually add complexity.
- **Feedback:** Provide visual, auditory, and haptic feedback for interactions.
- **Optimization:** Ensure the performance is optimized to prevent lag, which can cause discomfort in VR.
- For more interactiveness you can implement a scoring mechanism.