

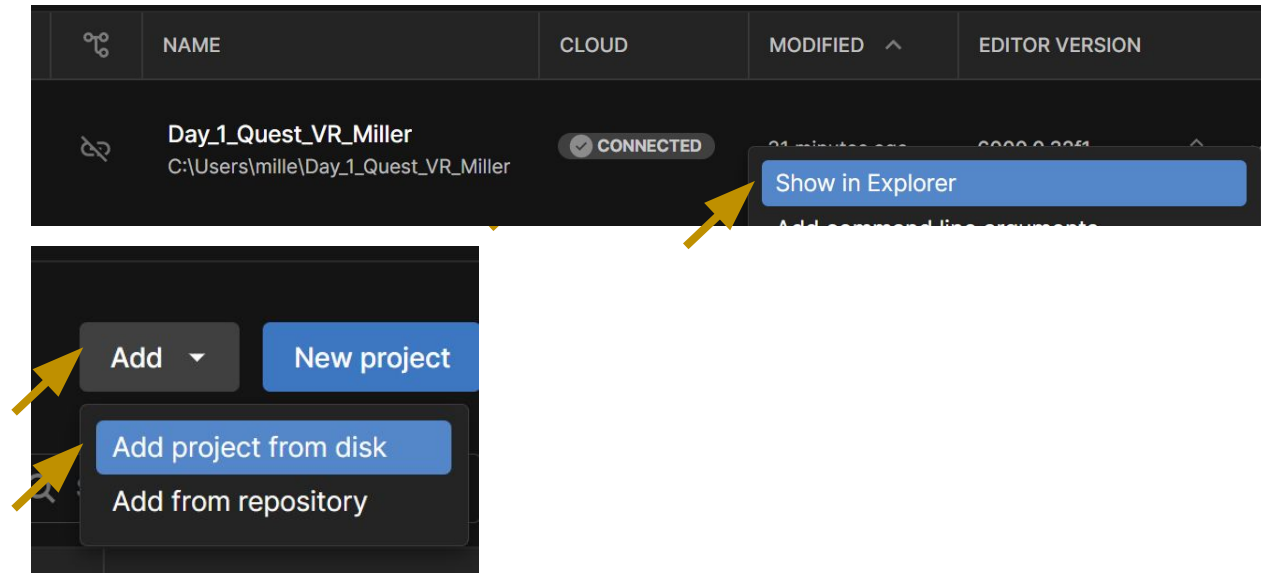


COESC AI+AR/VR Day 2 Tutorial

Spring 2025

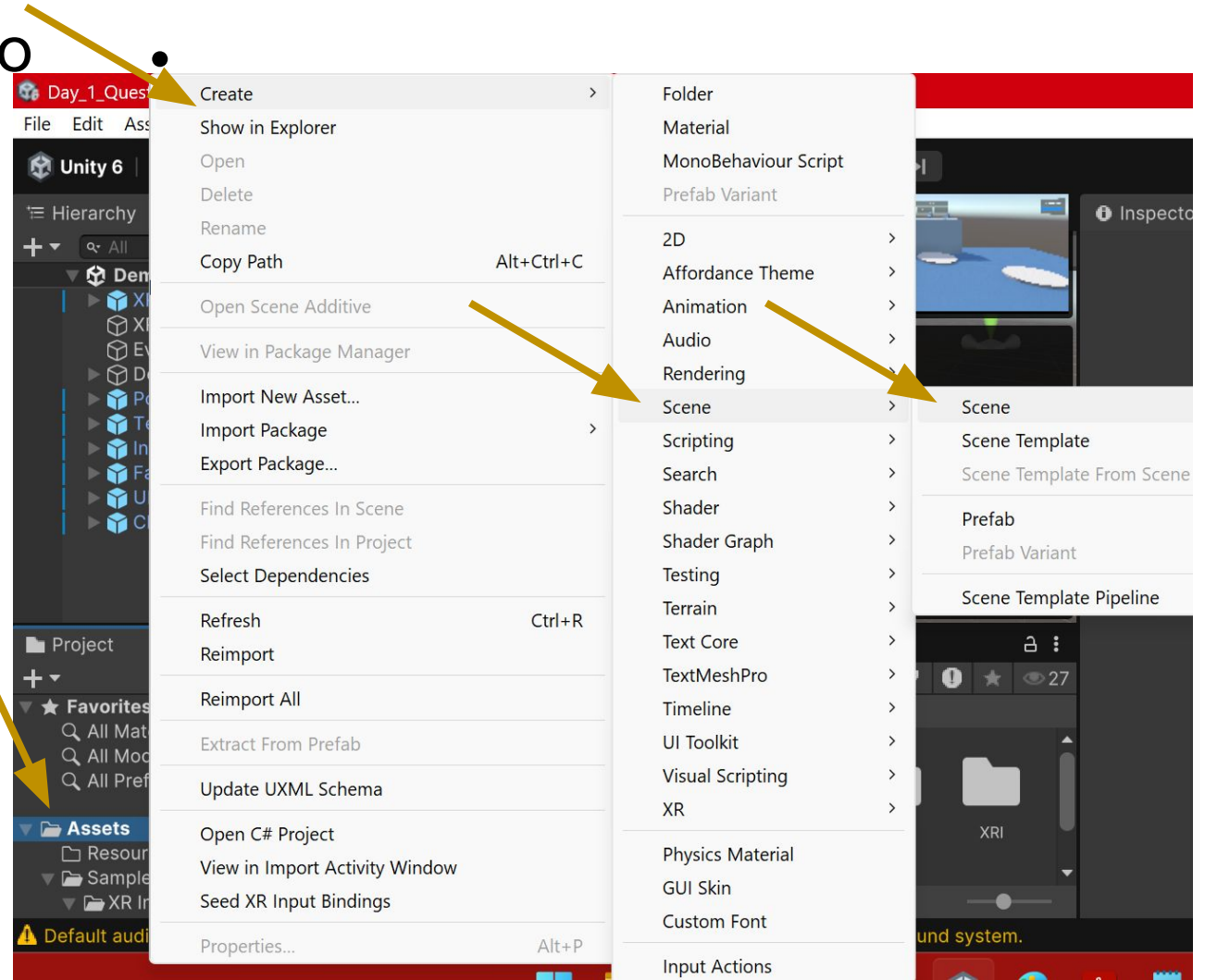
Copy Your Project from Day 1

- In the Unity Hub: Click the dots>Show in Explorer
- Copy and Paste the Project within the same folder. Rename it "Day 2"
- In the Unity Hub: Click "Add">"Add project from disk"
- Open this new Project



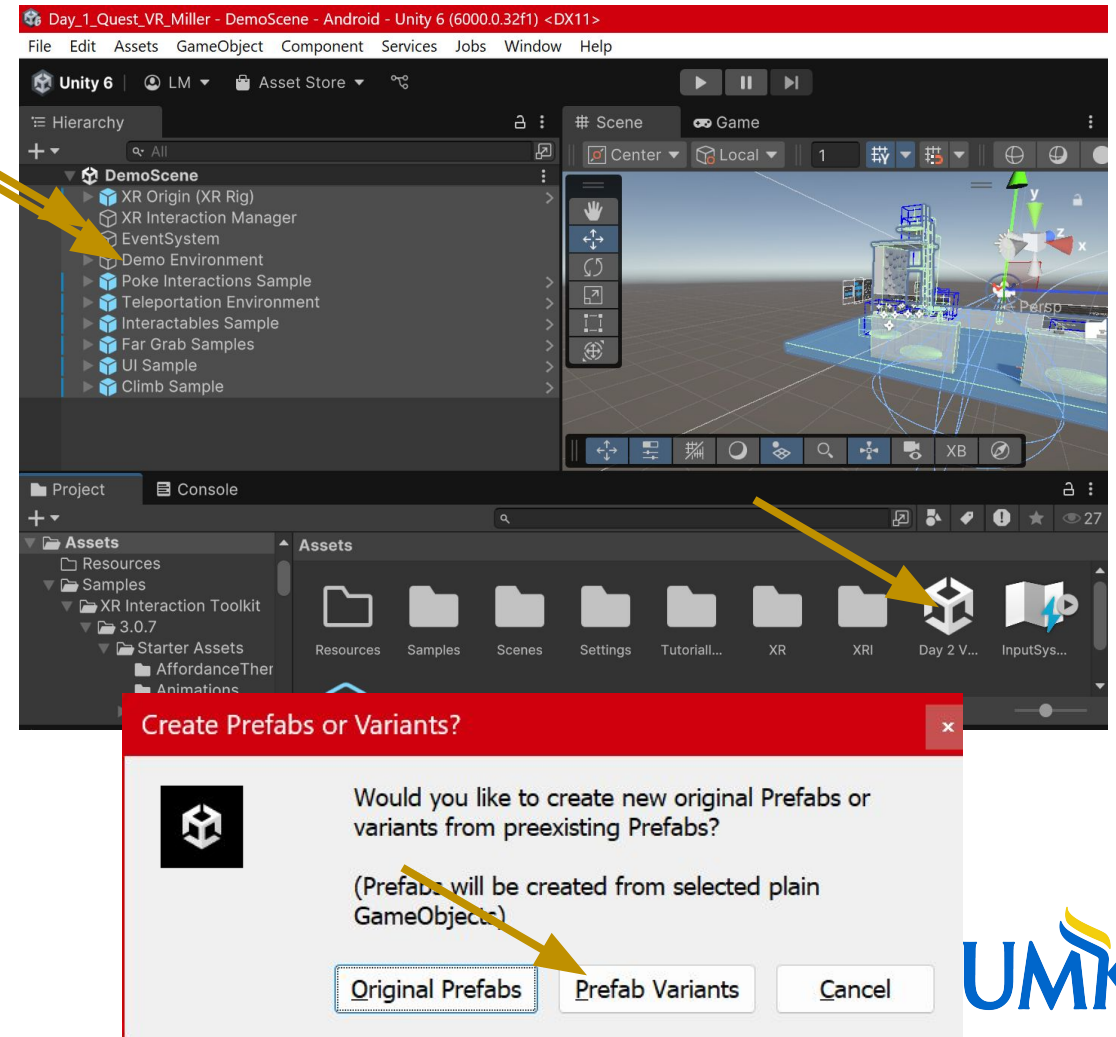
Copy Your Project from Day 1

- This prevents us from needing to reaccomplish the setup.
- Right click Assets in the Project Window > Create > Scene >Scene
- Rename the Scene "Day 2" or something similar



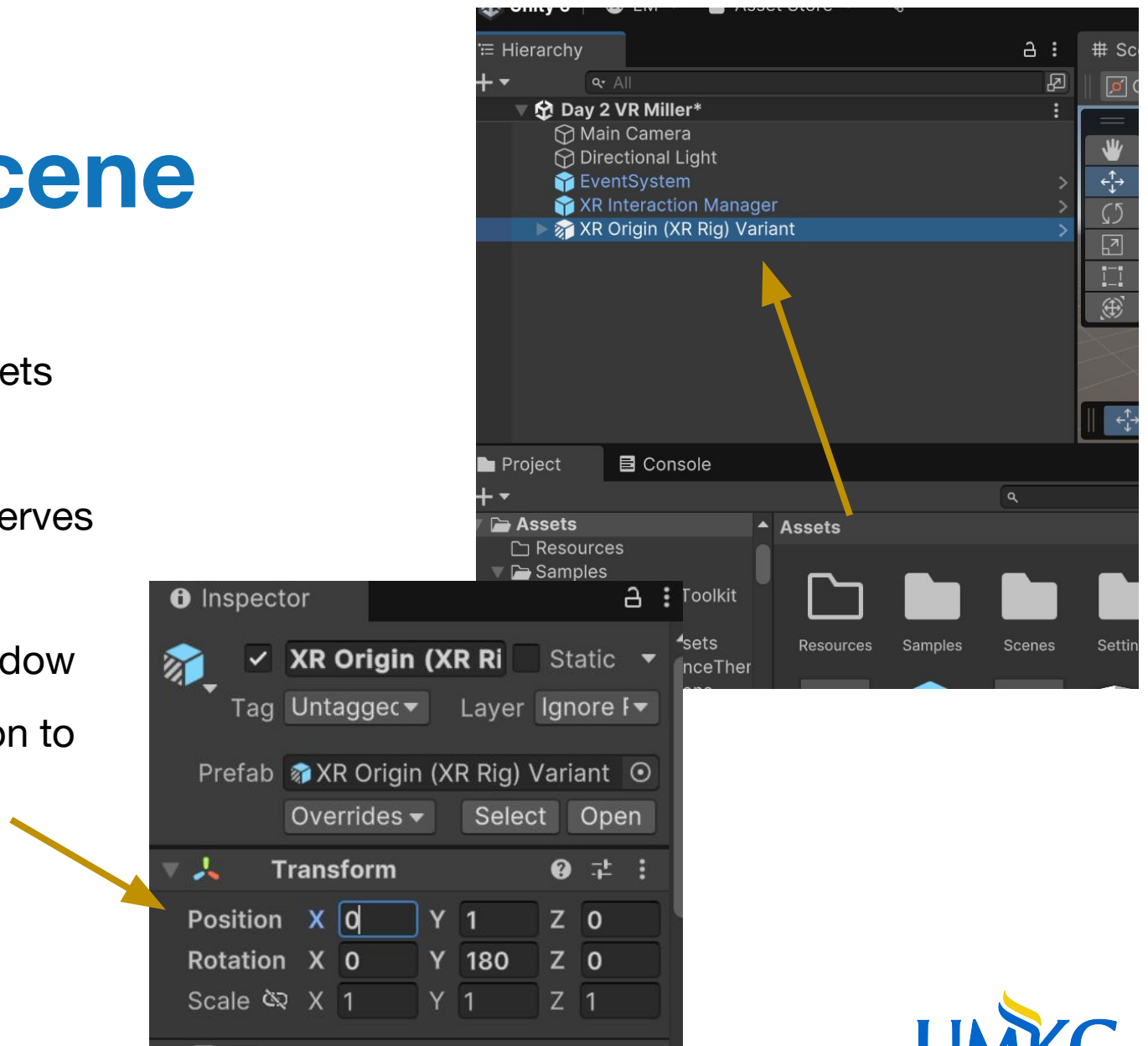
Steal Assets from the Demo Scene

- We could import all the assets from the XR toolkit, but we're going to copy and paste.
- Select everything in the hierarchy window
- Drag and drop onto the scene you've just created. Click "Prefab Variants"
- Double Click the "Day 2" Scene



Add Assets to Scene

- Drag "Event System", "XR Interaction Manager", and "XR Origin..." from Assets window to the Hierarchy Window.
- Delete "Main Camera", the XR Origin serves as the camera
- Click on XR Origin in the Hierarchy window
- In the inspector window, set it's position to 0,1,0
- We'll build the scene around this



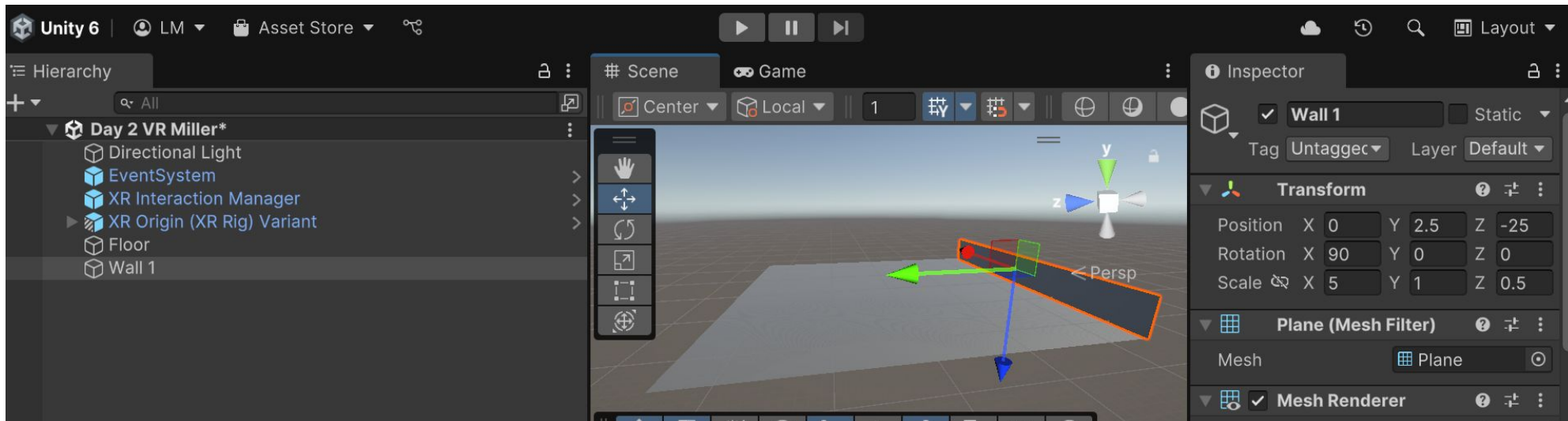
Add Walls

- Right click in the Hierarchy

Window > 3D Object > Plane

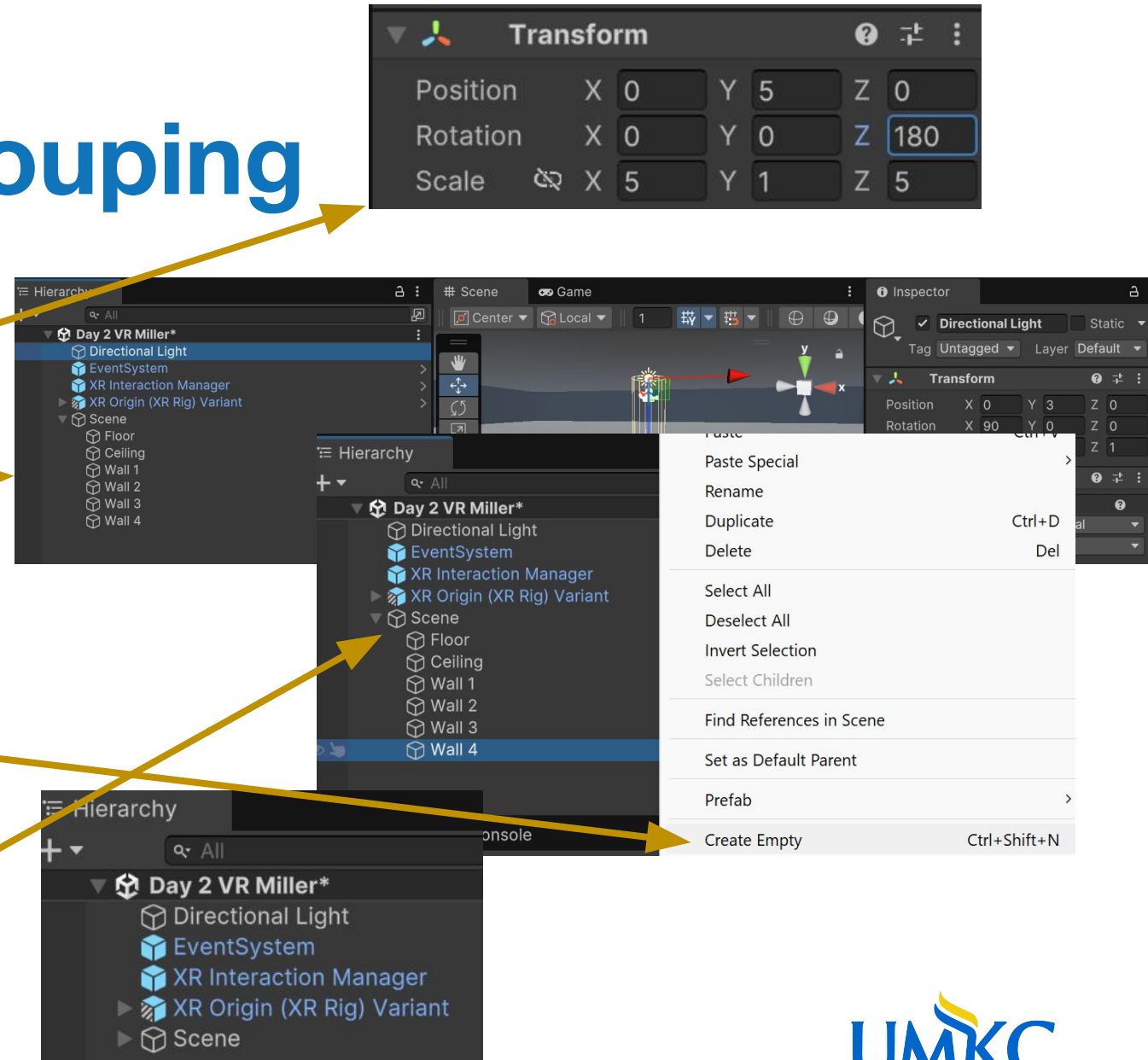
- Rename it "Wall 1"
- Resize and Rotate it as shown

- Planes are one directional, so be sure to rotate the opaque side toward the room.
- Repeat for the other 3 walls.
Resize and Rotate as necessary.



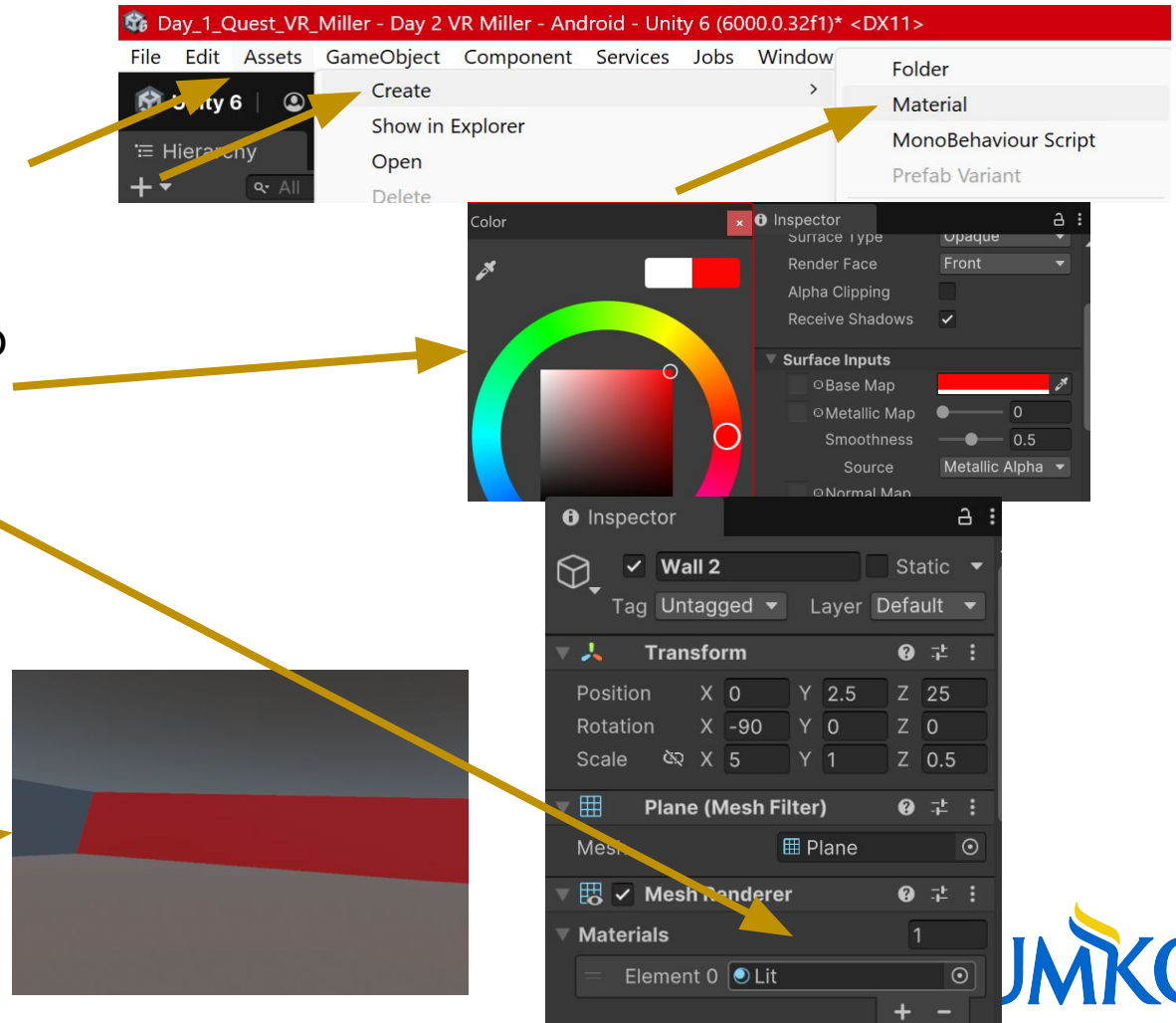
Ceiling, Lights, Grouping

- Add another plane for the ceiling. Resize and Rotate it to match the walls.
- Move your directional light source to be in the room.
- The Hierarchy window is getting cluttered—Create an empty game object by right-clicking in the hierarchy window>Create Empty. Rename it Scene.
- Drag the elements of the room onto this object.
- Now it can be minimized.



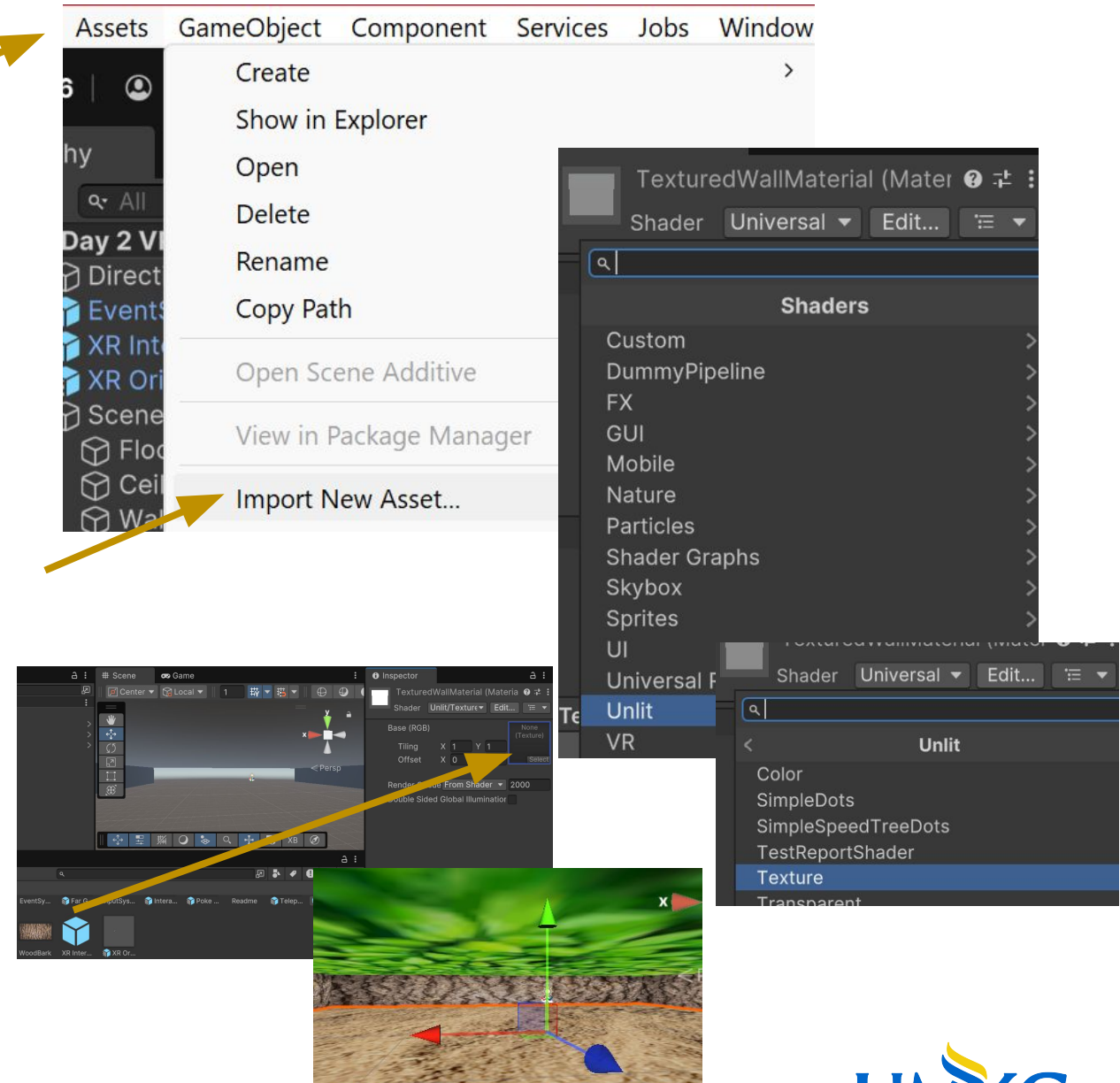
Color Surfaces

- Let's add color and textures to the walls
- Add a Material: Assets>Create>Material
- Name it "WallTexture"
- In the Inspector Window, Click on Base Map and Select a color
- Click a Wall in the Hierarchy Window, Drag your wall texture onto element 0 in the Materials section
- If you like, now is a good time to press play to test your room.



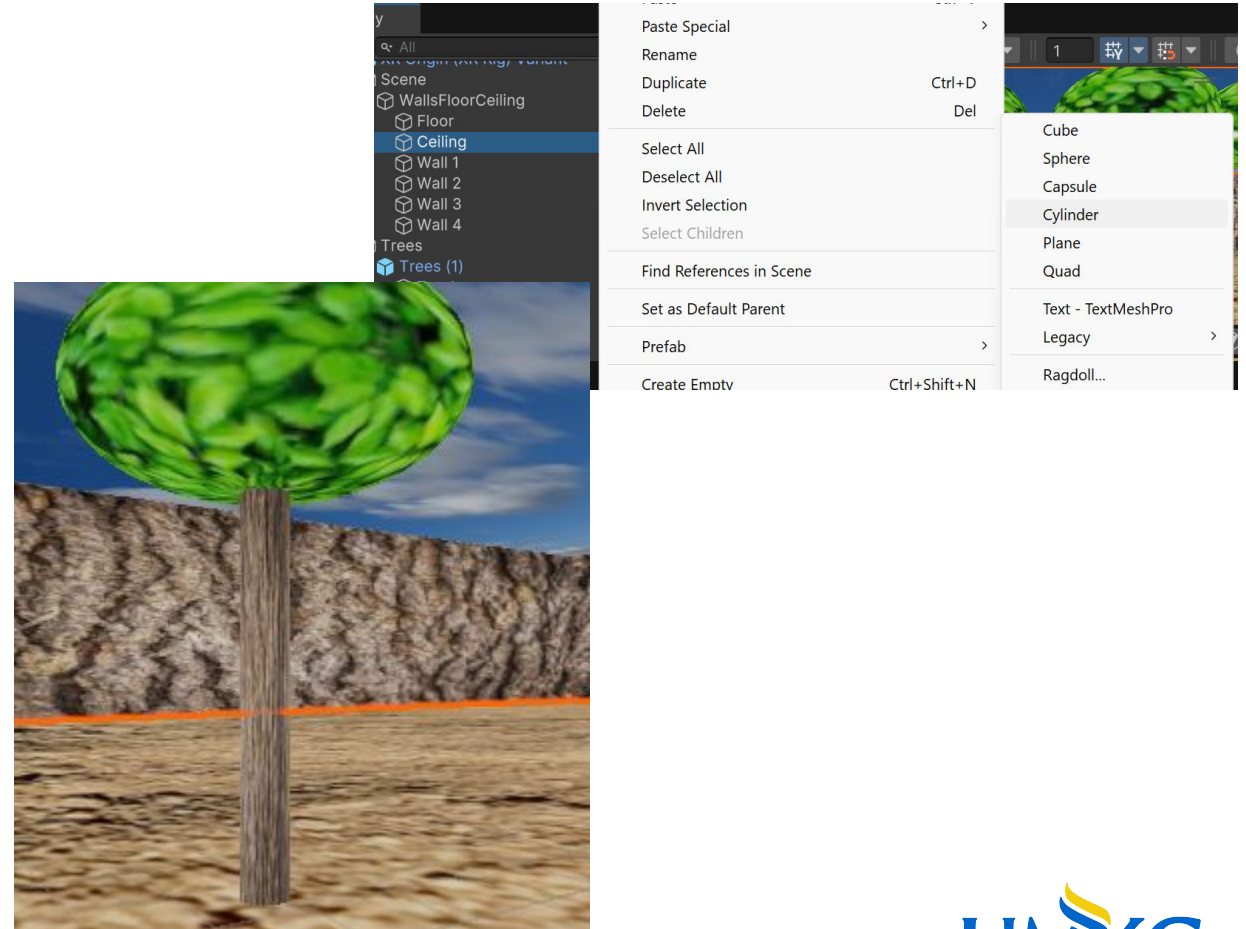
Texturing Surfaces

- Flat colors are kind of boring, lets texture them.
- Create a new Material as before. Rename it.
- Find a JPEG online to use as your texture.
- Go to Assets>Import New Asset
- Select your image
- Click on your Material, Select Shader>Unlit > Texture
- Drag your imported image to the None (Texture) box
- Assign the material to a wall as before



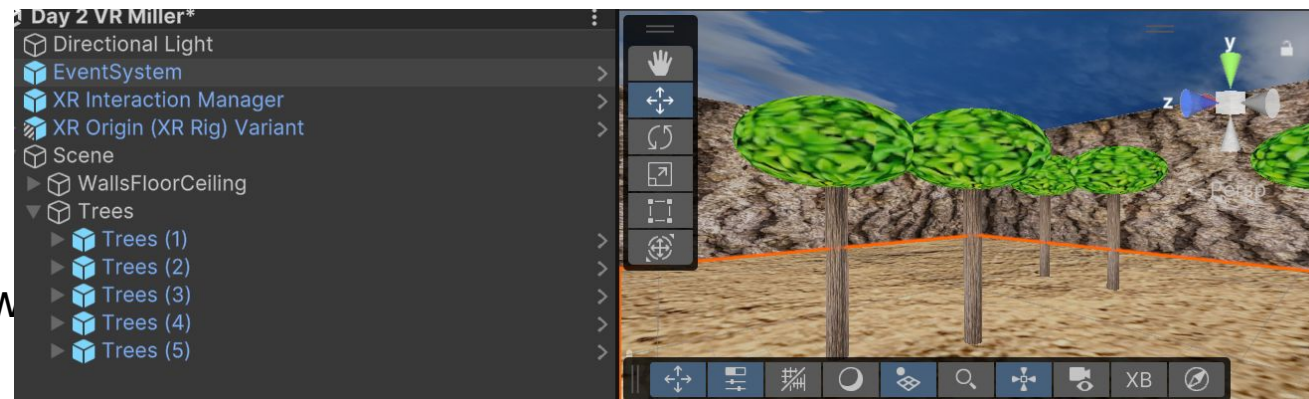
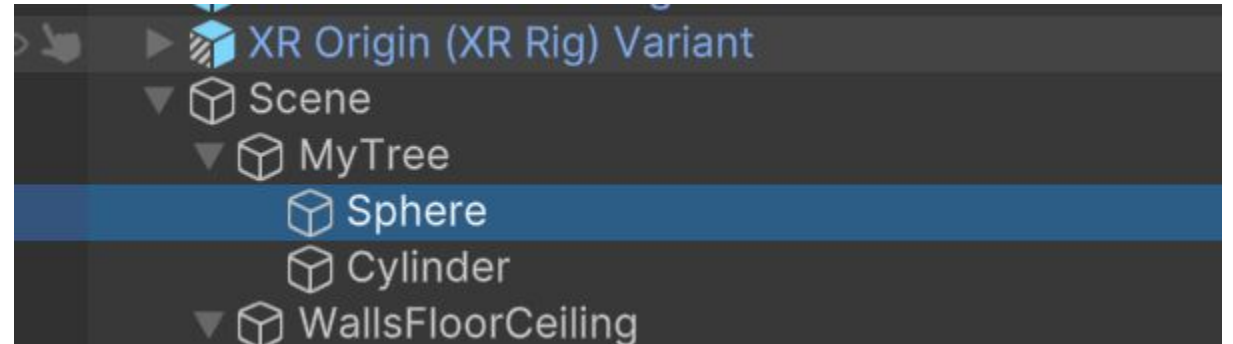
Adding Room Features

- I'm adding trees.
- Create a cylinder by right clicking in the Hierarchy window>3D Object>Cylinder
- Resize and reposition as needed
- Create a Sphere by >3D Object > Sphere
- Reposition and resize the objects to make a rough tree
- Color or texture the objects as before



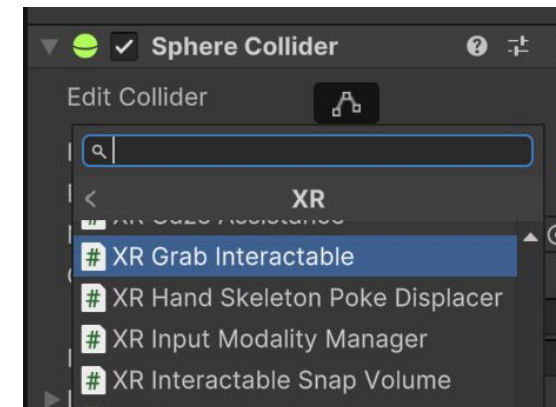
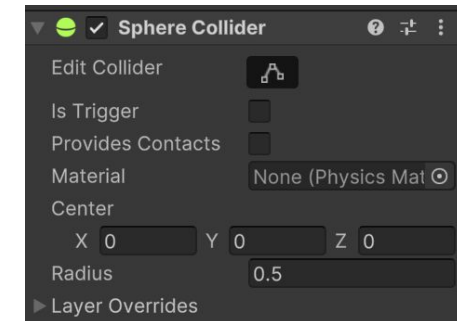
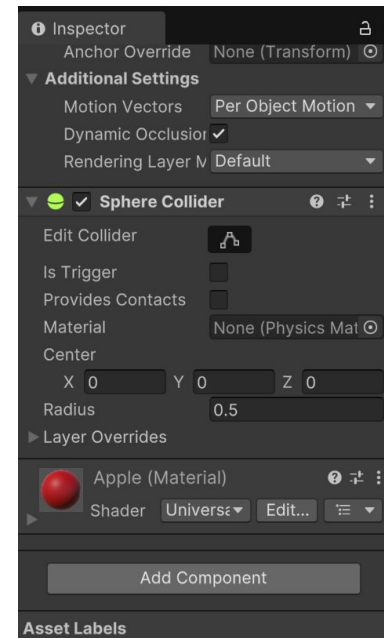
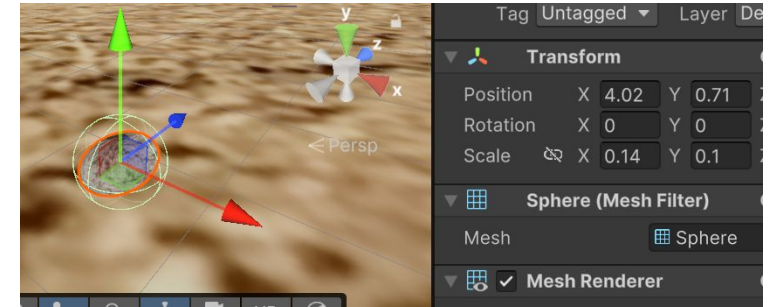
Making Prefabs

- I want many trees, so lets make a prefab
- Create an empty game object in the hierarchy. (Right click>Create Empty)
- Name it "Tree"
- Drag the Cylinder and the Sphere on to tree so that they are children
- Click on "Tree" and drag it into the assets window
- You can now drag "Tree" into the scene view to place trees.



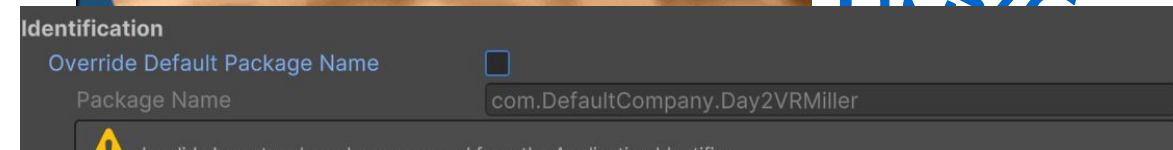
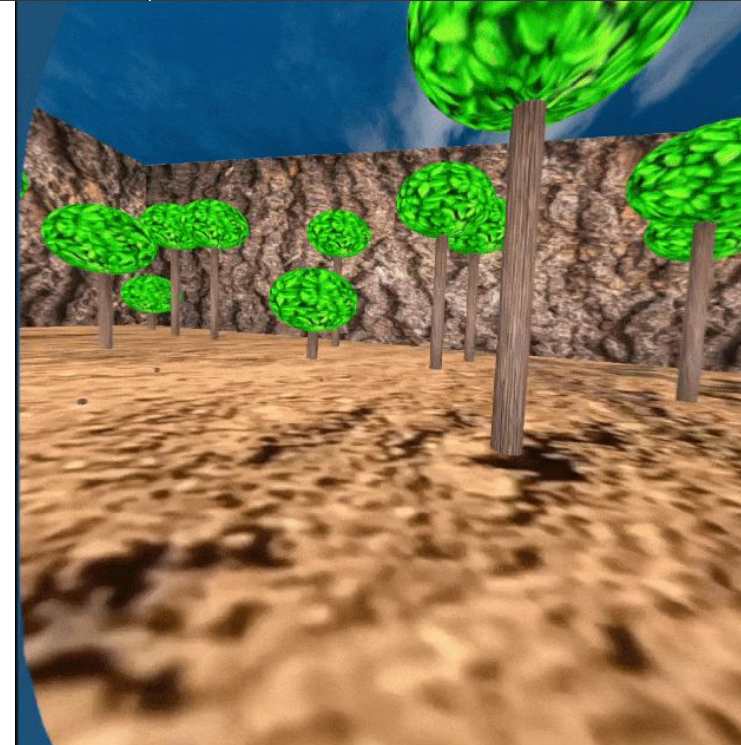
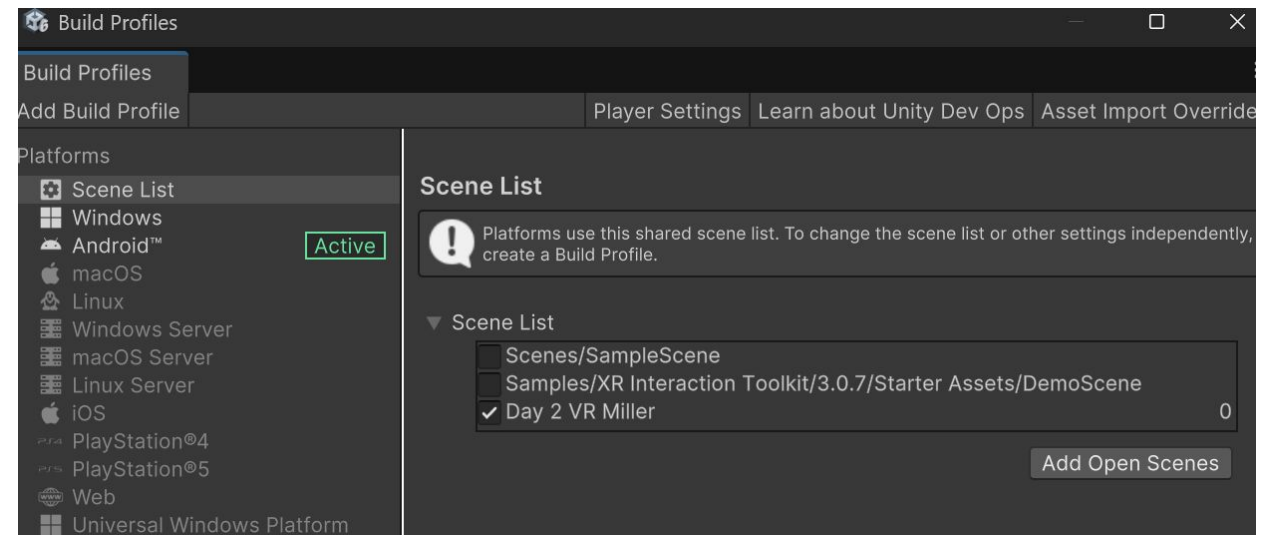
Add Interactable Objects

- I want rocks on the ground I can pick up
- Create a Sphere, create a material, color it or texture it, resize and place slightly above the ground, name it "Rock"
- In the Rock inspector, make sure you have a "Sphere Collider"
- Let's add VR interaction. In the "Rock" Inspector, click "Add Component">XR > XR Graph Interactable
- Make this a prefab



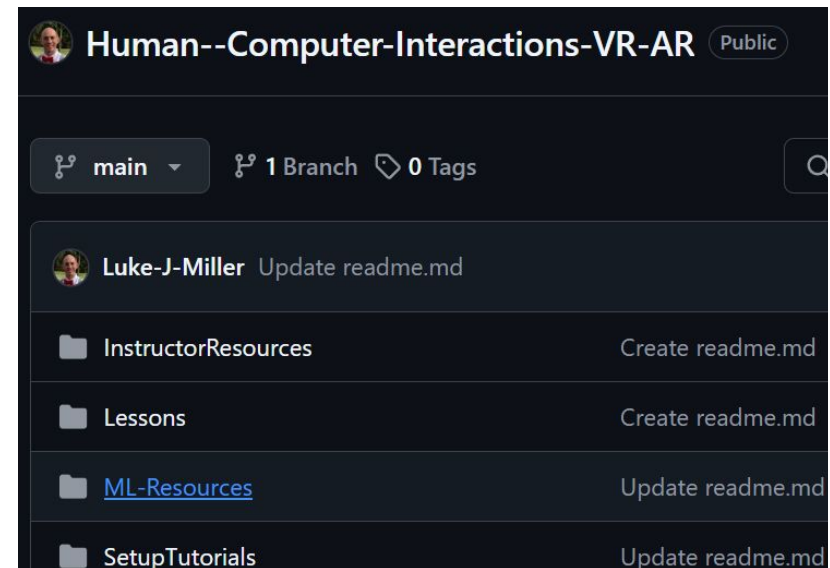
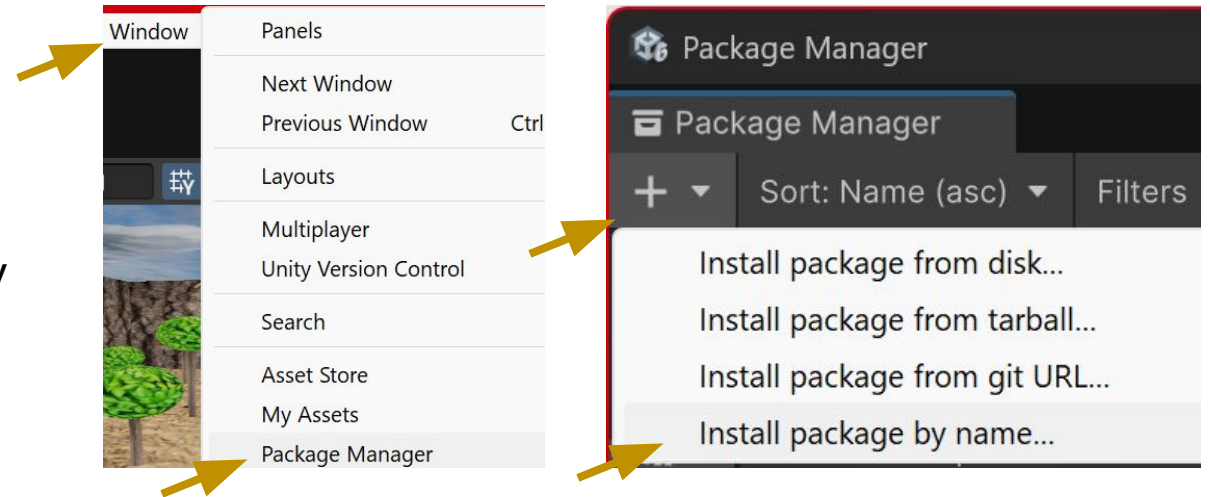
Add more objects, test, build

- Add trees and rocks around the scene
- Press play to test on the headset
- File > Build Profile > Scene List > Add Open Scene > (The scene you built today)
- In Build Profile>Player Settings>Identification> uncheck "Override Default Package Name"
- Build the project: File>Build & Run



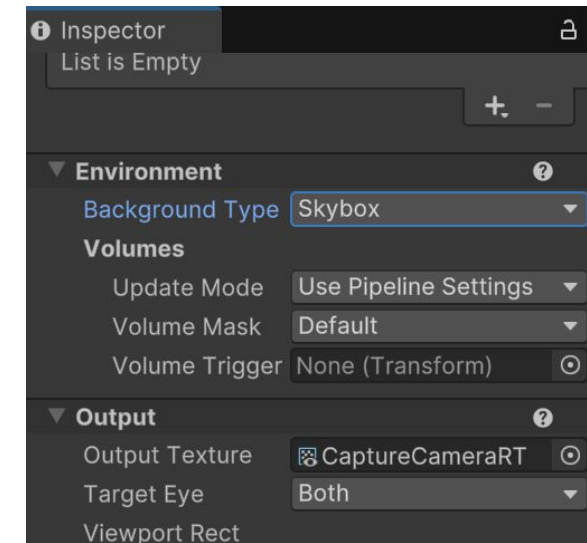
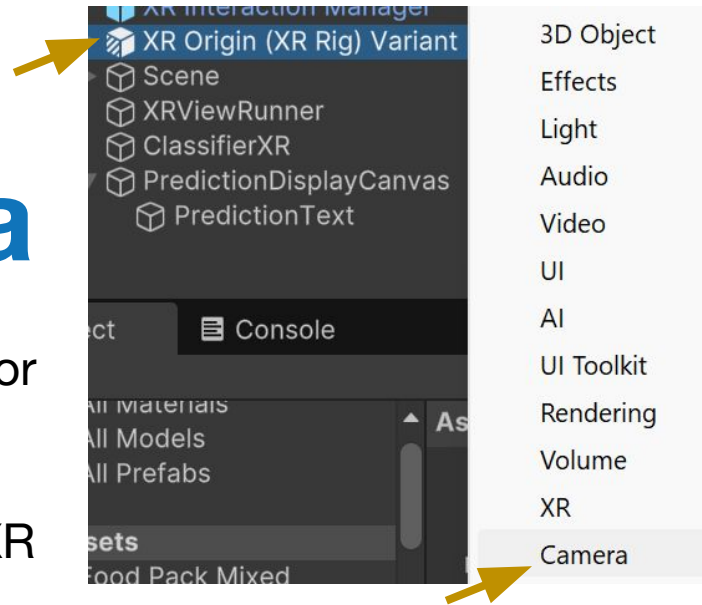
Setup ML

- Duplicate the project as before, name it Day 2 ML
- Go to Window>Package Manager
- Click the Plus>Install package by name
- Type com.unity.barracuda, Click Install
- Add the files from the [GitHub](#)->[ML Resources](#) to your Project Window. You need the [labels](#), download the [model](#) from the link, and the 3 C# files: [Preprocess](#), [XRView](#), [XRClassifier](#)



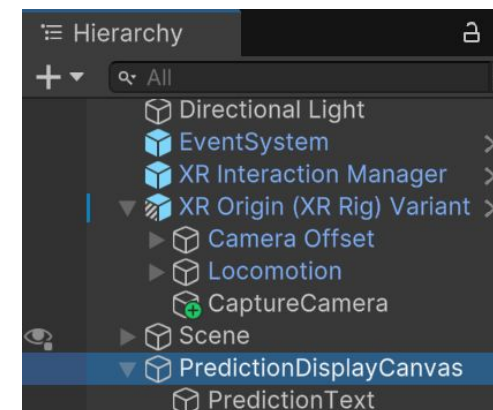
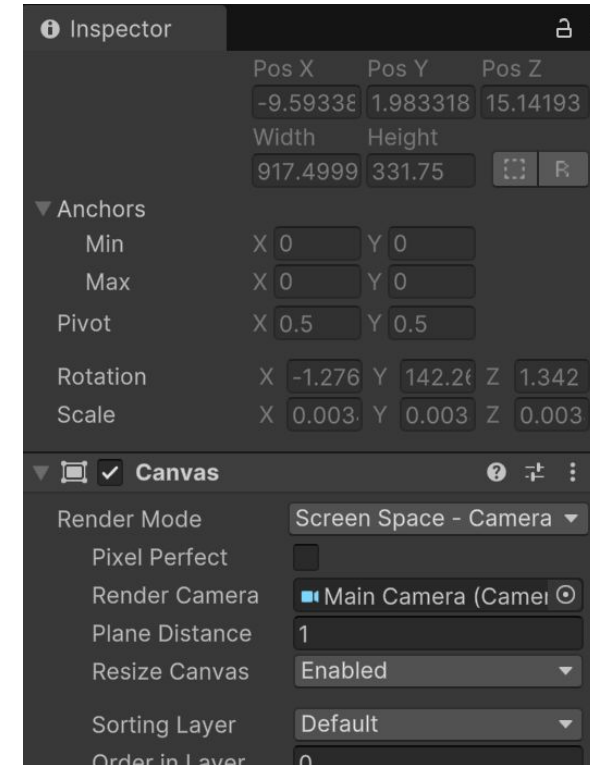
Setup ML Camera

- Using the XR Rig camera can get tricky for ML. We're going to set up another.
- In the Hierarchy window: Right click on XR Origin > Camera. Rename it "CaptureCamera"
- Right click in Assets > Create > Rendering > Render Texture. Rename CaptureCameraRT
- Click on "CaptureCamera", drag CaptureCameraRT into the output texture



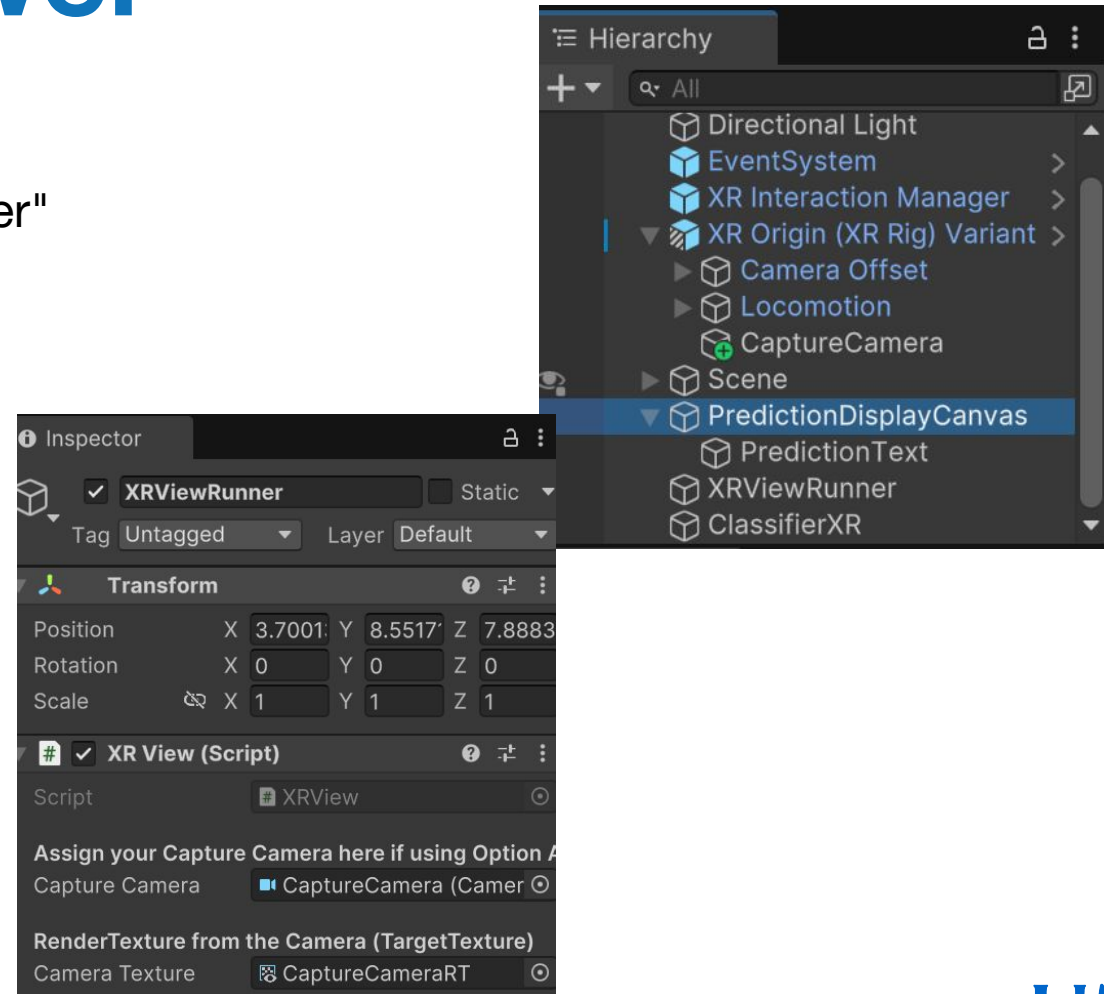
Set up Prediction Text

- Right click in Hierarchy > UI > Canvas.
Rename it PredictionDisplayCanvas
- In the Inspector window, set render mode to "Screen Space - Camera"
- Drag the XR Origin Rig's Main Camera (not the "Capture Camera" into the Canvas's Display Camera
- Right click on the PredictionDisplayCanvas > UI > Legacy > Text. This is what will display the predictions. Color it as you like



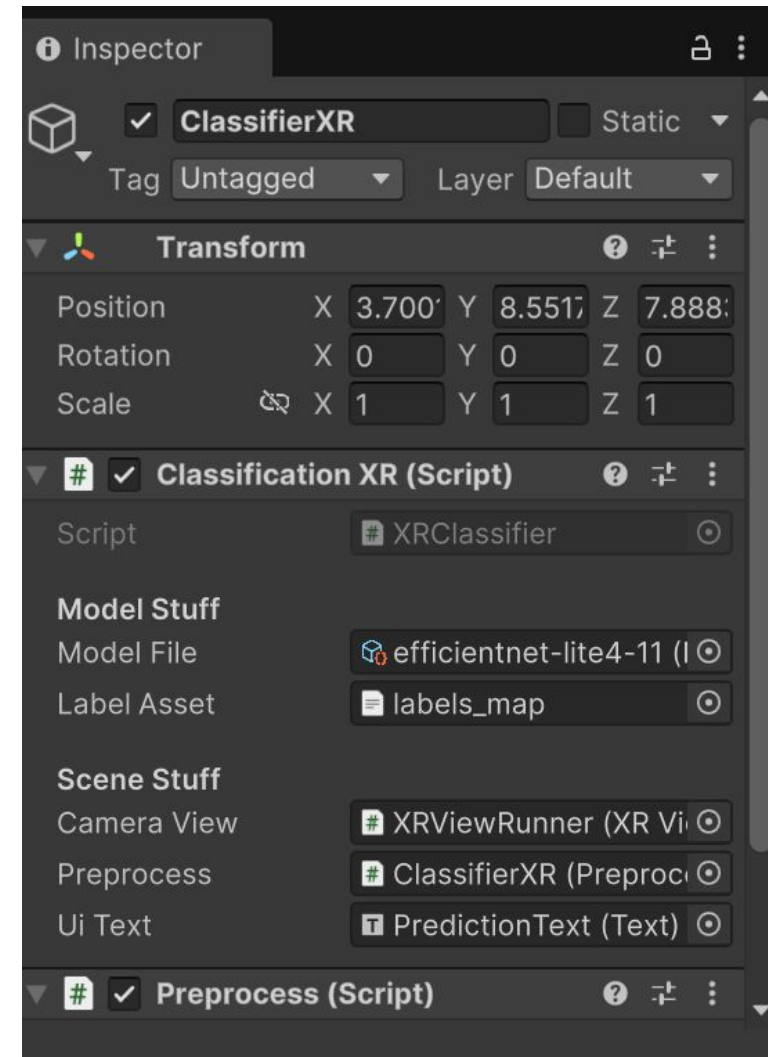
Make the ML Viewer

- Create an empty game object in the hierarchy window. Name it "XRViewRunner"
- Drag the XRView C# script onto the XRViewRunner.
- Now drag the CaptureCamera we made onto Capture Camera, and CaptureCameraRT onto Render Texture



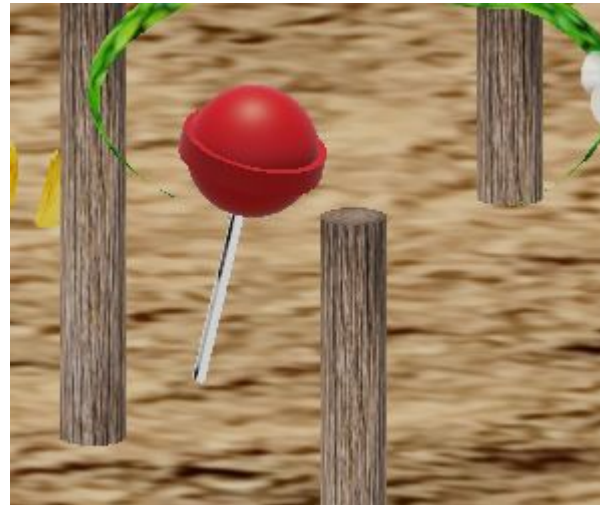
Make the ML Classifier

- Create an empty game object in the hierarchy window. Name it "XRClassifier"
- Drag the XRClassifier and Preprocess C# scripts onto the XRClassifier.
- Put our model on Model File
- Labels on Labels
- XR View Runner on Cameraview
- Drag the Preprocess up to Preprocess
- Drag Prediction text to UI Text



Make some stuff to identify

- Import images as assets, make them into a material and apply them to a plane to make a photograph.
- Go to the Unity Asset Store and import assets.
- Try building you own stuff.



Your Turn - Test and Build

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