

A Simple World in Unity

Module Code: CS3VR16

Assignment report Title: VR Individual World

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Actual hrs spent for the assignment: 20 hours

Assignment evaluation: This assignment was rather heavy as it was largely independent work. However, I found this helped me develop a deep understand as I needed to rely on myself. I now feel like I am able to perform complicated tasks in Unity.

Project

A Building with Door and Window

The first task I completed was creating the building. In a Prefab I used the 3D objects cube and plane to create a new object that resembles a garage. For the door to the garage I used an animation that will open when a box collider is triggered. The box collider looks at all the objects in its area and if a certain defined object is in it, the door will open and as soon as the object leaves the box collider the door will close.

I now have a building with a working door, so my next task is to include a window on the building. Thankfully, Unity has a built-in colour system *RGBA* which means I can control the colour of an object as well as how transparent the object is. As such I have cut a square into the garage and made that object transparent to give us a window. I also gave this window a slight blue tint since this makes the glass easier to see with the other objects.

Since the building is enclosed, the inside of the building is very dark. I added a little spotlight to the roof of the building so the player will be able to see when inside the garage. I also noticed the window had some nice-looking reflections with the light, so I therefore decided to make the light point at a slight angle towards the window.

Import .fbx Object

To import something into Unity from an external program, I decided to use Blender. Blender is a free, open-source 3D computer graphics software. I found a YouTube clip on how to create tillable roads. I followed this tutorial and was able to create my own roads with a texture file included. I imported these roads into Unity.

Using Blender was interesting however took a long time for me to create anything. Therefore, I decided to go to the Unity 'Asset Store' and I imported some buildings. The player will not be able to enter these buildings as they are only for decorations. Some of the buildings came with their own textures which I just applied straight to them. The others I decided to add my own. I simply just used two colours to highlight the brickwork from the rest of the building.

I also decided to import a terrain texture from the Unity 'Asset Store'. I then tiled it across the entire terrain to create a nice texture for the floor.

To make it so the player does not just look at into the endless world, I used a world board that creates a nice seamless end of the world.

Player and Coins

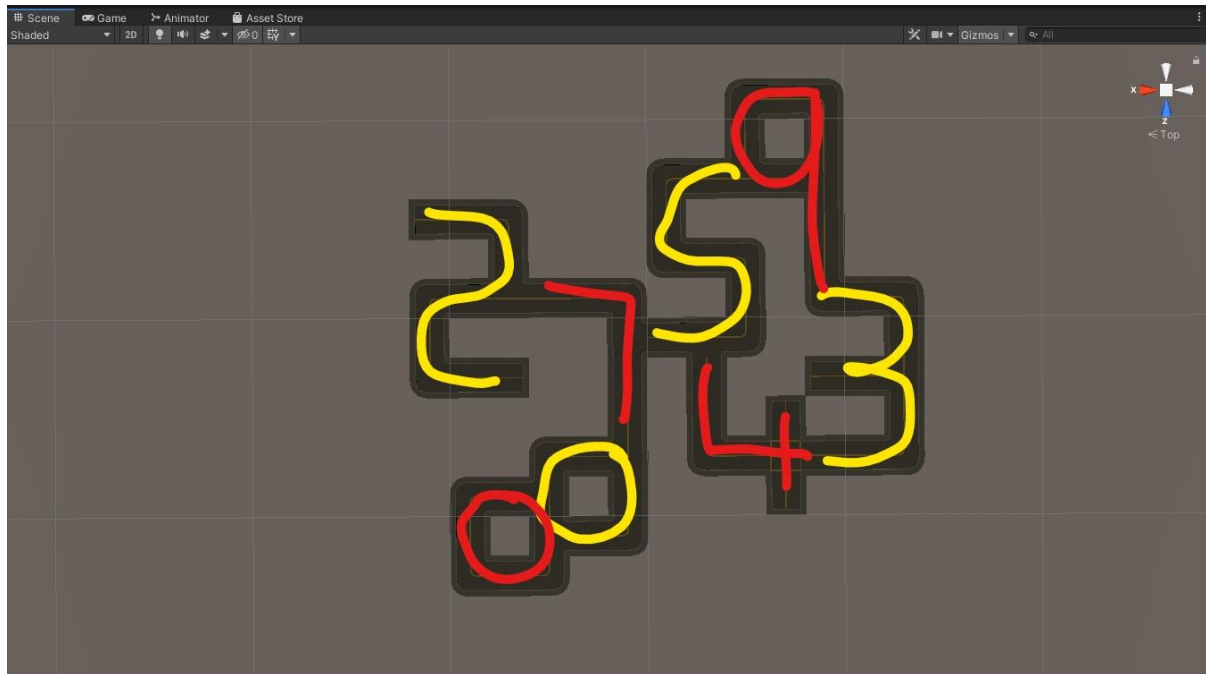
To create a player, I put two spheres together to create a bot. I then used two metal textures to apply to the player. The user can control the movement of this bot using "WASD" or the arrow keys.

There are also coins scattered throughout the world, if the user is close enough, they can press the "E" key to collect the coin.

For the texture of the coin, I used the program 'Paint' to create a gold colour that also has my student number written across it.

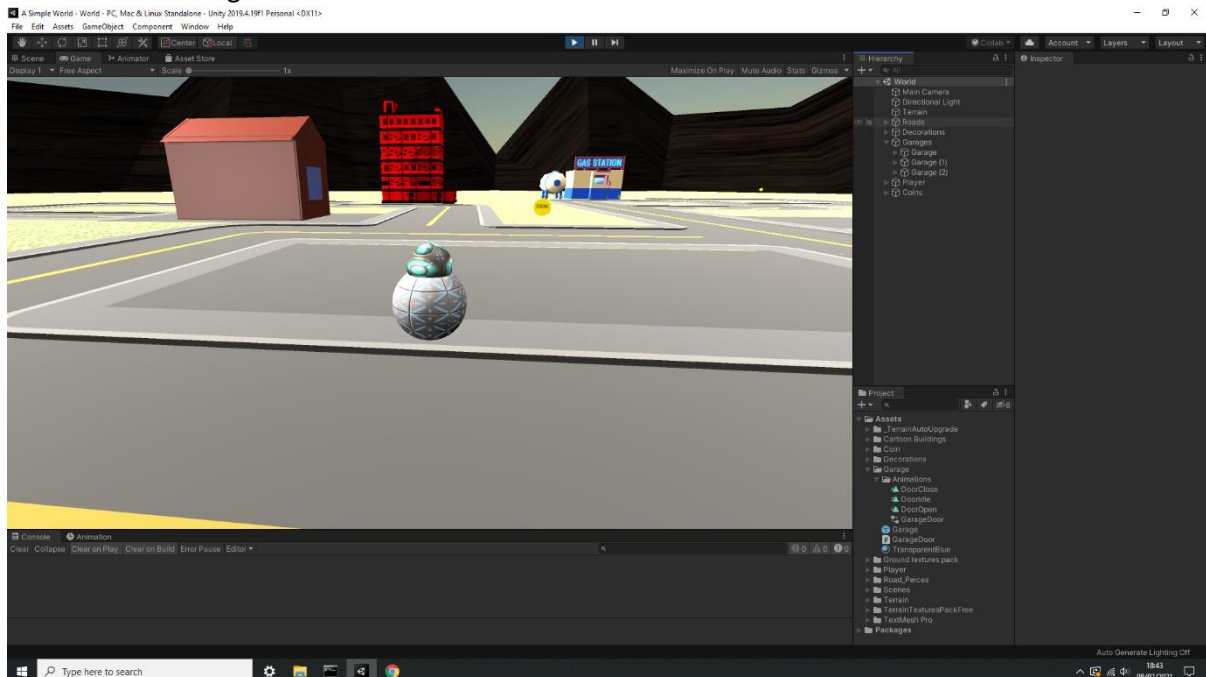
Include My Student Number

To include my student number, I decided to include it in the texture of the coin. I also decided to make the road layout my student number. Below I have shown how each number is included in the road layout.



In the World

This is a screenshot of the player in the world. On the left is the garage I built with the working door. The building in the middle and on the left are just there for decoration. The player is in the middle of the screen standing on the road.



Scenes

I have three different scenes in my world.

The first is **Sandbox**. This was just a simple world where I can test the movement of the player. The animation of the garage door opening and closing. I could also test the interactions between objects. In short, this scene is just a testing world.

The second is **Roads**. This is just the layout of the roads in the shape of my student number. I created it in a scene so I could easily modify it without affecting the decorations and other objects.

The last is the **World**. This is the main scene. This is where everything comes together to provide a nice world of the player to explore and interact with.

Scripts

I use a total of five different scripts for my world.

The '*PlayerMovement*' script provides the movement for the user. When the user presses the 'WASD' keys or the arrow keys, the player will move around the world.

I also included a '*PlayerCamera*' script which moves the camera around with the user. This provides a smooth experience for the user when moving. The camera follows the player at a set distance and rotates with the player as well.

To get the door animation to active when the player gets close, I created a '*GarageDoor*' script which tells the program to active the opening animation. When the player exits the box collider the close door animation is performed.

The next script is '*CollectCoin*' script. This allows the user to collect coins when they are next to it.

The final script is '*CoinSpinBounce*'. This just slowly spins the coin around while it is in the world. This just makes the coins look nicer than just sitting there.