The scene I tried recreating in OpenGL was a picture of my desk that included a Coca-Cola can to the front left, an iPad in the middle back, and a cat toy on the front right, and all objects on my galaxy desk pad. For the Coca-Cola can, I chose to make a cylinder with a black cube as the opening of the can. The cylinder had an aluminum texture for the aluminum can and the block had a matte black texture to make it as dark as possible in order to see it. The iPad had some complications at first, as I chose to make a thicker plane or thinner cube. After making the object, I could not get the textures to work so I changed the object to a cube. I added a matte blue texture since the case on my iPad was matte blue. The cat toy was supposed to be a ball, but not a perfect ball, so I changed it to a pyramid with a blue and silver tinsel texture. For the final piece, the galaxy pad, I created a plane and gave it a galaxy texture. This scene has one complex object (the cylinder and cube together) and has four different types of objects.

In my 3D scene, the user can load in and immediately see the scene. Putting the camera where the user can see the scene makes it easier to see what is all in the world. The user can then use WASD to move around, along with Q and E to move vertically. The mouse can be used to look around and zoom to see the details in the scene. When the user loads in, you cannot see both lights that are there without looking around. One light is to the top left, and the other starts off on the right that can orbit the scene if the user presses the “K” key and “L” to stop. The light to the left has a slight orange/yellow tint to it to make it seem “sun”-like while the light on the right is just white to mimic the lamp in my background.

Coding this final project was not easy and took a lot of time to make it more user friendly and reusable. The original code I had was very blocky, confusing, and overall, too much in my opinion. As I learned more throughout the weeks, I made it simpler for not only myself, but for the professor or anyone else that would look at my code. I labeled anything I could so I or another person would know what that line of code was and organized in a way that makes the program flow. I started off with making the window, then going into my VAOs, VBOs, and vertices. For each object in my scene, they had their own VAO, VBO, and vertices for less confusion. I then went on to my textures, shaders, and the positions of each object and light. After this I went into the vertex and fragment shaders that had many details commented so anyone who reads my code knows exactly why it is there and what it does. I then went on to creating the shader programs and the textures that each object was going to have. The code then went into the inputs that were possible for the user to press. Finally, the good stuff, I created the objects and then called to render. I made the cylinder have its own mesh as I didn’t want it touched since it was not easy to create, then the cubes, pyramid, plane, and lights were created below it. I believe my code is very reusable as any user can use it, redo the vertices to make it their own, add a new texture, and it would work great. Light can be adjusted easily, and the objects can be moved anywhere.