Reflection

My three-dimensional scene was a creation of household items that I thought would be great to render in OpenGl. It starts off with this weird, shaped stand that was a rendition of a square base and a circle plane that holds a cylinder candle on top. The other two objects were a flat cubed coaster that had a cylinder cup sitting on top of it. These were objects that I found around the living room and thought would be interesting to render.

The development of this project began with creating a window, and our first shape which ended up becoming our plane the coffee table. With the creation of the window and a basic shape, I then went ahead and began developing our first three-dimensional shape, which ended up being the coaster. I had to use different vertex array objects and buffers for each object. This allowed me to choose the vertexes for each object individually. This is because although some objects share the same shape, they do differ substantially. For example, the candle and cup are both cylinders, the cup’s base is smaller than the top, resulting in its unique shape. After creating separate vertex array objects and buffers, I created more for every other object needed to complete the scene. After all the shapes were created to my liking, I went and found textures that would be appropriate for every object. Luckily for me, the stand and cup object are both a simple matte color, which made texturing these objects simple. The coaster and table were fairly simple to texture as well. The one object that gave me the most issues with texturing was the candle. Since it is a complex shape, overlaying a texture over it required a lot of testing and figuring out how to wrap the texture around the shape. After, everything was successfully built and textured, the addition of a light was the last piece. Creating a lamp and adding light was simple, but the difficult part was the effect it had on every object. Since the candle and stand are directly under the lamp, those were illuminated normally, but the cup and coaster had to be adjusted accordingly. Since, one side of the cup and coaster face the light, I had to adjust the other sides to become dimmer, because they do not receive as much light as the side facing the lamp.

With the scene completed, controls for camera movement were implemented. I had implemented for the camera to move with various key presses. “W” was set to forward, “S” was set to backward, “A” was set to left, “D” was set to right, “Q” was set to up, “E” was set to down, and “P” was set to change the perspective of the scene to change from orthogonal to normal. The mouse was set to move the camera, and the scroll wheel to change the field of view of the scene, which adds a zooming effect. This allows the user to navigate throughout the entirety of the scene.

In this project, a good number of functions were created to allow the project to be smaller and easier to read. Some functions include, a function used to load a texture, UCreateTexture. a function used to destroy said texture, UDestroyTexture, a function to initialize the program, UInitialize, a program used to process the various inputs from the user, UProccessInput, a function used to create a shaderprogram, UCreateShaderProgram, and a function used to destroy a shader program, UDestroyProgram. These are most of the functions used in this project, but there were a few not mentioned. The use of these functions is to be able to use them repeatedly with having to use the same code repeatedly. For example, I loaded a total of 6 textures, and instead of coding all the textures individually, I created a function that loads the textures, and I only had to call the function for each texture. Therefore, this reduced the number of lines of code from roughly over 100, to just 6 lines.