**Final Project - Reflection**

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This is my second go around taking this course, and it was extremely intimidating to me. With every passing week, I gained confidence in my ability to program in OpenGL and was no longer fearful of it. With the initial picture, I was going to render it into a 3D scene. I took a picture of a coffee mug, two apples, and a pen. I was going about my business of trying to recreate the scene until I started running into issues of the program failing when trying to create a sphere. Anytime I implemented and called on the sphere, the program would crash, and I could not figure out the issue. So, I decided to change my scene to a more work-related theme. I work for a company called Lockheed Martin which is a Department of Defense contractor, and we specialize in aircraft and spacecraft. I decided to change the scene to how my cubicle appears at work.

The first object I created was a makeshift spaceship using two objects to create one object. I created a cylinder, which is the spaceship's body, along with a silver texture. I had to create a separate function and call that function inside of the render function to get the proper output that I needed for a cylinder. On top of the cylinder, I added a pyramid to give off the nose of the spaceship and have a red texture on it and positioned the pyramid on top of the cylinder to make the spaceship complete. The plane, or what would be the desktop of my cubicle at work, fits perfectly into the scene, and instead of doing a wooden tabletop, I decided to keep it space-themed for my workplace. The only issue I have is the picture I used to give off the outer space scene that it is extremely pixelated. I also added a smaller block that is supposed to be a rubrics cube which is a toy I have on my desk at work. The only issue I had was getting a proper picture to give off the rubrics’ color pattern. The final one is what I attempted with a notebook I used at work with the Lockheed Martin logo, which I did not use and stuck with the company color of blue for the booklet or what could be sticky notes as that is something I use more regular than a notebook at work. I created a simple block and scaled down the size of the block to give off the effect of sticky notes. I positioned the block so most of the block is positioned beneath the tabletop as I could not get the correct size that would work. I also created two lights for the environment. One light, the biggest and furthest from the model, is what I consider the “natural” light. The other light, which is much smaller and closer to the model, has the ability to rotate and stop when specific keys are pressed.

Navigating through the entire scene that I created is simple and fun. By using the WASD keys, you can move around the environment. The W key will move you forward. The S key will move you backward, and the D key will move you to the right, the A key will move you to the left. There are several other keys I used that I programmed with the keys “Q” and “E.” When Q is pressed, the camera will raise upward until the key is unpressed. When the E key is pressed, it will move downward until the key is unpressed. Keys “P” and “O” are programmed to give a different direction to the camera. When the P key is clicked, not continuously pressed down, it will give you an orthographic view which is like an aerial view overlooking the project. When the ”O” key is pressed, it will reset the camera to its original position. Two more keys are programmed, which will control the smaller light in the environment to orbit and rotate around the model to give off lighting and shadow effects to activate the orbiting. You can press the “L” key, and the light will start orbiting until the user presses the “K” key, which will stop the light from orbiting.

The only function I had to create on its own was the cylinder known as the “CreateCylinder” function. It was a lengthy process to get the cylinder down correctly, and then we could call the cylinder to be drawn inside the render function. Also, inside the render function, I created vertices and indices for all the other objects inside the render function. For each object that is drawn, you would have to activate the program ID for each object that was created. I believe that going forward. I will incorporate using an OOP method because things were getting extremely chaotic for me when all the code was in one file. I believe it will be more organized and make adding objects to the project more manageable.