CS-330 Comp Graphic and Visualization

Project One: Final 3D Scene

Module 7-1

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Description automatically generated**

**Development Choices:**

The 3D objects that I have chosen to develop in Visual Studio consists of multiple primitive shapes that come together to make up my 3D scene. In my opinion, this was difficult to perform but I was able to work through the many roadblocks and run the code without any errors. The above image is a screen shot of my 3D scene. Although it differs from my original selection of objects, I was able to piece the objects together to make a 3D scene. The scene consists of a pyramid as the roof, a cube as the base of a wooden house that also has a window and a door, which consists of two planes. The pyramid is placed on top of the cube to make a wooden house/hut. There is a plane as the foundation or backdrop, which I consider to be as a dirt surface, and lastly another set of planes that make up a wooden fence. Some may not be impressed, but I believe it shows progress from where I started. With minimal graphic knowledge prior to this course and the struggles that I faced to get here, I see improvement but know there is always room for growth. I attempted multiple times to implement a cylinder in my scene as well as in my milestone assignments but was unsuccessful with implementing that code. To create the 3D objects, I used vertices in order to build each object.

**3D Scene Navigation:**

Working through the tutorials provided in the class, I was able to set up the camera to appropriately control the 3D scene. Using the GLFW library, I was able to implement a callback function to navigate to control the cameras orientation as well as the speed as you use the mouse scroll. Using the same library, I incorporated the GLFW\_KEY function to use keys W, A, S, D, Q, and E. As you select one of these keys, it is used to control the body of the image, meaning forward, backward, left, right, up, and down motion.

**Program Functionality:**

For this project, majority of the code for the camera and lighting in this 3D scene was incorporated and pieced together from other assignments throughout this course. The camera is stationary when you first run the code, but changes as the user navigates using the correct keys. As the project development progressed, many different functions were required to generate the data that was incorporated within the code. A function that I had to modify was the glm::translation and glm::rotation functions. For the camera to view the 3D scene front faced, I had to rotate the scene 180 degrees. I learned this method in previous assignments and was able to reuse this throughout the rest of my assignments and implement in my project. Another custom function is the UcreateMesh function. Through trial and error, I was able to incorporate the correct coordinates for the position, normal z, and texture of each object.

The entire course has been challenging, but as I see progression in my skillset, it becomes more rewarding and I look forward to learning more on this subject.