**Project 7-1: Design Decisions**

Evan Bush

Southern New Hampshire University

CS-330: Computer Graphics and Visualizations

Jeff Phillips

April 16, 2023

**Project 7-1: Design Decisions**

The selected objects I chose were the camera, the film roll, and an envelope. I chose these objects because they highlighted the different uses of primitive shapes within the scene. Although difficult, the film roll was a simple cylinder to be placed, the envelope was an additional plane to use, and the camera could be made up of two or more primitive shapes. Due to my skill level with working with OpenGL, I chose to stick with two shapes with easier implementation for the camera. The toughest object to create the functionality for was a cylinder. To avoid the tedious method of writing every single triangle to make a smooth cylinder, the use of a function was needed. This helped limit the amount of code needed to draw every triangle needed for the object.

A user was able to navigate my created scene with a few keys and their mouse. To start they were able to move along the X-and Z-axis with their W, A, S, and D keys. To traverse the Y-axis the user would use the Q and E keys. Finally, the mouse cursor would change the camera’s look-at position allowing the user to move freely across the entire scene in any direction they would like. If the user wanted to change the sensitivity of the travel time, they could use the scroll wheel of the mouse to increase and decrease the movement speed.

The main custom function I created was the use of textures. After watching multiple videos online and reading over many different techniques for managing textures within OpenGL, I combined what I learned to make the texturing of an object an easy and straightforward process. I ended up changing the fragment and vertex shader source code to have an additional address point of a texture index. After assigning a texture file an index value, I could put a final float after the vertices, normals, and texture coordinates to specify which section used each texture file. This made the entire process a lot easier for me as I needed to add multiple texture files to a single object.

Outside of these specific functions and changes, keeping the entire program organized based on the module tutorials and not the OpenGL web-based guide helped make sure everything was situated in the correct spots.