Comp Graphic and Visualization

Final Project

* **Justify development choices for your 3D scene**. As you write, think about why you chose your selected objects. Also, consider how you were able to program for the required functionality.

For this project, I decided to recreate a 3D scene of the items on my dresser in my bedroom. On top of my dresser are a book, a miniature statue of the Eiffel Tower, a tall perfume box, and a toy building block. I chose to recreate the book as it was my object that was made up of two different shapes, a square, and a rectangle. I then chose the Eiffel Tower statue as it was very close to the shape of a pyramid, I chose the perfume box and toy building block as I believed that it was an object that I would be able to recreate along with the other objects successfully, and lastly, I chose the plane to be the base that the object was on.

Programming for the required functionality was very hard, I felt as though each functionality was a challenge that required a lot of research and trial and error. The hardest part for me was coding the two light sources. I was able to duplicate the code to create two sources, however, for some reason, I could not get the secondary light source to project light. I also struggled with creating a fourth object for the scene, I believe that I have mastered the plane, pyramid, and cube, however, the other 3D shapes are still very hard for me to grasp.

Applying navigating to the scene was relatively simple as we had already completed this task in previous chapters. The same was true for applying textures to objects. I was also able to appropriately place objects in the 3D world using the X, Y, and Z axis by visualizing the triangles that made up the objects and where I wanted them to go.

* **Explain how a user can navigate your 3D scene**. As you compose your thoughts, discuss how you set up to control the virtual camera for your 3D scene using different input devices.

When designing the 3D scene for this project I added some basic movements for navigating the scene. I utilized the WSAD key for motion, the W key allows the user to zoom in on the scene, and the S key allow the user to do the opposite and zoom out. The A key then allows the user to move to the left of the scene and the D key allows the user to move to the right of the scene.

I also added code that allows the user to use their mouse cursor to change the orientation of the screen. This allows the user to be able to look up, down, left, or right by moving their cursor in the desired direction. Lastly, the user is able to adjust the speed of the camera’s movement by using the mouse scroll.

* **Explain the custom functions in your program that you are using to make your code more modular and organized**. Ask yourself, what does the function you developed do and how is it reusable?

The **UProcessInput** function is a function that was developed to control the navigation of the camera of the scene, control the mode of the texture and control the orbiting of the lamp. This function can be reused in another scene as a way of adding navigation and texture control to a scene.

The **UMesh** function is a function that holds the position vertex, normals, and texture coordinates of a 3D object or scene. The position coordinate is responsible for creating the 3D objects in the scene, the normals are responsible for creating the light source and the texture coordinates is responsible for adding texture to the object. The **UMesh** can be reused multiple times in different projects as a way of recreating that specific object or scene in another project.