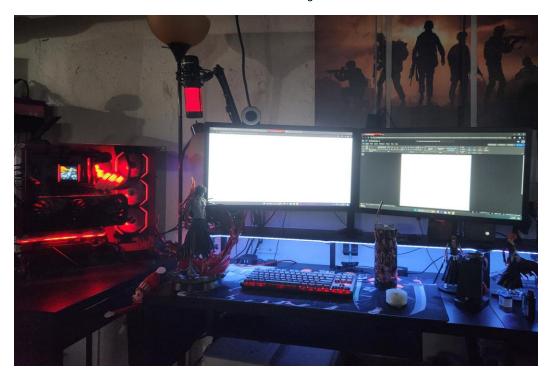Richard Seabridge
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Final Project Reflection

I would like to start this out by adding the picture of my scene as I failed to do so in an earlier module. Now, I will say that my design within the CS330 final project doesn't portray the scene 100% but I added a lot of elements than what was required. The overall development of the project was engaging, fun, and every bit worth learning. The PC mouse and mouse pad are everyday objects that most users can easily recognize, making them relatable and understandable within a 3D scene. I guess this can also apply to any of the objects within my scene from the poster on the wall to everything on the desk. To program the functionality of all these objects took a lot of practice and YouTube tutorials. The reading felt a little unbearable as I am more of a visual learner, but they were useful in the long run. These objects serve as excellent examples for demonstrating various 3D techniques like transformations, lighting, and shading. For instance, the mouse's curved surface allows for the application of different shading techniques, while the mouse pad provides a flat surface that contrasts with the mouse's curves.

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The navigation is relatively simple as we were already given the tools to implement the keys to use for the navigation. The WASD keys will allow you to move left, right, back (zoom out), forth (zoom in). The Q and E button will allow the user to make the camera traverse up and down. The mouse has two functions, the first is that it will allow the user to pan around any objects or the scene in general. The mouse scroll wheel allows the user to accelerate/decelerate the movements while traversing the scene. Finally, the O and P keys will change the scenes perspective or Orthographic display. I was a little weird to code in because I had no idea where to even begin. Eventually, I figured it out and the keys are operational, and it works perfectly as intended.

The lighting functionality was by far the most intimidating as really getting use this required some mathematical persuasion. To say the least, I was not very successful at achieving the darker side and there is too much light. So, instead what I did was modify the fragmentshader.glsl file specifically "float specularComponent = pow (max (dot(viewDirection, reflectDir), 0.0), light.focalStrength);". Initially I adjusted the 0.0 to 0.20 which was a big help in getting rid of the spotlight affect me and probably other students were getting. This eliminated the need to adjust the files TOTAL_LIGHTSOURCES to the number of cameras you actually had in the .cpp file. This function is reusable across different objects in the scene, as it abstracts the rendering logic. It allows you to render any object by passing it along with the current camera and light setup, making the rendering process consistent and reducing redundancy in the code.

A few more thing specifically needed my attention was the mouse object I created, as there were no real round shapes that I could use. So, I eventually had to go into the shapesmesh.h and shapesmesh.cpp files and study how the other shapes were created. I ultimately had to find

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some website that gave me the basic structure of a hemisphere 3D shape. It took a few hours to adjust the codes so that it would render as intended. Initially when I coded it with the provided verts and indices it rendered flat. Eventually, I was able to code it in a way that didn't need those large amounts of coordinates. After being able to create the 3D object I had a texture issue as the given parameters did not allow the texture to form on a rounded object. After some adjustment to the UV scaling I was able to for the texture to the hemisphere.

In conclusion, this final project opened a lot of thoughts and questions I was struggling to ask when it comes to being a software engineer. The incredible amount of patients and knowledge I gained is vast. I wish I would have messed with the lighting a little more to achieve the desired affect but there are so many variables. I believe that my scene is and will function as required beyond my expectations or the courses expectations. I did go ahead and install all the relevant libraries and IDEs necessary to learn even more using OpenGL.