**Final Project: Reflection**

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I chose to replicate a 2D image of my desk at work as a 3D scene. When choosing objects, I made sure to include at least one complex object, like my coffee tumbler, and multiple simple objects to make the replication process challenging but also suitable for this course. I made sure to replicate the scale, position, and rotation of each object as close as possible to the original image to the best of my ability on the XYZ plane. Since I only had access to free textures online, trying to get the exact texture/material of an object proved to be challenging at times, but I did a decent job at making the 3D objects look like the 2D image. The hardest texture to find was the jpg for the keyboard for my laptop. There were only two free keyboard textures online, and I picked the most accurate one.

A user can navigate the 3D scene using a mouse and keyboard. To move around the scene, the user can press the “W” key to move forward, the “S” key to move backward, the “A” key to move to the left, and the “D” key to move to the right. The user can also press the “Q” key and the “E” key to move the camera up and down. The user can press the “P” key for a perspective view of the scene and the “O” key for an orthographic view of the scene. The user can move the mouse around to move the camera around and can use the mouse scroll wheel to change the speed at which the camera travels around the scene. The scroll wheel functionality was the hardest part when it came to setting up scene navigation as it was not fully included in the required reading and was not yet integrated into the header file for the ViewManager.cpp file.

The program for this 3D scene was broken into three different .cpp files: ViewManager.cpp, SceneManager.cpp, and MainCode.cpp. The ViewManager.cpp file kept all the code for stuff like navigation and window setup. The SceneManager.cpp kept all the code for stuff like shape generation, lighting, and scene rendering. The MainCode.cpp file functioned as the “driver” that put everything together to make the program run. Making the program modular like this made things more organized and made everything as a whole run smoothly. For example, anytime I was working on generating objects for the scene, I solely worked on the SceneManager.cpp file. Anytime I fixed the camera, I solely worked on the ViewManager.cpp file. This also made the entire learning experience easier and more enjoyable. The function I developed is also reusable, as future developers can easily replace objects, I generated with objects of their own so that they can render their own 3D scene.

In all, I thoroughly enjoyed working on this project, and I feel as if I am one step closer to pursuing a successful career in the software engineering industry.