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CS 330: Final Scene

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When looking at the 3D scene that I chose to render for the final project, I tried to use a thought process of finding as many unique shaped items as possible, while not selecting anything that would be overly complex. Due to my inexperience with 3D visualization, the objects chosen were more difficult to render than first anticipated. The scene includes one textbook, which was rendered via a cube VAO. A plane was then needed to set the objects upon to create a scene. The plane was set up with its own VAO. The glasses case was rendered via calling the cylinder function. The only difference to that of most cylinders is the number of triangles used was reduced to create a more ridged container to set it apart from a standard cylindrical item.

The screw driver was the most difficult object to create. It is comprised of 3 cylinders and a pyramid. The handle is a cylinder rotated 90 degrees to be parallel with the plane. The housel of screw driver was made by another cylinder that was adjusted to have a slightly larger radius and a much shorter height. This object was originally supposed to be a torus, but due to issues in uploading torus headers, I made the adjustment to a cylinder instead. The tip of the screw driver was rendered from a VAO of a pyramid from previous assignments. The pyramid was rotated 90 degrees and reduced in size to fit the tip of the screw driver.

This was a very difficult project that required many trials along with many errors. After attempting to research multiple set ups of the project. I went through all tutorials, readings, and videos to understand the set up of the program. After many hours of attempting to set it up, I was able to create a successful program that would render the objects in the desired locations. The plane, book, and pyramid objects were rendered via calling their VAO through the proper shader. The cylinders were rendered via their shader and the Cylinder header and cpp.

Creating the lighting was very difficult in its own right. The light sources were created via a call to their lighting shader and the light positions located the lights in the desired positions. For each position light, the directional light, and the spot light were set up in multiple lighting aspects to adhere to the Phong lighting model. The lighting was set to show the scene appropriately, helping bring the scene to a more realistic visualization.

Texture objects were created for the objects within the scene. The textures were then activated and bound to the appropriate objects within the scene. The textures were chosen to closely reflect the objects in the example picture of the scene. Texture allowed the scene to be presented in a more realistic light.

The user can navigate the scene via a rendered camera. The camera is a stationary object within the scene, but the scene translates to the mouse and key functions activated. The basic key functions of the scene are the WASP keys to navigate forward, back, left, and right. The mouse function is implemented to be able to navigate the scene as well. I implemented addition key functions to the scene as well. The Q key was implemented to move up in the scene. The E key was implemented to move down in the scene as well.