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CS-330

Final Project 7-1

I chose the objects because I knew it would be a reasonable accomplishment given the time frame available. I started with the mug, this proved to be much easier than I expected due to the initial shapes being perfectly suited for it. The tapered cylinder had to flipped 180 degrees which altered the height at which it sat on the y-axis. The laptop was 2 boxes stacked on top of each other, with a small gap between added to prevent them from looking like one large box. The blender bottle consists of three shapes, two cylinders and one taurus. The first cylinder acts as the base for the bottle which consists of a different material than the cup section forcing me to combine two cylinders than use one long one. The second cylinder is the section that holds the liquid this is a tinted plastic. The final shape is a taurus which I shrunk on the z axis to form a rim for the bottle. The airpods case is a cylinder that is rotated, and shrunk on its z axis to create an oblong shape. I then added a box in its face to simulate the charging port.

When it came time for lighting and materials I created four object materials. The hardwood floor material has a dark brown ambient color to simulate the base color of wood. Its diffuse color is a lighter brown to reflect the wood's appearance under direct light. A medium specular color added a slight shine similar to polished wood. This was my biggest deviation from my picture. In my original picture the wood floor is white, rather than the brown shown in my scene. This is because when transferred over to my virtual scene, it did not look good. It had too many light colors that left my scene looking washed out, and lacking depth and contrast. Mild shininess gives the wood a polished look. The clear plastic material has a black ambient color with a very low strength, this gives it its translucent appearance. Its diffuse color is very low, enhancing the transparent effect, and high specular color and shininess creates strong reflections like real plastic would. The ceramic material’s diffuse color combines brown and gray. A moderate specular color and a high shininess attempt to mimic the glossy finish of glazed ceramics. Lastly, the polished metal material has a gray ambient color. This gives the laptop its base tone. High specular color and low shininess gives a low shine, similar to real polished metal.

To maneuver though my scene I bound the camera controls to keys on the keyboard. This includes W to move forward, A to move left, D to move right, and S to move backwards. In addition to lateral movements, the Q and E keys raise and lower the camera along its y axis. Using the mouse, I can control the direction in which the camera is facing, this gives a more virtual experience and more control over the angels one can view the scene. The movement speed of the camera can be slowed down or sped up by sliding the scroll wheel on the mouse up and down. This was accomplished by using the ProcessKeyboardEvents and Mouse\_Wheel\_Callback methods. glfwGetKey and ProcessKeyboard then register and initiate the movement based on the function call parameters. ProcessMouseScroll uses the scroll distance as a parameter to determine how much to increase or decrease the camera speed. I also added a few additional functions to the base code to better suit the needs of the scene. The DefineObjectMaterials function sets up and assigns the materials to objects in a scene. The LoadSceneTextures function loads texture maps and images into the scene to provide surface details. SetupSceneLights configures the lighting environment by placing and adjusting light sources. All movement both mouse and keyboard required a callback to process changes while the program is running.