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CS 330

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**7-1 Final Project**

A nightstand with a lamp on top

Description automatically generated

The image above is what I chose to replicate in 3D my final project. I chose this image because it has several different objects in it and is not too complex. When thinking about how I would replicate this in a 3D scene I decided to remove one of the books, the bed and just have the back wall along with a wall on the right and left of the scene. This gave my 3D scene more focus on the table and the objects on it.

Programming this 3D scene for the required functionality was easy on some parts and harder on others. I started by looking at the picture I chose to replicate and seeing what shapes I would need. I decided I would need a plane shape for the floor and walls. A box shape would be used for the tabletop, bottom, legs and the book. A cylinder shape for the paper roll, lamp stem and cup were used, and a tapered cylinder shape was used for the lamp shade. A sphere was used for lamp base and a half torus was used for the cup handle and drawer handle. After deciding all my shapes, I had to adjust the scale and position on all of them to have them look like my reference image. Some of the objects like the paper roll, cup handle and drawer handle had to use rotation to achieve the right position.

Navigation of the scene is easy using a keyboard and mouse. Moving the camera with these input devices was implemented into the code to work with certain keys on the keyboard. The key “q” was set up to control the up movement and the “e” key for downward movement. The “w” and “s” keys were set up for up and down and “a” and “d” for left and right. I also had to implement a way to change the view from orthographic to perspective and I did that by using key “o” to turn on orthographic view and key “p” to turn on perspective. The mouse can control the up, down, left and right while the camera is in a stationary position. I increased the mouse sensitivity slightly to enable better navigation around the scene. I also added a method for the mouse scroll to control the speed of movement around the scene. Rolling the mouse scroll forward would increase speed and rolling it back would decrease it.

To make the code more organized I used a few different things. I declared a few different methods in the header file of the SceneManager to use for loading textures, defining object materials and setting up scene lights. In the scene manager main code all the methods are organized with comments telling what they are used for. Different things could be used multiple times like the scale, position and rotation functions. These would be used to create the object how I needed them to be. Comments were also used throughout the code in all of the classes to make the code easier to understand and keep different things separate such as the different objects that were created in the SceneManager class.