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CS-330

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Professor Scott Gray

**Final Projection Reflection**

At the beginning of this course, I decided to set up my laptop, a coffee cup, Vicks Vaporub, and a pen on my desk and snap a photo. I used this image as a reference for the 3D scene I would later build for this final project. The items I chose were something I felt comfortable designing within Visual Studio since the course as a whole seemed daunting at first. I included a plane for the laptop, a half sphere mesh for the coffee cup, a torus for the cup handle, cylinders for the Vaporub container, a long cylinder for the base of the pen, and finally a cone shape for the tip of the pen. These shapes provided me with a challenge while also enabling me to tackle the task in a timely manner.

To navigate around the 3D scene within the program itself, we were tasked to program appropriate functionality for the user to navigate through the scene via their mouse and keyboard. When loaded into the program, users may traverse the scene through the camera that is situated on the X, Y, Z axes. This enables you to traverse through the scene and view the objects from multiple viewpoints as you please. I programmed functionality using the WASD keys on your keyboard to move forward, backward, left, or right. This format is exactly similar to those used within video games that are played on mouse and keyboard so these controls would seem more accessible and learnable for most users. Additionally, The Q and E keys were programmed to manage the upward and downward movement of the camera (height). On top of these keyboard controls, I included functionality for the mouse to control the camera’s orientation. The mouse plays an important role in controlling the view perspective of the user and can change where the camera is directly focused within the 3D scene. Furthermore, a user may decide to change their view and orthographic perspective using the P and O keys. Using the P key gives the user a perspective view and the letter O enables orthographic views. You can navigate through these different orthographic views by using the 1, 2, 3, and 4 keys on your keyboard. With all these controls combined, the user is capable of navigating through the 3D scene and interacting with the environment that was designed.

To develop a more modular and organized program, the code utilizes constructor and destructor functions such as ‘SceneManager’ that encapsulates all the initialization and cleanup processes within the class. By doing so, this makes the code more modular since the class itself is handling all the appropriate initializations that are used within the program. This enables a more easy to use program that is simple to maintain. Other ways the program employs modularity is by utilizing functions such as the ‘CreateGLTexture’ function. This function encapsulates all of the steps needed to load and prepare all textures used in the 3D scene, making it reusable within any part of the program and reduces redundancy in the code.