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CS 330

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Final Project Reflection

The objects I chose for my 3D scene were a deck of playing cards, a massage ball, a pencil holder with pencils in it, and a water bottle all laying on a wood table. I chose the water bottle because it is a complicated object as it was created using 6 shapes and two different shapes. The torus at the top of the bottle had to be edited to have a slight x angle so that it could sit flush on the bottle. The textures for this object were imported into the program and set as the object’s texture which allows the texture to wrap around the object. The water bottle was also a perfect candidate for working with specular lighting as the bottle is made of metal and could be used to reflect light. The object material had to be edited to highlight the specular lighting strength and was then set as the bottle’s material so that it may reflect light. The pencil holder with pencils inside was chosen so that we could work with a shape that needs to be open so that objects can go inside of it. This was particularly tough because we had to go into the shape files and edit the tapered cylinder so that the top could be opened, and the pencils could be placed inside. Editing the pencils in place was particularly tricky because there was constant editing to get the pencil top (cone) to be angled perfectly and constant movement of the x, y, and z coordinates to sit flush against the top of the pencil (cylinder). The deck of playing cards and massage ball were chosen to get to work with different shapes and textures. The material for these objects was then created to barely reflect any light because the textures for the objects do not require them to reflect light. The textures for these objects were added to give them more life rather than just being colored.

The virtual camera was set up to be able to navigate through the 3D scene in different ways. The virtual cameras horizontal (left, right), vertical (up, down), and depth (forward, backwards) navigation were set up by mapping the WASDQE keys to their respective movement: W-forward, S-backward, A-left, d-right, Q-up, E-down. The orthographic 2D view was mapped to the O key and the perspective 3D view was mapped to the P key with their different camera positions, angles, and zoom. These were created using the keyboard inputs. The mouse input was then used to control the orientation of the camera and speed of the camera movement. The mouse cursor is used to change the camera orientation whether you are looking up, down, left, or right. This was set up by calculating the change in the mouse’s x and y offset and moving the camera orientation in accordance with this offset. The mouse scroll wheel is used to adjust the camera movement speed. When scrolling up, the camera movement speed decreases so that you may move around the 3D scene precisely and when scrolling down, the camera movement speed increases so that you may move around the 3D scene quickly.

The code in the program was made more modular and organized with the use of different functions. For example, there is a transformation function used to edit the positions, scale, and x, y, and z rotations of an object. The shader color function was used to set the r, g, b, a color values of an object. The load scene textures function was used to load the textures into memory. The define object materials function was used to set the material settings for the objects in the scene. The render scene function was able to call on all the above functions to transform, set the colors, add texture, and set the material to each individually created object in the 3D scene. Finally, the set-up scene lights function was used to set up the lights of the scene. All these functions kept the code in the program modular, organized, and easy to follow.