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CS 330: Computational Graphics and Visualization

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**Final Project: Reflection**

**A bottle of wine and a glass of cheese and grapes

Description automatically generated**

In my 3D scene I choose to recreate the scene with the wine bottle, pear and cheese. The shapes that were chosen were the Plane, Cylinder, Sphere, Tapered Cylinder, Prism, and Torus.

The plane was chosen to recreate the table that the items are sitting on. The rest of the shapes are as follows below:

* **Plane-** base for the scene, what all items are placed on.
* **Bottle-**

**Base:** Was constructed from the cylinder shape. This gave the bottle the curve at the bottom and was the most appropriate shape to choose from to recreate the bottle body.

**Neck Bottle Base:** The Tapered Cylinder was chosen due to the nature of the neck of the wine bottle. The neck is rounded with a curve at the bottom and gets thinner towards the top.

**Neck of Bottle:** The Cylinder shape was used to recreate the neck . The cylinder gave the bottle with minor adjustments to the X and Y values to the size that closely resembles the neck in the scene.

**Ridge of Bottle:** The Cylinder was also used for this part of the bottle. These shapes closely resemble the ride in the reck of the bottle halfway between the mouthpiece of the bottle and the base of the neck.

**Mouthpiece of bottle:** To recreate this portion of the bottle I used the Cylinder shape again to give it the realistic look of the opening of the bottle.

* **Pear-**

**Pear Base:** The sphere was chosen fir the base of the pear. Because of the pears rounded shape the sphere was the best choice.

**Pear Middle:** To give the pear the slim but curved look. I used a Tapered Cylinder on top of the sphere to recreate the look

**Pear Stem:** I choose the Cylinder to recreate the pear stem. I feel like with this shape I got as close to the pear stem as I could, however I feel like maybe using another shape such as the sphere and adjusting the X,Y,Z values could have maybe gave me a more accurate recreation of the stem due to it curve.

* **Cheese-**

**Wedge:** For the cheese I chose to use the prism. The prism allowed me to get the sharp narrower point as seen in the scene. However, the was a bit tricky as I could not recreate the roundness from the bottom of the cheese. I tried with the sphere however I could not get the narrow point and shown in the picture above, so I choose to stay with the prism as it allowed me to get the different sides of the cheese wedge.

* **Wine Glass-**

**Wine Glass Base:** I used the sphere to construct the base of the glass. This gave the right shape, however I had to manipulate the X,Y,Z values to get the angle as shown in the photo.

**Wine Glass Stem:** I used the Cylinder to recreate the stem of the glass which was pretty accurate to the stem that was in the photo**.**

**Wine Glass Bowl:** For the bowl I used the Torus Shape. This was the hardest part to recreate. Unfortunately, I could not get the shape dead on however I believe this shape got me as close as I was going to get in getting a shape to resemble the bowl in the photo.

All the shapes in the scene required manipulation on the X.Y.Z values of position and scaling to get the shapes in the right position in the scene and the right height and width as well as considering how one shape maybe place in front of the other such as the case with the wine glass and the bottle, which adjusting the z position allowed me to put the glass in front of the wine bottle with out the wine bottle shapes covering the shape of the glass.

Users can navigate the 3d Scene by using the “W, A, S, D” keys to move right, left, away and backwards. The “Q, E” keys allow the user to move up and down. The “P” key will allow the user to view the scene in projection view and the” O” allows the user to view the scene in orthographic view.

The mouse can also be used to navigate the scene through the yaw and pitch. Which the 3D camera moves according to the front vector of the camera meaning that the camera will move in the direction that the camera is facing. The camera sensitivity is controlled using the scroll wheel. This sensitivity is between 1.0 and 45.0.

The custom functions that I utilize in my program consist of texture management. Thru the CreateGLTexture I am able to load images, configure the texture parameters and store the texture IDs so I can use them again if needed on any of my shapes for a realistic look. Thru material management I can customize my lighting to reflect off surfaces based on its tag. Thru Transformation management I can set up my shapes for scaling, rotating or shift objects in my scene.