CS-330 7-1 Design Decision

I chose my objects because they were all different from one another, making the scene unique. I chose a box that wasn’t completely square; it had a shortened back end. Then, I chose a cup, and I used a cylinder to represent the object. Finally, I chose a green ball on top of some white tape. I placed them together so I could split them apart. The green ball represents a sphere that would need to be circular in nature from every angle. The bottom part of the last object is the white tape that can be represented as a torus. The torus is a surface or solid formed by rotating a closed curve, especially a circle, around a line that lies in the same plane but does not intersect it. The torus was the most difficult part of the final project; at the time of choosing, I was unaware of the time required to complete the object.

To control the virtual camera, one must press the alt key and left-click on the program to move around from that vantage point. There is a 360-degree radius, allowing the user to go above and beneath the scene. It grants the ability to view in front and behind the objects. WASD and QE also work when the program is running. The W allows one to zoom out from the scene, allowing a full view of the scene. If pressed too long, the scene will become distant. When pressing S, the camera will zoom all the way to the point where the scene reverses, and the camera starts to zoom out again. Using the A and D keys allows one to rotate the scene either left or right from the position the camera is currently on. While rotating, the camera will zoom in and out when the scene moves from a shorter or longer part of the scene. It does this to keep the scene in full view at all times. The camera does not rotate the full 360 degrees; however, at a point around the 180 mark, the camera starts to zoom out. This is due to the camera being calculated with the x-axis. The Q and E buttons control the camera on the y-axis. Q allows the camera to pivot upwards and can look down on the scene. The E moves the camera down the y-axis so the camera can look underneath the scene. The letter F resets the camera to the starting position. P switches the scene between orthographic and perspective mode. The mouse scroll allows one to control the camera speed.

In the beginning, I used vertices and indices inside the main function to create the box and plane objects. The torus, cylinder, and sphere require much more attention to detail to get the shape right. I created functions outside the main that can easily be used in other programs. Both vertices and indices are in the outside function and only require calling in the main the program it moves into.