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CS 330 Final Project Design Document

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My final design is supposed to represent a deadlift platform with weights and a barbell next to a chalk bowl and stand. I wanted to represent each object with a unique shape, however actual implementation proved quite challenging. I wanted to use a cylinder to represent a barbell. I figured the barbell is a rounded object so this should be simple. However, most cylinders that are generated are more of that representing a tower, so this was my first hurdle. I wanted to add two tori to represent the plates, but I had a difficult time trying to design a torus, and the resources I found I could not implement to my best knowledge. I was able to create a stand for the chalk bowl but not the bowl itself. I was most proud when coming up with using an elongated cube and a half sphere to represent these items. Similarly to the torus, I have trouble rendering circular shapes in a 3D environment. I have a light source that seems to mimic the gym lighting the best with just a light hue of yellow that captures the light reflecting off most of the equipment we have at my gym.

Navigating the scene is simple. The WASD keys control frontal and lateral movement, while the Q and E keys control going up and down respectively. The mouse controls the view to get a more outside view of the entire environment when the left mouse is held. The Shift key when held also slows the movement.

The code developed allows one to generate shapes in a 3D environment that has camera movement controls and a Phong style lighting. If someone has a good knowledge of creating shapes, they can use my code to replace any of the vertices or indices with their desired coordinates. The camera has a separate code to be updated to one’s liking. There are other compartments for the code that each one has useability. The fragment shader and vertex shader each have their own sections to be modified rather than having the entire code on main code. This would be a nightmare for someone trying to troubleshoot any errors going on. For example, if everything was lumped into one giant source code, there could be issues with a draw function but because everything is mixed together you might not be able to figure out what is causing the error as time efficiently as possible.