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[CS-330-T6632 Comp Graphic and Visualization 22EW6](https://learn.snhu.edu/d2l/home/1116041)

Reflection

Learning OpenGL for the first time was a challenging, yet rewarding experience. I would be lying if I said there wasn’t a point during the term where I thought I was in over my head and genuinely worried I wouldn’t be able to figure it out, but alas here we are on week seven and I strongly feel I am all the better for my struggles.

Back at the beginning of the course we were tasked with choosing what kind of scene we wanted to develop in 3D. Originally I had settled on the idea of a fast food meal with things such as a cup with a straw, maybe a burger box or even the old McDonald’s happy meal container. This vision shifted over the course of the term and what I ended up with was the cup and straw as I had envisioned, a table to hold them, and a floor for the table. I also included a pyramid to include an additional shape, and textured it to resemble a toy one might get from a fast food joint.

When it came to programming these shapes there were various trials and tribulations. Once I delved deeper into the world of OpenGL my eyes were opened to how complex various shapes could be, specifically anything round such as in my case the dreaded cylinder. I spent a considerable amount of time trying to figure it out, and managed to make a decent circle via a triangle fan, but hit a wall when it came to making the sides of the cylinder themselves. Ultimately I wound up leaning on an outside resource for the cylinder specifics, but was still running into the issue of how to implement it. After hours of staring at my monitor and perhaps a stroke of luck I started to grasp the concept of the vertex attribute pointer and how they relate to the vertex shader and then the fragment shader. How the stride defines the difference between the components of your vertex arrays and the space between them. This was absolutely the turning point for me in the course, once I figured out that cylinder I felt like I could do anything.

After this revelation of mine I had more trust in my abilities and enough knowledge of OpenGL to be dangerous, which was a good thing too considering I had yet to experience a host of other features included in the final such as camera work. Having had spent so much time seemingly finding every way to not get a cylinder to work I had picked up on quite a bit and as such I found the camera to be a relatively straightforward task to implement. Thanks to our class resource LearnOpenGL, we were provided with the camera header file that did the heavy lifting. I simply added on to the existing features to allow for up and down movement as well as using the mouse scroll wheel to adjust the view sensitivity by adding some variables and updating the process mouse scroll function.

As for organization and modularity I would have to say that it is good, but could be better. I stayed close to the format of our tutorials as I had leaned on them heavily throughout the course, however I could see a good argument for splitting up the render method into parts. By breaking down the render function you could increase organization and readability, although I am unsure of the performance ramifications of calling so many functions inside of the render loop. When it comes to specific components such as the rectangular prism that makes up the table, the plane that serves as the floor, or any other component in the scene they are hard coded in so far as the vertices that make up each object, but are able to be duplicated and transformed / scaled with relative ease by storing the shapes data in another vertex array object and adjusting the model components accordingly, much like can be observed from the various cylinders in the scene, the cup, straw, and table legs all being cylinders and sharing certain qualities while differing in others to create completely different objects contextually.

Alas texturing and lighting followed suit and I continued to learn more, and found that some of the things I thought I figured out prior were totally wrong. As I’m sure there is still plenty of, but looking back just a few short weeks ago I have to say I feel exceptionally accomplished and am excited at the idea of working in some OpenGL into future projects.