Final Project Reflection – Ty Petty

I used basic shapes to create my 3D image, but I translated and transformed them into a bigger picture. I tried not to overcomplicate the shapes, but to make more detail with light and textures. For example, the laptop is essentially made up of boxes. I changed the textures and lighting effects on it to make the body look like grey plastic. Then I made the screen more reflective to allow it to look like glass.

Secondly, to handle challenges like the cup, I decided to go with a tapered cylinder. That shape best matches what I had in my original image. The biggest challenge, however, was making it look empty. I decided to put a smaller tapered cylinder inside of it that was white, to symbolize milk. That way it still looks realistic and like a cup full of something. I also changed the texture and lighting effects so that the cup would look like stainless steel.

The last few pieces were a pen, a pencil, and paper. These themselves were a challenge to determine the material values I needed to make the light reflect correctly. Paper is more a matt look, so I made it not shiny or reflexive. Along with the texture, it looks like a great pad on paper. The pencils were hard just because they needed so many shapes. It was hard to line them up correctly. However, I was able to find the correct coordinates through making a few calculations with trigonometry. I then translated the x, y, and z values so that they landed in the correct places.

Next was the requirement of navigating the 3D scene with my keyboard and mouse. Each type of input (mouse movement, mouse scrolling, keyboard click, etc.) requires its own function. I needed to create callback functions so that it could watch and adjust the camera angle based on the slightest movement.

Scrolling was the hardest thing. The requirement that I received was to allow the user to adjust the speed by scrolling the mouse. I worked on that a bit but eventually found a solution that worked, requiring a similar callback function.

There are a few modular functions that are included in the development that are very helpful in rendering 3D images. One is to create material objects. This helps determine how light will react to an object and what it will look like. We can add a tag to the material for easy use later. On every object that I rendered, I simply had to call a function to apply the vectors and values to the object so that it would appear correctly.

Similarly, I had a function that created and applied texture images to objects. They would take time to load in the images initially so that it didn’t waste time during the rendering. Then, during each drawing of objects, I would simply call back the function to apply the values to the current rendering. It works a lot like the material functions described above and even has tags or titles I can use to pick up a wood or plastic texture.

Overall, I am very excited to have the project done and have it to look back on. It was an awesome experience to improve my coding skills and understand 3D renderings. It is a lot more complex than I would have thought and required a bit of math to get many of the vectors correct for lighting, position, or anything else.