CS330 Final Reflection

My 3D scene was comprised of 6 main objects. They are a ball of playdough, a book, a wooden #2 pencil, a pencil sharpener, a table for all of the objects to sit on and lastly, a floor for the table itself to sit on. In drawing it is said that most objects can be drawn by combining a base set of shapes. This also applies to 3d objects. Using a base of 5 different 3d objects I was able to develop the entire scene. Keeping the base objects to a low number removed the artificial complexity that arises when too many choices are present. Cutting some of the shapes came down to how complex they made the overall scene and how well a texture or image could be applied to them. The amount of shapes needed to create each object was also a consideration. Most of the base 3d shapes can be combined to create larger real-life objects but as each shape is already an assortment of triangles it makes sense to keep the overall shapes low to reduce needed processing time and power. The objects selected were also based on simplicity. Each object selected for the scene can be easily sized up or down without breaking realism. When selecting the objects for use in my scene I used objects that were readily available. This was so that I could analyze each object without needing to use multiple angles through a 2d picture which may influence my perspective of the objects. This allowed me to pursue a 1 to 1 recreation of the scene more easily.

The scene itself starts off from somewhat far away to allow the user to properly see the full layout. Each piece of the scene is its own 3d object with texture mapping and lighting settings applied. This includes the table legs and the floor. Users have a selection of 7 different keys that can be used to help them navigate the scene. The mouse is used to adjust the view of the scene. This allows the user to look up, down, left, and right and even behind them. The mouse is a 360 degree control for the viewpoint of the scene. Pressing the w key allows the user to move forward within the scene while pressing s allows the user to move backward. The a and d keys allow the user to move left and right respectively. This is a standard movement configuration for most 3d computer applications which allows the user to easily grow accustomed to the controls. The e key is used to move down and the q key is used to move up. To speed up the movement of the scene from pressing the keys the user can use the scroll mouse. Scrolling up speeds up the scene and scrolling down slows the movement of the scene down. In the code this is enabled with a function that is called on every render that listens for button presses. Once the corresponding button on the keyboard is pressed an if statement directs the logic to the proper action. There are also functions that track the scroll wheel and mouse position that enable them to perform their desired functions as well. When the p button on the keyboard is pressed it switches the scene to its orthographic view. Another press of the key switches the scene back to perspective view.

When building the opengl project a lot of different instructions had to be written in order for the scene to be rendered properly. Each one of those instructions is grouped into a function based on its use. A lot of these functions were created from outside sources and implemented in the project in ways that made it more modular and accessible for future use. The scene I created did not require any custom functions of my own implementation. I did however decide to use the pencil as a scale and was therefore able to accurately size all of the objects within the scene using the pencil as a base measurement. If improving upon the project I would be able to take this a step further and create a function capable of resizing or moving the entire scene.