The scene that I decided to recreate using graphic visualization was that of a photo of a simple castle. I chose this scene because it had several different objects built in varying shapes including cones, cylinders, pyramids, boxes, and prisms. I enjoyed that all the objects combined to create one cohesive object, in this case being a complete castle. The challenge involved with this decision was that I had to ensure perfect positioning of all the objects since there were no gaps between the various pieces. I was able to do this by calculating the dimensions of each object and determining their 3-dimensional coordinates so that I knew where to place the other pieces around it.

The one aspect my decision didn’t fully implement was the varying of textures. There were only three textures used which included gray brick, red brick, and grass textures. I know some scenes likely had each object made using a completely different texture for each one.

As far as the lighting and the object materials went, I expected not too much variation in reflectiveness between gray and red stone materials. I did assign the grass with a higher shininess value than the bricks. This part of my scene never did come to fruition because after many attempts to implement lighting and reflections into my scene, I could only populate a blank, black screen. This was disappointing because I looked forward to how much the various types of light could bring out the realism in my scene.

To navigate my scene, I was able to allow the user to control the camera position using the WASD keys for directional movement as well as Q and E keys for elevation. The O key was used to implement an orthographic perspective while the P key was used to utilize the 3D perspective that could be used to completely reposition the eye/camera. Within the 3D perspective, I implemented mouse input to change the direction of the camera’s perspective. This allowed the viewer to completely customize the perspective they viewed my scene from.

The functions that I utilized for my scene are relatively modular. If someone were to wish to make their own custom scene, they merely need to change what shapes are loaded and upload their own custom textures using the same functions that exist in my code. Each object has its own set of parameters that include positions, XYZ Scaling, texture, material tag, and UV Scaling. The textures are all loaded in so that they can be reused for multiple objects, and the material parameters are saved to just a simple string tag for each object.

All the drawn objects are grouped at the end of the scene manager cpp file and are identical in layout which creates an organized layout so that adding, removing, or editing these are objects is simple and easy to find.

All things considered; I felt my scene was executed well except for the issue of lighting. This just ended up being a challenge I was unable to resolve and certainly would have added to the overall scene I had picked. I feel the variations in shape, positions, and scaling were executed very well. The textures I utilized were appropriate for my scene and I feel their UV scaling was executed well to create a uniform texture amongst all the objects that made up the overall structure.