3D Scene Reflection

I wanted the program to be modular from the beginning so that I could reuse components for subsequent iterations. Separating the algorithms for shape construction from the rendering techniques was necessary. Additionally, I thought grouping scene-creating things into their own class would improve the application's usability and allow users to concentrate on adding and texturing shapes instead of having to deal with scene-creating elements. I refactored the GLMesh structure to include all the shape parameters to accomplish this. The mesh object is then provided to the ShapeBuilder class, where it is created. The mesh object is added to a vector named "scene" once the shape has been created and texture applied.

The application's navigation section has several tools the user can use to control what is displayed on the screen. The WASD keys are used for basic camera movement, Q and E are used for up and down movement, and the mouse is used to switch the camera's view. To move the camera about in the scene, these keys and motions employ the specified motions in camera.h. Additionally, the user can move the spotlight's placement within the scene using the keyboard's opposite end to offer some "testing" capabilities to the application. U and O move the light up and down, while the keys IJKL move it around within the x and z planes. With the left and right alt keys, you may move the light around the area while using the left and right brackets to control the direction of the light coming from above. Finally, the V and B keys and the left and right arrows can be used to adjust the view perspective and display the shapes in wireframe mode, respectively.

Throughout this project, I gained experience working with many unfamiliar tools. OpenGL was completely new to me when I began and is still challenging. I chose the image selected to gain experience working with different shapes and coloring. I found OpenGL to be an excellent tool for creating a 3D scene and have gained a lot of experience working with shapes, textures, and lighting. The objects in my scene allowed me to work with different shapes and textures to see how lighting could impact the scene. Going forward I intend to continue working with OpenGL and further developing my skills working with 3D graphics. This project has given me great insight into the work that goes into creating a simple 3D scene.