COSC4370 HW3 – 3D Viewing and Shaders

1. Introduction

In this assignment, we will practice 3D viewing and dive a little more deeply into OpenGL by implementing the Phong shader model.

2. Setup

a. Fork this link: https://replit.com/@MartinLee7/Template
b. Get permission to read and execute script.sh by using the following command: chmod u=rx script.sh
c. Then run script.sh by using ./script.sh (Instead of run button, you must run this command every time to compile.)
   Then, you will be able to see a black window. Note that we have provided ample starter code. Among the features we've included, you can pan and shift the camera. Moving the mouse will rotate the camera. Using the W+A+S+D keys will shift the camera. You can press the Escape key to quit the program.

3. The Main Assignment

The goal of this assignment is to implement the 3D viewing and Phong shading model. To view the object from the camera, you need to complete the GetViewMatrix() function in Camera.h and the projection matrix in main.cpp. You will write the vertex and fragment shaders for the Phong model to shade a simple cube, whose geometry is constructed in main.cpp; stubs for the shaders are provided in phong.vs and phong.frag, respectively. If you implement everything correctly, you should be able to reproduce an image like the following:
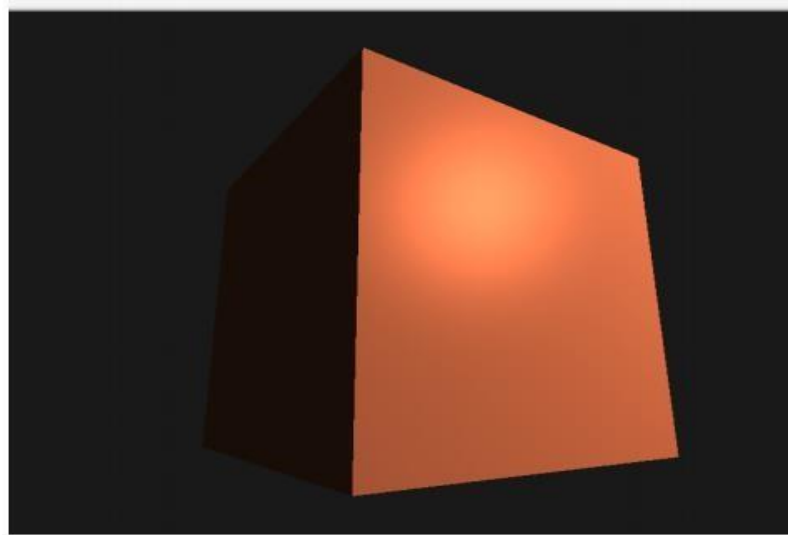
4. Tips

Initially, you will get a black screen. We recommend that you first attempt to get a solid red (or other color) cube visible. Once you have that, then you can proceed to build up your Phong model, and you can debug as you progress.

5. Deliverables

Submit all deliverables to your Github repository.

a. Code (main.cpp, phong.frag, phong.vs, Camera.h) (50%)
b. A file called "Report.pdf" (50%)

6. Late submission and plagiarism check

A punishment deduction of 50% credit will be applied if your submission is later than the due date for less than 2 days. Later than that will be treated as give up, and the grade will be 0.

All your submissions will be subject to plagiarism check; if found, your behavior will be reported directly to the department. Any referred materials should be labeled in your source code and declared in your report.