COSC 4370 – Homework 3

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1. Problem

The assignment requires us to implement a Phong shading model to view an object from the camera. We will also need to complete the GetViewMatrix function and setup a projection matrix.

2. Method

It was required that I had to modify the Phong.vs and Phong.frag files to implement the correct shaders for vertex and fragmentation using the pre created variables in the respective files. Then had to implement a GetViewMatrix using eular angles and LookAt matrix to return the view of the matrix in Camera.h. Finally had to setup a projection matrix in main.cpp. Important that I had to use the glm library for main.cpp and camera.h to implement those functions correctly.

3. Implementation

For the vertex shader in Phong.vs, I first needed to calculate the gl_position which factored in the projection, view, model, and position variables. Then needed to find the normal vector in world space so I had to transpose the inverse of the model against the normal vector. Then had to calculate vertex position in world space which took in model and position.

For the fragmentation shader in Phong.frag, First calculated the ambient color which was just the product of object color and 0.1. Next, I had to calculate the diffuse color which calculated the direction vector between the light source and the fragment's position. Then calculate the diffuse impact of the light on the current fragment to find specular color.

Implementing the GetViewMatrix in camera.h was pretty straight forward. I needed to implement a cameraTarget which uses the camera vector attribute ‘position’. Secondly, created a camera direction which used Camera target against the ‘position’ attribute. Then created the up axis to be able to view the y-axis. Finally, I return the matrix using ‘lookat’ which took in position attribute, camera target and the up variable.

Setting up the projection matrix in main.cpp was pretty straightforward, all I did was use the perspective attribute from GLM.

4. Results

The output of the file is a graphics window and when clicking on “WASD” you can adjust the camera angle.