Faculty of Science

Course:	CSCI 4110U: Advanced Computer Graphics
Lab Assignment:	8
Topic:	Specular shading

Overview

In this lab, you will build upon last week's lab. You are going to add multiple light sources, and specular shading, to the scene.

Note: If you were not able to get Lab 07 working, simply create a project (using the Draw Sphere example as a base) that draws two motionless spheres.

Instructions

First, you should download the base project from the repository is given, below:

- https://github.com/randyfortier/CSCI4110U_Labs

Lab 07 should have two celestial bodies animated with a single light source and Lambertian shading. In this lab, we will create two light sources, replacing the previous ones:

1. A point source light. This will represent the moon, and will be moved along with the moon during your simulation.
2. A directional light. This will represent the sun, and will be of much greater intensity.

We will also be adding specular lighting, in order to see the effects of the two light sources (including one moving light source) on our scene. You will generate two sets of shaders for this program, allowing someone to switch between them by toggling a Boolean variable (e.g. `useBlinnPhong`). Both will use normal interpolation, and both will require the lighting information be passed in (light position for the point light, and light direction vector for the directional light). The two shading models to be implemented are:

1. Phong (ASD) shading
2. Blinn-Phone shading

Modify the time step and camera position so that it is possible to see the solar and lunar eclipses in action.

Need an Extra Challenge?

If you feel like this is too easy for you (e.g. you have some background with OpenGL), you are welcome to try one of these variations (presented in order of difficulty):

1. Add a Bloom effect to the fragment shader, to make the moon glow.
2. Add a Bloom-filtered sun sphere at the sun's position.
3. Add shadow rays/feelers to make shadows of the moon on the Earth (and vice versa)

Lab Report

To demonstrate to the lab instructor your completion of this laboratory assignment, merely show them the modified OpenGL program.