CS 432 – Interactive Computer Graphics

Assignment 5

The goals of this assignment are

1. Lighting
2. Materials

Requirements

For each programming assignment you should submit a **zip file** containing the code (and MSVS/Xcode project/solution files) and a **report** stating: what you did; how you did it; any particular features you want to draw attention to; any problems with the program that you know about.

In addition:

1. Your code must be original. You may discuss approaches with your colleagues but not how to code it.
2. You must use GLSL (shaders) and vertex buffer objects (VBOs)
    a. Therefore you **may not** use glVertex*, etc..
3. Make sure you program complies and runs on either a Windows 7/8 machine with VC++, freeglut and glew or on a Mac with OSX and Xcode

What to Submit

For your submission, zip together the following.

- A README file with instructions on how to compile and run your program(s). This should also include the environment in which you are developing and running (OS version, Developing Environment version, Shader Version) and any issues/features you want to draw attention to.
- Your source files
- Your file(s) containing rules for compiling and running your program(s) (i.e. project files, make files, etc...)
- **A short screencast video that you talk over (5 minutes max)**

Overview

In this assignment you will build a small world consisting of three objects each with different material properties. You will also have two different light sources to "illuminate" the scene.

Objects

1. Your recursively built sphere
2. Your cube
3. A ground plane

Lights:

1. One light will be a *directional light* that acts like a "sun". It rises in the east and sets in the west. You can decide what you consider "east" and "west".
2. The second light is a "flashlight". We will implement this as a spotlight that is always positioned at the center of the camera pointed in the direction of the camera.

Interaction:

You should have your "flying camera interface" as specified in previous assignments. In addition, if the user hits the spacebar it will toggle the flashlight on and off.

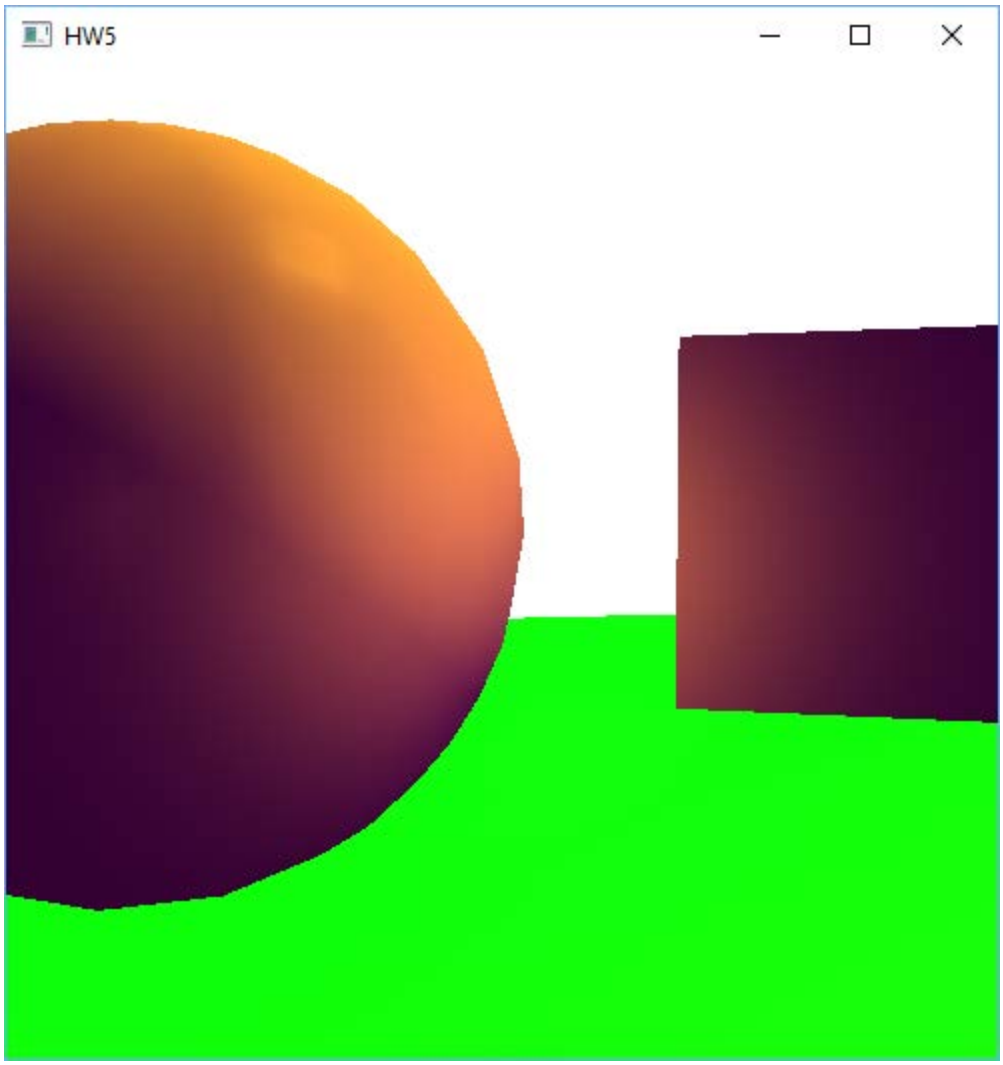
The directional light should also change its direction via a timer to simulate moving around the scene.

Additional Details:

1. Lighting/shading of the sphere should be done in the vertex shader
2. Lighting/shading of the ground plane and cube should be done in the fragment shader.
3. You may want to consider braking the ground plane into several triangles in order to have better rendering.

Grading

- Draw Scene (30pts)
- Directional Light (20pts)
- Flashlight (20pts)
- Interaction (20pts)
- Vertex Shading for sphere, Fragment shading for others (10pts)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