

# CS6610 PROJECT 3 – Shading

## Varsha Alangar

### Implemented features:

All the three steps of the requirements as well as the additional requirements for CS6610 listed in the Project 3 has been implemented.

1. The triangles of the teapot are displayed using the *glDrawElements* call. As a result, I obtained a *flat shaded teapot*.
2. A *normal* buffer was generated and the normals sent to the vertex shader where they were transformed using the inverse transpose of the model view matrix. The result was normalized to clamp the negative values between 0 and 1.
3. *Blinn shading* was implemented with the material properties hard-coded and the light position as a uniform parameter.
4. The *light rotates* around the teapot object using a combination of key and mouse input.

### Using the above implementations:

*CTRL + Left mouse button*: Rotates the light around the teapot object.

As in the previous assignment:

*Left mouse button*: Hold the left mouse button down and drag the cursor to change the camera angle (rotation)

*Right mouse button*: Hold the right mouse button down and drag the cursor to change the camera distance (zoom-in and zoom-out)

### OS Used: Windows 10

### IDE: Visual Studio 2013

### Libraries and dependencies:

All the libraries used in the project are included under the *lib* folder within the zip file. They include: *opengl32.lib*, *glu32.lib* and *freeglut.lib*

All the header files are included within the GL folder contained in an include folder within the zip file. They have been included as *#include <GL/gl.h>*, *#include <GL/freeglut.h>*, *#include <GL/vmath.h>*, *#include <GL/glfw3.h>* in the code. All the header files from *cyCodeBase* recommended for use are included in the *cyCodeBase* folder in the same include folder that holds the GL folder.

All the DLLs required are placed in the Debug folder of the zip file.

The source code itself was created and compiled in Visual Studio and is available as *main.cpp* in Shading folder along with the solution.

The executable is available in the Debug folder.

**Requirements to compile the project:**

Unzip the project zip file and open the solution in Visual Studio.

In the properties of the project, link to the libs, dlls and header files. Make sure to choose “All configurations” in the properties window before adding the dependencies.

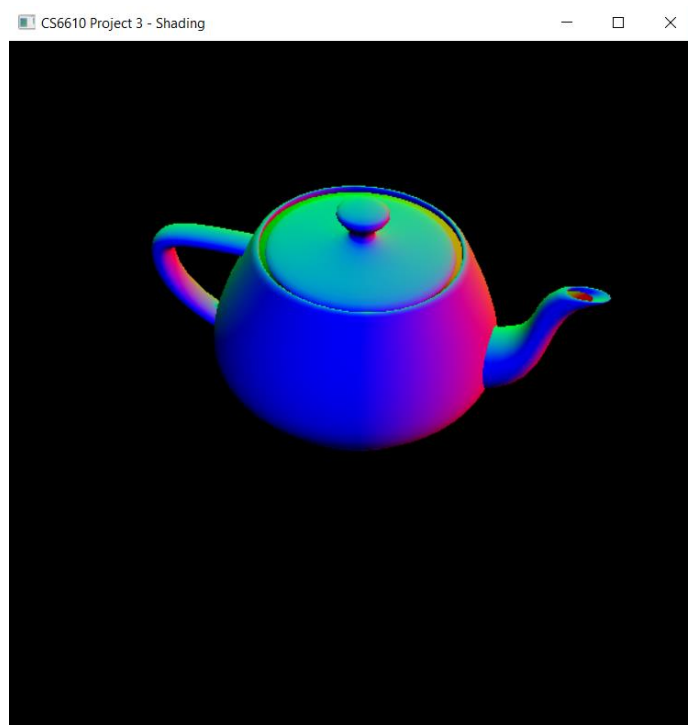
As mentioned earlier, all the required libraries, dlls and header files are available in the lib, Debug and include folders respectively of the zip file.

**Please let me know if there is any issue in running the code.**

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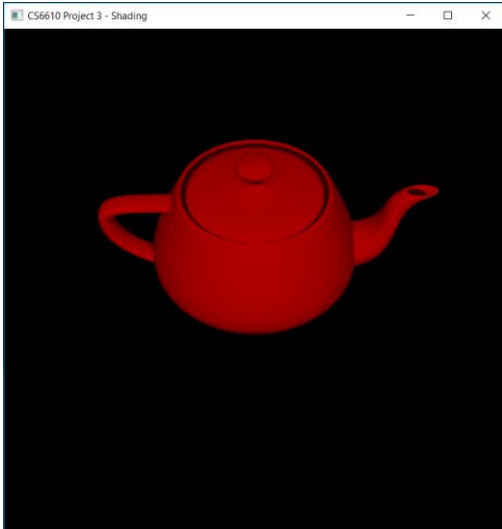
**Screenshot of output:**

After Step 2: Surface normal as color

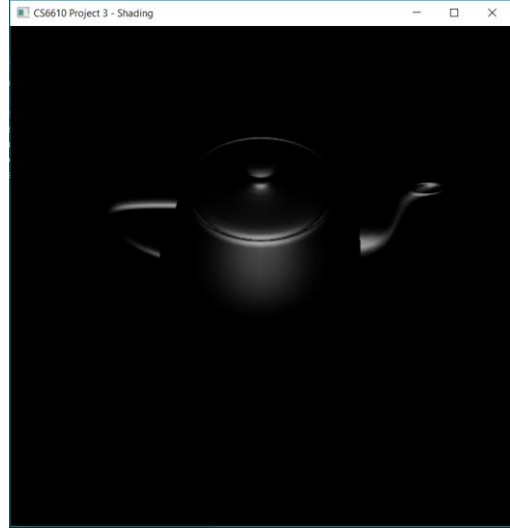


After Step 3: Blinn shading:

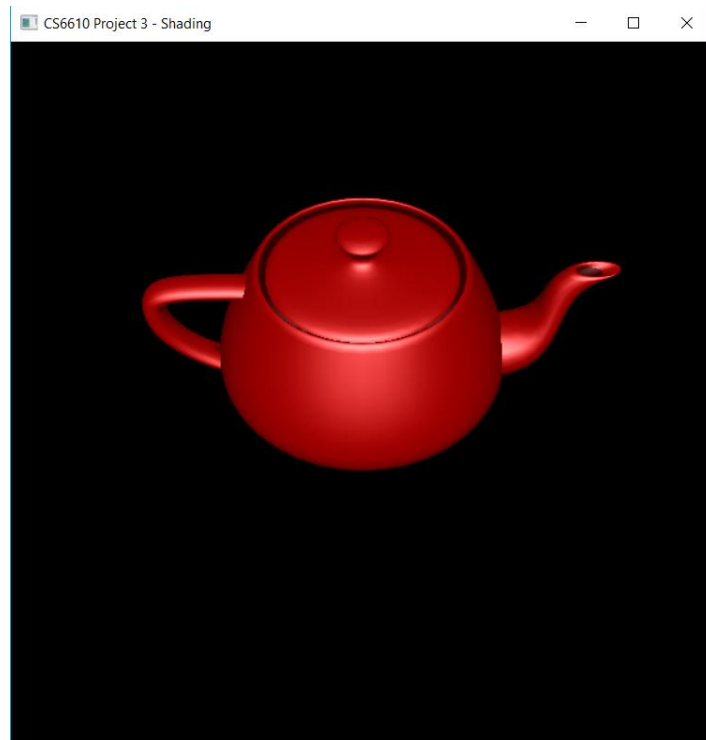
Ambient + Diffuse:



Specular:

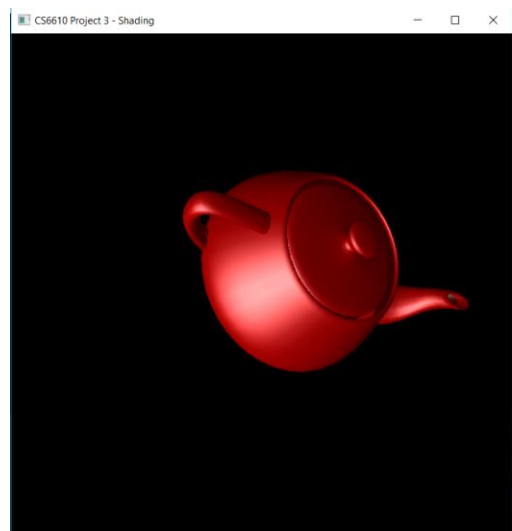
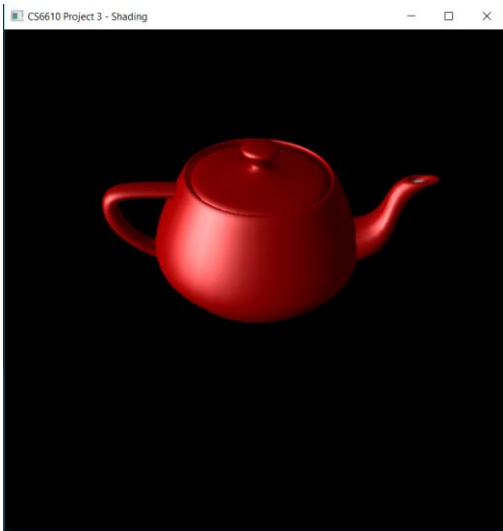


Ambient + Diffuse + Specular:



Additional Requirement: Lighting from a different direction:

- Rotating teapot with same light direction:



- Rotating lighting with teapot remaining the same:

