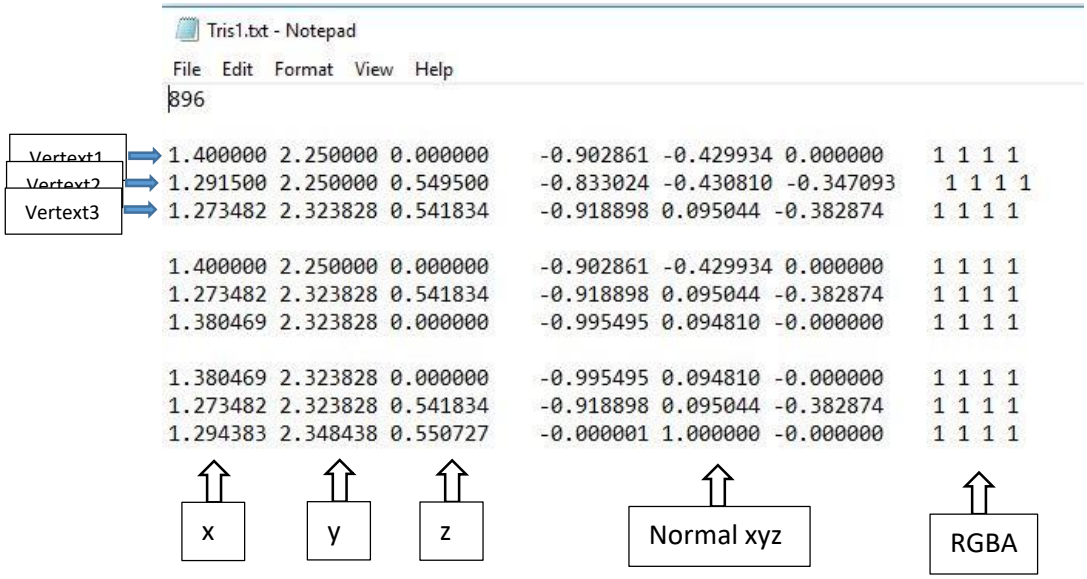
COSC4370 – Homework4

In this homework, you will learn light and shading in modern OpenGL.

You will give another text file – Tris.txt which contains the vertex coordinates of each triangle(separated by a blank line) , its corresponding normal and colors. The first line is the number of triangles.



And then you need to render 4 figures of different shading.

You need to use keyboard to control the switch between different results. When you press “1”, the window will show the result of first figure and “2” for the second one and so on.

The parameters are as followings:

For all results, we need to add three directional light:

1) Color: (1, 0.1, 0.1) Direction: (0, -1, 0)
2) Color: (0.1, 1, 0.1) Direction: (-1, 0, 0)
3) Color: (0.1, 0.1, 1) Direction: (0, 0, -1)

The material information are as followings:

ambient	diffuse	specular	Specular power
0.1	0.3	0.6	3

Four shading figures:

1) Shading model: Gouraud

Model Transformation:

Translate (-1) in y-direction.

Orthographic projection:

left	right	bottom	top	near	far
-2.4	2.4	-1.8	1.8	1	50

Camera transformation:

Eye position			Optical center			View-up vector		
x	y	z	x	y	z	x	y	z
10	10	10	0	0	0	0	1	0

2) Shading model: Gouraud

Model Transformation:

1. Rotate 45 degrees about x-axis.
2. Translate (-1) in y-direction.

Perspective projection:

field of view	aspect	near	far
50 degree	4/3	1	50

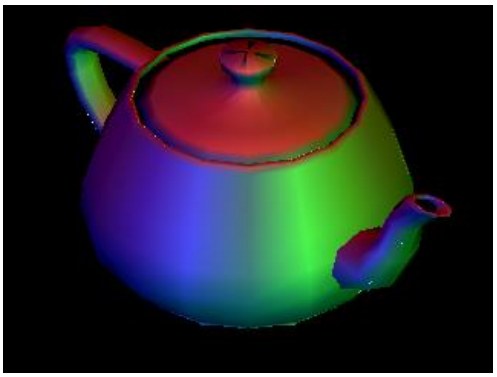
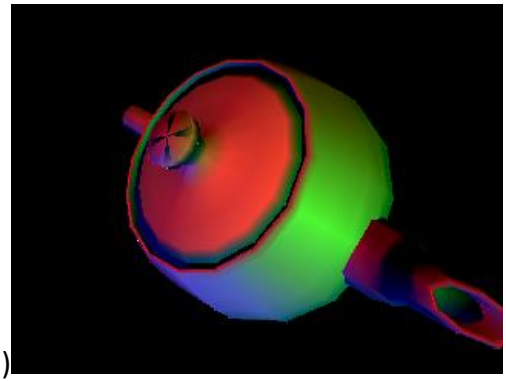
Camera transformation:

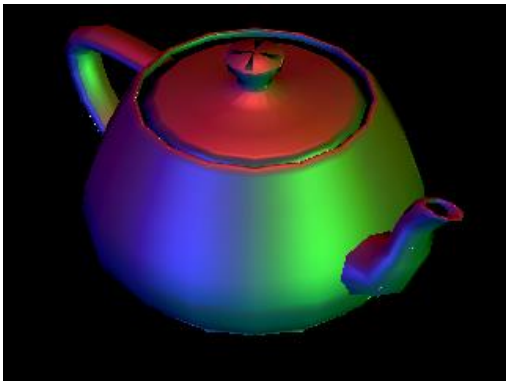
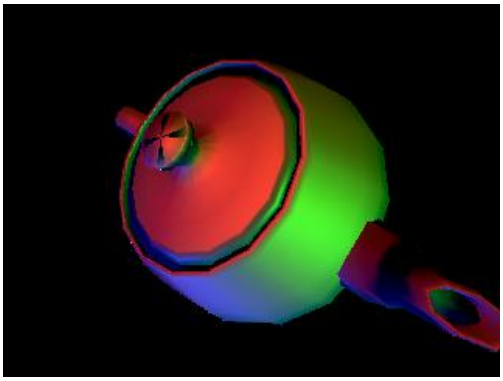
Eye position			Optical center			View-up vector		
x	y	z	x	y	z	x	y	z
3	3	3	0	0	0	0	1	0

3) Shading model: Phong
The other parameters are same to (1).

4) Shading model: Phong
The other parameters are same to (2).

The results look like these:

1)  2) 

3)  4) 

The deadline is 11:59pm Oct 24th, 2017.

Instruction:

1. Put the contents in a zip file(FileName: “firstname_lastname_HW4.zip”).
2. Please also name the window as “firstname_lastname_HW4.zip” in your codes.
3. Upload the zip file on blackboard by deadline.
4. Late submissions incur penalty. (Refer to late submission policy from the lecture of class introduction).
5. All coding must be done using C/C++.
6. You must use the modern OpenGL way which you need to write the shader by yourself.

Submission Instruction:

7. You need to submit the source code, like C/C++ header and source files. Also, you need to submit a snapshot of your result. (The print of your entire screen to make it different from others, refer to previous homework).
8. The TA will have the OpenGL (including Glut or Freeglut , Glew, glfw and glm) setup in her development environment and will paste your code and

run it. So do not use any other third party libraries as the TA will not have access to it.

9. Include a readme file to describe any required set up or instruction to run the code if necessary.

Tips: There is discussion board built in blackboard. If you have any question, you can post your questions there. And everyone is welcome to answer it.