

CSE 2012 Fundamentals of Computing II

Spring 2008

Lab handout for Week of March 17

Objectives

1. Learn how to use basic OpenGL computer graphics using the GLUT API
2. Choose another previous CSE tutorial to pick up additional knowledge appropriate for your final projects
3. Have fun!

Prelab activities

1. Review the following online tutorials:
<http://www.lighthouse3d.com/opengl/glut/index.php?2> (and links on the left)
<http://nehe.gamedev.net/> (OpenGL tutorials on the left)

In-lab activities

1. (1 point) Report to lab **on time**. Attendance will be taken at the scheduled lab time.
2. Briefly refamiliarize yourself with the online GLUT tutorials, especially the ones from LightHouse 3D.
3. Based on tutorial material, draw a green triangle in a window of size 300X300 offset from the upper left corner of the screen by 150X150 pixels.
4. Copy the code from #3 into a new file. In this new file, add the appropriate code such that when the user resizes the window the triangle has the proper proportions.
5. Now, add to the program from #4 code such that when the user presses Escape the window closes. Also add the corresponding code such that when the user hits the “q” character is also closes.
6. Copy the code from #5 into a new file (3rd file this lab). Add mouse functionality such that the triangle changes color when you click different mouse buttons. Also, add a function such that when the mouse moves the color changes in some way (either as mentioned in the tutorial or in a random way you decide).
7. For this step, we will go back to the triangle code from #5. Copy this into a new file (4th file) and add a menu to this program to allow the user to change the color of the triangle from a collection of options you provide. Test this new functionality.
8. Now, add the text “CSE2012” to the display using a bitmap font.

9. Add two more shapes of your own choosing to the scene (e.g., the famous GLUT teapot, a square, an octahedron, etc.). Information can be found in the second tutorial on the NeHe site.
10. Add interesting colors to at least one of your new shapes. Information can be found in the 3rd tutorial on the NeHe GLUT tutorial.
11. Finally rotate your objects, one along the X axis and one along the Y axis, as discussed in the 4th NeHe glut tutorial.
12. (4 points) Flag down the lab TA and have them examine and check off that you have a basic understanding of the codes up until at least #8.

Post-lab:

Write and submit (in your dropbox) a lab report with the following sections.

- (6 points) Code for the program resulting from step #5 in lab.
- (6 points) Code for the program resulting from step #8 in lab.
- (6 points) Code for the program resulting from step #11 in lab.
- (7 points) Read either the Qt tutorial from Prof. Flynn or the GTK+ tutorial from Prof. Izaguirre. Submit a roughly one page report on either, what you learned, and how it may impact your final project. GTK+ and the Glade2 designer are available on the machines downstairs, and Qt is available in the windows lab or on your own machines. Comment on what features you like in GLUT/Qt/GTK+ and what features you would include if you were to develop your own API.

Code is expected to be well-commented, and the narrative portions of your report must be written professionally (*i.e.*, complete sentences, correct grammar and punctuation, consistent tense and voice, formal tone).