Homework #4 - Reading Meshes

README.txt: Be sure to include each piece of the README as required from project #2. If you need, refer to that pdf for a more complete list of required components. In addition, answer this question: Which of the meshes are visible on the screen? Check the webpage for 7 simple meshes and report which are visible and which are not.

In this project you will read in a mesh from a file and display it on the screen. The mesh will have the following format. n and t will be replaced by integers in the file. x_i, y_i and z_i will be floats or real values in the file. Lastly, t_i will be a 0-based index into the list of vertices (and thus an integer) in the file.

```
Number of vertices: n
x_0    y_0    z_0
x_1    y_1    z_1
.
.
.
x_{n-1}    y_{n-1}    z_{n-1}

Number of faces: t
t_{a0}    t_{b0}    t_{c0}
t_{a1}    t_{b1}    t_{c1}
.
.
.
t_{a t-1}    t_{b t-1}    t_{c t-1}
```

A simple example file is shown at the end of this document.

1. Change your orthographic projection to gluOrtho2D(-1,1,-1,1).
2. Provide a method to enter the filename such that it does not require you to use the console window. Use glui or the keyboard function to accomplish this. Be sure to mention this in your read me.
3. Correctly read in files (include error detection for bad file names). Your program should not crash from this user input.

4. Once read, display the mesh by throwing away the z component. You must then draw lines connecting the vertices of each triangle face. Simply use glVertex2f(x,y) in place of each vertex.

5. Use C:\MODELS as a default directory for the mesh files. You may code extra logic to check this directory first or second, but you must at least look in this directory.

To receive a few points of extra credit, implement these features

1. Allow the user to switch to "special" display mode. In this mode, instead of plotting (x, y) and throwing away the z, plot $(-2 * x/(z - 2), -2 * y/(z - 2))$. What do you think this is doing? Respond in README.

2. Incorporate a toggle to do backface culling. Be sure to mention how to do this in your README.

A sample mesh file:

```
Number of vertices: 4
-.5 -.5 0.49
0.5 -.5 0.49
0    .5    0.49
0    .5   -.49

Number of faces: 4
0 1 2
1 3 2
3 1 0
0 2 3
```