

ICS 280 F02: Computer Graphics
Programming Assignment 1
Gopi Meenakshisundaram

Assigned: Oct 1, 2002

Due Date: Oct 8, 2002 11:59pm.

PROJECT GOAL: Read a model file and display the model.

Write an OpenGL program to

1. Open a window using GL utility toolkit (GLUT).
2. Place the center of projection at the origin and the viewing direction along the negative Z axis.
3. Draw a model consisting of a set of triangles using OpenGL functions such that the axis aligned bounding box of the object is inside the viewing frustum along the negative Z axis. To achieve this, compute the center and the dimensions of the axis aligned bounding box of the object. Translate the object along the negative Z axis to an amount equivalent to approximately 2.5 times the length of the largest dimension of the bounding box. Assuming that the center of the object is at (X, Y, Z) , and the largest length is L , the total translation should be $(-X, -Y, -(Z+2.5L))$.
4. The object is given in “.ply” format using an input file, and the format is as follows (V: number of vertices, T : number of triangles):

```
int <# of vertices>
float[3]: x1 <space> y1 <space> z1
float[3]: x2 <space> y2 <space> z2
.
.
.
float[3]: xV <space> yV <space> zV
int <# of triangles>
int[3]: v11 <space> v12 <space> v13
int[3]: v21 <space> v22 <space> v23
.
.
.
int[3]:vT1 <space> vT2 <space> vT3
<eof>
```

The triangles are denoted by the indices of each of the triangle vertices in the list of vertices given above the list of triangles.

Your data structure should store these models in a similar way (number of vertices, array of vertices with three vertex coordinates, number of triangles and the array of three integers giving the indices of the vertices into the vertex array data structure).

Have classes for vertices, triangles, and model.