

ICS 280 F02: Computer Graphics
Programming Assignment 2
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Assigned: Oct 8, 2002

Due Date: Oct 15, 2002 11:59pm.

PROJECT GOAL: Interact with the model.

I. Rotate and translate the model using GLUT routines. (Handle Keyboard inputs, left/middle/right mouse buttons and x and y motion of the mouse using GLUT input handling routines.)

1. Type Z and any subsequent use of left mouse button along with mouse motion should rotate the object around itself.
2. Type X and any subsequent use left mouse button along with mouse motion should translate the object along the viewing direction. (Zooming in and out)
3. Type C and any subsequent use the left mouse button along with mouse motion should translate on a plane parallel to the image plane.
4. While rotating (Z), make sure that the center of the model is not affected, and the axis of rotation is passing through the center of the model, parallel to the image plane and perpendicular to the 2D motion of the mouse on the image plane.
5. While translating along the viewing direction (X), mouse motion going up means zooming IN and motion going down means zooming OUT.

II. Enhance the face (triangle) class of the model to include the normal vector. Make sure you store *unit* normal vector.

III. Enhance the vertex class to include the list of indices of the triangles (in the triangle list of the model) that are incident on the vertex. (Integer array. Remember you don't know the length before hand. Have a static length, say, 10. If the number of incident triangles is more than 10, generate an error message and reallocate accordingly. Do not bail out. Handle the exception.)

IV. Enhance the vertex class of the model to include the normal vector of the vertex. This normal vector has to be computed as an average of the normal vectors of the triangles incident on the vertex. Make sure you store a *unit* normal vector.