Homework 2 – 3D Transformation

Source code due Oct 3rd , Demonstration on Sept 30th or Oct 3rd.

In this assignment you will add interactive 3D transformation to your homework 1 program. A new template program will be given that accepts mouse input. The mysterious shape from the first homework is already drawn there. You need to implement the following modes of operations

1. Scaling: The user clicks on one point (denoted as P) on the screen (without releasing the button) and then drag the mouse around. The distance between Point P and the mouse's current position defines the scaling factor. The scaling is uniform in all three dimensions.

2. Translation: The user clicks on a point, and drag the mouse, the shape will translate accordingly.

3. Rotation: Drag mouse up/down for rotation about Y, left/right for rotation about Y, right mouse button + drag to rotate about Z.

4. Zoom: this is achieved by changing the focal length of the projection matrix, press 'g' to increase the focal length (e.g., zoom in) and 'h' to decrease.

In all cases, the transformation effect should be shown interactively until the mouse button is released. To enter different transformation, keyboard strokes are needed: 's' for scaling, 't' for translation, and 'r' for rotation. It is also useful to Press 0 to reset the transformation.

Note, you are **not allowed** to use OpenGL transformation functions to move/zoom the object around.

Grading:

Your grade will be based on your program's functionality (whether or not it works under different settings). The weights for different components are as follows:

Correct scale transformation	20%
Correct translation	20%
Correct rotation	30%
Correct zoom	10%

Submission and Grading

You are required to submit all the java source code to the CS online submission system before the midnight of the due date. Your source code should include a brief readme file explaining the file/class structure, in particular the location of your main function. The instructor reserves the right to compile and run your submitted code to determine your final score. In addition, you will need to demonstrate your program to the TA.