Assignment 5: Transformation of Vectors

The coordinates of 8 vertices of a rectangular solid are:

V1: (0, 0, 0),	V2: (3, 0, 0),	V3: (3, 0, 2),	V4: (0, 0, 2)
V5: (0, 1, 0),	V6: (3, 1, 0),	V7: (3, 1, 2),	V8: (0, 1, 2)

Each vertex forms a point vector. If the rectangular solid, and hence all the 8 point vectors, rotate 60 degrees about z-axis and then translate 2 units along x-axis, 4 units along y-axis, and 1 unit along z-axis, determine the coordinates of 8 vertices of the geometric solid after transformation, using the combined rotation-translation transformation matrix.

Requirements

1. Write a program using a language of your choice to perform the transforms.

2. Demonstration: display the coordinates before and after transformation. **(60%)**

3. At demonstration, the coordinates of 8 vertices of another rectangular solid, with different dimensions and position, will be provided, and you will run your program to transform (both the rotation and translation remain the same) the geometric solid. **(40%)**

4. Optional: Draw the 3-D rectangular solid before and after transformation within your program. **(Bonus mark 20%)**

5. Results for coordinates should use 4 decimal places where applicable.

6. Demonstration is due Dec. 6, 2012. The following rule applies to late assignment: One day delay results in 20% mark deduction; two day delay results in 40% mark deduction; three day delay results in 60% mark deduction; a delay of more than three days results in 0 mark.