CMSC 405 Week 5 Homework

1. Show the results and intermediate steps for a translation of (50,30,-60), a rotation of 115 degrees about the z-axis applied to a starting point of (95,-195,40). You should use the output of each matrix multiplication as the input to the next transformation. You should use 4x4 matrix math for your calculations. Show that the composite matrix resulting from the combination of all 3 transformation will yield identical results if applied to the original input points.

2. Using quaternions, determine the final transformed location of point P1= (-12, 32, 50), after a 45-degree rotation about the z-axis. Be sure to show your work including the quaternion values for all steps.

3. Using quaternions, determine the final transformed location of point P1= (10, 7, -30), after a 90-degree rotation about the x-axis and a 75-degree rotation about the y-axis. Be sure to show your work including the quaternion values for all steps.

4. Using the examples and materials provided in week 5, design and create your own unique 3D graphic scene. Your scene should include both existing OpenGL objects and your own 3D shape creations. You should use glTranslatef(), glScalef() and glRotatef() functions.

Deliverables: You should submit a well-organized, word document that includes the results for each question of this assignment. You should also include a screen shot in the word document showing your 3D graphic scene. You should name your word assignment "yournamehw5.doc" (or .docx or .pdf). You should also submit the .cpp code used to generate your 3D scene. You can name your code file yournamehw5.cpp.