Assignment 5

Tom Kelliher, CS 320

Due Apr. 5

Each of the following four problems is worth five points.

1. Show that two-dimensional translation is commutative.

2. For the two-dimensional case, write the sequence of OpenGL/C++ code necessary to construct a modelview matrix that will rotate vertices 30 degrees about the point $(3, 5)$.

3. Three vertices determine a triangle if they do not lie in the same line. Devise a test for collinearity of three vertices for the two-dimensional case.

4. The current transformation matrix is the product of the projection and modelview matrices:

$$\text{CTM} = \text{P} \times \text{MV}.$$

We have seen this paradigm expressed over and over again in our programs. Why do we send the projection and modelview matrices separately to the vertex shader, rather than simply sending the current transformation matrix to the shader?