Andrew Seba  
Math/Phys 191

Matrix Rotations Lab

# Introduction:

# Methods:

Sense we’ve defined how to do matrix multiplication before we just need to know how the rotation axis matrixes are defined to rotate around the different axis. Rotating in 2D is simply a 2x2 matrix defined like the following

If we think of this of rotating around the z axis in a 3D world it would look like the following 4x4 matrix

Rotating around the x axis we can use this matrix to multiply our vertex by

Rotating around the y axis we can use this matrix to multiply our vertex by

# Results:

For this object of 2 vertices (0,0,0) & (1,0,0) we can rotate around each axis so if we rotate 90 degrees around the z axis we will result in:  
 (0,0,0) & (0,1,0)

If we rotate that new object 90 degrees around the x axis we will result in:  
(0,0,0) & (0,0,1)

If we rotate that new object by 90 degrees around the y we will result in:

(0,0,0) & (1,0,0) right were we started again.

# Conclusion:

We can rotate objects around any axis anywhere with any rotation axis, in this lab we only worked on the major axis, but we can move those to anywhere we would like.

# Post-Lab:

1. The rotations have always been 2D per axis. But in a 2d world we are only viewing the object from the z direction. To rotate an object we would only have to apply the z axis rotation.
2. Move the rotation axis to the origin then do the rotation then move it back.
3. We need to move the rotation axis to the origin of the world. Then we need to flatten the rotation into the z,y plane by rotating it until it is parallel with the z,y plane. Then do the same for the x,y plane. Rotate the amount we want to rotate around the z. then reverse the 2 previous steps and move the rotation axis back to where it was.