Homework 1, due Wed Sep 7, 2016

Hand in your solution on RPILMS. You may work in teams of 2. Each team should submit their solution under only 1 student's name, but mention both people at the top of the submission. The other student's submission should just name the lead student. (This makes it easier for us to track things and to avoid grading it twice.) As for formats, we'll take (at least) a scanned image of a neatly handwritten page, raw text, PDF, and MS Word.

1. *(4 pts)* One graphics pioneer was Ivan Sutherland. Name an influential tool that he created and an influential algorithm that he helped create.
   1. Tool: SketchPad – Sketchpad is considered the ancestor of CAD programs and is also seen as a major breakthrough in computer graphics. It allowed the user to sketch different designs and featured window drawing and clipping algorithms which even allowed for zooming.
   2. Algorithm: Cohen-Sutherland computer graphics line clipping algorithm – the Cohen-Sutherland algorithm is used for line clipping. It divides 2d space into 9 regions and determines which lines and line segments are visible in the viewport.
2. *(4)* Consider these 3-D vectors: A=(0,4,2), B=(1,2,3), C=(8,7,9). Compute:

A.BxC AxB.C

1. *(4)* *(This is another a test of your linear algebra knowledge. Feel free to refer to books to find the correct formulae.)*

Suppose that we have a plane in 3-D thru the points A(3,2,0), B(2,2,0), and C(0,1,1).

* 1. What is its equation, in the form *ax+by+cz+d=0* ?
  2. Consider the line L thru the points O(0,0,0) and P(1,1,1). Where does this line intersect the plane?

1. *(4)* Modify the program in <http://www.cs.unm.edu/~angel/WebGL/7E/CLASS/square.html> , which calls several other files, to display shapes that are the first initials of the last names of the team members.

I'll give more details about how to do this in class on Wed Aug 31.

Files included separately, changed code also pasted below (open square.html with any webbrowser):

var vertices = [

vec2( -0.9, -0.9 ),

vec2( -0.9, -0.6 ),

vec2( -0.8, -0.6),

vec2( -0.8, -0.9),

vec2( -0.9, -0.7),

vec2( -0.9, -0.6 ),

vec2( -0.7, -0.6 ),

vec2( -0.7, -0.7 ),

];

1. *(2)* Do exercise 1.1 from the textbook, page 37. TODO: Read pages 1-38
2. *(2)* Do exercise 1.8 from the textbook, page 38.