

CIS 441/541: Project #1E

Due October 24th, 2016 (which means 6am October 25th)

Worth 6% of your grade

Instructions

- 1) Download reader1e.cxx. It extends the previous “GetTriangles” routines by setting the normal at each vertex.
- 2) Download the geometry file “proj1e_geometry.vtk”.
- 3) NOTE: there are new data members for the Triangle class.

```
class Triangle
{
public:
    double    X[3];
    double    Y[3];
    double    Z[3];
    double    colors[3][3];
    double    normals[3][3];
};
```

Normals is indexed by the vertex first and the dimension second.

```
int vertexId = 0;
int x = 0, y = 1, z = 2;
normals[vertexId][y] = ...;
```

- 4) Download the file shading.cxx. This file defines a data structure that contains the parameters for shading.
- 5) Extend your reader to do Phong shading. Use two-sided lighting for the diffuse component, but only one-sided lighting for the specular component.
 - a. Note: we will do shading as we rasterize, and use a view direction of (0,0,-1). This is at best approximately correct, and we will re-visit this decision in 1F.
- 6) The correct image is posted to the website

When you are done upload the following to Canvas:

- your code
- a screen shot of the differencer program congratulating you
- if there are differences, send me the differenceMap.png that differencer produces and image output of the program.
 - o Note: incorrect images are likely to earn less than half credit. I'd rather have correct submissions late than incorrect submissions on time.