DT285 Programming Lab 4

Implement the DisplayFaces() as describes below

void DisplayFaces(Mesh& m,const Affine&A, constMatrix& P,const Vector&c) –
draws mesh m as asolid; i.e.,only the faces of the mesh are drawn.The affine transformation A specifies the transformation from the meshs object space to OpenGL world space.After the mesh vertices have been transformed to world space, the perspective projection P should be applied to the vertices before rendering the mesh faces. Only faces that are visible with respect to E=(0,0,D) should be rendered.Each visible face should be drawn using diffuse shading (see below), assuming a color of c at normal incidence.

Backface culling should be used to determine if a mesh face should be rendered or not.
That is, face f will be drawn if

$$\vec{n} \cdot \overrightarrow{PE} > 0$$

where n is the outwardly pointing surface normal for face f, P is any point on f and E is the center of projection.

For the diffuse shading of each visible mesh face, assume that the light shines in the direction L = (0,0,1) ; i.e., parallel to the z axis. So if the color you choose for the mesh faces is (R,G,B), then the face f should be drawn using the color

$$(\mu R, \mu G, \mu B), \quad \text{where} \quad \mu = \frac{|\vec{L} \cdot \vec{n}|}{\|\vec{L}\| \, \|\vec{n}\|}$$

and n is the outwardly point surface normal for face f.