

1. In a previous tutorial we discussed how important the polygon normal (an outward pointing vector that is orthogonal to the plane that the polygon lies in) is. If we are given the set of points (in an array, let's say) that define the polygon, how do we compute the normal?
2. One problem that arises frequently in games / graphics is to compute the shadow of an object. For example if an aircraft is travelling over a desert we might want to show its shadow due to the sun on the terrain. The problem here, in terms of vectors, is one of projecting a point (on the outline of the aircraft) onto a more-or-less flat 2-D plane.

Determine how a given point gets projected onto a given plane when given the angle of projection as a vector. You may assume that you are given the plane's normal, \mathbf{N} , and a point \mathbf{p} on the plane; let the direction vector that the sun makes with the aircraft be \mathbf{D} .

Hint: see *Oblique Projections onto the Plane* [here](#).