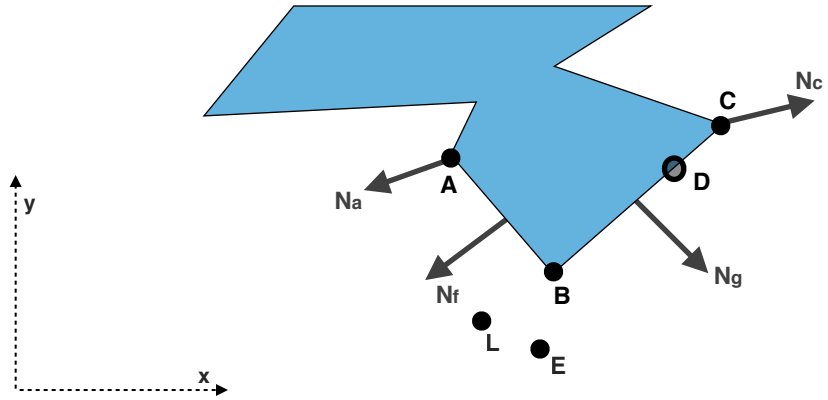
CPSC 314, Written Homework 3

Out: 2 March 2016
Due: 9 March 2016 2pm (hand in at start of lecture)
Value: 4% of final grade
Total Points: 100

For all the following questions, refer to the figure and parameters below. Vertices are always to be shaded using their own normal (example, C must be shaded using N_c). Show your work. Remember to normalize all vectors used in lighting calculations!

- B = (2, 3, 0)
- C = (8, 12, 0)
- D = (6, 9, 0), not a vertex
- N_a = (-0.5, -0.3, 0)
- N_c = (0.9, 0.5, 0)
- N_f = (-1, -1, 0)
- N_g = (1, -1, 0)
- eye point E = (1,-2,0)
- light position L = (-1,0,0)
- ambient light color I_a = (0.5, 0.1, 0.5)
- light color I_l = (0.9, 1, 1)
- diffuse material color k_d = (.3, .8, .2)
- ambient material color k_a = (.5, .2, .5)
- specular material color k_s = (0.5, 1, 1)
- shininess exponent k_{se} =10



1. (4 pts) Compute the normal at point B using per-vertex normals, interpolating between the provided normals for face F and face G. Use equal weight average normal (no multiplier factors).
2. (50 pts) Compute the ambient, diffuse, specular, and total illumination at points B, C, and D using Phong lighting and the flat shading model. Note: for flat shading, use the rightmost vertex on each face.
3. (18 pts) Do those computations using the Gouraud shading model.
4. (28 pts) Do those computations using the Phong shading model.