

Lab 4 – CSC 572

Due ~one week from when assigned

This project is to be worked on in pairs or individually (any pairs you'd like)

Objective: Complete the Catmull-Clark Subdivision code given to you

Using the base code provided as a starting point, complete the code to re-position the vertices to the correct position given the Catmull-Clark subdivision rules:

- Subdivision for arbitrary polygon
 - For each face, add a face point
 - Set to centroid of original points
 - For each edge, add an edge point
 - Set to average of 2 neighboring face + 2 original endpoints
 - For each face point, add edges to all new edge points
 - For each original point P
 - F = Average all n faces points touching P
 - R = Average all edge midpoints touching P
 - P' = $(F + 2 * R + (n - 3)P) / n$

The base code currently supports subdividing and drawing quadrilaterals for up to 4 levels of subdivision. Currently the code places the new face points at the correct location, but places edge points at the mid-point of the previous edge and does not move the original vertices. Please modify the code to position the vertices correctly, given the above rules.

Note that for border and corner vertices, please leave them in place (for corners) and at the mid-point of the appropriate edge (for border vertices).