

2 to 1 Meshing Logs

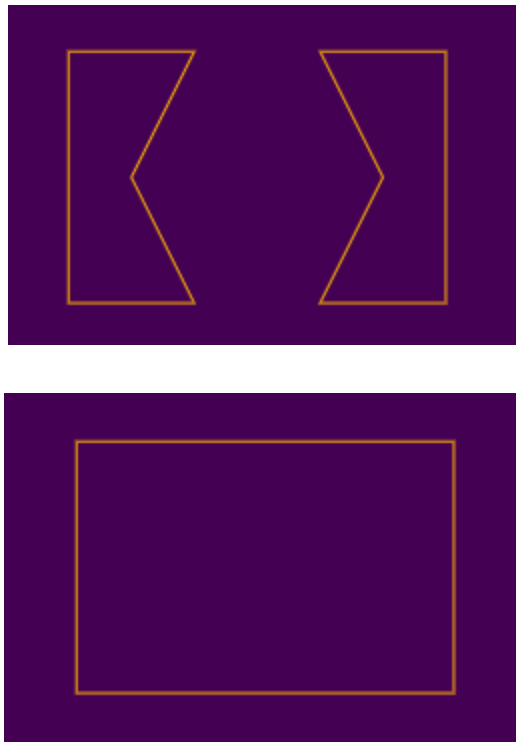
General Idea

When meshing 2 to 1 contours, split work in two:

- outside points that correspond to convex hull (but use indented points too).
- inner points which should only mesh to the two midpoints in the mid plane.

Test Cases

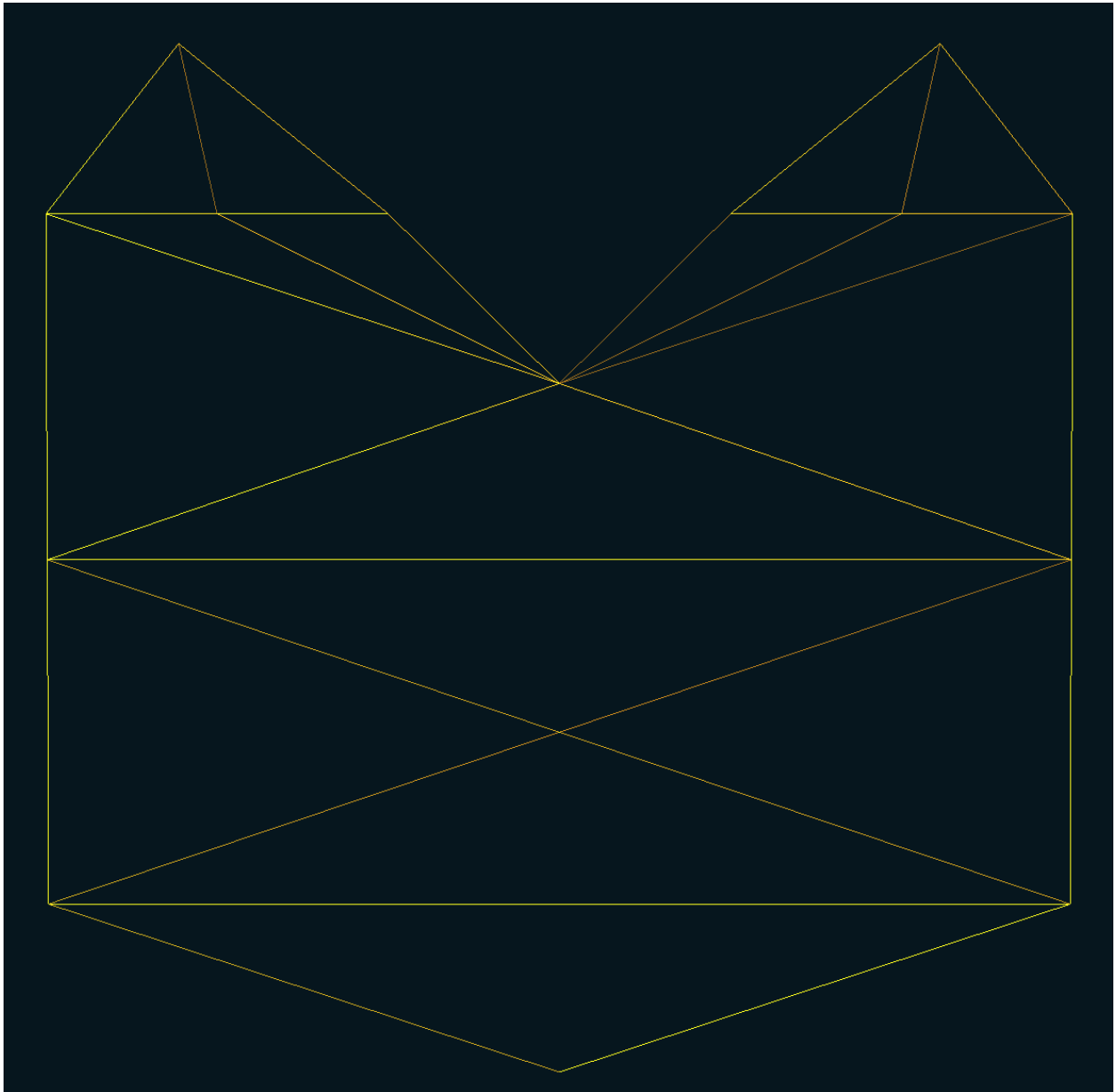
Base Case

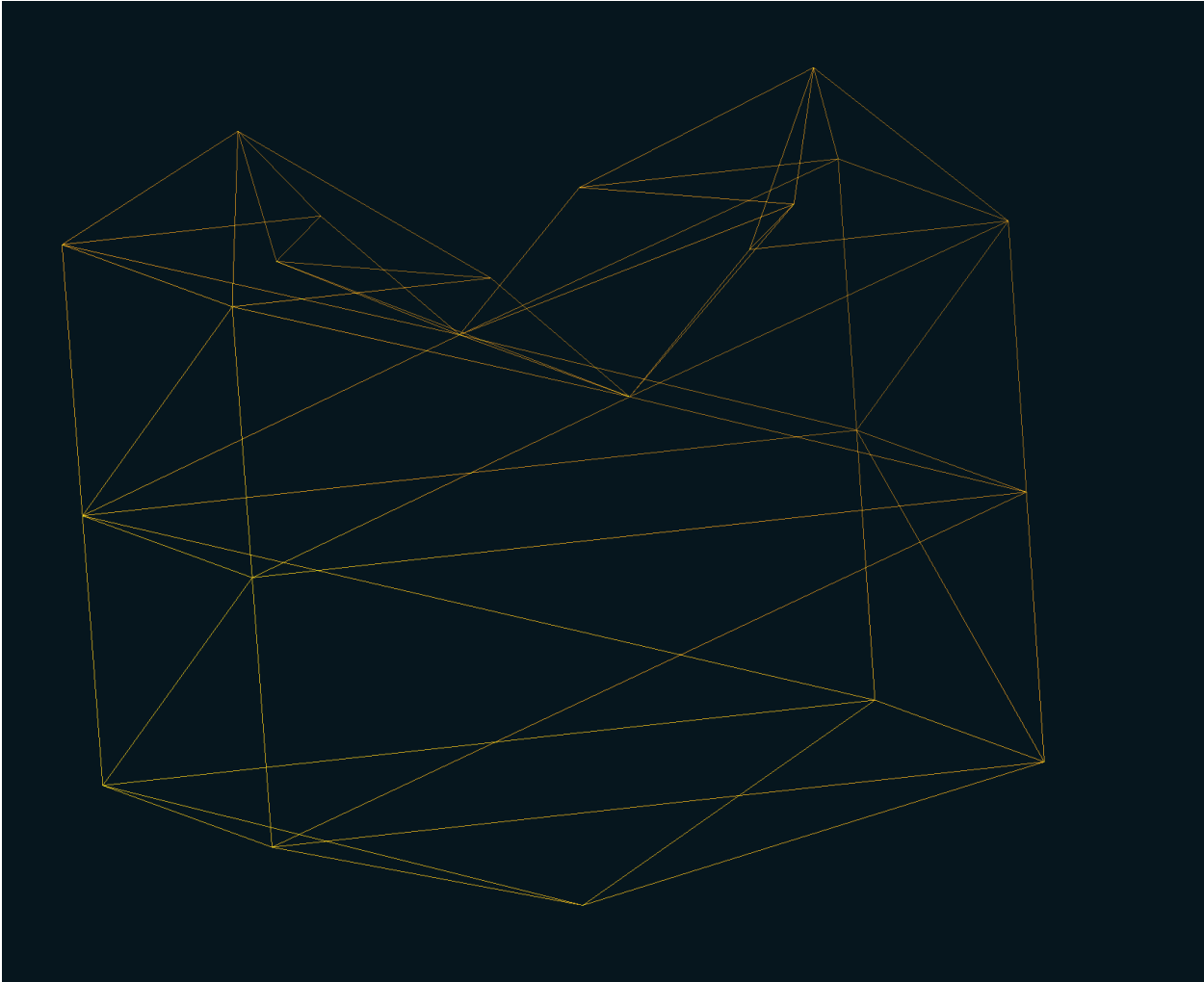


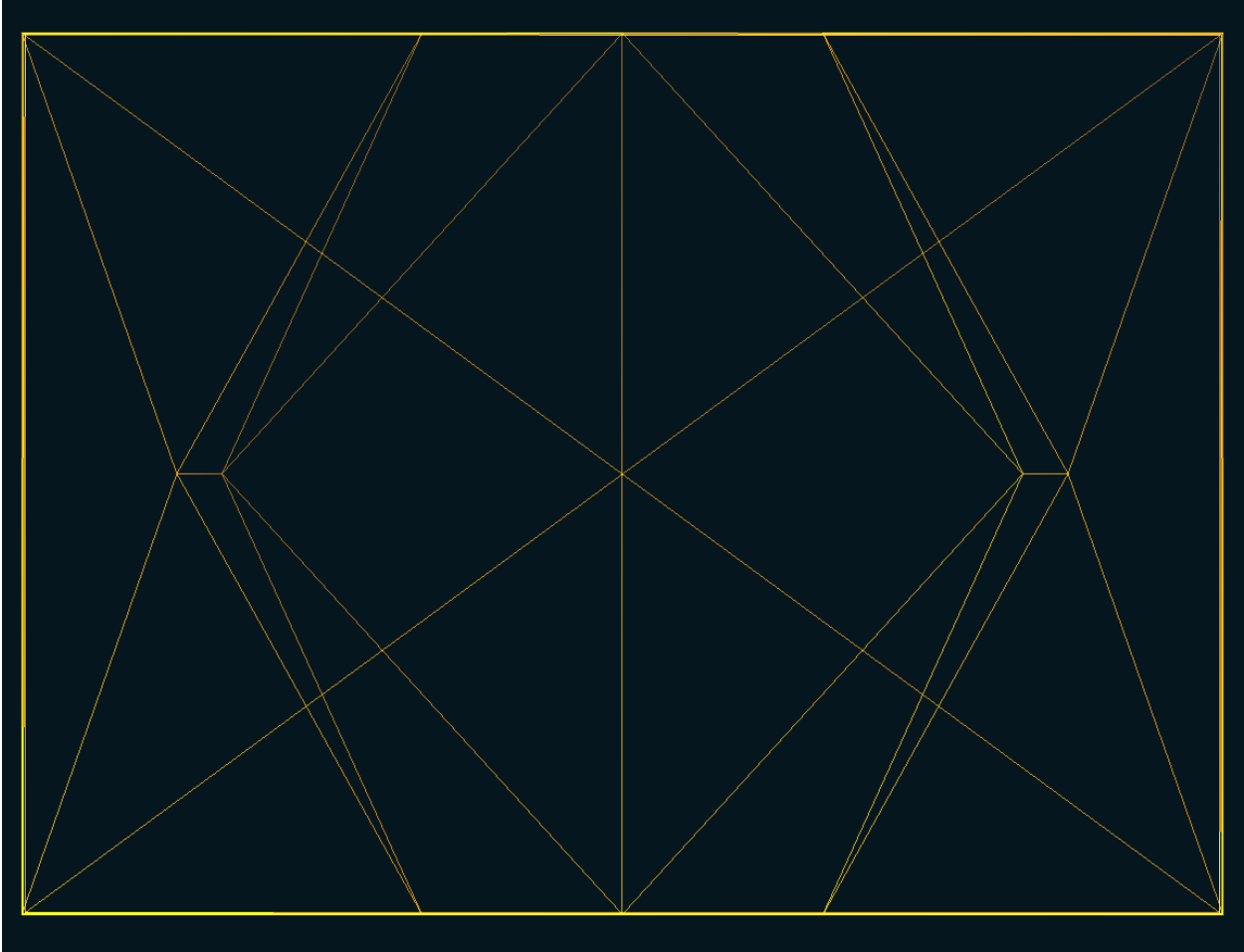
Things to look out for:

- two midpoints are created.
- inner points are meshed correctly (mid point is split equally).

- manifold (no holes, only triangles)
- “convex” contour includes midpoints and is meshed with bottom layer
- symmetry
- close hole in roof is ok



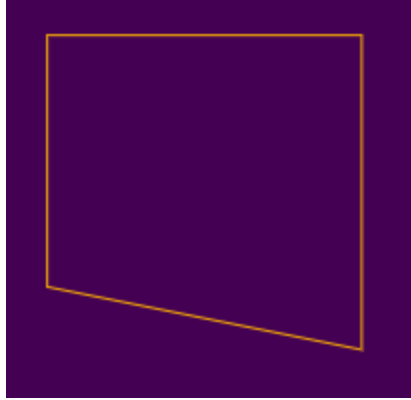




Slightly Shifted

Same contours as before, but slightly skewed.



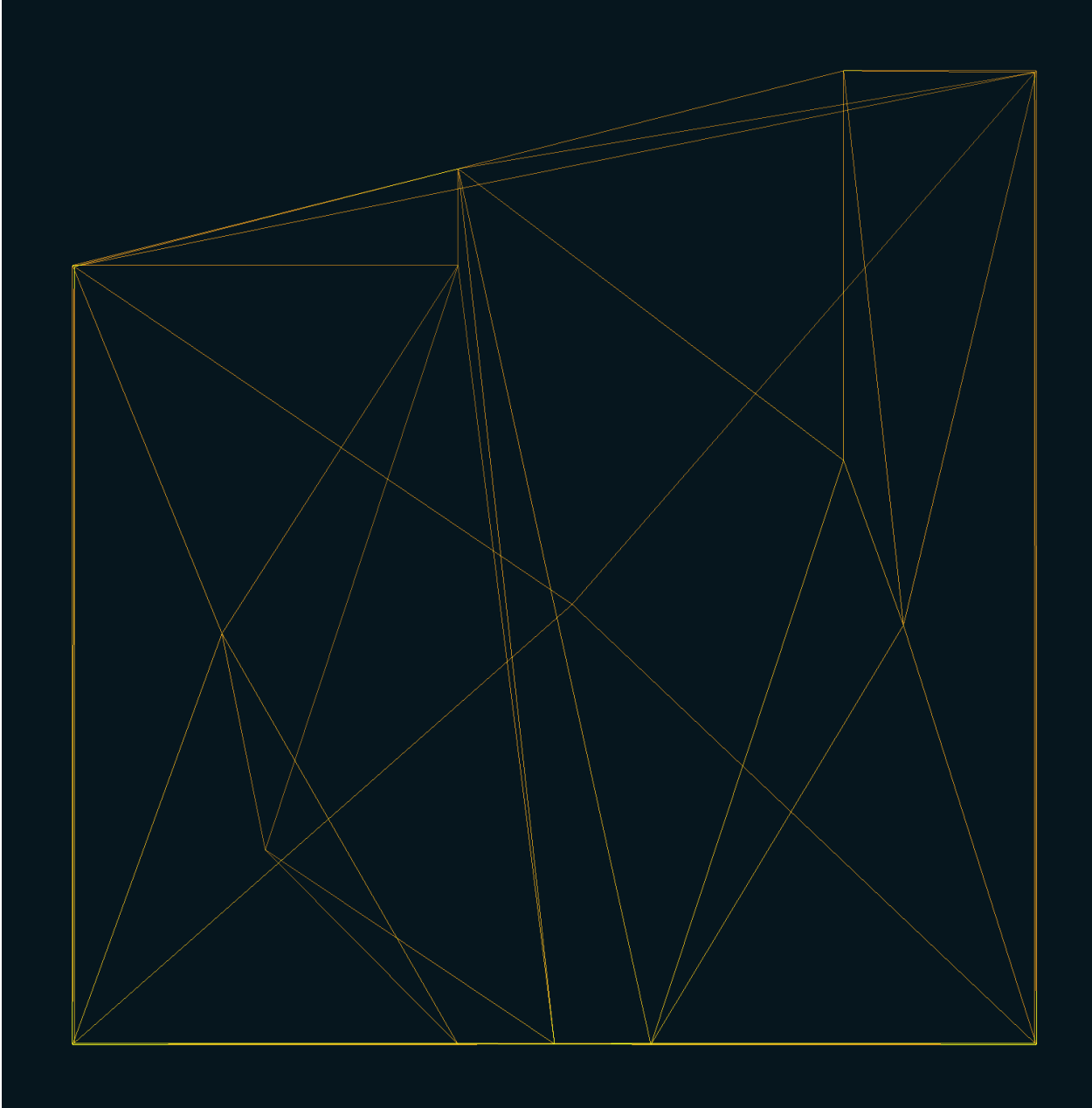


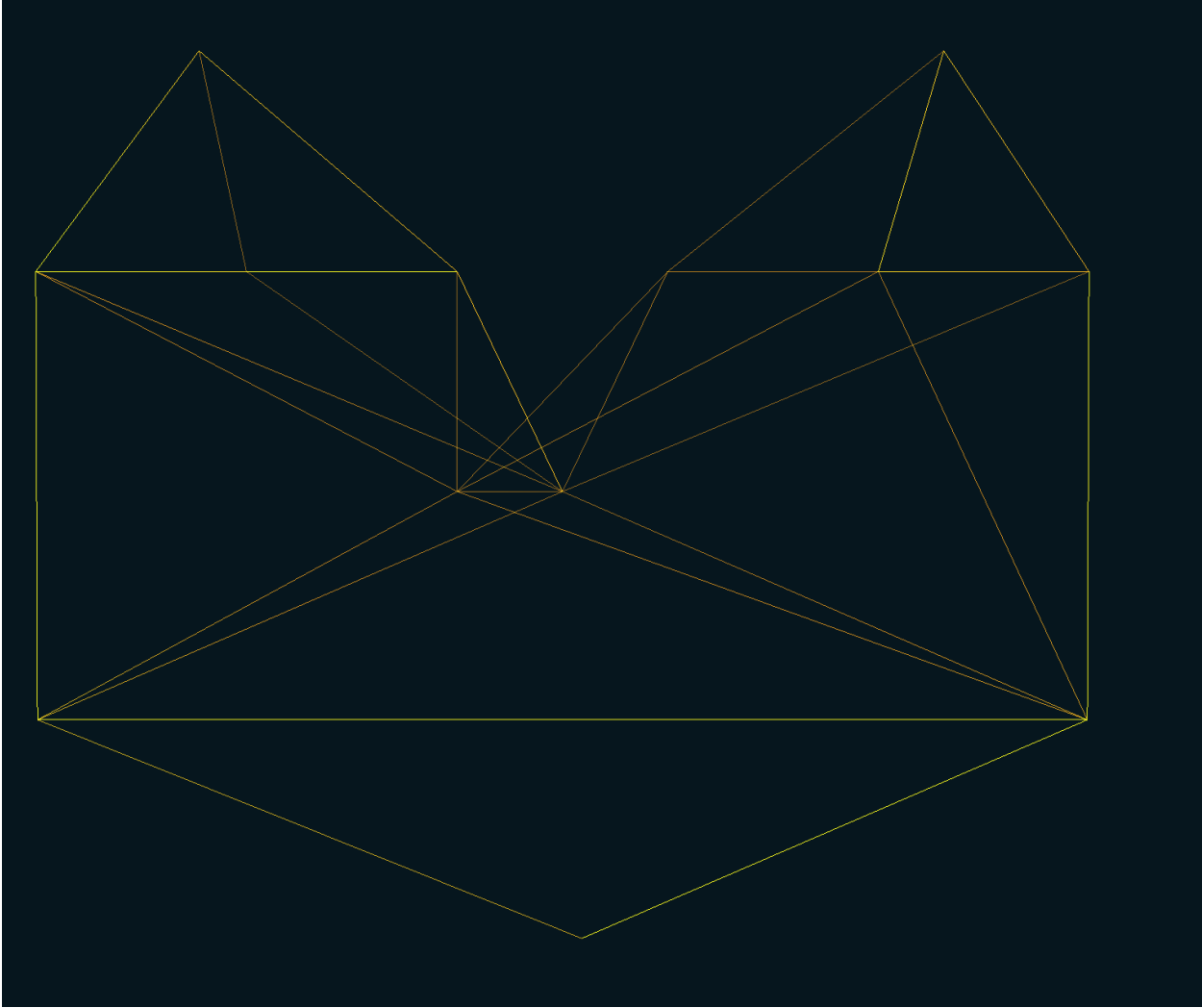
Things to look out for:

- all points are considered.
- order of points (CW vs CCW) doesn't matter.
- convex hull method works and midpoints are in the right position.

Possible changes:

- instead of switching to the other midpoint when distance is closer, take the indexed middle point for the switch.







Collinear Points

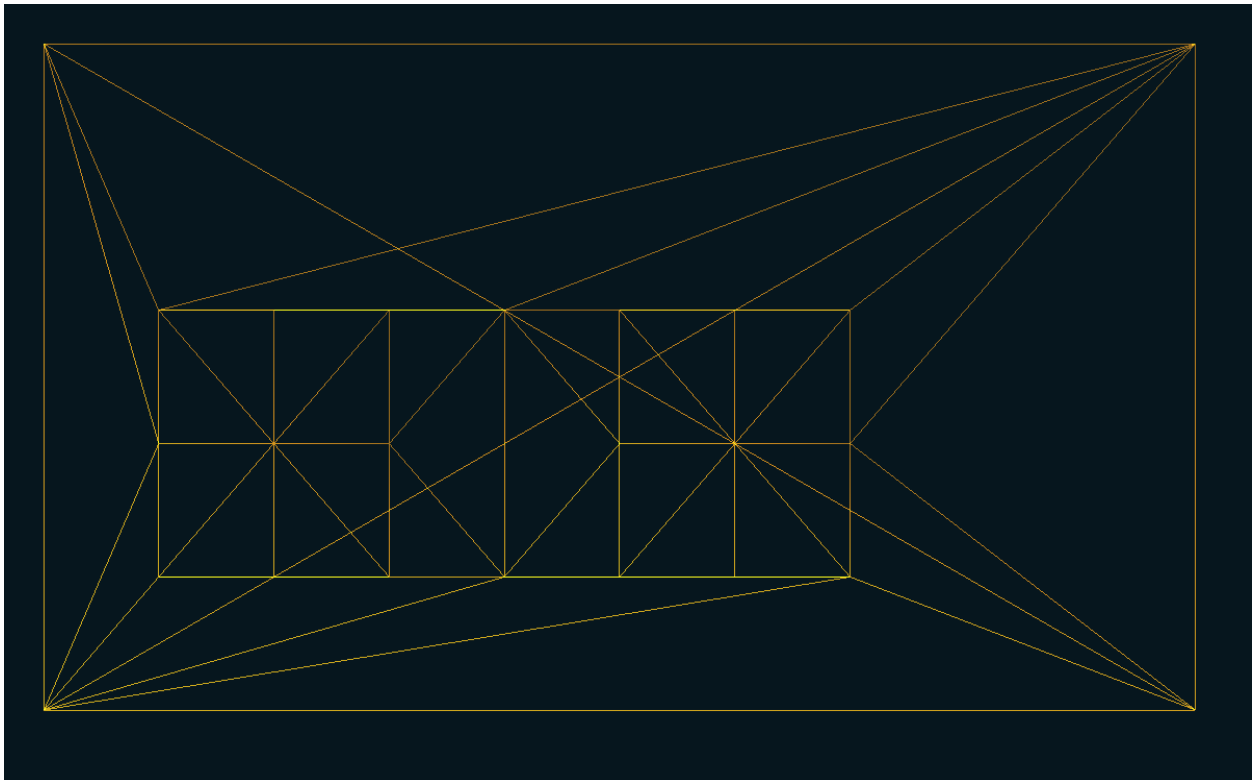
More collinear more points and bottom is shifted to the right.

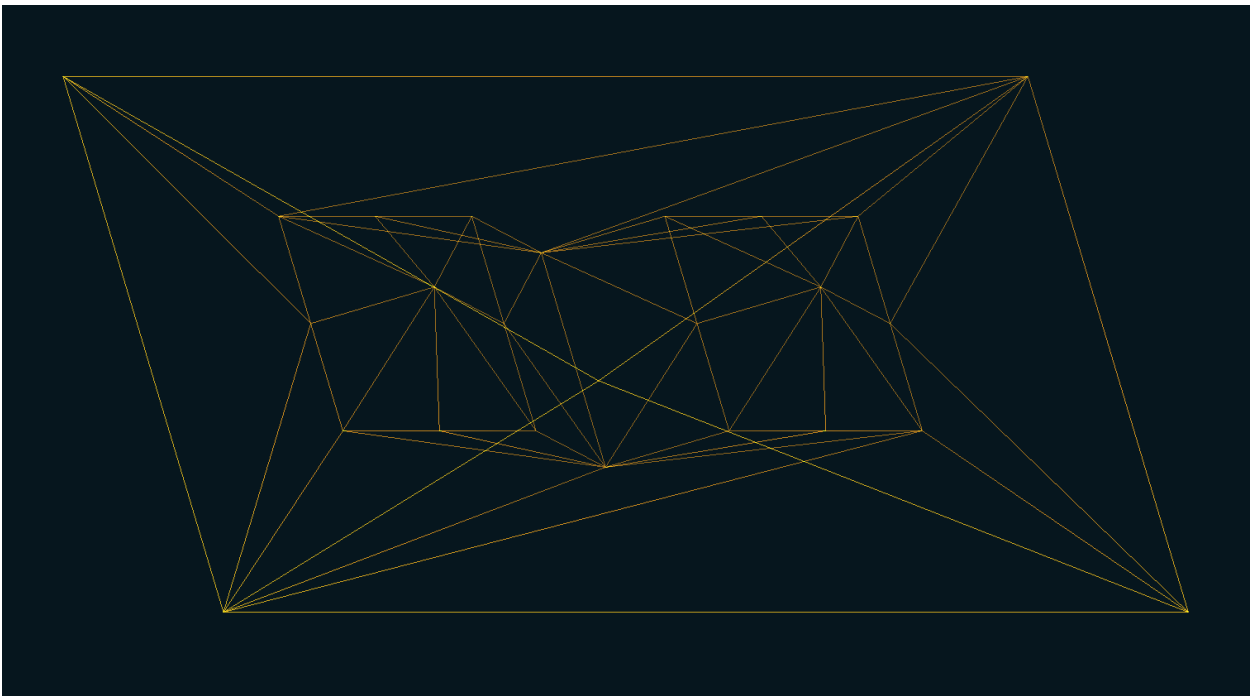
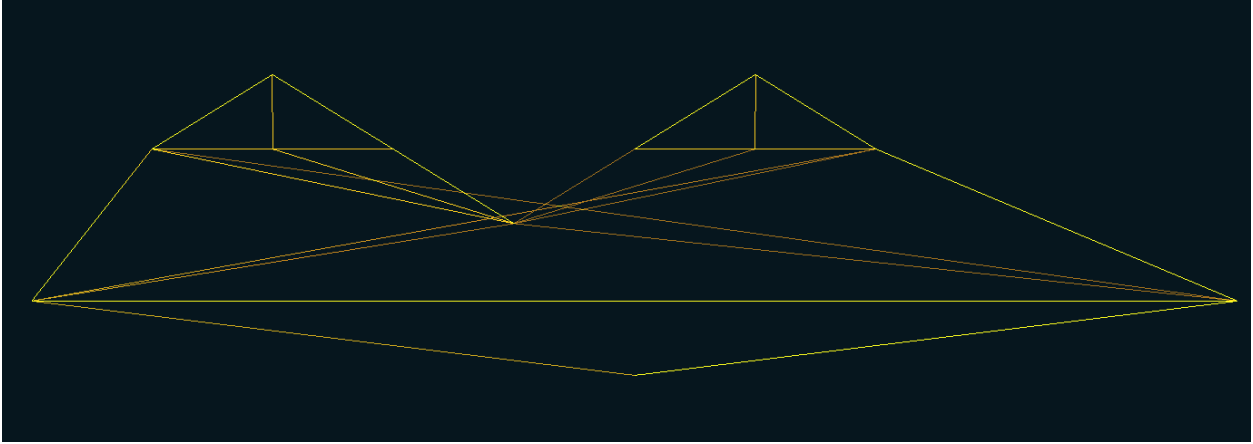




Things to look out for:

- collinear points are included and correspond to the correct inner/outer contours
- symmetry





Long and Narrow Contours





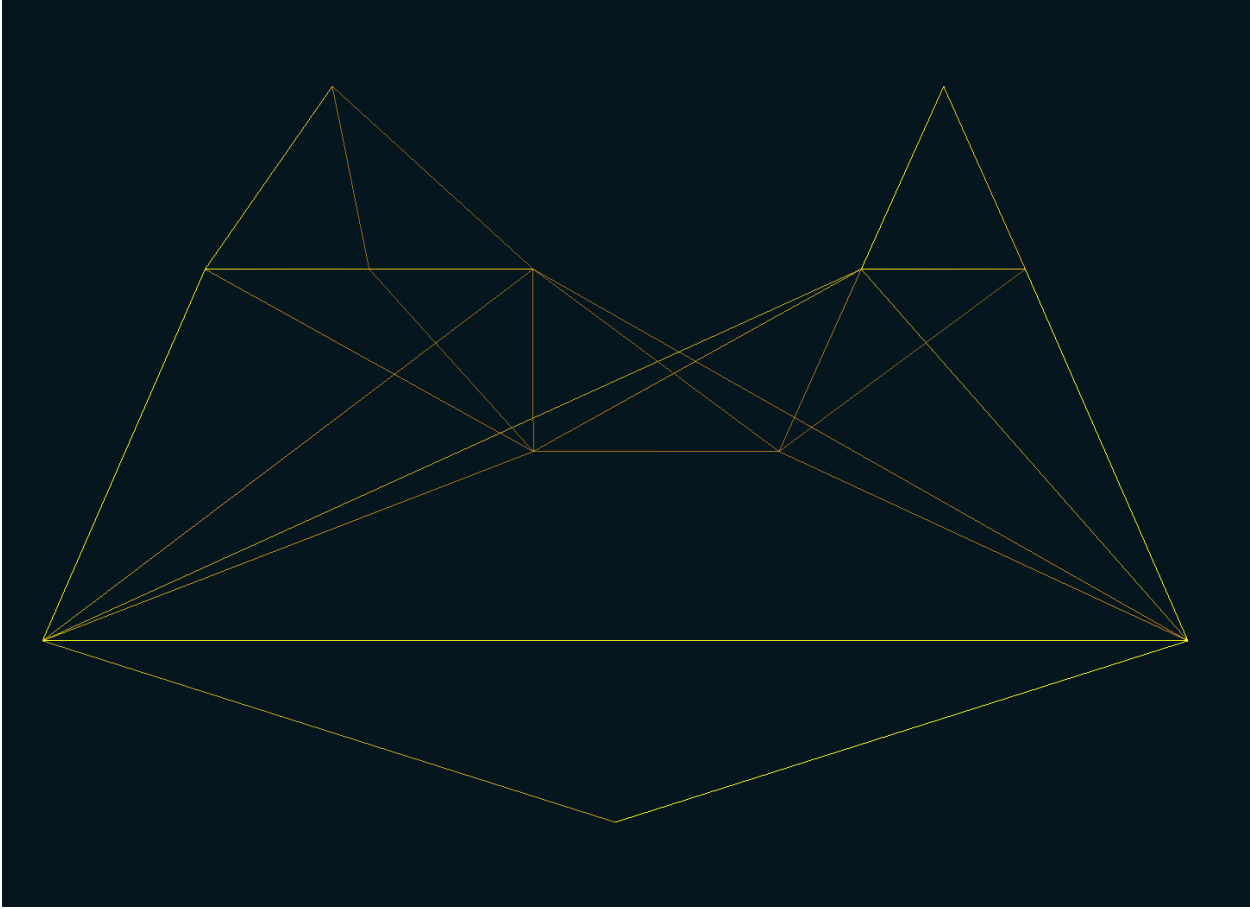
Things to look out for:

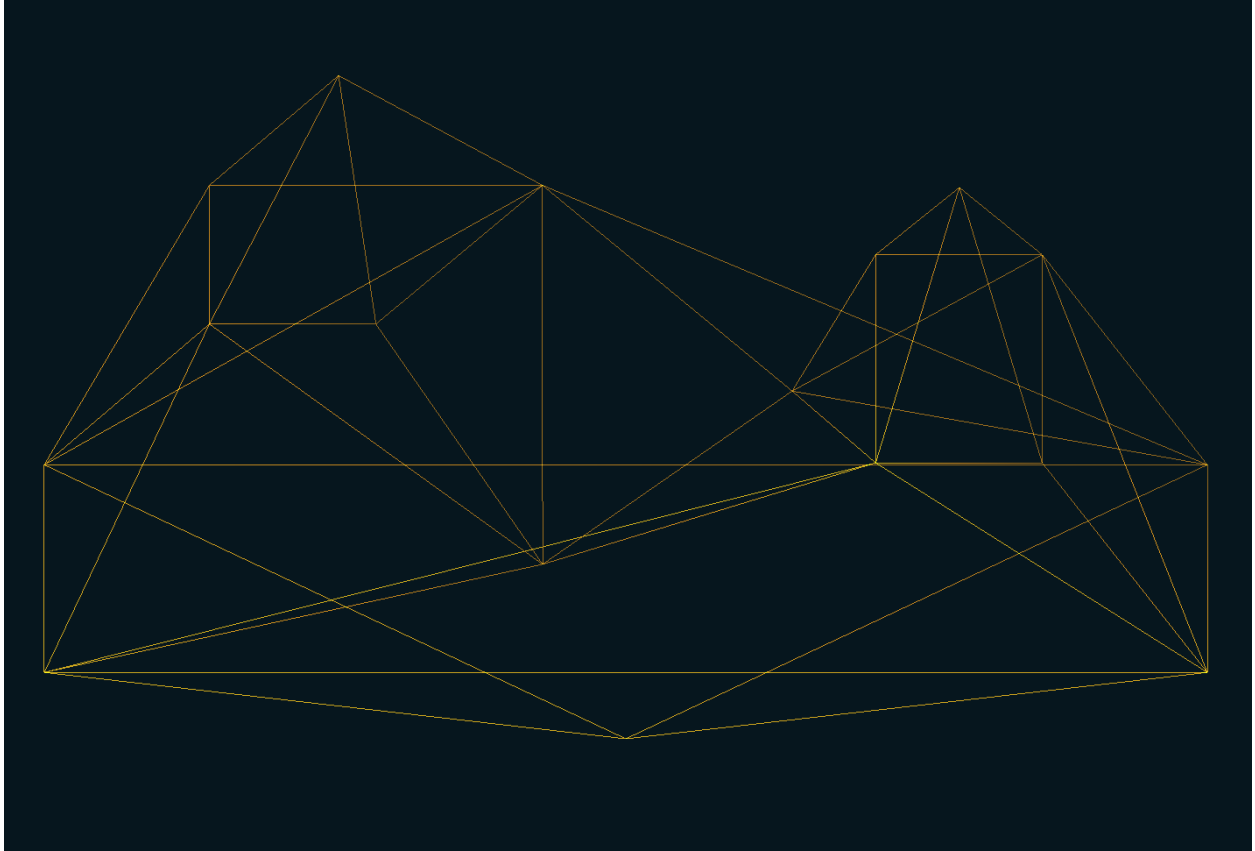
- midpoints are ok + convex hull.

Possible changes:

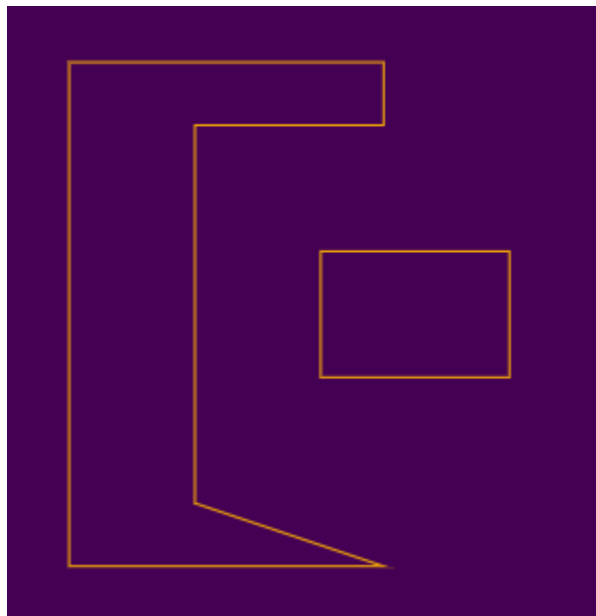
- outside mesh is “higher” than some inside meshes. Could move midpoint plane closer to 2-contour plane.

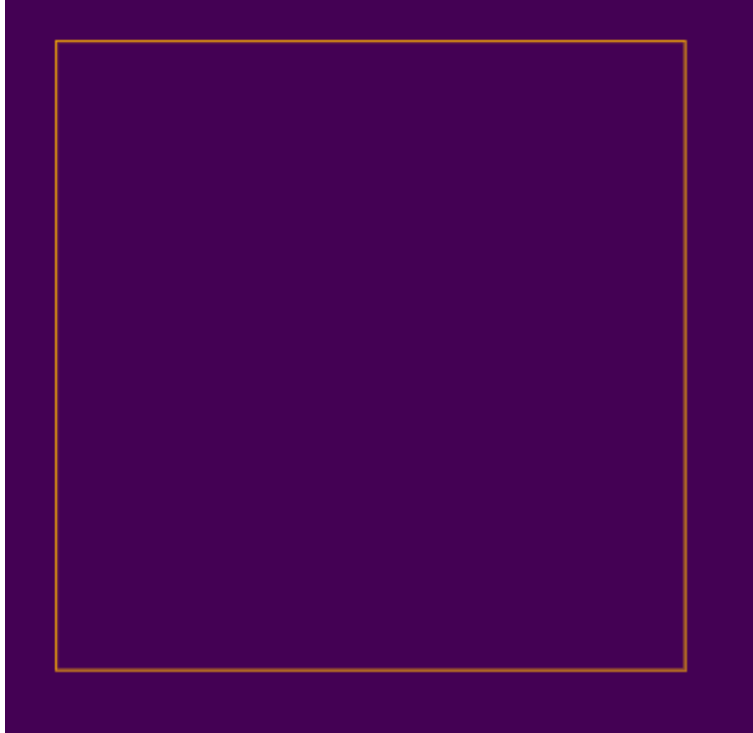






Half-enclosed contours





Things to look out for:

- meshing inner to midpoints might look weird
- check orientations are consistent + convex hull

Possible changes:

- have intermediate points between the two midpoints to follow path properly (!!!)

