

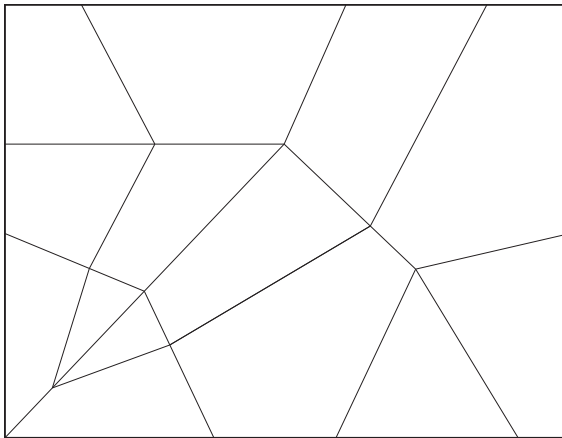
6.849: GEOMETRIC FOLDING ALGORITHMS

Fall 2010 — Prof. Erik Demaine

Problem Set 1

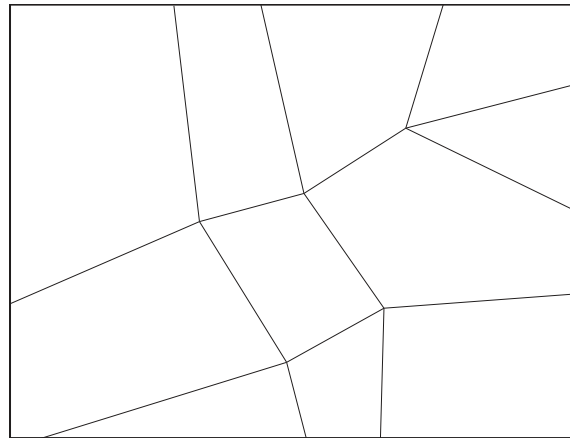
Due: Monday, October 4, 2010

Problem 1. Which of the following crease patterns are flat foldable? Are any simply foldable (foldable by a sequence of simple folds)? Justify each answer by either submitting a flat folding or arguing why the crease pattern cannot fold flat.



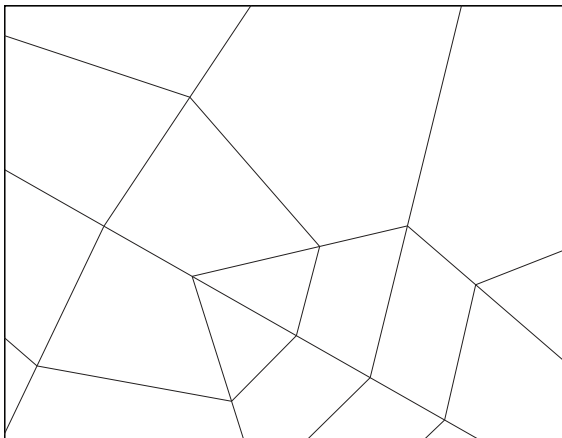
(a)

<http://courses.csail.mit.edu/6.849/fall10/psets/ps1a.pdf>



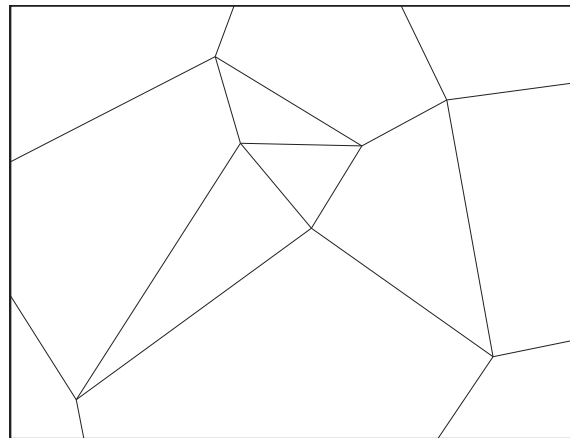
(b)

<http://courses.csail.mit.edu/6.849/fall10/psets/ps1b.pdf>



(c)

<http://courses.csail.mit.edu/6.849/fall10/psets/ps1c.pdf>



(d)

<http://courses.csail.mit.edu/6.849/fall10/psets/ps1d.pdf>

Problem 2. Find a two-vertex crease pattern that is locally flat foldable but not flat foldable. Submit a precreased sheet along with an argument why it cannot fold flat.

Problem 3. Design an origami base using the TreeMaker software (<http://www.langorigami.com/science/treemaker/treemaker5.php4>), or by hand using the tree method, and fold it. Submit both the design and the folding. If you want, you can also shape the base into artistic origami.