

MCS 481 - Computational Geometry - David Dumas

Homework 2

Due Wednesday, February 12

From the textbook. 2.2, 2.5, 2.8, 2.11*, 2.14*

(Problems marked with * are harder than the other ones, in my opinion.)

Other problems.

(P1) Suppose you are given a DCEL data structure. How would you check its validity, i.e. decide whether or not it represents an actual planar subdivision?

To construct a complete DCEL verifier is a large undertaking. For this problem, I just want you to propose some checks (at least two of them) that would detect various kinds of invalid DCELs. For each one, explain the purpose and write pseudocode for the check.

None of the invariants proposed in problem 2.5 in the textbook are acceptable for this problem, nor is anything that can be checked in $O(1)$ time. Try to verify larger-scale features of the subdivision.