CISC-868 FALL 2011

HOMEWORK 7

These questions come from *Discrete and Computational Geometry* by Satyan Devadoss and Joseph O' Rourke.

Exercise 5.1: Show that the medial axis of a convex polygon with n vertices could have a vertex of degree n.

Exercise 5.2: Compute and describe the medial axis for a rectangle.

Exercise 5.3: What is the maximum and minimum number of edges the medial axis tree M(P) can have for a convex polygon with n vertices?

Exercise 5.7: Show how to implement the algorithm described for computing the medial axis of a convex polygon to run in $O(n \log n)$ time. (This exercise requires familiarity with priority queue data structures.).

Exercise 5.8: Is there a non-convex polygon whose medial axis does not contain any parabolic arcs, but instead is composed entirely of straight segments?

Exercise 5.9: What is the minimum number of edges the medial axis tree M(P) can have for an arbitrary polygon of n vertices?

Exercise 5.10: Construct the medial axis and the straight skeleton of Figure 1.8(a).

Exercise 5.12: Show that the maximum number of edges of the S(P) tree is $2n - 3$ for a polygon with n vertices.