CMSC 420
Polygon-to-quadtree
Project 2

Due:
Written description: December 10
Program submission: December 16, 1998
NO LATE SUBMISSIONS

A problem that arises in many map data base systems is converting from one spatial data representation to another. So, for example, we might originally have the shape of a region represented by a polygon (possibly because the region was defined by some ground survey in which the polygon's vertices were measured with surveying equipment), and we might want to convert that polygonal region into its equivalent region quadtree.

Your project is to convert an arbitrary rectilinear polygon (a polygon whose sides are all vertical or horizontal) into a region quadtree. You will be given:

a) the width of the desired region quadtree, and
b) a list of the coordinates of the vertices of the rectilinear polygon whose region quadtree is to be constructed. All of the vertices of the polygon will have integer coordinates that fall within the array represented by the region quadtree.

After constructing the region quadtree you will outputs its nodes in level order for testing the correctness of your implementation.

There are MANY ways that you can solve this problem, and you will submit a written description of the method you chose as part of the project. This should be 3-4 pages in length, and should NOT be a detailed description of your program. Rather, it should be a discussion of your approach, with sufficient figures to illustrate your algorithm. Your discussion should include a description of the computational requirements of your algorithms.

The written description is worth 40% of your grade, and the program submission is worth 60%.