CS4/531
Spring 1997
Homework #6

(No credit will be given for unsupported answers.)

1. Given a set *S* of *n* points in the plane, give an efficient algorithm to determine a closest pair of points in the set. Give algorithms and complete analysis for the following models:
   a) RAM
   b) PRAM
   c) Mesh
2. Given a set *S* of *n* points in the plane, give an efficient algorithm for determining a farthest pair of points in the set. Give algorithms and complete analysis for the following models:
   a) RAM
   b) PRAM
   c) Mesh
3. Given a binary digitized $n \times n$ image, describe an efficient algorithm to compute the number of pixels in every connected component. Give algorithms and complete analysis for the following models:
   a) RAM
   b) Mesh
4. Given a binary digitized $n \times n$ image, describe an efficient algorithm to compute the internal diameter (maximum of the minimum internal distance between any pair of connected pixels) of every connected component. Give algorithms and complete analysis for the following models:
   a) RAM
   b) Mesh
5. Given a binary digitized $n \times n$ image, describe an efficient algorithm to find for every connected component, a nearest connected component. Give algorithms and complete analysis for the following models:
   a) RAM
   b) Mesh