

## CS133 - Winter 2003 - Quiz 4 - March 13, 2002

Name:

SSN (4 last digits):

You have to answer all 3 problems. Each is worth 33%. Good luck!

Only students that are registered for CS133 can take this exam.

1. Does the Delaunay Triangulation of a set  $S$  of  $n$  points on the plane have the same number of edges for any set of  $n$  points?

Either prove it, or give a counter example (for  $n \geq 4$ ).

Assume that no 4 points lie on the same circle.

2. Given a set of  $n$  points on the plane, give a fast algorithm to find the pair of points with the shortest Euclidean distance.

What is the running time of your algorithm?

3. Show that no two edges in the Delaunay triangulation of a set of  $n$  points on the plane can intersect each other.

Assume no four points lie on the same circle.

Hint: Use the theorem that states that if  $(u_i, u_j)$  is a Delaunay edge, there exists a circle passing from  $u_i$  and  $u_j$  that does not include any other point.