

CS 663: Algorithms in Structural Molecular Biology

Assignment #4

Please submit to your TA by 2/22/2013

Problem 1

Given a set of n points $P \subset \mathbb{R}^2$, let $RB(P)$ be the smallest convex polygon containing all points in P .

1. Find the optimal algorithm for finding $RB(P)$. You will get partial credit for sub-optimal solution.
2. Analyze the complexity of your algorithm.
3. Argue that your algorithm is optimal, i.e. no algorithm can perform better.

Extra Credit

Extend the problem to three-dimensions. Given a set of n points $P \subset \mathbb{R}^3$, and $RB(P)$ now is the smallest convex polyhedron containing all points in P . Find the algorithm to find $RB(P)$ and analyze its complexity.