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29.11.2009

Computational Geometry — Exercise Set 7 — HS09

URL: http://www.ti.inf.ethz.ch/ew/courses/CG09/

Exercise 1

You are given n axis–parallel rectangles in $\mathbb{R}^2$ with their bottom sides lying on the x–axis. Construct their union in $O(n \log n)$ time.

Exercise 2

Let S be a set of n segments that are either horizontal or vertical. Describe an $O(n \log n)$ time and $O(n)$ space algorithm that counts the number of pairs in $\binom{S}{2}$ that intersect.

Exercise 3

What is the algebraic degree of the InCircle predicate? More precisely, you are given three points p, q, r in the plane that define a circle C and a fourth point s. You want to know if s is inside C or not. What is the degree of the polynomial(s) you need to evaluate to answer this question?