

CS 420: Advanced Algorithm Design and Analysis

Spring 2015 – Lecture 22

Department of Computer Science
University of British Columbia



March 26, 2015

Announcements

Assignments...

- ▶ Asst8/9 posted today (due April 9)

Exams...

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Exams...

- ▶ NO MORE EXAMS

Announcements (cont.)

Readings...

- ▶ matchings and network flows [Kleinberg&Tardos, Chapt. 7], [Cormen et al., Chapt. 26], [Dasgupta et al., Chapter 7]
- ▶ reductions and NP-hardness [Kleinberg&Tardos, Chapt. 8, 11], [Cormen et al., Chapt. 34,35]
- ▶ computational geometry... light treatment in texts, EricksonNotes has more; notes of David Mount are highly recommended

Last class...

Finding extrema revisited...

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Finding extrema revisited... convex hulls (in 2 and higher dimensions)

- ▶ “equivalence” 2-d convex hull and sorting problems
 - ▶ $O(n \lg n)$ time algorithms following various sorting paradigms
 - ▶ $\Omega(n \lg n)$ lower bound by reduction from sorting

Last class...

Finding extrema revisited... convex hulls (in 2 and higher dimensions)

- ▶ “equivalence” 2-d convex hull and sorting problems
 - ▶ $O(n \lg n)$ time algorithms following various sorting paradigms
 - ▶ $\Omega(n \lg n)$ lower bound by reduction from sorting
- ▶ breaking the “equivalence” ...output-size sensitive algorithms

Coming up...

- ▶ low-dimensional linear programming
- ▶ two-dimensional searching...planar point location
- ▶ motion planning problems