CS 420: Advanced Algorithm Design and Analysis
Spring 2015 – Lecture 18

Department of Computer Science
University of British Columbia

March 12, 2015

Announcements

Guest Lecturer... Patrice Bellville

Assignments...

- Asst6/7...(due March 19)

Midterm III...

- Q/A session...March 24; 5:30-7:00; DMPT 110
- Exam...March 25; 5:30-7:00; DMPT 110
- ...on *all* course material up to and including March 19 lecture

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]

Last day...

Reductions and relative hardness of problems

- reductions...treated more formally
- overview of problems with efficient algorithms
  ... and related problems with no known efficient algorithm
- the complexity classes **P** and **NP**
- **NP**-hardness and **NP**-completeness

Today...

Reductions and relative hardness of problems

- some examples of reductions establishing **NP**-hardness and **NP**-completeness
  - HC $\leq_{\mathrm{P}}$ TSP
  - Clique $\leq_{\mathrm{P}}$ LargestCommonSubgraph
  - VC $\leq_{\mathrm{P}}$ DominatingSet
  - 3-SAT $\leq_{\mathrm{P}}$ VC