

Problem Set #2

Instructor: Anna Karlin

Due on **January 20, 2007** by 7pm.

Instructions: You are welcome to brainstorm on ideas for solving these problems with fellow students taking the class. You may also collaborate with one other classmate on writing up your solutions. If you do collaborate in any way, please acknowledge for each problem the people you worked with on that problem. Please do not post solution ideas to discussion boards – discussion boards can be used to clarify the problems and perhaps to discuss specific examples. Learning will not be effective if people can find solutions (even partial solutions) to the problems on the discussion board, on the Web or in other algorithms textbooks.

Most of the problems require only one or two key ideas for their solution – spelling out these ideas should give you most of the credit for the problem even if you err in some finer details. So, make sure you clearly write down the main idea(s) behind your solution even if you could not figure out a complete solution.

Be sure to carefully read the grading guidelines page linked off the course web page.

A final piece of advice: Begin work on the problem set early and don't wait till the deadline is only a few days away.

Readings: Kleinberg and Tardos: Chapter 4.

Each problem is worth 10 points unless noted otherwise. All problem numbers refer to the Kleinberg-Tardos textbook.

1. Chapter 3, Problem 6.

2. Chapter 3, Problem 9.

Hint: consider running BFS starting at s .

3. Chapter 3, Problem 11.

Hint: While this kind of connectivity includes a notion of time, it can be converted into a graph connectivity problem of a more standard sort.

4. Chapter 4, Problem 4.