

# Fifth Homework Assignment for Math 448

**Due: Thursday, March 27th.**

All section references are to the text.

Problems to hand in for Math 448 and 748:

Chapter 9, exercises 9.4, 9.28, 9.30, 9.40, 9.46.

Chapter 10, exercises 10.2, 10.4.

Additional problems to hand in for Math 748:

Chapter 9, exercise 9.36.

Chapter 10, exercise 10.14.

Math 448 students are also welcome to try these problems.

Some other problems you might try:

The book offers many useful practice questions.

Reading for this week:

If you haven't already, please read up to Section 9.6.

For Thursday, March 20th, Sections 10.1 and 10.2.

For Tuesday, March 25th, Sections 10.3 and 10.5.

For Thursday, March 27th, Sections 14.1 and 14.2.

For Tuesday, April 1st, Section 14.3.

For Tuesday, April 8th, Sections 15.1 and 15.2.

Notes:

This is the final homework assignment. In the final week of class, graduate students will be presenting talks on recent research papers in network flows. All students should attend these talks if possible (one is in the seminar slot rather than in class time).

Due to a snow day, we missed two hours of class in January. These should be made up if material remains to be covered. I propose doing so at the usual class times in the week of April 7th. We can have a one hour lecture followed by office hours for the exam. The details will be confirmed in class.

The final will cover everything through the end of the lecture on April 1st. The plan is to be at the end of Section 14.3 by this point. The graduate student presentations and any material covered in the following week will not be on the exam.

The final exam itself will take place on **Friday, April 11th at 15:30** in room **SUR 3340**. It is a three hour exam.

## Presentations:

Here is the preliminary schedule of student presentations, along with the papers they will be presenting. Please check the information for correctness. Also, please let me know if you need any equipment for your presentation, for instance if you would like to project from a computer.

Arman Kaveh, [Jai01], Tuesday, April 1st, 10:30 a.m.

Simon Lo, [Tar85], Tuesday, April 1st, 11:00 a.m.

John LaRusic, [GK07], Wednesday, April 2nd, 2:30 p.m. in SC 14-400 (O.R. Seminar).

Brad Woods, [Sku02], Thursday, April 3rd, 9:30 a.m.

Hua Zheng, [RV93], Thursday, April 3rd, 10:00 a.m.

## References

- [GK07] Naveen Garg and Jochen Könemann, *Faster and simpler algorithms for multicommodity flow and other fractional packing problems*, SIAM J. Comput. **37** (2007), no. 2, 630–652 (electronic).
- [Jai01] Kamal Jain, *A factor 2 approximation algorithm for the generalized Steiner network problem*, Combinatorica **21** (2001), no. 1, 39–60.
- [RV93] Mauricio G. C. Resende and Geraldo Veiga, *An implementation of the dual affine scaling algorithm for minimum-cost flow on bipartite uncapacitated networks*, SIAM J. Optim. **3** (1993), no. 3, 516–537.
- [Sku02] Martin Skutella, *Approximating the single source unsplittable min-cost flow problem*, Math. Program. **91** (2002), no. 3, Ser. B, 493–514, ISMP 2000, Part 1 (Atlanta, GA).
- [Tar85] Éva Tardos, *A strongly polynomial minimum cost circulation algorithm*, Combinatorica **5** (1985), no. 3, 247–255.