Due: Monday, January 23rd (in class)

Reading

For Wednesday, January 11th, Chapters 1 and 2.

For Monday, January 16th, Sections 3.1–3.3.

For Wednesday, January 18th, Sections 3.4–3.6 and Sections 4.1-4.4.

For Monday, January 23rd, Sections 4.5-4.6.

Assignment exercises to hand in for Math 448 and 748

Chapter 1, exercises 1.2, 1.4.

Chapter 2, exercises 2.20, 2.24, 2.44.

Chapter 3, exercises 3.6, 3.10.

Chapter 4, exercise 4.10.

Additional problems to hand in for Math 748

Chapter 1, exercise 1.7.

Chapter 4, exercise 4.34.

Math 448 students are also welcome to try these problems.

Some other exercises you should try

The textbook offers a large supply of good problems, many of them not too difficult. The formulation problems in Chapter 1 are nice, you should make sure you have an idea how to solve them. Chapter 2 is a review of graph theory in the context of network flows. Similarly, Chapter 3 is a review the CS material we need.

Presentations

Math 748 students will give presentations of recent research papers in class or in the Operations Research Seminar. These presentations will take place from March 26th to April 11th. The presentation will be 25 minutes. Please sign-up for a date and time on a first-come, first-served.

Please also choose a paper. I would like to finalize the choices by Monday, February 6th. The ideal situation would be to choose papers that are relevant to your own research. If you have, or are considering, an advisor, I recommend consulting with them.

Examples of some suitable papers are on the back of this page, but I am quite flexible on what you present.

References

[Ald08] David J. Aldous, *Cost-volume relationship for flows through a disordered network*, Math. Oper. Res. **33** (2008), no. 4, 769–786.

[FS07] Lisa Fleischer and Martin Skutella, *Quickest flows over time*, SIAM J. Comput. **36** (2007), no. 6, 1600–1630 (electronic).

[GJ99] Donald Goldfarb and Zhiying Jin, *A new scaling algorithm for the minimum cost network flow problem*, Oper. Res. Lett. **25** (1999), no. 5, 205–211.

[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).

[Gue01] Bertrand Guenin, *A characterization of weakly bipartite graphs*, J. Combin. Theory Ser. B **83** (2001), no. 1, 112–168.

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[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.

[RW09] Mateo Restrepo and David P. Williamson, *A simple GAP-canceling algorithm for the generalized maximum flow problem*, Math. Program. **118** (2009), no. 1, Ser. A, 47–74. MR MR2470885

[Tar85] Éva Tardos, *A strongly polynomial minimum cost circulation algorithm*, Combinatorica **5** (1985), no. 3, 247–255.