Fifth Homework Assignment for Math 496 and 827

Due: Friday, April 3rd, in class.

All references are to the Bertsimas and Tsitsiklis text.

Problems for Math 496 and 827:

1. Consider the problem of minimizing $c^t x$ subject to $x \geq 0$ and, for every subset S of exactly half the variables (say there are $2n$), $\sum_{i \in S} x_i \geq 1$. Explain why this problem can be solved in polynomial time.
2. Exercise 9.1.
3. Exercise 9.5.
4. Exercise 9.11.

Problems mainly for Math 827:

5. Exercise 8.6.
6. Exercise 8.9.
7. Exercise 9.3.

Reading:

Chapters 9 and 12.

Reminder:

The final exam is scheduled for **Monday, April 20th** at 3:30 p.m. in SUR 3010.

Presentations:

The schedule of graduate student presentations is on the back of this page. As part of the grading of this project, please send me a digital copy of your overheads following your presentation.

Tentative schedule of presentations:

Monday, March 30th, 3:30: Sareh Nabi-Abdolyousefi. (O.R. Seminar, SUR 15-300).

Erling D. Andersen and Knud D. Andersen, *Presolving in linear programming*, Math. Programming **71** (1995), no. 2, Ser. A, 221–245.

Wednesday, April 1st, 2:30: John LaRusic.

Gil Kalai, *A subexponential randomized simplex algorithm*, Proceedings of the Twenty Fourth Annual ACM Symposium on Theory of Computing (STOC), 1992, pp. 475–482.

Wednesday, April 1st, 3:20: Brad Woods.

John Dunagan and Santosh Vempala, *A simple polynomial-time rescaling algorithm for solving linear programs*, Math. Program. **114** (2008), no. 1, Ser. A, 101–114.

Thursday, April 2nd, 3:30: Arman Kaveh. (O.R. Seminar, SUR 15-300).

Sanjay Mehrotra, *On the implementation of a primal-dual interior point method*, SIAM J. Optim. **2** (1992), no. 4, 575–601.

Friday, April 3rd, 2:30: Hengameh Vahabzadeh.

Antoine Deza, Eissa Nematollahi, and Tamás Terlaky, *How good are interior point methods? Klee-Minty cubes tighten iteration-complexity bounds*, Math. Program. **113** (2008), no. 1, Ser. A, 1–14.

Friday, April 3rd, 3:20: Hua Zheng.

Shinji Mizuno, Michael J. Todd, and Yinyu Ye, *On adaptive-step primal-dual interior-point algorithms for linear programming*, Math. Oper. Res. **18** (1993), no. 4, 964–981.