Due: Friday, October 9th (drop box, 1 p.m.)

Reading

For Wednesday, September 30th, Chapter 3, however for Sections 3.3 and 3.4 it is enough just to know the results rather than going into the proofs.

For Friday, October 2nd, Chapter 4 through Section 4. You should read Section 5 as well for fun, but don't worry much about it – think of it as an anecdote rather than something to study.

For Wednesday, October 7th, Chapter 5 through Section 5.

For Friday, October 9th, Chapter 5, through Section 8.

Assignment exercises to hand in

1. Chapter 2, problem 4.

2. Chapter 2, problem 10.

3. Chapter 2, problem 18.

4. Chapter 3, problem 2.

5. Chapter 3, problem 5.

6. Suppose that you are solving a problem using the simplex method from the following initial feasible dictionary:

$$\begin{array}{rcrcrcrcr}
\zeta & = & & & x_1 & + & 4x_2 & + & x_3 \\
\hline
w_1 & = & 0 & - & 6x_1 & + & x_2 & + & x_3 \\
w_2 & = & 1 & - & x_1 & + & 2x_2 & - & x_3 \\
w_3 & = & 1 & - & 2x_1 & - & 4x_2 & - & x_3
\end{array}$$

a. List all pairs (x_r, x_s) such that x_r could be the entering variable and x_s could be the leaving variable.

b. List all such pairs if the largest coefficient rule is used for choosing the entering variable.

c. List all such pairs if Bland's rule for choosing the entering and leaving variables is used.

7. Revisiting question 7 from assignment 1, consider now planning a schedule for an entire week. Over a week, those working 8-hour shifts work 5 days straight, followed by 2 days off; while those working 12-hour shifts work 3 consecutive days, followed by 4 days off. Also, at most $\frac{1}{3}$ of the employees can work 12-hour shifts. Find the optimal schedule.

8. Chapter 4, problem 3.

Note that you can use the on-line pivot tools from Vanderbei's homepage to check your calculations.

Some other exercises you should try

Try problems 3.3 and 4.5 for additional simplex practice.

Chapter 3, problem 4.

It is interesting, but not essential, to work through the exercises 4.6 through 4.8. These exercises complete the analysis of a version of simplex on the Klee-Minty cube.