MATH 482, Spring 2013 - Homework 3
Due Wednesday, 02/27.

Solve 3 of the first 4 problems below, and also solve problem 5. Students registered for 4 credits must solve all problems.

1. [5pts] Solve (in mixed strategies) for both players the game with the payoff matrix

$$\begin{pmatrix} -2 & 3 & 0 & -6 & 3 \\ 0 & -4 & 9 & 2 & 1 \\ 6 & -2 & 7 & 4 & 5 \\ 7 & -3 & 8 & 3 & 2 \end{pmatrix}.$$

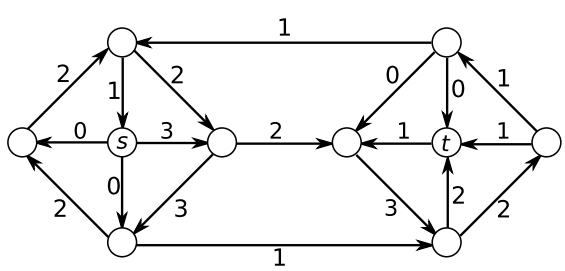
2. [5pts] Use the revised simplex method to find an optimal solution to the problem

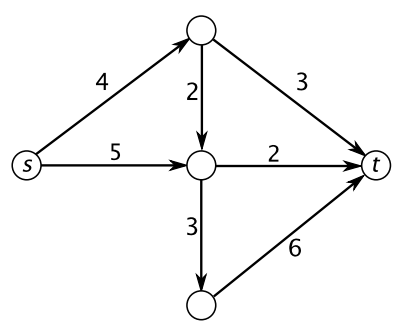
$$\text{Minimize } z = -7x_1 - 11x_2 - 4x_3 - x_4$$

subject to

$$\begin{cases} 2x_1 + 3x_2 + x_3 + 2x_4 & \leq & 5, \\ 3x_1 + 5x_2 + 2x_3 + x_4 & \leq & 8, \\ x_1, x_2, x_3, x_4 & \geq & 0. \end{cases}$$

3. [5pts] Let G be the network with the flow drawn below on the left (the numbers correspond to flow values). Write the flow as a linear combination of flows along cycles and paths from s to t.





4. [5pts] Solve the flow problem above and on the right using revised simplex (the numbers correspond to capacity values).

5. [15pts] Use the Sage linear programming tools, GLPK, or another linear programming software to solve the linear program given on the course webpage.