Group Assignment 5
SA305, Spring 2012
Instructor: Phillips

**Due date: Friday, 2/24 by 1700.**

Hand in:

1. One writeup per group, please **put all names on the draft**.
2. Email one excel sheet with all lastnames (in alphabetic order) of your group in the filename as well as "gw5". For example, if I had a group with Professors Sanders and Traves, our excel sheet would be:

   `phillips_sanders_traves_gw5.xlsx`

The Red Cross needs to determine how to send and inventory pharmeceuticals to its various hospitals around the world over a fixed time period. Address the following problems:

(1) Suppose that there is only one type of pharmeceutical, namely, doses of penicillin. Also assume that Red Cross has 2 hospitals and that each can store up to 600 penicillin doses at a cost of \$2 per dose. Each hospital begins with an initial supply of 100 doses. Transporting the penicillin to either region has the same cost but the cost varies over time. The two hospitals are designated $H_1$ and $H_2$, and have varying needs for penicillin over the next three months. The transportation costs and estimated needs are as follows:

| Month | H1 need | H2 need | Transportation cost (\$/dose) |
|---|---|---|---|
| 1 | 900 | 700 | \$8 |
| 2 | 1300 | 1200 | \$10 |
| 3 | 1100 | 1400 | \$15 |

Formulate and solve an LP that minimizes transportation and inventory costs while meeting the needs for the pharmeceuticals.

(2) Now consider generalizing your formulation from part (1). Suppose there are an arbitrary number of hospitals and pharmeceuticals and that storage space and storage cost varies by hospital. Also, assume that transportation costs vary by both month and hospital (rather than just by month). Finally, assume the time horizon is also an arbitrary number of months. Formulate this generalization (note that you cannot solve it without data given).