EXCEL ASSIGNMENT 1
SA405, FALL 2012
INSTRUCTORS: FORAKER AND PHILLIPS

**Due on Dropbox in the submissions folder by 9/24 at 2200.**

*In what follows, replace* `YOURLASTNAME` *with your last name. For example, the first file MIDN Smith would save would be:*

`Smith_guiness_mcf.xls`

**To be completed for class on Monday 9/10/12**

1. Download the sheet `guiness.xls` from http://www.usna.edu/Users/math/dphillip/sa405.f12/guiness.xls. Using the data given, use solver to formulate the minimum cost flow problem, i.e., **do not model the fixed costs for opening warehouses**). Solve the problem to optimality and save the worksheet as `YOURLASTNAME_guiness_mcf.xls`.

**To be completed by the due date.**

1. Save your previous worksheet as `YOURLASTNAME_guiness_fl.xls`. Add in the fixed charge constraints and objective sum to the solver model. Be sure to add the constraint that your warehouse variables are binary. Also, when adding in the fixed charge constraints, use the formulation:

$$\sum_{\{i|(i,j)\in A\}} x_{ij} \leq u_j y_j, \text{ for all } j \in \mathcal{W}.$$

   Note that the column `Flow-in` equals the summation on the left. Solve the model.

2. Save your previous worksheet as `YOURLASTNAME_guiness_fl_strong.xls`. Write a macro that will add the fixed charge constraint in the strong formulation, i.e.,

$$x_{ij} \leq u_j y_j, \text{ for all } i \in \mathcal{B} \text{ and } j \in \mathcal{W}.$$

   Add in the strong formulation and solve.

3. Using your strong formulation sheet, write a macro that will determine how expensive Kilgore needs to be for the solution to change to stop using Kilgore. The macro should double the fixed cost of opening Kilgore until the solution changes. Run the macro to test it.