Project

Last updated: March 17, 2014

1   Overview

For this project, you will:

- choose a problem in midshipman life that you believe can be solved using linear programming,
- model this problem as a linear program,
- write GMPL code for your linear program and solve it using GLPK, and
- analyze the optimal value and optimal solution.

By doing this project, I want you to gain some experience with using linear programming to solve your own problems. Creative and realistic projects will be rewarded!

2   Tasks

1. **Preliminary problem statement**, due Monday March 31
2. **Final report**, due Monday April 28

You must work in teams of 2 (one team may have 3). Detailed requirements for each of these tasks are given below.

2.1   Preliminary problem statement

Your problem statement should resemble the modeling problems we have done this semester. In particular, your statement should in prose:

- give some background information,
- indicate what decisions are to be made,
- how these decisions are constrained, and
- what objective should be used to guide these decisions.

For example, take a look at the problems in Lessons 4–15, and the homework problems from Chapter 2 in Rader.

In addition, you should describe how you will get data for the problem, (e.g. surveys given to your peers, online databases, numbers based on your expert opinion).

2.2   Final report

Your final report must consist of:

- your problem statement;

- a "pen-and-paper" version (typed) of the LP that correctly models your problem – be sure to

  - define the symbolic input parameters,
  - define the decision variables, and
  - explain the objective function, general constraints, and variable bounds;

- a brief analysis of the optimal value and solution of this linear program – in particular,
    - What does the optimal value and optimal solution mean?
    - Does the optimal solution make sense in the context of your problem? Why?
- GMPL model and data files, commented so that their contents are easily decipherable, uploaded to one team member's SA305 Google Drive folder (indicate whose folder on your final report).