Project

Last updated: 2 March 2016

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 COB Friday 25 March
2. **Final report**, due COB Wednesday 4 May

You must work in teams of 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, in prose, your statement should:

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

For example, take a look at the problems in Lessons 5–12, 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 revised 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 seem reasonable in the context of your problem? Why?
- GMPL model and data files, commented so that their contents are easily decipherable.