

MATH 4-5794: Optimization Modeling - Spring
Semester 2005
Assignment 2

Date due:

Note: The word solve means, "Use MATLAB (or Excel or GAMS or Lindo or another mathematical programming software) to find the solution. What you turn in will be the source followed by the solution (in sequence corresponding to the problems given below)

Undergraduates (8 points total)

1. Solve example 1 on page 5
2. Solve example 2 on page 8
3. Solve example 1 on page 39 for factory A, factory B and the company
4. Solve example 1 on page 73
5. Solve example 3 on page 81 (make a note of the solution - it has to be integer)
6. Set up and solve example 4 on page 84
7. Solve example 6 on page 86
8. Solve the untransformed problem (page 90) with

$$\begin{aligned}b_1 &= 62 & c_1 &= 4 \\b_2 &= 82 & c_2 &= 5 \\b_3 &= 39 & c_3 &= 2 \\b_4 &= 91 & c_4 &= 6 \\b_5 &= 56\end{aligned}$$

Graduates (5 points total)

1. Choose one reference given on pages 60-65, read it and write a (minimum) one page summary of its contents (single spaced, 12pt font).
2. Set up and solve example 2 on page 76
3. Look up the proof of what Paul Williams (page 82 at the end of the first paragraph) says, "...the minimum cost flow problem (whether capacitated or not) can be guaranteed to yield an optimal *integer* solution so long as the availabilities, requirements, and arc capacities are integer." Once you have found the proof, read it and summarize the proof in writing.
4. Look up the Ford and Fulkerson algorithm. Summarize it and illustrate the algorithm on the network given in Figure 5.3 of our text.
5. Set up and solve the transformed problem given on page 91 using the data given to the undergraduates (number 8 above).