Math. Methods in Decision Making
D Term, Sections D01-D02
W. J. Martin
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Decision Making Assignment 1

DUE DATE: Thursday, March 22, by 4pm in the course mailbox, SH108.

Please carefully read the presentation rules on the back of this sheet. **Any paper submitted which is sloppy or uses two sides of a page will be returned immediately with no credit.**

1.) *[10 points]* Solve Problem # 26 on page 73. Be sure to define your variables and place text above or next to each constraint!

2.) *[15 points]* We will solve the following linear program via the simplex method:

$$\begin{aligned}
\textbf{maximize} \quad & 3x_1 + 2x_2 + 4x_3 \\
\textbf{subject to} \quad & x_1 + x_2 + 2x_3 \leq 4 \\
& 2x_1 + 3x_3 \leq 5 \\
& 2x_1 + x_2 + 3x_3 \leq 7 \\
& x_1, x_2, x_3 \geq 0
\end{aligned}$$

(a) Introduce slack variables x_4, x_5, x_6 and set up the initial tableau for this problem.

(b) Apply the simplex method. Be sure to indicate the entering and exiting variable (as well as the relevant ratios) at each iteration.

(c) Reading the final tableau, write down the optimal solution $\mathbf{x}^*$ and the optimal objective value z^*.

3.) *[20 points]* Complete Problem 8 on page 256.

4.) *[5 points]* Using the final tableau of the previous exercise, write down the dual price of each of the operations (Cutting and dyeing, Sewing, Finishing, Inspection and Packaging).

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BASIC RULES FOR ASSIGNMENTS

I) Each student must compose his/her assignments independently. However, rough work may be done in groups;

II) Write legibly and use only one side of each sheet of paper;

III) Show your work. Explain your answers using FULL SENTENCES;

IV) No late assignments will be accepted for credit.