

I.E. 2001 OPERATIONS RESEARCH

(Homework Assignment 5: Due Thursday Feb. 16, 2012)

- Question 1.** Answer Question 4 on page 213 of the text.
- Question 2.** Answer Question 6 on page 213 of the text; use only the Big-M method.
- Question 3.** Answer Question 18 on page 214-215 of the text.
- Question 4.** Consider Question 3 from last week's assignment (HW 4). Take the optimal tableau that you found last week (it's in the solutions posted on the website) and obtain an alternative optimum basic feasible solution. Then characterize the entire solution set to this problem.

Question 5. Consider the following LP problem:

$$\text{Maximize } Z = 6X_1 + 9X_2$$

$$\text{st } X_1 + 4X_2 \leq 8$$

$$X_1 + 2X_2 \leq 4$$

$$X_1, X_2 \geq 0.$$

Suppose we use the simplex method, but with the following rule to break ties when we have more than one variable that could be removed from the basis (i.e., for the leaving variable): "*Always pick the leaving variable as the one that is higher up in the tableau.*" Show that the problem is temporarily degenerate. Sketch the feasible region and clearly explain what happens.