
Home Work #1 (Due Sat, Oct'1/05)**Question 1**

A LP model is presented below:

$$\text{Max} \quad 10 x_1 + 20 x_2$$

Subject To

$$-x_1 + 2 x_2 \leq 15$$

$$x_1 + x_2 \leq 12$$

$$5x_1 + 3 x_2 \leq 45$$

$$x_1, x_2 \geq 0$$

- i) Introduce three variables x_3 , x_4 and x_5 . Form matrix **B**. what is x_B ?
- ii) Is the current basic solution optimal? Why or why not.
- iii) If the current basic solution is not optimal, what is entering variable?
- iv) Apply minimum ratio test, and, find leaving variable.
- v) Update matrix **B**, new basic solution x_B , solution value z_0 .
- vi) Is the new basic solution optimal? If not, what is the entering variable?
- vii) Apply minimum ratio test, and, find leaving variable.
- viii) Update matrix **B**, new basic solution x_B , solution value z_0 .
- ix) Is the present solution optimal?

{ Hint, since the procedure explained in class deals with minimization problems, multiply the objective function with -1 to make it a minimization problem }

Question 2

Solve Question No.1 by using **revised** simplex method.

Question 3

Write **dual** problem of the LP model given in Question 1.