

Introduction to Optimization

Homework #1 – Due Wednesday, September 20

1. Consider the following linear programming problem:

$$\text{Maximize } z = 4x_1 + 5x_2$$

subject to

$$6x_1 + 4x_2 \leq 24$$

$$x_1 + 2x_2 \leq 6$$

$$-x_1 + x_2 \leq 1$$

$$x_2 \leq 2$$

$$x_1, x_2 \geq 0$$

- (a) Solve the problem by the simplex method, where the entering variable is the nonbasic variable with the *most* positive z -row coefficient. (Please solve it in the algebra way introduced in class. Do not solve it by a tabular manner.)
- (b) Resolve the problem by the simplex algorithm, always selecting the entering variable as the nonbasic variable with the *least* positive z -row coefficient. (Please solve it in the algebra way introduced in class. Do not solve it by a tabular manner.)
- (c) Compare the number of iterations in (a) and (b). Does the selection of the entering variable as the nonbasic variable with the *most* positive z -row coefficient lead to a smaller number of iterations? What conclusion can be made regarding the optimality condition?