

FIT3139: Lab questions for week 10

1. Use simplex method in the tableau form to solve the linear program:

Maximize

$$x + 2y$$

subject to the constraints:

$$\begin{array}{rclcl} 4x & + & y & \leq & 44 \\ 3x & + & 2y & \leq & 39 \\ 2x & + & 3y & \leq & 37 \\ & & y & \leq & 9 \\ -x & + & y & \leq & 6 \\ x & & & \geq & 0 \\ & & y & \geq & 0 \end{array}$$

Report the values of the decision variables that lead to the maximized objective function. (This is **NOT** a computer problem. This is to help you rationalize and understand the tableau simplex on paper.)

2. Develop a script that implements simplex method to solve canonical linear programming formulations. The input to the script should be
 - (i) a vector corresponding to the coefficients of the objective.
 - (ii) a matrix corresponding to the coefficients in the basis at the start of the simplex method.
 - (iii) a vector corresponding to the right-hand-side of the linear inequalities.

The program should output the maximized value of the objective and the values of the decision variables which lead to that optimization.

Run your program using the linear program given in Question 1 and validate your solution.