

# FIT3155: Tute and Lab (combined) questions for week 11

<b>Objectives:</b> Concepts from week 10
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1. Use simplex method in the tableau form to solve the following 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-based question. This will help you rationalize the tableau-based simplex method of solving a linear program on paper.)

2. Write a program that implements the tableau simplex method to solve the canonical linear program. The input to your should be
  - (i) a vector corresponding to the coefficients of the objective function.
  - (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 output of your program should be: (a) the maximized value of the objective function, and (b) the values of the decision variables corresponding to that optimization. Run your program using the linear program given in Question 1 and validate your solution.

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