

Question 1:

Solve the following Mixed Integer Linear Problem (MILP) by Branch and Bound algorithm (with both manually and GAMS solver):

$$\max z = 2x_1 + 3x_2 + 4y_1 + y_2 + y_3 + 2y_4$$

$$S. t \quad x_1 + 2x_2 + 3y_1 + 2y_2 + y_3 + 3y_4 \leq 12$$

$$3x_1 - 2x_2 - y_1 + 2y_2 - 2y_3 - 3y_4 \geq 5$$

$$2y_1 + y_3 + y_4 \geq 4$$

$$y_1 + 2y_2 \geq 5$$

$$x_1, x_2 \geq 0,$$

$$y_1, y_2 \geq 0, \text{ integer}$$

$$y_3, y_4 \in \{0,1\}$$