MAT 3007 Optimization: Tutorial 5
Simplex Tableau

Guxin Du

The Chinese University of Hong Kong, Shenzhen

June 19, 2025

Exercise 1

Use the simplex tableau method to solve the following problem

$$\begin{aligned} \max \quad & 3x_1 + 4x_2 \\ s.t. \quad & x_1 + x_2 \leq 4 \\ & 2x_1 + x_2 \leq 5 \\ & x \geq 0 \end{aligned} \tag{1}$$

Exercise 2: Two-phased Method

Use the two-phase simplex method to completely solve the linear optimization problem:

$$
\begin{aligned}
\min \quad & 2x_1 + 3x_2 + 3x_3 + x_4 - 2x_5 \\
s.t. \quad & x_1 + 3x_2 + \quad + 4x_4 + x_5 = 2 \\
& x_1 + 2x_2 + \quad - 3x_4 + x_5 = 2 \\
& x_1 + 4x_2 - 3x_3 + \quad + \quad = -1 \\
& x \geq 0
\end{aligned}
$$

Exercise 3: Big-M Method

Use the big-M simplex method to completely solve the linear optimization problem:

$$\begin{aligned} \min \quad & 4x_1 + x_2 + x_3 \\ s.t. \quad & 2x_1 + x_2 + 2x_3 = 4 \\ & 3x_1 + 3x_2 + x_3 = 3 \\ & x \geq 0 \end{aligned}$$

Acknowledgements

Acknowledgements: Thank Prof. Zizhuo WANG, Wentao Ding and Yicheng Liu for the original code and content of this tutorial.