

Индивидуальные задания

Решить задачу оптимизации Симплекс методом
линейного программирования

1

$$\begin{aligned} Z(x) &= x_1 + 2x_2 + x_3 - x_4 - 6 \rightarrow \max, \\ \begin{cases} -x_1 + 5x_2 + x_3 + x_4 + x_5 = 10, \\ 2x_1 - x_2 + x_3 - 3x_4 = 6, \\ 10x_2 + x_3 + 2x_4 + 3x_5 = 25, \end{cases} \\ x_j &\geq 0, j = 1, 2, \dots, 5. \end{aligned}$$

3

$$\begin{aligned} Z(x) &= x_1 + 2x_2 + x_4 + x_5 \rightarrow \max, \\ \begin{cases} 2x_1 - x_2 - x_3 = -1, \\ x_2 + x_4 = 6, \\ x_1 + x_2 - x_5 = 25, \end{cases} \\ x_j &\geq 0, j = 1, 2, \dots, 5. \end{aligned}$$

2

$$\begin{aligned} Z(x) &= 5x_1 + x_2 - 3x_3 + 2x_4 \rightarrow \min, \\ \begin{cases} 3x_1 + 2x_2 + x_3 + x_4 = 7, \\ 5x_1 + 3x_2 + x_3 + 2x_4 = 11, \end{cases} \\ x_j &\geq 0, j = 1, 2, 3, 4. \end{aligned}$$

4

$$\begin{aligned} Z(x) &= 2x_1 - x_2 + 3x_4 + 2x_5 + 4 \rightarrow \min, \\ \begin{cases} x_1 - 2x_3 + x_3 - 3x_5 = 2, \\ 2x_1 + x_2 + 4x_3 + x_5 = 6, \\ -x_1 + 2x_2 + 3x_4 = 4, \end{cases} \\ x_j &\geq 0, j = 1, 2, \dots, 5. \end{aligned}$$

5

$$Z(x) = -6x_1 + 3x_2 + 3x_4 \rightarrow \max,$$

$$\begin{cases} 3x_1 + 2x_2 + x_4 \geq 18, \\ 2x_1 + x_2 + 2x_4 \leq -9, \\ 2x_1 - 4x_2 + 2x_3 = 10, \\ x_j \geq 0, j = 1, 2, 3, 4. \end{cases}$$

6

$$Z(x) = x_1 + x_2 + x_3 - x_4 \rightarrow \max,$$

$$\begin{cases} x_1 + x_2 + 2x_3 + x_4 = 12, \\ x_1 + 2x_2 + x_3 \leq 20, \\ x_1 + x_2 + x_3 \leq 20, \\ x_j \geq 0, j = 1, 2, 3, 4. \end{cases}$$

7

$$Z(x) = 6x_1 - 2x_2 - 8x_3 \rightarrow \min,$$

$$\begin{cases} x_2 - x_3 \geq -2, \\ -5x_1 + x_2 + x_3 = 4, \\ -8x_1 + x_2 + 2x_4 + 3x_5 = 25, \\ x_j \geq 0, j = 1, 2, 3. \end{cases}$$

8

$$Z(x) = -2x_1 - 4x_2 - 2x_3 \rightarrow \min,$$

$$\begin{cases} -2x_1 + x_2 + x_3 \leq 4, \\ -x_1 + x_2 + 3x_3 \leq 6, \\ x_1 - 3x_2 + x_3 \leq 2, \\ x_j \geq 0, j = 1, 2, 3. \end{cases}$$

9

$$Z(X) = x_1 - x_2 + x_3 \rightarrow \max,$$

$$\begin{cases} 4x_1 + 2x_2 + x_3 \geq 6, \\ -x_1 + x_2 + x_3 = 1, \\ x_1 - x_2 + 4x_3 \leq 24, \\ x_j \geq 0, j = 1, 2, 3. \end{cases}$$

10

$$Z(X) = 5x_1 + 2x_2 + x_3 \rightarrow \max,$$

$$\begin{cases} x_1 + x_2 + x_3 \geq 3, \\ x_1 + 2x_2 + 2x_3 = 4, \\ 3x_1 + 4x_2 + 2x_3 \leq 12, \\ x_j \geq 0, j = 1, 2, 3. \end{cases}$$