Assignment 2:

Solve the following linear programming problems. If you wish, you may check your arithmetic by using the simple online pivot tool:

1.

$$\begin{aligned} \text{maximize } & 6x_1 + 8x_2 + 5x_3 + 9x_4 \\ \text{subject to } & 2x_1 + x_2 + x_3 + 3x_4 \leq 5 \\ & x_1 + 3x_2 + x_3 + 2x_4 \leq 3 \\ & x_1,\ x_2,\ x_3,\ x_4 \geq 0. \end{aligned}$$

2.

$$\begin{aligned} \text{maximize } & 3x_1 + 2x_2 \\ \text{subject to } & x_1 - 2x_2 \leq 1 \\ & x_1 - x_2 \leq 2 \\ & 2x_1 - x_2 \leq 6 \\ & x_1 \leq 5 \\ & 2x_1 + x_2 \leq 16 \\ & x_1 + x_2 \leq 12 \\ & x_1 + 2x_2 \leq 21 \\ & x_2 \leq 10 \\ & x_1,\ x_2 \geq 0. \end{aligned}$$

3.

$$\begin{aligned} \text{minimize } & x_{12} + 8x_{13} + 9x_{14} + 2x_{23} + 7x_{24} + 3x_{34} \\ \text{subject to } & x_{12} + x_{13} + x_{14} \geq 1 \\ & -x_{12} + x_{23} + x_{24} = 0 \\ & -x_{13} - x_{23} + x_{34} = 0 \\ & x_{14} + x_{24} + x_{34} \leq 1 \\ & x_{12}, x_{13}, \ldots, x_{34} \geq 0. \end{aligned}$$