Mosek wrapper

最优化 最优化 Mosek

线性规划

Problem:

$$
\begin{aligned}
&\max 3x_0 + 1x_1 + 5x_2 + 1x_3 \\
&\text{s.t. } 3x_0 + 1x_1 + 2x_2 = 30 \\
&2x_0 + 1x_1 + 3x_2 + 1x_3 \geq 15 \\
&2x_1 + 3x_3 \leq 25 \\
&0 \leq x_0 \leq \infty \\
&0 \leq x_1 \leq 10 \\
&0 \leq x_2 \leq \infty \\
&0 \leq x_3 \leq \infty
\end{aligned}
$$

Ans:

$$
x = [0.0, 0.0, 15.0, 8.333333333333334]
$$

混合整数线性规划

Problem:

$$
\begin{aligned}
&\max 7x_0 + 10x_1 + 1x_2 + 5x_3 \\
&\text{s.t. } x_0 + x_1 + x_2 + x_3 \leq 2.5 \\
&x_0, x_1, x_2 \in \mathbb{Z} \\
&x_0, x_1, x_2, x_3 \geq 0
\end{aligned}
$$

Ans:

$$
x = [0.0, 2.0, 0.0, 0.5]
$$

二次优化

Problem:

$$\min \frac{1}{2} x^T Q^{obj} x + c^T x$$
$$\text{s.t. } \frac{1}{2} x^T Q^{con0} x + Ax \geq b,$$
$$x \geq 0$$

where

$$Q^{obj} = \begin{bmatrix} 2 & 0 & -1 \\ 0 & 0.2 & 0 \\ -1 & 0 & 2 \end{bmatrix}, c = [0, -1, 0]^T, A = [1, 1, 1], b = 1$$
$$Q^{con0} = \begin{bmatrix} -2 & 0 & 0.2 \\ 0 & -2 & 0 \\ 0.2 & 0 & -0.2 \end{bmatrix}$$

Ans:

$$x = [0.4488485199618974, 0.9319361480448437, 0.6741131920778094]$$