

Example: BOQP

$$\begin{aligned}
 \mathcal{P} : \quad & \min \quad \mathbf{f}(\mathbf{x}) = [f_1(\mathbf{x}) = \tfrac{1}{2}\mathbf{x}^T Q_1 \mathbf{x} + \mathbf{p}_1^T \mathbf{x}, f_2(\mathbf{x}) = \tfrac{1}{2}\mathbf{x}^T Q_2 \mathbf{x} + \mathbf{p}_2^T \mathbf{x}] \\
 & \text{s.t.} \quad \begin{array}{ll} x_1 & \leq 3, \\ x_2 & = 2 \\ x_1, x_3 & \geq 0. \end{array} \quad (1)
 \end{aligned}$$

where

$$Q_1 = \begin{bmatrix} 6 & -6 & 6 \\ -6 & 14 & -10 \\ 6 & -10 & 8 \end{bmatrix}, \mathbf{p}_1 = \begin{bmatrix} 0 \\ -3 \\ 0 \end{bmatrix}, \quad Q_2 = \begin{bmatrix} 2 & -4 & 2 \\ -4 & 16 & -2 \\ 2 & -2 & 4 \end{bmatrix}, \mathbf{p}_2 = \begin{bmatrix} -1 \\ -1 \\ 1 \end{bmatrix}.$$

Note: Constraint $x_2 = 2$ is modified as $x_2 \leq 2$ and $-x_2 \leq -2$ when using the mpLCP method.