Assignment– Optimization

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Solve the following Non linear Optimization problem.

0.1

$$\begin{aligned} min \quad & 100(x_1 - 1)^2 + x_2 \\ s.t \quad & x_1 + 6x_2 = 36 \\ & -4x_1 + x_2 = 0 \end{aligned}$$

0.2

$$\begin{aligned} min \quad & x_1^2 + x_2^2 + 2x_3^2 + x_4^2 - 5x_1 - 5x_2 - 21x_3 + 7x_4 \\ s.t \quad & 0 \leq 8 - x_1^2 - x_2^2 - x_3^2 - x_4^2 - x_1 + x_2 - x_3 + x_4 \\ & 0 \leq 10 - x_1^2 - 2x_2^2 - x_3^2 - 2x_4^2 + x_1 + x_4 \end{aligned}$$

0.3

$$\begin{aligned} min \quad & e^{x_1}(4x_1^2 + 2x_2^2 + 4x_1x_2 + 2x_2 + 1) \\ s.t \quad & x_1 + 2x_2 = 5 \\ & x_1^2 + x_2^2 \leq 25 \end{aligned}$$