Continuous Optimization

Equality Constrained Optimization

Sections covered in the textbook (2nd edition):

- Chapter 12: 1, 3, 5, 7, 8, 9 (equality constrained problems)

Suggested exercises in the textbook:

- 12.1, 12.2, 12.3, 12.4, 12.5, 12.6 12.16, 12.20

General formulation

$$\begin{aligned} \underset{x \in \mathbb{R}^n}{\text{minimize}} \quad & f(x) \\ \text{subject to} \quad & \\ & c_i(x) = 0, \quad i \in \mathcal{E}, \\ & c_i(x) \leq 0, \quad i \in \mathcal{I}. \end{aligned}$$

- The *objective* function f; the *equality constraints* $c_i, i \in \mathcal{E}$; the *inequality constraints* $c_i, i \in \mathcal{I}$.
- The *feasible set* Ω:

$$\Omega = \{x \mid c_i(x) = 0, i \in \mathcal{E};\ c_i(x) \leq 0, i \in \mathcal{I}.\}$$

Equivalent formulation: $\underset{x \in \Omega}{min}\ f(x)$.