Introduction to Mathematical Optimization and Mixed-Integer Programming

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R Markdown

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- Mathematical Optimization
- Mixed-Integer Programs
  - Examples

Overview of Mathematical Optimization

Mixed-Integer Programs

$$\begin{aligned}
\max \quad & f(x) \\
s.t. \quad & g(x) \leq 0 \\
& x \in \mathbb{R} \times \mathbb{Z}
\end{aligned}$$
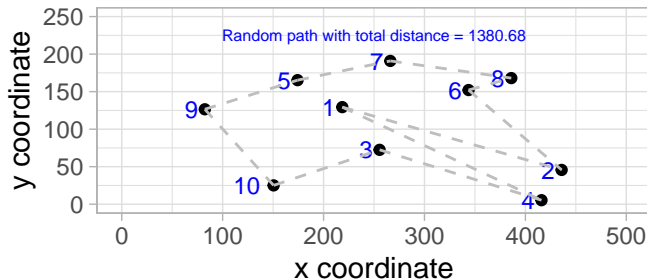
Portfolio Optimization

Traveling Salesman Problem

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  The travelling salesman problem (TSP) asks the following question: Given a list of cities and the distances between each pair of cities, what is the shortest possible route that visits each city exactly once and returns to the origin city?

TSP example with 10 cities

Add distance to the figure