

Hands-on Tutorial on Optimization

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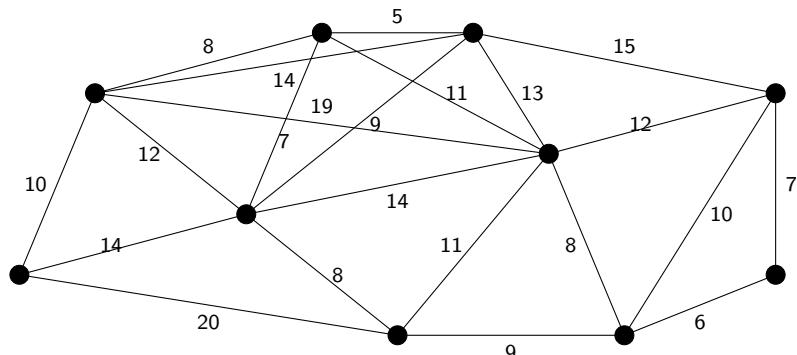
September 25, 2019

# **Travelling Salesperson Problem (TSP)**

## Problem: TSP

Given:  $n \in \mathbb{N}$  cities with  
distances  $d_{ij}$  between  $i, j \in [n]$

Task: Minimize the length of a tour that visits all cities exactly once

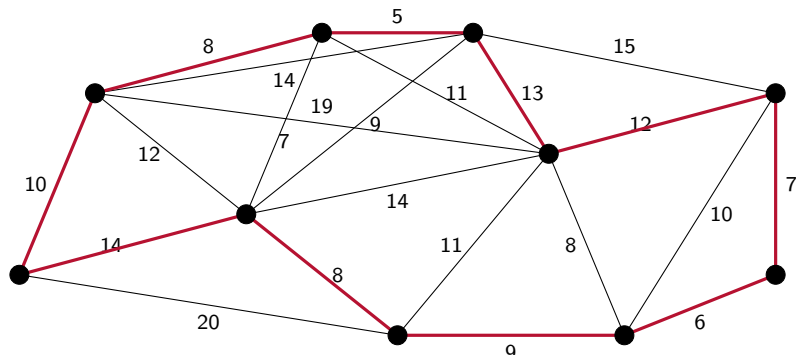


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$$\begin{array}{ll} \min & \sum_{i,j} d_{ij} x_{ij} \\ \text{s.t.} & \sum_j x_{ij} = 1 \quad \text{for all } i \in [n] \\ & \sum_j x_{ji} = 1 \quad \text{for all } i \in [n] \\ & x_{ij} \in \{0, 1\} \quad \text{for all } i, j \in [n] \end{array}$$

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