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## Discrete Mathematics WS 07/08 Homework 11 (due 08/02)

## Exercise 1:

Given the complete undirected graph G = (V, E) for a set V of vertices, and a function  $w \to \mathbb{R}^+$  that assigns a positive weight to each edge, the *Traveling Salesman Problem* (*TSP*) is to find a cyclic path in G that contains each vertex in V exactly once and has minimal total weight.

- a) Describe a brute force algorithm for solving the TSP.
- b) Describe several heuristics to approximate the TSP. Use at least the following techniques:
  - Iterated local search.
  - Simulated annealing.
  - Ant colony optimization.
  - Evolutionary computing.
- c) How can the TSP be formulated as an ILP?