

The Travelling Salesman Problem

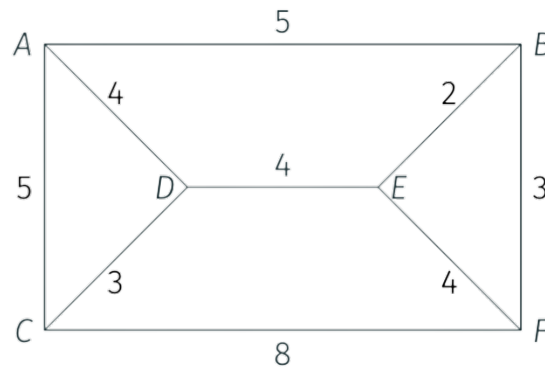
Difficulty level: advanced

Keywords

- Graph theory
- Undirected graphs
- Heuristic algorithms
- Integer Linear Programming
- Excel Solver
- Exact algorithms

Problem description

Consider the following weighted graph, representing an instance of the Travelling Salesman Problem with six vertices and nine edges, each edge associated with a weight. By starting from a vertex, you want to visit all the other vertices exactly once, and then return to the starting point, by minimizing the total length travelled.



Tasks

1. Find some feasible solutions by applying different constructive heuristic algorithms, each time choosing a different vertex as the starting point. Note that the graph is not complete: what might this imply by applying some heuristics?
2. Formulate the problem as an Integer Linear Programming problem and implement the model with Excel Solver.