

Introduction to Term Project

Topic:

Travelling Salesman Problem

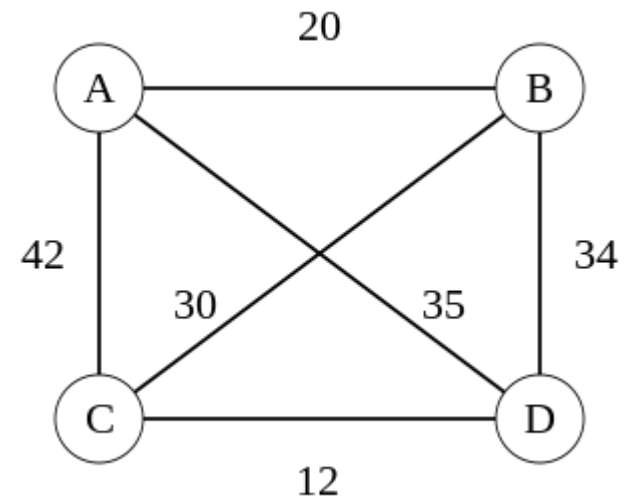
Definition:

- **Traveling salesman problem** is an algorithmic problem in combinatorial optimisation.
- Problem of **finding the shortest path that allows a salesman to visit a series of cities, passing through each city only once**, before returning to the starting point.
- **NP-hard problem**: to date, there exists no algorithm capable of solving this problem optimally in polynomial time.

Key characteristics :

- Set of **cities**
- **Distances** between each pair of city
- **Optimal path**: order of visiting cities that minimizes the total distance traveled

This problem can be modelled as an undirected graph, where cities are vertices and the edges' costs are the distances between each pair of cities



Application of GAs for TSP: why are they well-suited for this problem ?

- Ability to handle complex search spaces, since the problem is NP-hard
- Flexibility and adaptability
- Natural parallelism
- Ease of implementation