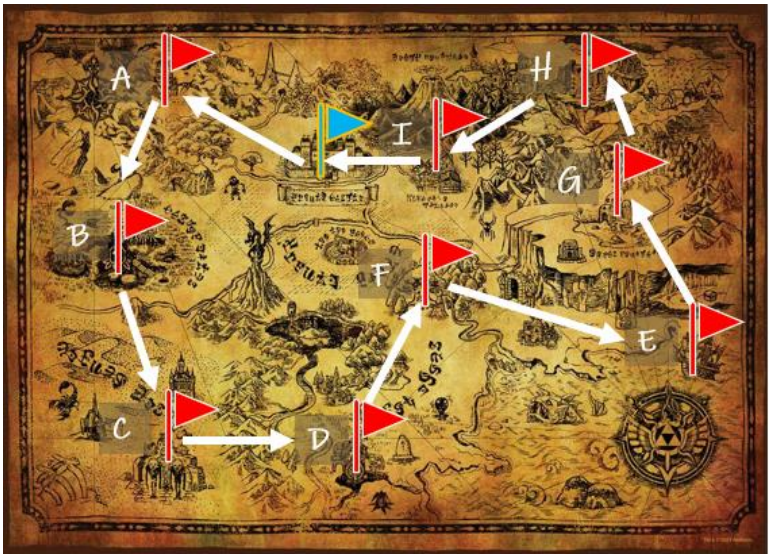
BAO: Bioinspired Optimization Algorithms

Traveling Salesman Problem with ACO



Introduction

The Traveling Salesman Problem (TSP) is a classic problem in the field of optimization and computer science, illustrating the concept of combinatorial optimization. The problem is deceptively simple to state: given a list of cities and the distances between each pair of cities, the task is to find the shortest possible route that visits each city exactly once and returns to the original city. An example of a Possible solution to a TSP can be found in the image above.

In this assignment we will solve the TSP using ACO. An example TSP have been collected from the website: http://comopt.ifi.uni-heidelberg.de/software/TSPLIB95/ . The file with the TSP info is available at Moodle. In addition, a Google Colab with the code necessary to read the file and calculate the distance between points and the distance of a particular circular route is also available at Moodle. **Please make a copy of this colab in your own google drive in order to be able to edit the notebook.**

Objective

Implement an ACO algorithm that solves the TSP problem. The shortest route for the problem has a length of **2323**. Using a greedy heuristic the route obtained has a length of **2761.96**. Let's see who can find a best route!