CSCI 4560/6560 Evolutionary Computation

Assignment Number 2: Due 9/30/2025 by eLC

The use of generative AI tools is not allowed

[100 points]

The Traveling-salesperson problem is stated as follows. Given a set of N cities, find a tour that minimizes the total distance traveled while visiting all the cities and returning to the point of origin. In this assignment you should use the locations of the cities in the file:

khaledmrasheed.github.io/ECcourse/TSPDATA.txt

and use Euclidean distance. The file has the X and Y coordinates of 127 cities.

Use an evolutionary algorithm to solve the traveling salesperson problem. You should try to find the shortest tour among the cities **[20 points]**. The shortest known tour has length 118282. Turn in a PDF printout of your code and a screen shut of your solution **[60 points]**. If you use an existing package, you should only turn in the printout of the parts you modify/introduce, such as the fitness function.

Note:

- You can write your own code or use a package that supports permutation representation to solve the Traveling-salesperson problem. In the latter case, you need to modify the fitness function and possibly other settings and choice of operators. However, you cannot use a package or program written specifically to solve only the Traveling salesperson problems. This will not be acceptable as you will not learn much. In any case, you need to modify the fitness function and possibly other settings and choice of operators.
- You should also include a brief description of your problem formulation (representation, parenthood selection, mutation, crossover, survival selection) **[20 points].**
- **If you like Python, an excellent package for this assignment is called DEAP (https://github.com/DEAP/deap). If you prefer Java, you can use the Jenetics package (https://jenetics.io/). They both support permutation representation.**