

Assignment 3: Implementation of Standard Genetic Algorithm to solve the Traveling Salesman Problem

This is an assignment to be performed and submitted individually.

You are required to implement the Genetic Algorithm in Python Programming Language to solve the TSP problem with 10, 30 and 50 cities, each city recorded as a pair of coordinates (x, y). You may use any resource(s) you wish provided you cite clearly the sources. Avoid copying code which will result to zero marks. Your program must be self-explanatory and well-commented, i.e. it must be easy to figure out what each part is achieving. You are expected to implement at least **two** selection strategies, **two** distinct crossover methods, and **one** mutation approach. It should be clear which values you have used for the GA parameters.

The program must produce the following:

- (a) A graph of the final optimal route (fitness) achieved for each number of cities 10, 30 and 50.
- (b) A graph showing the average fitness obtained for number of cities 10, 30 and 50 after running the program a certain number of times R (say 25).

More credit shall be given for the following criteria:

- (a) An object-oriented approach.
- (b) Program clarity, readability and understandability, with ample comments to document your program.

Deliverables: A fully-commented working Python program and the graphs mentioned above. Favour the simplest implementation.

Deadline to submit: **Sunday 27 November 2022 at 23:59** on Moodle.

Date issued: 14 November 2022