6/10/2021 City distances corrected in red

MET CS 767 Assignment 5T: GA’s

*replace this with your name*

Please fulfill the requirements in the gray text, handing in this filled-out template and the accompanying source code, leaving the gray text and the headings unchanged.

You are to implement the *traveling salesman problem* using a genetic algorithm in the manner outlined below, particularly in the *Crossover* section—which you are advised to read first. You can assume that there is a route connecting every pair of cities, and that no two distances are equal.

Eric Braude created this technique independently as a way to perform smooth crossover for Traveling Salesman but it may be published. If so, please do not use the work of others in responding.

# Representation of the Data

## Explain how the application will represent *the data*. Include how the following example is to be represented: B(oston) to L(ondon) 3(k miles), L to M(umbai) 4.5, M to S(hanghai) 3.1, S to L 5.7, B to M 7.6, and B to S 7.8.

your response replaces this

# Representation of a Route

## Explain how the application will represent *a route* starting and ending in Boston. Include how the following route is to be represented: B to L to M to S to B.

your response replaces this

# Crossover

## Provide a crossover function. The implementation should create a child from two parents as in the following example. Bold and italics are added to clarify what part of the child comes from what part of the parent.

## Parent 1 Boston 🡪 2nd closest unvisited city[[1]](#footnote-1) 🡪 2rd closest unvisited city[[2]](#footnote-2) 🡪 closest unvisited city 🡪 Boston

## *Parent 2 Boston 🡪 closest unvisited city 🡪 closest unvisited city 🡪 closest unvisited city 🡪 Boston*

## Assuming that the crossover point is at 1, the child route will be

## Boston 🡪 2nd closest unvisited city *🡪 closest unvisited city 🡪 closest unvisited city 🡪 Boston*

your response replaces this

# Mutation

Explain (clearly) how the application will perform mutation.

your response replaces this

# Result on the Given Data

## Describe the result from executing on the data … *B(oston) to L(ondon) 3(k miles), L to M(umbai) 4.5, M to S(hanghai) 3.1, S to L 5.7, B to M 7.6, and B to S 7.8*. What do you think of this result? Explain.

your response replaces this

# Result on Your Data

## Describe the result from executing on illustrative data of your choice. What do you think of this result? Explain.

# Source Code

Paste your source code below. It should accompany this doc as well.

your response replaces this

# Comments on the Design

If possible, compare the performance of this TSP GA with at least one known TSP GA implementations.

Supply what could be improvements on your design and explain.

your response replaces this

# References

Show that you used a wide variety of resources by listing them below and clearly indicating in the body above where you used. Make sure to use proper referencing in your paper. We suggest using APA format, but other formats are fine as long as they clearly distinguish your work from work of others in your response. In general, observe the stated plagiarism rules.

[1] your first reference replaces this

[2] …

# Evaluation



1. i.e., compared to all other direct hops from the city just visited (Boston in this case) [↑](#footnote-ref-1)
2. i.e., compared to all other direct hops from the city just visited [↑](#footnote-ref-2)