## HW4 Readme

This assignment consists of the following python programs:

1. pyevolve\_ex12\_tsp.py
2. hw4\_greedy.py
3. hw4\_astar.py
4. hw4\_wrapper.py
5. pyevolve\_decision\_tree.py

It has been submitted along with a folder of datasets and a Latex report

1. **Modified pyevolve\_ex12\_tsp.py**

The program runs a genetic algorithm using the Pyevolve library to generate a tour length for a TSP dataset.

To run the program, write the following in your terminal:

Python pyevolve\_ex12\_tsp.py att48.tsp

Also make sure that the file written after the program name is a .tsp file and not a directory. Also the .tsp file needs to be in the same folder as the program to run

The program outputs the tour length and time taken as output on the terminal screen. For att48, it also generates a output\_tsp.txt file containing the entire tour

Output:

Rashmis-MacBook-Pro:HW4 rashmivarma$ python hw4\_ga.py att48.tsp

==================File Name att48.tsp===================

Total time elapsed: 13.293 seconds.

The tour length for file att48.tsp is:44613.6405762 and time taken is:13.2925598621

1. **Greedy Algorithm hw4\_greedy.py**

This program runs a greedy algorithm for TSP to output tour length and time taken.

The program should be run from the terminal as follows:

Python hw4\_greedy.py att48.tsp

The output of the program is as follows:

Rashmis-MacBook-Pro:HW4 rashmivarma$ python hw4\_greedy.py att48.tsp

Greedy Algorithm - Tour length for att48.tsp is: 40526.4210563

Time taken:0.00582218170166 seconds

1. **A\* algorithm hw4\_astar.py**

The program runs A\* algorithm to try and solve TSP. The program runs only on datasets: astar1.tsp, att48.tsp and astar2.tsp. The program should be run from the terminal using:

Python hw4\_astar.py att48.tsp

The program outputs the following:

Rashmis-MacBook-Pro:HW4 rashmivarma$ python hw4\_astar.py astar1.tsp

Time taken:0.0416820049286 seconds

Tour length of A star is:12481.218813

1. **Hw4\_wrapper**

**Th**is program consists of a code that accesses the DIMAC dataset folder and runs every file through the greedy and GA algorithm to generate output

Wrapper must be run from terminal. Input to wrapper must be as follows:

Python hw4\_wrapper.py /Users/nataliakhuri/<nameOfFolder>/<nameOfSubFolder>/RASHMI\_VARMA\_HW4/benchmarks

1. Decision Tree

The program takes 4 values as input and classifies them into w1 and w2.

On termination, the code shows a Traceback error due to a datastructure misassignment but it does not affect the output.

Latex Report:

While running the tex file, please give the path of “graph1.png” before running the file. If path is not updated, the PDF will fail to display the graph