EE3980 Algorithms

Homework 12. Travelling Salesperson Problem

Due: June 7, 2020

In this homework you will write a `C` program to solve the Travelling Salesperson Problem (TSP) as efficiently as possible. Six sets of data are provided for you to test your program. They are `t1.dat`, `t2.dat`, `t3.dat`, `t4.dat`, `t5.dat`, and `t6.dat`. The first line of each file is the number of cities the salesperson needs to travel, followed by the names of the cities. After that, a 2-dimensional matrix is given that depicts the distance between different cities. The starting and ending city of the travelling plan is the first city on the list.

As part of this homework, you need to describe your algorithm, analyze the complexities of your program and state your observations and/or conclusions.

Program execution and output should follow the example below.

```
$ ./a.out < t1.dat
Minimum distance route:
 Ann Arbor -> Iowa City
 Iowa City -> Manhattan
 Manhattan -> Charlottesville
 Charlottesville -> Corvallis
 Corvallis -> Ann Arbor
Total travelling distance: 28
```

Notes.

1. One executable and error-free `C` source file should be turned in. This source file should be named as `hw12.c`. Execution of the program is invoked by

   ```
   $ ./a.out < t1.dat
   ```

   And the output of the program is listed above.

2. A `pdf` file is also needed. This report file should be named as `hw12a.pdf`.

3. Submit your `hw12.c` and `hw12a.pdf` on EE workstations using the following command:

   ```
   $ ~ee3980/bin/submit hw12 hw12.c hw12a.pdf
   ```

   where `hw12` indicates homework 12.

4. Your report should be clearly written such that I can understand it. The writing, including English grammar, is part of the grading criteria.