

CS 101 - Makeup Program

Fall 2018

No Algorithm is Due

Program Due : **December 9th, 2018**

**All work submitted must be your own.**

**Deliverables :** You only need to submit your solution. You must use functions to modularize your work. You should use exception handling where necessary as well. This program can replace any of the first five programs.

## Visiting Professor

A professor wants to visit other universities, they only want to visit each one once and would like to find the shortest way to do so. We also want to find the longest route in case we wanted to pad our mileage voucher.

Your program will read a file that contains all the cities, the origination city, and all the distances from each city to other.

### Sample Input File

A , B , C

A

A, B, 2

A, C, 3

B, C, 5

The first line are the cities that are in the sample problem, we have cities, A, B, and C. The second line is what city we are starting from. Each line after that will be 2 cities, and the distance between them. The distance from A to B is 2, likewise the distance from B to A is 2. Using this we can go through all the possibilities. In this example if we start at A, then our possible routes are A->B->C and A->C->B. We can calculate the routes and find the shortest and the longest.

Your program should be able to respond to invalid files.

## Example Output

```
>>> ===== RESTART =====
>>>
Enter the travel information file ==> Input1.txt
The shortest path visiting each city is 7 along the path A->B->C

The longest path visiting each city is 8 along the path A->C->B

Enter the travel information file ==> input2.txt
The shortest path visiting each city is 92 along the path F->C->E->B->A->D

The longest path visiting each city is 225 along the path F->A->E->D->B->C

Enter the travel information file ==> Missouri.txt
The shortest path visiting each city is 637 along the path Kansas City->Springfield->Jefferson City->Kirksville->Hannibal->St. Louis

The longest path visiting each city is 1056 along the path Kansas City->St. Louis->Kirksville->Springfield->Hannibal->Jefferson City

Enter the travel information file ==> largeversion.txt
The shortest path visiting each city is 190 along the path E->F->G->D->I->H->C->B->A->J

The longest path visiting each city is 790 along the path E->G->I->C->A->H->F->J->B->D

Enter the travel information file ==> |
```