Specification for program "Travel"

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Name

Travel – Functions to help a person plan a trip

Usage

travel <input-file>

Description

Travel is a software system to help people reduce their traveling time so that they can enjoy the places they want to visit for longer times.

Suppose that I want to visit 5 cities, what travel does is arrange a combination of all those 5 cities in an order so that I end up with the shortest possible time that I can visit all 5 cites.

Example: (A, B, C, D) are cities

Starting point: A

A-B-10

A-C-25

C-A-20

C-B-5

C-D-7

B-D-2

D-A-30

First letter is a point of start, second is a point of end and the number is the time between the two cities. Note that can only be possible to go from A to B and not the other way around, unless explicit stated.

To this example the program should return:

A-C-B-D-32

Tip: use the Chinese postman algorithm.

Options

The user has access to the following commands, with different numbers of arguments and must take into account upper- and lowercase characters. Between the option and the arguments there are single spaces and each command must be written on a new line. The program should support the following options:

- addRoad <Argument1> <Argument2> <Argument3>
    - adds a road between two points and sets a distance
    - Argument1 = point of start
    - Argument2 = point of end
    - Argument3 = time between the two (Integer)
- startingPoint <Argument>
    - point of start for the algorithm.
- allPoints
    - should display all points on the system.
- calculatePath
    - calculates optimal path and returns the path along with the time needed (example: A-C-B-D-32)

Input Data

On each line of the file are command lines with arguments. Lower and upper case is relevant in order for the program to work correctly. The separator between each element of a line is a space.

Limitations

If there is no way possible to visit all different points the system should return on the option "calculatePath" an error message "Impossible to visit all points".