
Bus Routes

You work at a budget travel company. Your team leader has asked you to develop a program that identifies the cheapest bus route between two given cities. Routes may not be direct, and require passing through multiple cities to reach the destination city. Several possible routes may exist, with some cheaper than others. When several routes of equal cost do exist, the route that passes through the fewest number of cities should be chosen.

Problem Statement

Given a set of inter-city routes, each with a travel fare (\$), write a program that identifies the cheapest route between any two cities in the given set. A valid route solution will always be present. However, your program must handle several invalid cases.

Task

Your program should read city route information from a text file via `stdin`. The first line of the file will be the two cities for which you must find the cheapest route. Remaining lines 2:n consist of all inter-city routes with their fare. Your program must be case-insensitive, handle any leading and trailing spaces, and accept cities names that consist of one or more words separated by spaces.

1.1 Input

Example input file:

```
Christchurch, Dunedin
Christchurch, Rolleston, 5.5
Rolleston, Temuka, 15
Temuka, Timaru, 16.5
Timaru, Oamaru, 27
Oamaru, Palmerston, 21.5
Palmerston, Dunedin, 23
Christchurch, Palmerston, 85.5
```

1.2 Output

Output from the above example must read:

```
christchurch-palmerston-dunedin
```

1.3 Invalid cases

Your program must handle the following invalid cases. The input/output for this étude are **strict**. Your program output will be compared against the correct solution using `diff`. Any inaccuracy/difference will result in a grade of 0.

Your program must output the following text, when the given situation occurs.

- 'Invalid: route set' when input is more or less than 3-comma-separated values.
- 'Invalid: route' when first line is not a 2-comma-separated values.
- 'Invalid: Non-unique routes' when a duplicate route is in the set, regardless of fare value.
- 'Invalid: No input' when no input file is provided via `stdin`. Your program must then quit; it must not be left hanging waiting for user input.

Relates to Objectives

1.1 1.2 1.3 1.4 2.2 2.3 2.9 3.4 3.5 4.1 4.2 4.3

(2 points, Pair)