

Lab6 : Shortest-Path

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Description

The main purpose of this lab is to get you familiar with shortest-path algorithm. This is an individual assignment; you may not share code with other students. Java is the acceptable programming language.

Overview

A traveler's map gives the distances between cities along the highways. Now you are supposed to write a program to help a traveler to decide the shortest path between his/her starting city and the destination.

Specification

Input Specification

The "testcase.txt" file contains one test case. Your job is to read the test case from this file and test your code. The case starts with a line containing 4 positive integers N , M , S , and D , where N (≤ 500) is the number of cities (and hence the cities are numbered from 0 to $N-1$); M is the number of highways; S and D are the starting and the destination cities, respectively. Then M lines follow, each provides the information of a highway, in the format:

```
City1 City2 Distance
```

where the numbers are all integers no more than 500, and are separated by a space.

Output Specification

For the test case, print in one line the cities along the shortest path from the starting point to the destination, followed by the total distance. The numbers must be separated by a space.

Sample Input

```
5 5 0 4
0 1 20
1 2 30
2 3 20
3 4 20
0 4 100
```

Sample Output

```
0 1 2 3 4 90
```

Submission

Deadline: In class / 6 Nov, 2019 23:59, any uploads after 8 Nov, 2019 18:00 will get **ZERO** points. Create a zip file named **YourStudentID.zip** that contains your code project and **upload your zip file to the FTP server**.

Tips

- **Dijkstra's algorithm** is the recommended algorithm.
- Since the number of cities is only 5, you can consider using some simplified data structures. For example, use an **array** to store the distances between cities.