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(https://swayam.gov.in)   (https://swayam.gov.in/nc_details/NPTEL)

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NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL) » Design and analysis of algorithms (course)

Announcements (announcements)

About the Course (https://swayam.gov.in/nd1_noc20_cs27/preview)   Ask a Question (forum)

Progress (student/home)   Mentor (student/mentor)

Course outline
How does an NPTEL online course work?
Week 1 : Introduction
Week 1 : Analysis of algorithms
Week 1 Quiz
Week 2 : Searching and sorting
Week 2 Quiz
Week 2 Programming Assignment
Week 3 : Graphs
Week 3 Quiz

Week 4 Programming Assignment: Padayatra

Due on 2020-03-02, 23:59 IST

- Select your language (C/C++/Java/Python3)
- Paste your code into the submission window.
- There are some public test cases and some (hidden) private test cases.
- "Compile and run" will evaluate your submission against the public test cases.
- "Submit" will evaluate your submission against the hidden private test cases. There are 20 private testcases in all, each with equal weightage. You will get feedback about which private test cases pass or fail, though you cannot see the actual test cases.
- Ignore warnings about "Presentation errors".

Padayatra

(IOI Training Camp, 2004)

The exit polls indicate that the sitting MLA is likely to lose the upcoming election. The party high command instructs him to undertake a padayatra through his constituency to boost his popularity. To maximize coverage of the constituency, the party decides that he should choose a circular route that returns to the starting point without using any road twice. The route need not visit all the towns and villages in the constituency.

Being averse to physical exercise, the MLA would like to minimize the distance that he has to walk. He has a helicopter at his disposal, so he can begin the padayatra at any town or village.

The task is to help him find the shortest circular route. You are guaranteed that there is always at least one circular route.

Solution Hint

Given an edge (i,j) with weight W(i,j), the shortest cycle from i to i via j can be found by temporarily deleting the edge (i,j), finding the shortest path from j to i, and then adding W(i,j) to the length of this path. Do this systematically to find the shortest cycle in the graph.

Input format

The first line of input is an integer N, $1 \leq N \leq 1000$, the number of roads in the constituency. The constituency has no more than 300 towns and villages connected by roads.

The next N lines specify the roads. Each line consists of three space separated integers S, T and D where S is the starting point of the road, T is the ending point and D is the length of the road. Each road is a two-way road and is listed exactly once, in one of the two directions.

Output format
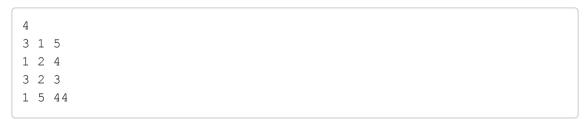
A single line with the integer distance around the shortest possible circular route.

Test data

There are at most 300 towns and villages and at most 1000 roads.

Example

Sample Input

```
4
3 1 5
1 2 4
3 2 3
1 5 44
```

Sample output 1

```
12
```

Sample Test Cases

	Input	Output
Test Case 1	139 1 2 93027 6 1 70813	20297