Cow Relays

Time Limit: 1000MS   **Memory Limit:** 65536K
Total Submissions: 6491   **Accepted:** 2532

Description

For their physical fitness program, N ($2 \leq N \leq 1{,}000{,}000$) cows have decided to run a relay race using the T ($2 \leq T \leq 100$) cow trails throughout the pasture.

Each trail connects two different intersections ($1 \leq I_{1i} \leq 1{,}000$; $1 \leq I_{2i} \leq 1{,}000$), each of which is the termination for at least two trails. The cows know the $length_i$ of each trail ($1 \leq length_i \leq 1{,}000$), the two intersections the trail connects, and they know that no two intersections are directly connected by two different trails. The trails form a structure known mathematically as a graph.

To run the relay, the N cows position themselves at various intersections (some intersections might have more than one cow). They must position themselves properly so that they can hand off the baton cow-by-cow and end up at the proper finishing place.

Write a program to help position the cows. Find the shortest path that connects the starting intersection (S) and the ending intersection (E) and traverses exactly N cow trails.

Input

* Line 1: Four space-separated integers: N, T, S, and E
* Lines 2..T+1: Line $i+1$ describes trail i with three space-separated integers:$length_i$, I_{1i} , and I_{2i}

Output

* Line 1: A single integer that is the shortest distance from intersection S to intersection E that traverses exactly N cow trails.

Sample Input

```
2  6  6  4
11  4  6
4  4  8
8  4  9
6  6  8
2  6  9
3  8  9
```

Sample Output

```
10
```

Source

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