Jeanie's Route

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Problem Submissions Leaderboard Discussions

Byteland has N cities (numbered from 1 to N) and $N-1$ bidirectional roads. It is guaranteed that there is a route from any city to any other city.

Jeanie is a postal worker who must deliver K letters to various cities in Byteland. She can start and end her delivery route in any city. Given the destination cities for K letters and the definition of each road in Byteland, find and print the minimum distance Jeanie must travel to deliver all K letters.

Note: The letters can be delivered in any order.

Input Format

The first line contains two space-separated integers, N (the number of cities) and K (the number of letters), respectively.
The second line contains K space-separated integers describing the delivery city for each letter.
Each line i of the $N-1$ subsequent lines contains 3 space-separated integers describing a road as u_i v_i d_i, where d_i is the distance (length) of the bidirectional road between cities u_i and v_i.

Constraints

- $2 \leq K \leq N \leq 10^5$
- $1 \leq d_i \leq 10^3$
- *Byteland is a weighted undirected acyclic graph.*

Output Format

Print the minimum distance Jeanie must travel to deliver all K letters.

Sample Input

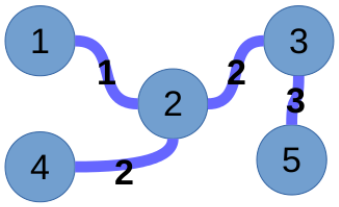
```
5 3
1 3 4
1 2 1
2 3 2
2 4 2
3 5 3
```

Sample Output

```
6
```

Explanation

Jeanie has 3 letters she must deliver to cities 1, 3, and 4 in the following map of Byteland:



One of Jeanie's optimal routes is $3 \xrightarrow{2} 2 \xrightarrow{1} 1 \xrightarrow{1} 2 \xrightarrow{2} 4$, for a total distanced traveled of $2+1+1+2=6$. Thus, we print 6 on a new line.

Submissions: 20
Max Score: 80
Difficulty: Moderate

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