City Travel

Time limit: 1.0s **Memory limit:** 512M

In Bob's country, there are N cities, numbered from 1 to N. For any two cities x and y, there is an undirected road connecting city x and city y with a length of $(x \oplus y) \times D$, where D is a given constant integer, and $\oplus$ represents the bitwise xor operation. Apart from these undirected roads, there are also M one-way highways. The i-th highway is from city u_i to city v_i with a length of w_i.

Now, Bob wants to travel from city A to city B. Can you find the shortest path for Bob?

Input Specification

The first line contains three integers N, M, and D ($2 \leq N \leq 10^5$, $0 \leq M \leq 5 \times 10^5$, $1 \leq D \leq 100$), representing the number of cities, the number of highways, and the constant integer D, respectively.

Each of the following M lines contains three integers u_i, v_i, and w_i ($1 \leq u_i, v_i \leq N$, $1 \leq w_i \leq 100$), representing a one-directional highway from cities u_i to v_i with a length of w_i.

The last line contains two integers A and B, ($1 \leq A, B \leq N$), representing the start city and the destination city.

Output Specification

Output one integer representing the length of the shortest path for Bob from city A to city B.

Constraints

Subtask	Points	Additional constraints
1	5	$M = 0$
2	5	$M = 1$
3	5	$M = 3$
4	5	$M = 10$
5	15	$M = 1\,000$
6	15	$N = 1\,000$
7	50	No additional constraints

Sample Input 1

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

Sample Output 1

```
5
```

Explanation

Bob can take the undirected road from city 1 to city 4 with a length of $(1 \oplus 4) \times 1 = 5$.

Sample Input 2

```
7 2 10
1 3 1
2 4 4
3 6
```

Sample Output 2

```
34
```

Explanation

Bob can take the undirected road from city 3 to city 2, then take the highway from city 2 to city 4, and finally take the undirected road from city 4 to city 6 with a total length of 34.