

PROBLEMS SUBMIT CODE MY SUBMISSIONS STATUS STANDINGS CUSTOM INVOCATION

F. Lazy KUETian

time limit per test: 2 seconds
memory limit per test: 256 megabytes

Dreamboy Tashin is a very lazy person. He currently lives in Khan Jahan Ali Hall at KUET for the purpose of studying. He is graduating from Department **X** at KUET. Since he is very lazy, he always wakes up just a few minutes before his class time and wants to attend his class as early as possible. There are **$n-1$** departments in KUET, each in different buildings. There are m -directed roads among the n buildings ($n - 1$ departments and Khan Jahan Ali Hall), each road needs some time to traverse, and **S** is the building number of Khan Jahan Ali Hall. Tashin can also use the reverse roads, but the rules are:

1. Tashin can use at most k reverse roads and
2. The time required for the reverse roads is twice that of the original roads.

As Tashin is very lazy, you have to help him. You are given q queries, and in each query, you are given the building number of the department that Tashin is graduating from. You have to calculate the minimum time Tashin needs to attend the class.

Input

The first line contains four integers n, m, k, S
($2 \leq n \leq 1000, 1 \leq m \leq \min(n \cdot (n - 1)/2, 1000), 0 \leq k \leq m, 1 \leq S \leq n$).

The next m lines contain three integers u, v, t ($1 \leq u, v \leq n, u \neq v, 0 \leq t \leq 10^{10}$) - indicates that there is a road from u to v which needs t minutes to traverse.

The next line contains an integer q ($1 \leq q \leq 1000000$) - the number of queries.

The next q lines contain an integer X ($1 \leq X \leq n, X \neq S$) - the building number of the department that Tashin have to reach from his hall S .

It is guaranteed that there are no self-loops and multiple roads.

Output

For each query, print the minimum time Tashin needed to reach the building X from the hall S . If it is not possible to reach building X , then print -1.

Example

input	Copy
10 10 2 1 1 2 5 10 1 3 4 2 3 2 3 8 3 10 1 3 5 4 4 3 2 6 4 7 7 8 3 8 9 0 5 3 5 6 8 4	
output	Copy
8 12 25 -1 11	

Note


For the first query, it is optimal to use the reverse roads of 10 -> 1 and 3 -> 10. So, the path will be 1 -> 10 -> 3, and the time required is $2 \cdot 3 + 2 \cdot 1 = 8$ minutes. There is no other path that needs less time than this.

Replay of Ostad Presents Intra KUET Programming Contest 2023

Finished

Practice

About Contest



Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

Submit?

Language: GNU G++20 13.2 (64 bit, win)

Choose file: Choose File No file chosen

Submit

Last submissions

Submission	Time	Verdict
302164107	Jan/21/2025 05:44	Accepted
302163944	Jan/21/2025 05:41	Wrong answer on test 2
301921754	Jan/19/2025 23:59	Accepted
301921704	Jan/19/2025 23:59	Time limit exceeded on test 19
301921037	Jan/19/2025 23:46	Accepted

Contest materials