MNYC '17: Skiing Competition

A skiing competition is taking place. There are N points on the hill and M trails to get from one to another. It takes t_m seconds to get from point a_m to b_m (and back) on the m^{th} trail. It takes the same amount of time to get back on the same trail. The competition starts from A and goes to B. There are Q competitors racing. Due to rigging of the race, the q^{th} competitor will take the ${k_q}^{\text{th}}$ fastest path. Two paths are identical in rank if they take the same amount of time. A competitor may not go back to a previously visited point.

To prepare the competitors, you will provide each of them with two pieces of information, the time they will take to finish the race, and the minimum time they will spend on *one* trail.

Input Specification

The first line will contain, $N\ M\ A\ B\ Q$, all space separated.

The next M lines will contain three integers, a_m b_m and t_m meaning a trail from a_m to b_m (and vice versa) will take t_m units of time to ski.

The next Q lines will contain a single integer, k_q, the designated path that the q^{th} competitor will take.

Constraints

For all subtasks: $1 \leq A, B \leq N$, $A \neq B$ and $0 \leq t_m \leq 10^6$

For subtasks 1 and 2: $0 \leq M \leq \frac{N(N-1)}{2}$

For subtasks 3 and 4: $0 \leq M \leq N \log N$

Subtask 1 [20%]: $2 \leq N \leq 100$ and $Q = k_0 = 1$

Subtask 2 [20%]: $2 \leq N \leq 100$ and $1 \leq Q, k_q \leq 10$

Subtask 3 [20%]: $2 \leq N \leq 1000$ and $Q = k_0 = 1$

Subtask 4 [40%]: $2 \leq N \leq 1000$ and $1 \leq Q, k_q \leq 50$

Output Specification

Q lines containing two integers, the time it will take this competitor to finish the race, and the fastest time this competitor can take to get from one point to another. If there are no more paths, output `-1` for that query.

Sample Input

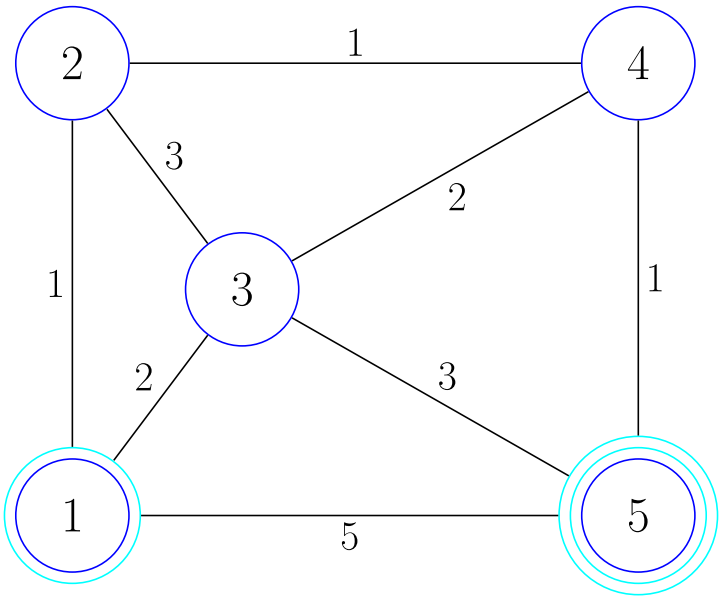
```
5 8 1 5 4
1 2 1
1 3 2
2 3 3
3 4 2
3 5 3
2 4 1
4 5 1
1 5 5
1
2
3
4
```

Sample Output

```
3 1
5 1
7 1
-1
```

Explanation for Sample Output

The trails look like the following:



The fastest path is $1 \rightarrow 2 \rightarrow 4 \rightarrow 5$

The second fastest path is $1 \to 3 \to 4 \to 5$

The third fastest (slowest) path is $1 \to 3 \to 2 \to 4 \to 5$

A fourth path doesn't exist.

The fastest *trail* on all these paths is 1 unit of time.