

People You May Know

Given a graph that describes a social network with n members ($n \leq 10^5$).

Every node is a member, every edge is the friendship between two members. Given member u , we call a set $f(k, u)$ is k -level friends of member u , in other words, they are members who have the shortest path to member u equal to k . Special cases:

- $f(1, u)$ is the set of friends of member u
- $f(2, u)$ is the set of members who are not friends with member u , but they are friends to member u 's friends.

Input:

- First line contains two integers n and m , the number of nodes and edges respectively
- Next m lines each contains two integers u and v , denoting an edge of the graph
- The next line is the integer u
- The following line has one integer q , number of queries ($0 < q < n$)
- The last line contains q distinct integers k_i ($0 \leq k_i < n$)

Output:

For each query, print out in one line the set of nodes which are k_i -level friends with member u , the nodes in the set are ordered increasingly by id and white-space separated.

Print out -1 if cannot find any k_i -level friends of member u

Sample:

Input:

4 3

0 3

1 2

2 3

2

2

3

1

Output:

-1

13