

# Patrol2

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            0.5 seconds  
Memory limit:         64 megabytes

Valerio is trying to escape from a bank that he has robbed. An alarm has gone off and the police are searching for him. Valerio needs to get out as fast as possible through the sewer tunnels that run near the bank. There is only one police patrol that has been sent to guard the manholes connected to the sewer system.

There are  $N$  manholes, indexed from 0 to  $N - 1$ , and  $M$  tunnels connecting manholes  $A_i$  and  $B_i$ . Valerio's friend Filippo is waiting for him near manhole  $N - 1$ , and if Valerio can reach it, he will escape safely. Valerio starts from manhole 0 and can choose to move to a manhole adjacent to the one he is in or to stay another minute under the same manhole. The police patrol is initially guarding manhole  $C_0$ , and every minute it moves from manhole  $C_i$  to manhole  $C_{i+1}$ , after reaching manhole  $C_{L-1}$ , it returns to manhole  $C_0$ .

Help Valerio to escape from the bank!

## Input

The first line contains the integers  $N$  ( $1 \leq N \leq 10^5$ ),  $M$  ( $1 \leq M \leq 10^5$ ),  $L$  ( $2 \leq L \leq 10^5$ ). The next  $M$  lines contain the integers  $A_i, B_i$  ( $0 \leq A_i, B_i < N$ ). The next line contains  $L$  integers:  $C_0, C_1, \dots, C_{L-1}$  ( $1 \leq C_i < N$ )

$C_i \neq C_j$  for all  $i \neq j$ .

It's guaranteed that there is a path from manhole 0 to manhole  $N - 1$ .

For tests worth 30 points:  $N, M, L \leq 1000$ .

For tests worth 30 points: The tunnels form a line starting from manhole 0 and ending in manhole  $N - 1$ .

For tests worth 40 points: No additional limitations.

## Output

You need to write a single line with an integer: the minimum amount of minutes needed to get from manhole 0 to manhole  $N - 1$ .

## Examples

standard input	standard output
5 6 3 0 1 2 3 3 0 2 0 2 4 1 3 4 2 3	4
7 10 5 2 6 1 4 2 5 0 5 3 4 5 3 4 0 3 2 1 5 4 6 2 4 1 6 5	4

## Note

In the **first sample case** Valerio can reach manhole 4 in 4 steps:

- He waits 1 minute in manhole 0 and the guard moves to manhole 2.
- He moves to manhole 2 and the guard moves to manhole 3.
- He waits 1 minute in manhole 2 and the guard moves to manhole 4.
- He moves to manhole 4 and the guard moves to manhole 2.

In the **second sample case** Valerio can reach manhole 6 in 4 steps:

- He waits 1 minute in manhole 0 and the guard moves to manhole 4.
- He moves to manhole 4 and the guard moves to manhole 1.
- He waits 1 minute in manhole 4 and the guard moves to manhole 6.
- He moves to manhole 6 and the guard moves to manhole 5.