Patrol

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

Valerio is robbing a bank, but an alarm started ringing as he was trying to break into the caveau.

He needs to get out as fast as possible through the twisted sewer tunnels running nearby the bank.

The police is already looking for him and has sent K patrols, indexed from 0 to $K - 1$ to guard the manholes connected to the sewer system.

There are N manholes, indexed from 0 to $N - 1$ and M tunnels connecting pairs of them. Valerio's friend Filippo is waiting for him nearby manhole $N - 1$, if he can reach it, he will escape safely.

Valerio starts from manhole 0 and, every minute, he can choose to move to a manhole adjacent to the one he is in or to stay another minute under the same manhole.

Each police patrol guard L_i manholes, indexed from 0 to $L_i - 1$. Patrol i is initially guarding manhole $H_{i,0}$, every minute it moves from manhole $H_{i,j}$ to manhole $H_{i,j+1}$, after reaching manhole H_{i,L_i-1}, it return to manhole $H_{i,0}$.

Input

The first line contains three integers N, M and K, the numbers of manholes, tunnels and patrols respectively. ($1 \leq N \leq 10^4$), ($1 \leq M \leq 5 * 10^4$), ($1 \leq K \leq 10^5$).

The following M lines contain two integers each: the manholes connected by tunnel i.

The following K lines contain the integer L_i followed by L_i integers $H_0, H_1, \ldots, H_{L_i-1}$. ($1 \leq L_i \leq 7$).

For tests worth 20 points, ($N \leq 100$, $M \leq 100$, $K \leq 500$).

For tests worth 10 more points, ($K = 0$).

For tests worth 30 more points, $L_i \leq 2$ for $i = 0 \ldots K - 1$.

Output

You need to write a single line with an integer: the minimum amount of minutes needed to get from manhole 0 to manhole $N - 1$, or -1 if it is impossible to do.

Examples

standard input	standard output
3 2 1 0 1 1 2 3 1 2 0	2
5 4 3 0 1 1 2 2 3 3 4 3 4 2 3 2 2 1 2 4 3	5

Note

In the **first sample case** Valerio is beneath manhole 0, and there is a single patrol watching manhole 1.

In the first minute Valerio moves to manhole 1 while the patrol moves to manhole 2.

In the second minute Valerio moves to manhole 2 while the patrol moves to manhole 0, making it out safely in 2 minutes.

In the **second sample case** it takes Valerio 5 minutes to escape while avoiding the patrols.