

## Problem E. Travelling by River

Input file: *standard input*  
Output file: *standard output*  
Time limit: 2 seconds  
Memory limit: 512 mebibytes

Little Vitechka loves to sail on the river, but if the ship will sail more than  $k$  hours, then he gets sea sickness, so he does not use such ships. There are  $n$  ports on the river which are numbered according to the river's flow. It takes exactly one hour for a ship to sail between any two neighboring ports. Vitechka knows all the routes along the river. Every route connects two different ports. He left only the routes which last no longer than  $k$  hours, and got a list of only  $m$  routes.

Now Vitechka wants to travel. He drew up a plan of his journey which is an ordered list of several (not necessarily different) ports in the order in which he would like to visit them. But it turned out that the journey isn't very economical, so Vitechka decided to delete some of the ports from his list. He wants to do it as follows: the first port stays on the list, and for each next port, it stays on the list if and only if it does not coincide with the previous non-deleted port, and it can be reached from the previous non-deleted port (possibly with transfers) sailing always in one direction (either always within the flow, or always against the flow of the river).

Help Vitechka to get his resulting journey.

### Input

The first line contains three integers  $n$ ,  $m$  and  $k$  ( $2 \leq n \leq 2 \cdot 10^5$ ,  $0 \leq m \leq 2 \cdot 10^5$ ,  $1 \leq k \leq 200$ ).

The next  $m$  lines describe the routes. Each of these lines contains two integers  $u_i$  and  $v_i$  ( $1 \leq u_i < v_i \leq n$ ,  $v_i - u_i \leq k$ ) which are the numbers of the ports connected by the route.

The next line contains one integer  $q$  ( $1 \leq q \leq 2 \cdot 10^5$ ), the number of ports in the plan.

The following line contains  $q$  integers  $x_1, \dots, x_q$  ( $1 \leq x_i \leq n$ ,  $x_i \neq x_{i+1}$ ) which are the numbers of ports in the plan.

### Output

Print the resulting plan of the journey in the same format as the initial one: on the first line, the total number of ports in the journey, and on the second one, the port numbers themselves in the order of visiting them.

### Example

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