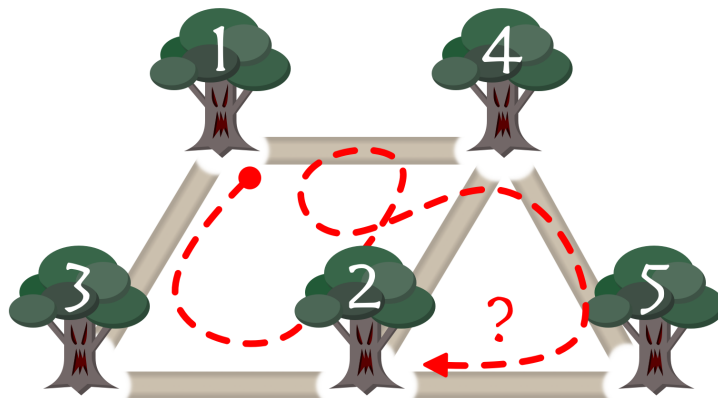


# Longest Path to Oblivion

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            **2 seconds**  
Memory limit:         **1024 megabytes**

Pyoseok set out on an adventure into the cursed forest to obtain the witch's potion rumored to grant eternal life.

There are  $N$  trees numbered from 1 to  $N$  in the cursed forest, and there are bidirectional trails between the trees. Pyoseok begins his adventure under tree  $S$  and wishes to find a path to tree  $E$  where the witch's hut is located at.



Legend says a memory erasing curse is placed on the cursed forest, which makes those who venture into it wander aimlessly until they even forget who they are. When an adventurer arrives under tree  $i$ , they completely forget ever visiting trees whose number is less than  $i$ .

To not lose his way, Pyoseok set one rule.

"An already visited tree is never visited again."

Due to the curse, he may forget visiting a tree and visit it again, but as long as he remembers visiting a tree, he will not visit that tree again.

. An eternity flashes by in an instant in his memory. Standing before the witch's hut, he finds an unfamiliar old

Pyoseok is currently standing under tree  $E$ . Among the trees he has visited, those that he remembers are given. Find the maximum number of times Pyoseok could have traveled along trails up to this point. Note that Pyoseok may have visited tree  $S$  or tree  $E$  multiple times. (Due to the curse, he may have forgotten that he started at tree  $S$ , or he may have passed by tree  $E$  without noticing the witch's hut.)

## Input

The first line of input contains four space-separated integers  $N$ ,  $M$ ,  $S$ , and  $E$ .

- $N$  denotes the number of trees in the cursed forest, and  $M$  denotes the number of trails. ( $2 \leq N \leq 100\,000$ ;  $1 \leq M \leq 300\,000$ )
- $S$  denotes the tree Pyoseok began his journey at, and  $E$  denotes the tree where the witch's hut is located at. ( $1 \leq S, E \leq N$ )

The following  $M$  lines of input contain two space-separated integers  $a$  and  $b$ , denoting the trees connected by a trail. ( $1 \leq a, b \leq N$ ;  $a \neq b$ )

- No trail is given twice as input.

- From any tree, it is possible to travel to all other trees through one or more trails.

The next line of input contains  $K$ , denoting the number of trees Pyoseok remembers visiting. ( $1 \leq K \leq N$ )

The next line contains  $K$  space-separated integers, denoting the trees Pyoseok remembers visiting. The numbers are given in descending order and the last number is always  $E$ .

## Output

Print the maximum number of times Pyoseok could have traveled along a trail before he arrived at the witch's hut. The travel path must start from tree  $S$  and end at tree  $E$ , and it must be consistent with Pyoseok's memory.

If the answer is greater than or equal to  $10^{18}$ , print **eternity** instead.

If a path that suits the given conditions does not exist, print **impossible** instead.

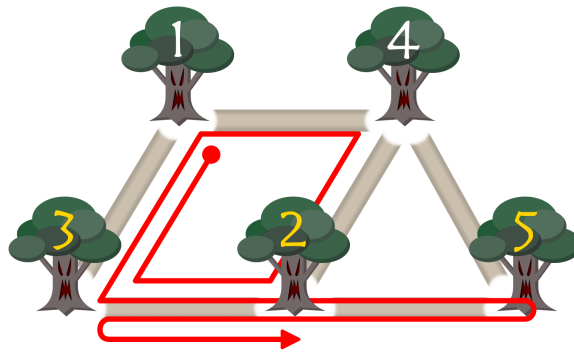
## Examples

standard input	standard output
<pre>5 6 1 2 1 3 3 2 2 4 4 1 2 5 4 5 3 5 3 2</pre>	10
<pre>3 3 2 2 1 3 3 2 2 1 2 3 2</pre>	4
<pre>4 4 4 1 1 3 3 2 2 4 4 1 4 4 3 2 1</pre>	impossible
<pre>60 59 1 1 1 2 1 3 1 4 ... 1 58 1 59 1 60 60 60 59 58 ... 3 2 1</pre>	eternity

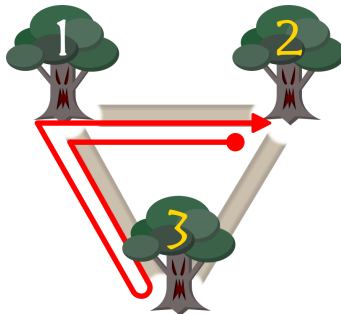
## Note

In the first example, visiting the trees in the order 1, 3, 2, 4, 1, 3, 2, 5, 2, 3, 2 results in the maximum number

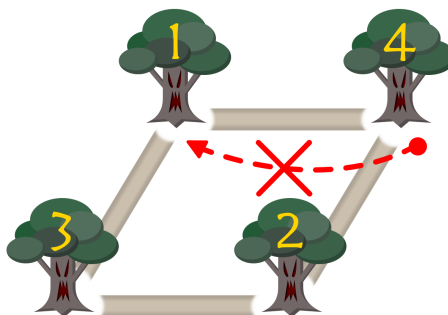
of movements.



In the second example, visiting the trees in the order 2,1,3,1,2 results in the maximum number of movements.



In the third example, either tree 3 or tree 4 must be visited in order to reach tree 1, so it is impossible to remember visiting tree 2.



In the fourth example, each trail connects tree 1 to trees 2,3,4,...,60, and Pyoseok remembers visiting all trees. The maximum number of movements is greater than or equal to  $10^{18}$ , so "eternity" is printed.

