All Tracks > Algorithms > Graphs > Topological Sort > Problem



a, then you select (uniformly and randomly) one of the islands that are directly reachable from a through the one-way bridge and move to that island. You are stuck on an island if you cannot move any further. It is guaranteed that after leaving any island it is not possible to come back to that island.

Find the island that you are most likely to get stuck on. Two islands are considered equally likely if the absolute difference of the probabilities of ending up on them is $\leq 10^{-9}$.

Input format

- First line: Three integers n (the number of islands), m (the number of one-way bridges), and r (the index of the island you are initially on)
- Next m lines: Two integers u_i and v_i representing a one-way bridge from island u_i to v_i .

Output format

Print the index of the island that you are most likely to get stuck on. If there are multiple islands, then print them in the increasing order of indices (space separated values in a single line).

Input Constraints

- $1 \leq n \leq 200000$
- $1 \leq m \leq 500000$
- $1 \leq u_i, v_i, r \leq n$

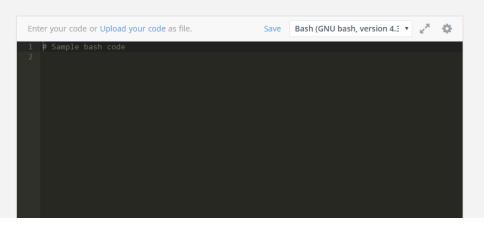
SAMPLE INPUT	% 4	SAMPLE OUTPUT	% 4
5 7 1		4	
1 2			
1 3			
1 4			
1 5			
2 4			
2 5			
3 4			

Explanation

There are two islands on which you could get stuck- 4 and 5 with 4 being more probable.

Time Limit:	1.0 sec(s) for each input file.	
Memory Limit:	256 MB	
Source Limit:	1024 KB	
Marking Scheme:	Marks are awarded when all the testcases pass.	
Allowed Languages:	Bash, C, C++, C++14, Clojure, C#, D, Erlang, F#, Go, Groovy, Haskell, Java, Java 8, JavaScript(Rhino),	
	JavaScript(Node.js), Julia, Kotlin, Lisp, Lisp (SBCL), Lua, Objective-C, OCaml, Octave, Pascal, Perl, PHP, Python,	
	Python 3, R(RScript), Racket, Ruby, Rust, Scala, Swift, Swift-4.1, Visual Basic	

CODE EDITOR





CONTRIBUTOR





THIS PROBLEM WAS ASKED IN



SOCIAL SHARE

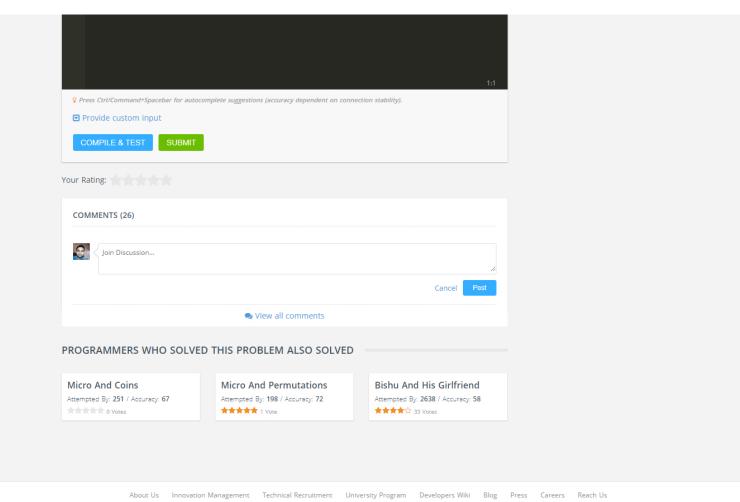












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