

## B. Berland Army

time limit per test: 3 seconds  
memory limit per test: 256 megabytes  
input: standard input  
output: standard output

There are  $n$  military men in the Berland army. Some of them have given orders to other military men by now. Given  $m$  pairs  $(x_i, y_i)$ , meaning that the military man  $x_i$  gave the  $i$ -th order to another military man  $y_i$ .

It is time for reform! The Berland Ministry of Defence plans to introduce ranks in the Berland army. Each military man should be assigned a rank — integer number between 1 and  $k$ , inclusive. Some of them have been already assigned a rank, but the rest of them should get a rank soon.

Help the ministry to assign ranks to the rest of the army so that:

- for each of  $m$  orders it is true that the rank of a person giving the order (military man  $x_i$ ) is strictly greater than the rank of a person receiving the order (military man  $y_i$ );
- for each rank from 1 to  $k$  there is at least one military man with this rank.

### Input

The first line contains three integers  $n$ ,  $m$  and  $k$  ( $1 \leq n \leq 2 \cdot 10^5$ ,  $0 \leq m \leq 2 \cdot 10^5$ ,  $1 \leq k \leq 2 \cdot 10^5$ ) — number of military men in the Berland army, number of orders and number of ranks.

The second line contains  $n$  integers  $r_1, r_2, \dots, r_n$ , where  $r_i > 0$  (in this case  $1 \leq r_i \leq k$ ) means that the  $i$ -th military man has been already assigned the rank  $r_i$ ;  $r_i = 0$  means the  $i$ -th military man doesn't have a rank yet.

The following  $m$  lines contain orders one per line. Each order is described with a line containing two integers  $x_i, y_i$  ( $1 \leq x_i, y_i \leq n$ ,  $x_i \neq y_i$ ). This line means that the  $i$ -th order was given by the military man  $x_i$  to the military man  $y_i$ . For each pair  $(x, y)$  of military men there could be several orders from  $x$  to  $y$ .

### Output

Print  $n$  integers, where the  $i$ -th number is the rank of the  $i$ -th military man. If there are many solutions, print any of them.

If there is no solution, print the only number  $-1$ .

### Examples

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

input
7 6 5 0 4 5 4 1 0 0 6 1 3 6 3 1 7 5 7 1 7 4
output

2 4 5 4 1 3 5
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input
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2 2 2
2 1
1 2
2 1

output
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-1
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