Problem K. New Level

Time limit: 2 seconds
Memory limit: 512 megabytes

Robocity has n crossroads connected by bidirectional roads. There are m roads in total, and all crossroads are reachable from each other. There is a level assigned to each crossroad specified by a number from 1 to k, inclusive. Any pair of crossroads directly connected by a road has distinct levels.

The city leaders are planning a reform. Namely, they want to assign new levels to crossroads, so that each level still has a value from 1 to k, connected crossroads would have different levels, and an additional condition has to be met: for each pair of crossroads u and v there must exist a path between them, such that any two adjacent crossroads along it have levels that differ by 1 modulo k.

Formally, for each pair of crossroads (u, v) there should exist a sequence of crossroads $p_1, \ldots, p_l$, such that:

- $p_1 = u$;
- $p_l = v$;
- for each i from 1 to $l - 1$, crossroads p_i and p_{i+1} are connected, and either their levels differ by one, or one of them has level of 1 and another has level of k.

Robocity government is convinced that such level assignment exists and asks you to find it.

Input

The first line contains three integers n, m, k ($1 \le n, m, k \le 500\,000$), number of crossroads, roads, and levels.

The second line contains n integers $c_1, c_2, \ldots, c_n$ ($1 \le c_i \le k$), c_i is the level of the crossroad i.

Then m lines follow, each of them contains two integers u, v ($1 \le u, v \le n$; $u \ne v$), a pairs of crossroads connected by a road.

It is guaranteed that there are no two roads connecting the same pair of crossroads, and that there exists a path between each pair of crossroads.

Output

Output n integers $d_1, d_2, \ldots, d_n$ ($1 \le d_i \le k$), the levels of the crossroads in the new assignment.

Example

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