Problem F. Good Coloring

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	256 mebibytes

You have an undirected graph, each vertex is colored in one of k possible colors, the graph is properly colored into k colors, i.e two ends of any edge are colored in different colors.

Your goal is to find another (or maybe the same) coloring of this graph into x colors, such that $x \le k$, and there exists a path of length x, which contains all possible colors.

It is guaranteed that it is always possible.

Input

The first line of input contains one integer t ($1 \le t \le 600\,000$): the number of test cases.

The first line of each test case contains three integers n, m and k: the number of vertices, edges, and the number of colors you are using of the graph ($1 \le n \le 300\,000; 0 \le m \le 300\,000; 1 \le k \le n$).

The next line contains n space-separated integers $c_1, c_2, \ldots, c_n$ ($1 \le c_i \le k$): colors of vertices.

It is guaranteed that the given coloring is correct.

Each of the next m lines contains two integers, u and v ($1 \le u, v \le n; u \ne v$): indices of vertices connected by edge.

It is guaranteed that in each test case there are no multiple edges in the graph.

It is guaranteed that the sum of $n + m$ is at most $600\,000$.

Output

For each test case output $n + 1$ integers, x ($1 \le x \le k$), $p_1, p_2, \ldots, p_n$ ($1 \le p_i \le x$): new coloring.

This coloring should be proper, i.e two ends of any edge are colored in different colors.

Also for each test case in next line print x integers $v_1, v_2, \ldots, v_x$ ($1 \le v_i \le n$), there should exists an edge between vertices v_i and v_{i+1}, and all colors of vertices should be different, so $p_{v_i} \ne p_{v_j}$ for all pairs $1 \le i < j \le x$.

Example

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