Doremy's Average Tree

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	1024 megabytes

Doremy has a rooted tree of size n whose root is vertex r. Initially there is a number w_i written on vertex i. Doremy can use her power to perform this operation **at most** k times:

1. Choose a vertex x ($1 \le x \le n$).
2. Let $s = \frac{1}{|T|} \sum_{i \in T} w_i$ where T is the set of all vertices in x's subtree.
3. For all $i \in T$, assign $w_i := s$.

Doremy wants to know what is the lexicographically smallest[†] array w after performing all the operations. Can you help her?

If there are multiple answers, you may output any one.

[†] For arrays a and b both of length n, a is lexicographically smaller than b if and only if there exist an index i ($1 \le i \le n$) such that $a_i < b_i$ and for all indices j such that $j < i$, $a_j = b_j$ is satisfied.

Input

The input consists of multiple test cases. The first line contains a single integer t ($1 \le t \le 10^4$) — the number of test cases. The description of the test cases follows.

The first line contains three integers n, r, k ($2 \le n \le 5000$, $1 \le r \le n$, $0 \le k \le \min(500, n)$).

The second line contains n integers $w_1, w_2, \ldots, w_n$ ($1 \le w_i \le 10^6$).

Each of the next $n-1$ lines contains two integers u_i, v_i ($1 \le u_i, v_i \le n$), representing an edge between u_i and v_i.

It is guaranteed that the given edges form a tree.

It is guaranteed that the sum of n does not exceed 50 000.

Output

For each test case, In the first line, output a single integer cnt ($0 \le cnt \le k$) — the number of operations you perform.

Then, in the second line output cnt integers $p_1, p_2, \ldots, p_{cnt}$ — x is chosen to be p_i for i-th operation.

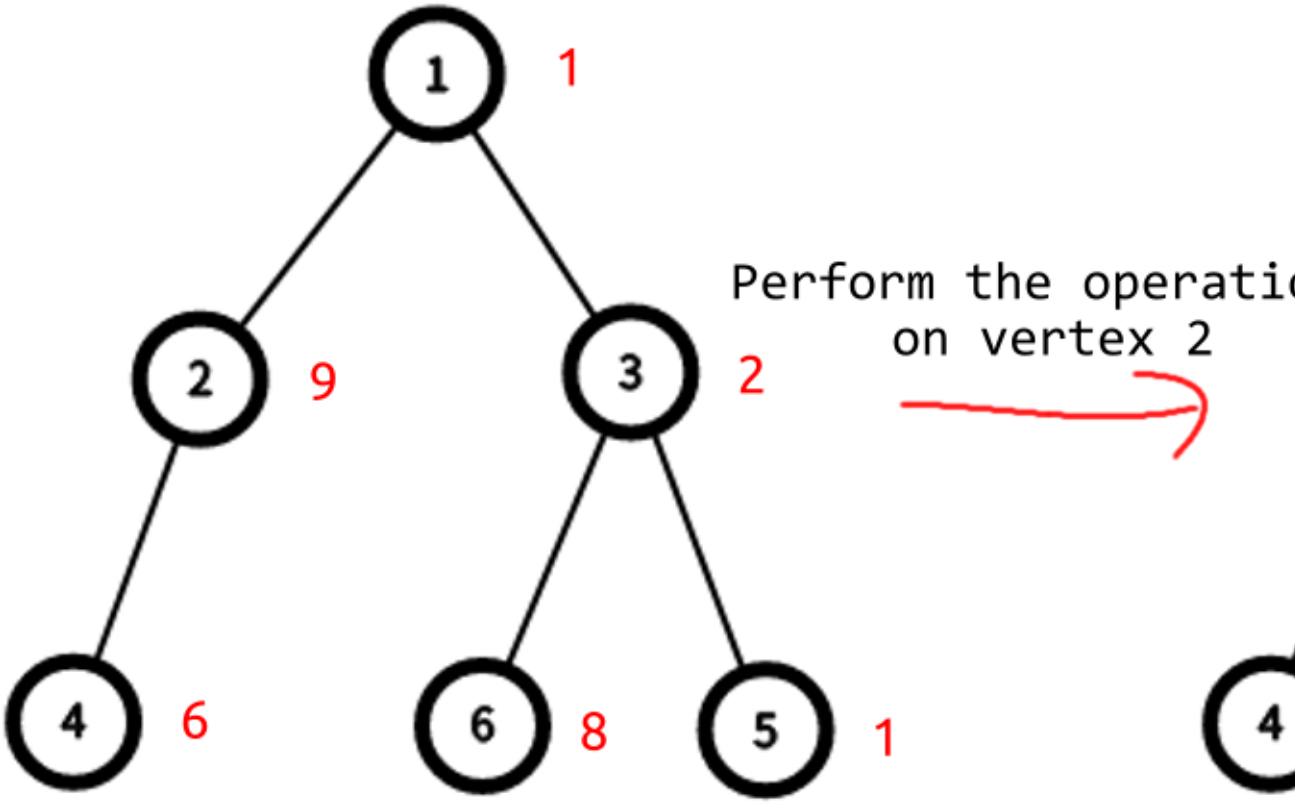
If there are multiple answers, you may output any one.

Example

standard input	standard output
4 6 1 1 1 9 2 6 1 8 1 2 1 3 2 4 3 6 3 5 7 7 2 3 1 3 3 1 1 2 7 1 7 2 7 4 1 5 2 3 4 6 6 5 1 3 1 3 1 1 3 5 3 5 1 5 6 3 4 1 2 3 2 1 1000000 999999 999997 2 1 1 3	1 2 2 1 4 1 5 1 1

Note

In the first test case:



At first $w = [1, 9, 2, 6, 1, 8]$. You can choose some vertex x to perform at most one operation.

- If $x = 1$, $w = [\frac{9}{2}, \frac{9}{2}, \frac{9}{2}, \frac{9}{2}, \frac{9}{2}, \frac{9}{2}]$.
- If $x = 2$, $w = [1, \frac{15}{2}, 2, \frac{15}{2}, 1, 8]$.
- If $x = 3$, $w = [1, 9, \frac{11}{3}, 6, \frac{11}{3}, \frac{11}{3}]$.
- If $x \in \{4, 5, 6\}$, $w = [1, 9, 2, 6, 1, 8]$.
- If you don't perform any operation, $w = [1, 9, 2, 6, 1, 8]$.

w is lexicographically smallest when $x = 2$.