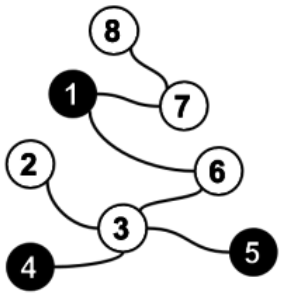
Black White Tree

Daisy has a tree with n node and $n-1$ edges. Each node of the tree is colored either black or white. She defines the *strangeness* of a tree as the absolute difference between the number of black nodes and white nodes.



The tree in the example above has 3 black nodes and 5 white nodes, so the strangeness is $|3-5|=2$.

One day Daisy got bored and decided to cut out a subtree with maximum *strangeness*. Can you help her to do that?

Note: A *subtree* of a tree is any of its connected subgraphs.

Input Format

- The first line contains n, the number of nodes in the tree.
- The second line contains n space-separated integers $c_1, c_2, \ldots, c_n$. If $c_i = 1$, it means the i^{th} node is black. If $c_i = 0$, it means the i^{th} node is white.
- The $n-1$ subsequent lines each contains two space-separated integers x and y, which means that there is an edge between nodes x and y.

Constraints

- $1 \leq n \leq 10^5$
- $1 \leq x, y \leq n$

Subtasks

- For 20% of the maximum score, $n \leq 20$
- For 40% of the maximum score, $n \leq 100$
- For 60% of the maximum score, $n \leq 1000$

Output Format

In the first line, print the strangeness of the subtree. In the second line, print m, the size of the subtree with maximum strangeness.

The third line should contain m space-separated integers denoting the nodes which are part of the subtree.

Sample Input 0

```
8
1 0 0 1 1 0 0 0
7 1
3 5
1 6
4 3
```

```
6 3
2 3
7 8
```

Sample Output 0

```
4
6
1 2 3 6 7 8
```

Explanation 0

The red subtree is the subtree with maximum *strangeness*. It has 5 white nodes and just one black node, the strangeness is $|5 - 1| = 4$.