

[HOME](#) [TOP](#) [CATALOG](#) [CONTESTS](#) [GYM](#) [PROBLEMSET](#) [GROUPS](#) [RATING](#) [EDU](#) [API](#) [CALENDAR](#) [HELP](#)
[PROBLEMS](#) [SUBMIT CODE](#) [MY SUBMISSIONS](#) [STANDINGS](#) [CUSTOM INVOCATION](#)

J. pancakes

time limit per test: 4 seconds
 memory limit per test: 1024 megabytes
 input: standard input
 output: standard output

Leroy the lion knows that money doesn't grow on trees, but he thinks that food can. In his quest to grow an everlasting supply of pancakes, he wants to learn all about trees, especially in computer science (for whatever reason).

He is given a problem that he is stuck on, and wants you to solve it.

You are given a tree with n nodes ($1 \leq n \leq 4 \cdot 10^5$) and $n - 1$ edges connecting these nodes.

Some of these nodes have a value of 1, and the rest have a value of 0.

Some of these nodes also have switches, which can be turned on at a certain integer cost c . This cost varies per node, and nodes that do not have switches cannot be turned on.

When a switch at node m is turned on, the entire subtree, where m is the root node, will have their value flipped: If a node with value 1 is contained in this subtree, its new value will be 0, and a node with value 0 will have a new value of 1.

Please output the the maximum number of nodes that can have value 1, as well as the minimum cost that this takes. Note: you need to maximize the number of nodes with value 1 first.

Input

The first line of input will contain n , the number of nodes in the tree.

The second line of input will contain a binary string of length n , with the i th character being a '1' or '0' denoting the value of the i th node.

The third line of input will contain n space separated integers where the i th number, is the cost c for the i th switch at the i th node. If the cost given for the i th node is -1, it is not possible to flip a subtree starting at that node.

Finally, the next $n - 1$ lines of input will contain two space separated integers a and b , denoting a connected edge from the a th node to the b th node.

Note: the tree will be rooted at node 1. This means the top node in the tree will be node 1.

Output

Please output two integers: the the maximum number of nodes that can have value 1, as well as the smallest cost that this takes.

Example

input

Copy

```
5
11010
2 1 -1 2 6
3 1
1 5
4 2
2 5
```

traverse-cs

Private

Participant



→ **About Group**



traverse-cs computer science competition

[Group website](#)

Intermediate Contest 2022

Finished

Practice



→ **Languages**

The following languages are only available languages for the problems from the contest

Intermediate Contest 2022:


- Clang++20 Diagnostics
- Clang++17 Diagnostics
- GNU G++14 6.4.0
- GNU G++17 7.3.0
- GNU G++20 11.2.0 (64 bit, winlibs)
- Microsoft Visual C++ 2017
- GNU G++17 9.2.0 (64 bit, msys 2)
- Java 11.0.6
- Java 17 64bit
- Java 1.8.0_241
- Python 2.7.18
- Python 3.8.10
- PyPy 2.7.13 (7.3.0)
- PyPy 3.6.9 (7.3.0)
- PyPy 3.9.10 (7.3.9, 64bit)

→ **Virtual participation**

 **output** Copy

4 3

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

[Start virtual contest](#)[→ Submit?](#)Language: GNU G++17 7.3.0 Choose file: Choose File No file chosenSubmit

[Codeforces](#) (c) Copyright 2010-2022 Mike Mirzayanov
The only programming contests Web 2.0 platform
Server time: Aug/14/2022 18:03:14^{UTC-7} (k2).
Desktop version, switch to [mobile version](#).
[Privacy Policy](#)

Supported by



ITMO UNIVERSITY