## Play with a Tree

Hey, ACRush and Jelly are playing a game ! Let take a look at its rule:
You are given a tree. Two players take turns cutting edges on a tree. Some nodes is on the "ground". When a player cuts an edge, all the edges that are no longer connected to the ground disappear. The player who can not take a move loses.

ACRush plays first. Both of them are very good players. If you know state of the tree they are playing with, can you guess who will win?


Node 4 is on the ground.

## Input

Input consists of multiple test-cases. The first line contains one integer $t$ - number of cases ( $0<t$ $<=20)$. For each case, the input format is following. The first line contains one integer $N(1<=N$ $<=100000$ ). The next line $N$ integers s[i] (1 or 0). If s[i] is 1 , the $i$-th node is on the ground. If sci] is 0 , the $i$-th node is not on the ground. Each line of the following $N-1$ lines contains two integers $u$, $v$. They denote there is an edge between node $u$ and node $v(1<=u, v<=N)$. There is no blank line after each case.

## Output

For each case, output who will win the game. If ACRush wins, output 1 ; otherwise, output 0 (Jelly wins).
There is no blank line after each case.

## Example

[^0]
## Output:


[^0]:    Input:
    1
    4
    0001
    12
    23
    24

