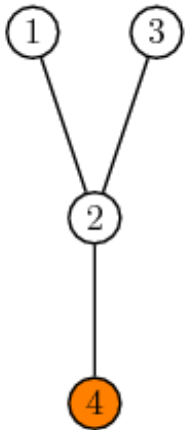


# Play with a Tree

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 ( $0 < t \leq 20$ ). For each case, the input format is following. The first line contains one integer  $N$  ( $1 \leq N \leq 100000$ ). The next line  $N$  integers  $s[i]$  (1 or 0). If  $s[i]$  is 1, the  $i$ -th node is on the ground. If  $s[i]$  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  $v$  ( $1 \leq u, v \leq N$ ).

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

**Input:**

```
1
4
0 0 0 1
1 2
2 3
2 4
```

**Output:**

```
1
```