Longest Path

You are given a tree with N nodes. Each node can either be black or white. You need to find the longest path in this tree that consists only of black nodes.
Nodes are numbered from 1 to N.

Input Format

The first line contains N the number of nodes. The second line contains N integers, representing c_i the colour of node i. Here, c_i is 0 for a white node and 1 for a black node.
The next line contains $N-1$ integers. The i^{th} integer (1-indexed) represents the parent of node $i+1$, which is between 1 and i.
1 is considered the root of the tree. You can assume that the input is a valid tree.

Constraints

$1 \leq N \leq 10^5$

Output Format

Output the length of the longest path containing only black nodes.

Sample Input

```
5
1 1 0 1 1
1 2 3 4
```

Sample Output

```
2
```

Explanation

The given tree is a path $1-2-3-4-5$ where 3 is a white node.
So, the longest path in this tree with only black nodes is of length 2, which is $1-2$ or $4-5$.