NOI '22 Multi-Provincial Team Selection P6 - MIS

Time limit: 1.0s **Memory limit:** 1G

Tommy has a binary tree rooted at 1 on n nodes. Each node has an integer weight w_i, and the father of node $i = 2, 3, \ldots, n$ is f_i. Tommy needs to disassemble this binary tree by sequentially removing edges. When an edge (u, v) is removed, the following happen, simultaneously:

- $w_u + w_v$ units of cost are incurred;
- w_u and w_v are swapped.

Find the minimum units of cost necessary to disassemble the binary tree.

Constraints

$2 \leq n \leq 5000$

$1 \leq w_i \leq 10^9$

Test	$n \leq$
1 - 3	10
4 - 7	100
8 - 11	500
12 - 16	$1\,000$
17 - 25	$5\,000$

Input Specification

The first line contains a positive integer n.

The second line contains n positive integers $w_1, w_2, \ldots, w_n$.

The third line contains $n - 1$ positive integers $f_2, f_3, \ldots, f_n$, describing the binary tree.

Output Specification

Output the answer.

Sample Input 1

```
3
2 1 3
1 1
```

Sample Output 1

```
7
```

Attachments