

# Ada and Graft

As you might already know, Ada the Ladybug is a farmer. She grows a big fruit [tree](#) (with root in 0). There is a fruit on every node of the tree. Ada is competing in grafting competition and this is her masterpiece. The most valuable tree wins the competition. The value of tree is product of values of each node. The value of a node is the number of distinct fruit kinds in its subtree.

Can you find the value of Ada's tree? Since this number might be pretty big, output it modulo  $10^9+7$

## Input

The first and line will contain  $1 \leq N \leq 4 \cdot 10^5$ .

The next line will contain  $N-1$  integers  $0 \leq p_i < i$ , the parent of  $i^{\text{th}}$  node.

The next line will contain  $N$  integers  $0 \leq F_i \leq 10^9$ , the fruit growing on  $i^{\text{th}}$  node.

## Output

Print a single integer - the value of tree modulo **1000000007**.

### Example Input

```
5
0 0 1 1
1 1 1 2 2
```

### Example Output

4

### Example Input

```
4
0 1 2
6 7 2 3
```

### Example Output

24

### Example Input

```
11
0 1 1 1 3 5 2 7 5 4
494052753 959648710 959648710 959648710 494052753 959648710 959648710 959648710 959648710 494052753 959648710
```

### Example Output

32