G. White-Black Balanced Subtrees

time limit per test: 1 second
memory limit per test: 256 megabytes

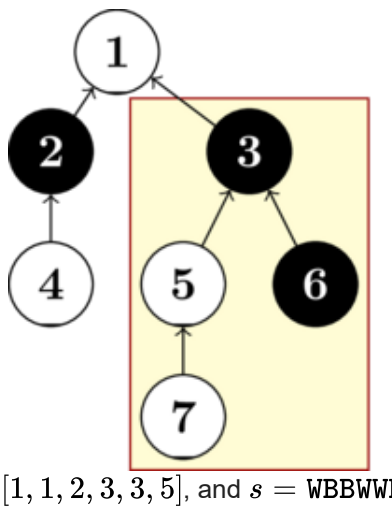
You are given a rooted tree consisting of n vertices numbered from 1 to n. The root is vertex 1. There is also a string s denoting the color of each vertex: if $s_i = \texttt{B}$, then vertex i is black, and if $s_i = \texttt{W}$, then vertex i is white.

A subtree of the tree is called balanced if the number of white vertices equals the number of black vertices. Count the number of balanced subtrees.

A *tree* is a connected undirected graph without cycles. A *rooted tree* is a tree with a selected vertex, which is called the *root*. In this problem, all trees have root 1.

The tree is specified by an array of parents $a_2, \ldots, a_n$ containing $n - 1$ numbers: a_i is the parent of the vertex with the number i for all $i = 2, \ldots, n$. The parent of a vertex u is a vertex that is the next vertex on a simple path from u to the root.

The *subtree* of a vertex u is the set of all vertices that pass through u on a simple path to the root. For example, in the picture below, 7 is in the subtree of 3 because the simple path $7 \to 5 \to 3 \to 1$ passes through 3. Note that a vertex is included in its subtree, and the subtree of the root is the entire tree.



The picture shows the tree for $n = 7$, $a = [1, 1, 2, 3, 3, 5]$, and $s = \texttt{WBBWWBW}$. The subtree at the vertex 3 is balanced.

Input

The first line of input contains an integer t ($1 \le t \le 10^4$) — the number of test cases.

The first line of each test case contains an integer n ($2 \le n \le 4000$) — the number of vertices in the tree.

The second line of each test case contains $n - 1$ integers $a_2, \ldots, a_n$ ($1 \le a_i < i$) — the parents of the vertices $2, \ldots, n$.

The third line of each test case contains a string s of length n consisting of the characters $\texttt{B}$ and $\texttt{W}$ — the coloring of the tree.

It is guaranteed that the sum of the values n over all test cases does not exceed $2 \cdot 10^5$.

Output

For each test case, output a single integer — the number of balanced subtrees.

Example

input Copy

```
3
7
1 1 2 3 3 5
WBBWWBW
2
1
BW
8
1 2 3 4 5 6 7
BWBWBWBW
```

output Copy

```
2
1
4
```

Note

The first test case is pictured in the statement. Only the subtrees at vertices 2 and 3 are balanced.

In the second test case, only the subtree at vertex 1 is balanced.

In the third test case, only the subtrees at vertices 1, 3, 5, and 7 are balanced.

Codeforces Round 790 (Div. 4)
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Practice

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You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++20 13.2 (64 bit, win

Choose file: Choose File No file chosen

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→ Last submissions

Submission	Time	Verdict
231094735	Nov/03/2023 12:31	Accepted
231093149	Nov/03/2023 12:19	Accepted

→ Problem tags

dfs and similar dp graphs trees *1300

No tag edit access

→ Contest materials

- Announcement (en)
- Tutorial (en)