

D. Peculiar apple-tree

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

In Arcady's garden there grows a peculiar apple-tree that fruits one time per year. Its peculiarity can be explained in following way: there are n inflorescences, numbered from 1 to n . Inflorescence number 1 is situated near base of tree and any other inflorescence with number i ($i > 1$) is situated at the top of branch, which bottom is p_i -th inflorescence and $p_i < i$.

Once tree starts fruiting, there appears exactly one apple in each inflorescence. The same moment as apples appear, they start to roll down along branches to the very base of tree. Each second all apples, except ones in first inflorescence simultaneously roll down one branch closer to tree base, e.g. apple in a -th inflorescence gets to p_a -th inflorescence. Apples that end up in first inflorescence are gathered by Arcady in exactly the same moment. Second peculiarity of this tree is that once two apples are in same inflorescence they **annihilate**. This happens with each pair of apples, e.g. if there are 5 apples in same inflorescence in same time, only one will not be annihilated and if there are 8 apples, all apples will be annihilated. Thus, there can be no more than one apple in each inflorescence in each moment of time.

Help Arcady with counting number of apples he will be able to collect from first inflorescence during one harvest.

Input

First line of input contains single integer number n ($2 \leq n \leq 100\,000$) — number of inflorescences.

Second line of input contains sequence of $n - 1$ integer numbers p_2, p_3, \dots, p_n ($1 \leq p_i < i$), where p_i is number of inflorescence into which the apple from i -th inflorescence rolls down.

Output

Single line of output should contain one integer number: amount of apples that Arcady will be able to collect from first inflorescence during one harvest.

Examples

input
3 1 1
output
1

input
5 1 2 2 2
output
3

input
18 1 1 1 4 4 3 2 2 2 10 8 9 9 9 10 10 4
output
4

Note

In first example Arcady will be able to collect only one apple, initially situated in 1st inflorescence. In next second apples from 2nd and 3rd inflorescences will roll down and annihilate, and Arcady won't be able to collect them.

In the second example Arcady will be able to collect 3 apples. First one is one initially situated in first inflorescence. In a second apple from 2nd inflorescence will roll down to 1st (Arcady will collect it) and apples from 3rd, 4th, 5th inflorescences will roll down to 2nd. Two of them will annihilate and one not annihilated will roll down from 2-nd inflorescence to 1st one in the next second and Arcady will collect it.