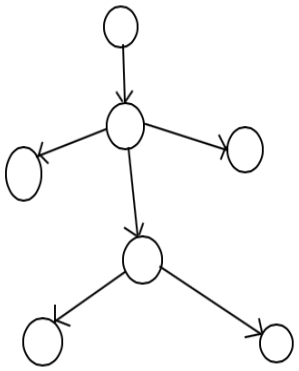
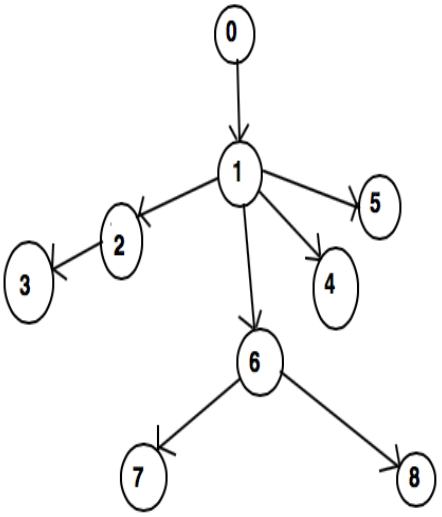
IOI Training Camp 2015

Tree Man

Anamika loves trees, and Anamika loves men. So whenever you give her a tree, she will try to find out the number of man-like figures in the tree. The tree we give to Anamika is a directed one and has $N + 1$ nodes. The nodes are numbered from 0 to N. The tree is always rooted at 0 and directed from top towards bottom. The parent of a node is always numbered lesser than itself. A sub-tree of the given tree is called "man-like" figure if it is bound by 7 nodes and forms such a shape:



Consider the tree given below:



It has five different man-like figures. These are the ones bound by the following sets of nodes:

- {0, 1, 2, 4, 6, 7, 8}
- {0, 1, 2, 5, 6, 7, 8}
- {0, 1, 3, 4, 6, 7, 8}
- {0, 1, 3, 5, 6, 7, 8}

- {0, 1, 4, 5, 6, 7, 8}

Note that the head, arms, legs and torso of the man can be any number of non-zero edges long. However, they need to attain the shape displayed above. Thus, a man-like figure can uniquely be defined using 7 nodes.

Anamika is finding it really difficult to count the number of man-like figures in large trees. Can you write a program which can help her?

Input

The first line of input will contain an integer N.

The next line will contain N space-separated integers, *i.e.*, the array P. $P[i]$ $(1 \leq i \leq N)$ defines the parent of node i. Node 0 – the root – has no parent.

Output

Print the number of man-like figures in the given tree modulo 1,000,000,007.

Test Data

In all the subtasks, the integers in the given array P are in the range $[1, N]$. As stated before $P[i] < i$.

Subtask 1 (20 Points): $N \leq 10^4$.

Subtask 2 (80 Points): $N \leq 2 * 10^5$.

Sample Input 1

```
7
0 1 2 2 2 5 5
```

Sample Output 1

```
2
```

Sample Input 2

```
16
0 0 2 2 2 4 0 4 7 2 10 11 9 0 1 0
```

Sample Output 2

```
7
```

Limits

Time: 3 seconds

Memory: 256 MB