

Problem G: Video Game Story

Filename: story

Timelimit: 3 seconds

Webros has finished what is now one of her favorite video games. What she notices about this particular video game is that there are several ways to finish the game and arrive at the ending of the game.

This game consists of n events indexed 1 through n , and event indexed i ($1 \leq i < n$) is followed by event e_i . Each event can only occur after all prior events leading up to it have already occurred.

Now Webros wonders how many unique ways (a way, in this context, is an ordering of the completion of the levels) she can play the game. Two ways are considered different if there are two events a and b where a occurs before b in one way, but b occurs before a in the other way.

Input

The first line of input contains single positive integer n ($2 \leq n \leq 5,000$), representing the number of events for the input case. The second line contains $n - 1$ space separated positive integers. The i th integer on this line, e_i , denotes that event i is required in order for event e_i to occur. The last event is guaranteed to require all of the first $n - 1$ events, directly or indirectly, and it's guaranteed that there exists at least one way to arrive at event n , satisfying all of the constraints.

Output

On a line by itself, output the *remainder* of the number of ways in which Webros can play the game when divided by 10^9+7 .

Samples

Input	Output
4 2 3 4	1
5 2 5 4 5	6
7 2 4 4 7 7 5	45