

British Informatics Olympiad Final

26–28 March, 2004

Sponsored by Lionhead Studios

Murder Mystery

The film company *Greenlight Casting Coach* have just finished filming their latest murder mystery, in which only one member of the cast survives at the end. Since audiences watch these films to see the intricate ways in which characters are bumped-off, the plot has not yet been written. Indeed, the characters have not yet even been given names and are currently known by numbers. Given a list of who dispatches whom, determine how many different ways they can be ordered in the film, ensuring nobody comes back from the dead.

For example, suppose 4 liquidates 2 and 3, and 2 silences 1. There are three possible orderings: 132, 123 and 312.

Write a program that, given a list of murders determines the number of possible valid orderings. The first line of the input will contain a single integer n ($2 \leq n \leq 128$), indicating the number of characters in the film (who are numbered from 1 to n). This will be followed by $n - 1$ lines, each containing a single integer; the i^{th} of these lines indicates who eliminates character i (suicides are not allowed). The input will be consistent with n being the solve survivor at the end of the film. You should output a single integer, the number of valid orderings. No test will require output above 2^{31} .

Sample Input

```
5
3
5
5
2
```

Sample Output

```
6
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