

DFS Orderings

Problem Code: **DFSORDER**



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Problem description

In this problem we consider a rooted tree Tr with root r (not necessarily a binary tree). A dfs - depth first search - traversal of the tree Tr starting from root r , visits the nodes of Tr in a particular order. Let us call that order as dfs ordering.

Observe that during a dfs traversal, from each node we have choices between which child to traverse first. These different choices lead to different dfs ordering.

You have to find different ways a dfs can visit the nodes i.e., number of different ordering of nodes possible by a dfs on Tr starting from root r .

Consider an example Tr with 3 nodes labelled 1, 2, 3 with 1 as root and with 2 and 3 as children of 1.

A dfs on this Tr can visit nodes in ordering (1, 2, 3) or (1, 3, 2). Hence there are 2 ways of dfs ordering.

See sample test cases for more examples

Input

The first line in input is equal to T , the number of test cases. Then follows the description of T test cases. The first line in each test case is the integer N , the number of nodes in the tree Tr . Each node is labelled with a distinct integer between 1 and N inclusive. On the next line there are N integers where i th interger represents parent label of node labelled i in rooted tree Tr . The value of each label in a test case will be between 1 and N , inclusive. Parent node of node labelled i will have label less than i . Node with label 1 is the root node r . Parent node of root node will be given as 0 in test cases.

Output

For each test case, output a single line containing number of different orderings possible by dfs on Tree Tr . Since this number can be huge output the value **modulo 1,000,000,007**.

Constraints

- $1 \leq T \leq 100$
- $1 \leq N \leq 1000$
- $0 \leq A[i] < i$

Example

All Submissions
(/DI17R055/status/DFSORDER)

Successful Submissions



Input:

```
6
2
0 1
3
0 1 1
4
0 1 1 1
3
0 1 2
4
0 1 1 2
5
0 1 1 2 2
```

Output:

```
1
2
6
1
2
4
```

Explanation

Example test case 1.

Tr has single leaf child for root node. Following is the only dfs ordering.

```
(1, 2)
```

Hence answer is 1 for first test case.

Example test case 2.

Tr has two leafs as children for root node. Following are different dfs orderings.

```
(1, 2, 3)
(1, 3, 2)
```

Hence answer is 2 for second test case.

Example test case 3.

Following are different dfs orderings

```
(1, 2, 3, 4)
(1, 2, 4, 3)
(1, 3, 2, 4)
(1, 3, 4, 2)
(1, 4, 2, 3)
(1, 4, 3, 2)
```

Hence answer is 6 for third test case.

Example test case 4.

Following are different dfs orderings

```
(1, 2, 3)
```

Hence answer is 1 for fourth test case.

Example test case 5.

Following are different dfs orderings

```
(1, 2, 4, 3)
(1, 3, 2, 4)
```

Hence answer is 2 for fifth test case.

Example test case 6.

Following are different dfs orderings

```
(1, 2, 4, 5, 3)
(1, 2, 5, 4, 3)
(1, 3, 2, 4, 5)
(1, 3, 2, 5, 4)
```

Hence answer is 4 for sixth test case.

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Date Added: 25-01-2015
Time Limit: 2 secs
Source Limit: 50000 Bytes
Languages: C, CPP 4.3.2, CPP 6.3, CPP14, JAVA, PYTH, PYTH 3.5

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