WALK

One morning, Răzvăran decided to invite his two friends, Matthew and Peter, to go for a walk in a well-known public garden. This garden has the shape of a tree with *n* nodes (indexed from 1 to n) and between *n-1* pairs of nodes there are paths which measure 10 meters. In each *i* node, there is an *i* spring. The friends only accept the invitation if the walk respects the following rules: Matthew, a pretentious young man, wants to get to **all** of the springs walking as **few** meters as possible and Peter, wanting to rise up to the challenge, says that he wants to visit m springs in a **pre-established order**: P_1 , P_2 , ... , P_m. Răzvăran now wonders in how many ways they can walk, knowing that both the entrance and the exit are at the first spring, which is at the same time the root of the tree.

TASK

Determine the number of ways in which the three friends can walk. This number must be printed modulo 10^9+7.

INPUT FORMAT

On the first line of the input file ***walk.in*** there are two positive integers, *n* and *m*, which represent the number of springs of the public garden and the number of springs Peter wants to visit. The next line contains *n-1* numbers T_2 , T_3 , ... , T_n representing the parent array corresponding to the tree. On the next line there are *m* distinct numbers P_1 , P_2 , ... , P_m.

OUTPUT FORMAT

On the first line of the output file ***walk.out***, you should print the required number.

LIMITS AND CONSTRAINTS

- 2 <= m <= n <= 400.000
- It is guaranteed that the shape of the public garden is a tree (an acyclic, connected and undirected graph).

SUBSTASKS

Subtask	Score	Additional input constraints
1	20	$1 \leq m \leq n \leq 10$
2	60	$1 \leq m \leq n \leq 4.000$
3	100	$1 \leq m \leq n \leq 400.000$

EXAMPLE

walk.in	*walk.out*
7 3 1 1 2 2 2 3 5 4 7	3

EXPLANATIONS

The correct ways the three friends can walk are:
1 2 5 2 4 2 6 2 1 3 7 3 1
1 2 6 2 5 2 4 2 1 3 7 3 1
1 2 5 2 6 2 4 2 1 3 7 3 1

Moreover, three invalid walks are:
1 2 5 2 4 2 1 3 7 3 1 (the 6th spring is not visited)
1 2 4 2 5 2 6 2 1 3 7 3 1 (they visit the 4th spring before the 5th one)
1 2 4 2 5 2 6 2 4 2 1 3 7 3 1 (the length of the walk is not minimal)