Task: SAB
Sabotage

In a Certain Inconspicuous Agency (which must not be named), the supervisor-subordinate relation can be represented by a tree – each employee except the head has a unique direct supervisor. Moreover, employees are numbered in the order of hiring, and due to strict seniority rules, a supervisor's number always precedes those of all their subordinates.

The board of directors fears that a saboteur may have infiltrated the agency, and might raise mutiny. To prevent such sorry state of affairs, the board is suddenly eager to maintain high employee spirits by means of providing various bonuses, events, and foosball tables. The whole team's morale is expressed by a real number x in the range from 0 to 1. Should any employee realize that at least x fraction of their subordinates (including the indirect ones) mutinied, they are going to join the mutiny (out of conviction or fear) and force all their subordinates to do the same. The board is right to expect the worst: The saboteur is in fact already among the employees, but have not yet revealed their true face. When they do, they will be the first to mutiny, though without forcing their subordinates to follow.

The board of directors is keen to know what is the minimum morale that have to maintain so that the potential mutiny is confined to at most k employees, as they believe such small-scale mutiny can easily be contained. Write a program to provide them with answers.

Input

The first line of the standard input contains two integers n and k ($1 \le k \le n \le 500\,000$), separated by a single space, that specify the number of the agency employees and the maximum number among them whose mutiny can be withstood. The employees are numbered with integers from 1 to n, and the head is, fittingly, employee no. 1. The following $n-1$ lines specifies the agency's structure: the i-th such line contains an integer p_i ($p_i \le i$), which specifies that the supervisor of employee no. $i + 1$ is the employee no. p_i.

Output

The first and only line of the standard output should contain a single real number, namely the sufficient morale sought by the board. Results differing from the true one by less than 10^{-6} will be deemed correct.
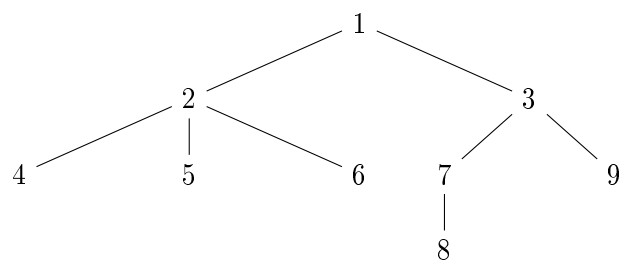
Example

For the following input data:
```
9 3
1
1
2
2
2
3
7
3
```
a correct result is:
```
0.6666666667
```


Explanation for the example: Should morale drop below $\frac{2}{3}$, then if employee no. 8 were the saboteur, 4 employees would mutiny, namely: 3, 7, 8, and 9.

Sample grading tests:

1ocen: head and 9 direct subordinates;

2ocen: random test with 20 employees;

3ocen: 500 000 employees, each of which (except the latest hire) has exactly one direct subordinate.

Caution: We recommend the floating-point type `double` for storing the result.

Grading

The set of tests consists of the following subsets. Within each subset, there may be several test groups.

Subset	Property	Score
1	$n \leq 10$	22
2	$n \leq 1000$	10
3	$k \leq 20$	13
4	no additional property	55