F. A Man, A Myth, A Legend of NUBTK

Input file:	**standard input**
Output file:	**standard output**
Time limit:	1 second
Memory limit:	256 megabytes

At the Northern University of Business and Technology, Khulna (NUBTK), there is one name known by every competitive programmer — Rahul Kumar Ghosh, hailed as The Uncrowned King.

A man, a myth, a legend — Rahul has dominated every contest and mentored countless students. Those students, in turn, mentor others, forming a mentorship hierarchy that spans the entire competitive programming community of NUBTK.

You are given this mentorship structure: for every student $2,3,\ldots,n$, you know their direct mentor. Your task is to determine, for each student, how many students are under their mentorship (both directly and indirectly).

Input

The first line contains an integer n: the total number of students.

The second line contains n-1 integers: for each student $2,3,\ldots,n$ their direct mentor.

Note: Student 1 always represents Rahul Kumar Ghosh — The Uncrowned King, A Man, A Myth, A Legend of NUBTK.

Output

Print n integers: for each student $1,2,\ldots,n$, the total number of students under their mentorship.

Example

standard input	standard output
5 1 1 2 3	4 1 1 0 0

Note

Student 1 (The king) mentors everyone.

Student 2 mentors 4.

Student 3 mentors 5.

Students 4 and 5 have no mentees.