Problem E
The Inversion Vector of a Permutation

Input File: *testdate.in*
Time Limit: 2 seconds

Problem Description

Let $a[0 \ldots n-1]$ be an array that contains a permutation of the integers $0, 1, 2, \ldots, n-1$. Define an array $b[0 \ldots n-1]$ by $b[k]$ = the number of values in $a[0 \ldots k-1]$ that are less than $a[k]$. The array b is called the inversion vector of the permutation.

For example, let $n = 10$ and the array a contains the permutation

```
2, 4, 7, 6, 0, 9, 1, 8, 5, 3
```

Then, the inversion vector b is

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

In each test case of this problem, we want to do one of the following two things.

1. Construct the inversion vector of a permutation;
2. Construct the permutation from its inversion vector.

Input Format

Each test case consists of 3 parts. The first part is an integer n, $1 \leq n \leq 30$. It is the length of array. The second part is a letter. If the letter is "p", the array is interpreted as a permutation. If the letter is "i", the array is interpreted as an inversion vector. The subsequent n integers are the elements of the array. The last line of the input file contains 0, indicating the end of input.

Output Format

If the input is a permutation, construct the inversion vector from the permutation. If the input is an inversion vector, construct the permutation from the inversion vector. The output of each test case should be printed in a line.

Sample Input

```
10 p 2 4 7 6 0 9 1 8 5 3
10 p 9 8 7 6 5 4 3 2 1 0
10 i 0 1 2 2 0 5 1 6 4 3
10 i 0 0 0 0 0 0 0 0 0 0
0
```

Sample Output

```
0 1 2 2 0 5 1 6 4 3
0 0 0 0 0 0 0 0 0 0
2 4 7 6 0 9 1 8 5 3
9 8 7 6 5 4 3 2 1 0
```