Yet Another N-Queen Problem

After solving Solution to the *n* Queens Puzzle by constructing, LoadingTime wants to solve a harder version of the N-Queen Problem. Some queens have been set on particular locations on the board in this problem. Can you help him??

Input

The input contains multiple test cases. Every line begins with an integer N (N<=50), then N integers followed, representing the column number of the queen in each rows. If the number is 0, it means no queen has been set on this row. You can assume there is at least one solution.

Output

For each test case, print a line consists of N numbers separated by spaces, representing the column number of the queen in each row. If there are more than one answer, print any one of them.

Example

Input:
4 0 0 0 0
8 2 0 0 0 4 0 0 0

Output:
2 4 1 3
2 6 1 7 4 8 3 5