2017 PHOTO FINISH

At the conclusion of a contest (in the cutthroat world of pigeon racing) it is quite common for the owners to place the birds in a straight line for a commemorative photograph. The birds, still buzzing with excitement, keep changing position so taking the desired snapshot is quite an art. Fortunately, as they are highly trained, the movement of the birds is predictable.

Whilst waiting to be photographed, a pigeon will only move by swapping position with an adjacent bird and no swaps take place simultaneously. The swap that takes place depends entirely on the current permutation of the birds, hence the sequence of swaps is fixed.

1234
1243
1423
4123
4132
1432
1342
1324
3124
3142
3412
4312
4321
3421
3241
3214
2314
2341
2431
⋮

Pigeons, always keen to encourage new competitors, follow a procedure for n birds that is derived from the one for $n-1$ birds. Starting from the birds in order from 1 to n the following procedure repeats: bird n is allowed to gradually move to the far end, followed by the other competitors performing the next swap they would have performed if n was not present.

If there are n birds, with unique competitor numbers from 1 to n, eventually every permutation of 1 to n will appear.

For example:

- Two pigeons will just keep swapping positions 12 → 21 → 12 etc.;
- Starting with 123, 3 gradually moves to the far end 123 → 132 → 312, then 1 and 2 swap 312 → 321, then 3 moves to the far end 321 → 231 → 213, then 1 and 2 swap 213 → 123 etc.;
- As shown by the figure on the left, starting with 1234, 4 gradually moves to the far end 1234 → ... → 4123, then 2 and 3 swap (since 123 → 132) 4123 → 4132, then 4132 → ... → 1324, then 3 and 1 swap (as 132 → 312), then 3124 → ... → 4312 etc.

SAMPLE INPUT

```
4
3 4 1 2
```

The first line of input will consist of a single integer, n ($2 \leq n < 2^{10}$), indicating the number of pigeons. The second line of input will consist of a permutation of the numbers 1 to n indicating a line-up of pigeons.

Just before the photograph is taken one more swap takes place!

SAMPLE OUTPUT

```
4 3 1 2
```

You should output a single line containing a permutation of the numbers 1 to n indicating the order of the pigeons in the photograph.