2022 DEAD DROP GORGEOUS

Fraternising between the spies of *Alpha Complex* and *Beta Complex* is generally discouraged, although it's generally acceptable when done in secret and nobody knows with whom they are fraternising. Training in the use of dead drops provides ample opportunity for leaving messages to which you'll never get a reply and getting replies to messages you never sent.

	0	1	2
0	α	β	
1		α	β
2	β		α

	2	1	0
1	β	α	
0		β	α
2	α		β

Dead drop training takes place on an n by n grid, whose columns and rows are both initially labelled (in order) 0, …, $n-1$. Trainee spies have been allocated co-ordinates on the grid, so that each row and column has a single spy from each complex. The spies learn their trade by leaving a message at their allocated co-ordinates before leaving the grid, at which point the labels on the columns and rows are then rearranged. When the spies return to the grid and head to their allocated co-ordinates according to the updated labels, the relabelling is such that they find a concealed message from a different complex's spy.

For example, suppose that *Alpha Complex* spies are allocated co-ordinates (0,0), (1,1) and (2,2), and *Beta Complex* spies are allocated to (1,0), (2,1) and (0,2). The row labels are now rearranged to 1, 0, 2 and the column labels are now rearranged to 2, 1, 0. Each spy, when they return to their co-ordinates, is at a different position on the grid and finds a message from the other complex. The only position on the grid whose co-ordinates have not changed is (1,2) and no spy occupies that position.

The first line of input will consist of a single integer, n ($2 \le n \le 2^{10}$), indicating the size of the grid. The next n lines will consist of a pair of integers, indicating the allocated co-ordinates of a spy from *Alpha Complex*. The next n lines will consist of a pair of integers, indicating the allocated co-ordinates of a spy from *Beta Complex*. No spy's co-ordinates will be listed more than once and no two spies (from either complex) will be allocated the same co-ordinates.

You should output 2 lines. The first line should contain a permutation of the numbers *0* to *n-1* giving the rearrangement for the rows. The second line should contain a permutation of the numbers *0* to *n-1* giving the rearrangement for the columns.

SAMPLE INPUT

```
3
0 0
1 1
2 2
1 0
2 1
0 2
```

SAMPLE OUTPUT

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1 0 2
2 1 0
```