Problem C: Cinderella's Chore

Time limit: 3 seconds

CINDERELLA's cruel stepmother and stepsisters often force her to do all kinds of hard work. They often mock her and sometimes even make up chores for her to do. This time, Cinderella wants to attend a local festival, but her stepmother refuses because Cinderella has no appropriate clothing.

When the girl insists, the woman guarantees her that she is going to give her permission if she manages to quickly complete a task. Specifically, Cinderella should place some flowers into porcelain pots arranged on a straight line in regular intervals. To make the task particularly infuriating and time-consuming, the woman does not tell her in which pots to put the flowers but only how far apart each pair of flowers should be.

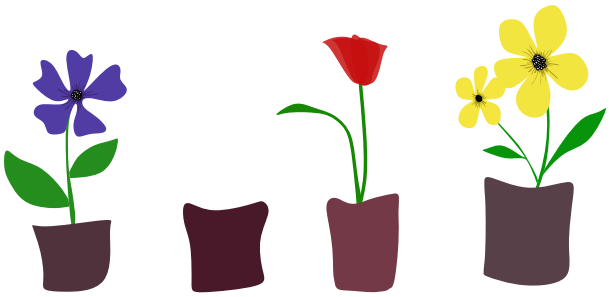

Figure C.1: Illustration of the first sample.

There are 10^{10} pots numbered 1 to 10^{10}, and flowers placed in pots i and j have distance $|i - j|$.

Input

The input consists of:

- One line with an integer n ($2 \leq n \leq 1000$), the number of flowers.
- n lines, the ith of which contains n integers $d_{i,1}, \ldots, d_{i,n}$ ($0 \leq d_{i,j} \leq 10^9$ for each j), where $d_{i,j}$ is the desired distance between flower i and flower j.

Integers on the diagonal are zero, all other entries are positive. It is further guaranteed that $d_{i,j} = d_{j,i}$ for all $1 \leq i, j \leq n$.

Output

If the flowers cannot be placed into the pots according to the stepmother's specification, output "`impossible`". Otherwise, output n integers, the ith of which is the pot Cinderella should put the ith flower.

If there are multiple valid solutions, you may output any one of them.

Sample Input 1

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

Sample Output 1

```
3 4 1
```

Sample Input 2

```
2
0 1000000000
1000000000 0
```

Sample Output 2

```
1 1000000001
```

Sample Input 3

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

Sample Output 3

```
impossible
```