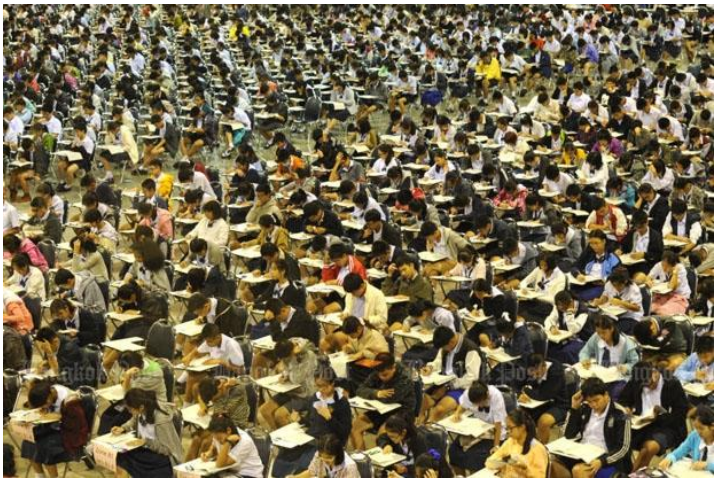

Goal

Your students are angry, they accuse you of canceling courses permanently and leave bad comments on the internet. You will have to stop accepting students if you can not teach each of them individually. As in the previous exercise, all students give you two slots of 60 minutes and you have to teach them during one of the two slots. This time, all you want to know is if you can give lessons to everyone and if so in which slots.

Warning: the number of students is much larger than in the previous exercise, your solution must run in polynomial time.

Data

Input

Row *1*: an integer **N** between *3* and *1000* inclusive, the number of students.
Rows *2* to **N** + *1*: two integers between *0* and *300 000*, the two starts of slots (in minutes) for which a student is available, each slot has a duration of *60* minutes from the beginning indicated (your days are very long).

Output

You will simply display *KO* if it is impossible to give lessons to everyone. If it is possible to lessons to everyone, you will indicate, for each student, on which slot you will give him courses i.e. 1 or 2 in the same order as the input (we will accept all possible solutions). You can separate students by line breaks or spaces.

Example 1

For the following entry:

```
5
205,300
210,370
290,380
120,305
390,110
```

The expected answer is *KO*, regardless of the slot chosen for each student, there will always be two overlapping slots.

For the following entry:

```
4
205,300
210,370
290,380
120,305
```

It is possible to teach everyone:

- Student 1 on his first slot from 205 to 265
- Student 2 on his second slot from 370 to 430
- Student 3 on his first slot from 290 to 350
- Student 4 on his first slot from 120 to 180

The expected answer for these 4 students is:

1
2
1
1

You can download sample input and output data files to work locally by clicking on the link at the bottom of the French version of the question.

Téléchargez des fichiers d'exemple ainsi qu'un modèle de code pour travailler localement.