Home on the Range — Part Two

The independent contractors have been taking advantage of the Range's management, producing a great number of overlapping surveys. Discouraging words are being heard. Lawyers have been called in and the future of the Range, with its poetic (if dangerous) fauna, is in doubt. To help determine which surveys do not overlap, a schematic will be produced, linking together those surveys that have safe units in common.

The lawyers have decided that placing the survey sequences on the schematic (left figure) makes it look too complicated. They want to replaced these sequences with single numbers that identify the surveys but do not give their results (right figure).
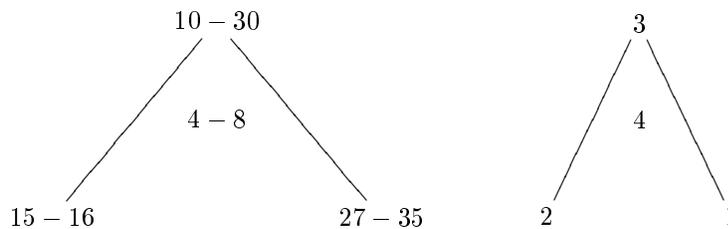
The problem with the lawyers' schematic is there is no way of checking if it is correct; indeed, it is possible to create schematics which no possible combination of survey sequences could produce. A concession has been reached whereby the surveys will be numbered in such a way that an example combination of sequences, consistent with the schematic, can be deduced. This would be a useful tool in court (not to mention a potential part three).

Suppose $L(x)$ is the label give to survey x. You need to produce a labelling for the schematic so that, if $L(u) < L(v) < L(w)$ *and* surveys u and w overlap, then surveys v and w overlap. Each survey must have a distinct label.

Write a program that, give a list of survey sequences, produces a valid labelling of the surveys. The first line of the input will consist of a single integer, n ($1 \leq n \leq 5000$), indicating the number of surveys. The next n lines will each contain two numbers, s then e ($0 < s \leq e < 2^{30}$), indicating the start and end of a range. *All ranges are inclusive, i.e. include both the start and end points.*

You should output n lines. The ith line should consist of the label you are giving to the ith survey from the input file. There will always be a valid solution.

Sample Input

```
4
10 30
4 8
15 16
27 35
```

Sample Output

```
3
4
2
1
```