

The Best Wife

Input file: **standard input**
Output file: **standard output**
Time limit: 3 seconds
Memory limit: 512 megabytes

Sofia is the best wife, and she constantly comes up with new ideas on how to spend time with her husband. Idea i could be described by a segment $[l_i..r_i]$. It means Sofia wants to visit some event that starts at day l_i and ends at day r_i . If she decides to visit an event, she fully commits to it and is there every day from l_i to r_i inclusive.

Sofia can't visit more than one event each day. Also, if some event ends on day d and another event starts on day d , she can only visit one of them.

After each new idea comes to her mind, she wonders what the biggest number of events she could visit.

Input

The first line contains one integer n ($1 \leq n \leq 3 \cdot 10^5$) — the number of ideas.

Each of next n lines contain two integers l_i and r_i ($1 \leq l_i \leq r_i \leq 6 \cdot 10^5$) — description of the i -th idea.

Output

For each i in a range $1..n$, print one integer — the maximum number of events out of $1, 2, \dots, i$ that Sofia can visit.

Example

standard input	standard output
5	1
1 3	1
3 5	2
1 2	2
5 6	3
4 4	