



H. Ice Baby

time limit per test: 2 seconds
 memory limit per test: 512 megabytes

The longest non-decreasing subsequence of an array of integers a_1, a_2, \dots, a_n is the longest sequence of indices $1 \leq i_1 < i_2 < \dots < i_k \leq n$ such that $a_{i_1} \leq a_{i_2} \leq \dots \leq a_{i_k}$. The length of the sequence is defined as the number of elements in the sequence. For example, the length of the longest non-decreasing subsequence of the array $a = [3, 1, 4, 1, 2]$ is 3.

You are given two arrays of integers l_1, l_2, \dots, l_n and r_1, r_2, \dots, r_n . For each $1 \leq k \leq n$, solve the following problem:

- Consider all arrays of integers a of length k , such that for each $1 \leq i \leq k$, it holds that $l_i \leq a_i \leq r_i$. Find the maximum length of the longest non-decreasing subsequence among all such arrays.

Input

Each test consists of multiple test cases. The first line contains a single integer t ($1 \leq t \leq 10^4$) — the number of test cases. The description of the test cases follows.

The first line of each test case contains a single integer n ($1 \leq n \leq 2 \cdot 10^5$) — the length of the arrays l and r .

The next n lines of each test case contain two integers l_i and r_i ($1 \leq l_i \leq r_i \leq 10^9$).

It is guaranteed that the sum of n across all test cases does not exceed $2 \cdot 10^5$.

Output

For each test case, output n integers: for each k from 1 to n , output the maximum length of the longest non-decreasing subsequence among all suitable arrays.

Example

input

Copy

```
6
1
1 1
2
3 4
1 2
4
4 5
3 4
1 3
3 3
8
6 8
4 6
3 5
5 5
3 4
1 3
2 4
3 3
5
1 2
6 8
4 5
2 3
3 3
11
```

Codeforces Round 1032 (Div. 3)

Finished

Practice



→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++23 14.2 (64 bit, ms)

Choose file: Choose File No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
325026345	Jun/18/2025 15:29	Accepted
325026062	Jun/18/2025 15:27	Wrong answer on test 2
324864437	Jun/17/2025 18:38	Wrong answer on test 1
324848959	Jun/17/2025 18:22	Wrong answer on test 1

→ Problem tags

binary search brute force
 data structures dp implementation
 sortings

No tag edit access

```
35 120
66 229
41 266
98 164
55 153
125 174
139 237
30 72
138 212
109 123
174 196
```

output

Copy

```
1
1 1
1 2 2 3
1 2 2 3 3 3 4 5
1 2 2 2 3
1 2 3 4 5 6 7 7 8 8 9
```

→ Contest materials

- Announcement

Note

In the first test case, the only possible array is $a = [1]$. The length of the longest non-decreasing subsequence of this array is 1.

In the second test case, for $k = 2$, no matter how we choose the values of a_1 and a_2 , the condition $a_1 > a_2$ will always hold. Therefore, the answer for $k = 2$ will be 1.

In the third test case, for $k = 4$, we can choose the array $a = [5, 3, 3, 3]$. The length of the longest non-decreasing subsequence of this array is 3.

In the fourth test case, for $k = 8$, we can choose the array $a = [7, 5, 3, 5, 3, 3, 3, 3]$. The length of the longest non-decreasing subsequence of this array is 5.

In the fifth test case, for $k = 5$, we can choose the array $a = [2, 8, 5, 3, 3]$. The length of the longest non-decreasing subsequence of this array is 3.

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