

Contest Duration: 2025-12-20(Sat) 23:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20251220T2100&p1=248>) - 2025-12-21(Sun) 00:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20251220T2240&p1=248>) (local time) (100 minutes)

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E - Sort Arrays

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 450 points

Problem Statement

There are $N + 1$ sequences A_0, A_1, \dots, A_N . A_i is defined as follows:

- A_0 is an empty sequence.
- A_i ($1 \leq i \leq N$) is a sequence obtained by appending an integer y_i to the end of the sequence A_{x_i} ($0 \leq x_i < i$).

Find the permutation $P = (P_1, P_2, \dots, P_N)$ of $(1, 2, \dots, N)$ that satisfies the following condition:

- For $i = 1, 2, \dots, N - 1$, one of the following holds:
 - A_{P_i} is lexicographically smaller than $A_{P_{i+1}}$.
 - $A_{P_i} = A_{P_{i+1}}$ and $P_i < P_{i+1}$

In other words, when A_1, A_2, \dots, A_N are arranged in lexicographical order (when there are multiple equal sequences, arrange those with smaller indices first), P is the sequence of indices that appears in that arrangement.

► What is the lexicographical order of sequences?

Constraints

- $1 \leq N \leq 3 \times 10^5$

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- $0 \leq x_i < i$
- $1 \leq y_i \leq 10^9$
- All input values are integers.

Input

The input is given from Standard Input in the following format:

```
N
x1 y1
x2 y2
⋮
xN yN
```

Output

Output P_1, P_2, \dots, P_N in one line, separated by spaces.

Sample Input 1

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```
4
0 2
0 1
2 2
0 1
```

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Sample Output 1

Copy

```
2 4 3 1
```

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$A_1 = (2), A_2 = (1), A_3 = (1, 2), A_4 = (1),$ so $P = (2, 4, 3, 1).$

Sample Input 2

Copy

```
5
0 1
0 1
0 1
0 1
0 1
```

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Sample Output 2

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```
1 2 3 4 5
```

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$$A_1 = A_2 = A_3 = A_4 = A_5 = (1).$$

Sample Input 3

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```
10
0 305186313
1 915059758
0 105282054
1 696409999
3 185928366
3 573289179
6 254538849
3 105282054
5 696409999
8 168629803
```

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Sample Output 3

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```
3 8 10 5 9 6 7 1 4 2
```

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