A. Shandom Ruffle

time limit per test: 8 seconds
memory limit per test: 1024 megabytes

Those of you who use Java (or are subscribed to SecondThread) likely know that calling Arrays.sort() on an array of primitives in Java can lead to TLE verdicts on Codeforces contests because there are some very specific cases in which quicksort runs in n^2 time. There are a couple solutions to this: one is to use Collections.sort() on an ArrayList. This uses mergesort and is always $n * log(n)$.

Another solution is to shandomly ruffle [aka randomly shuffle] the array before sorting so that it is very very very unlikely that it is still in some undesirable order. One way of doing this is to do the following:

```
shandom_ruffle(int a, int b, int[] array) {
  int bStart=b;
  while (a<bStart && b<=array.length) {
    swap(array[a], array[b]); //swap the values at indecies a and b
    a++;
    b++;
  }
}
```

In Java and the psuedocode above, arrays are pass-by-reference. Suppose David starts with the array $[1, 2, 3, 4, \ldots n]$, and calls this method n times on the array, the ith time passing in a_i and b_i. What will the array look like after these n method calls?

Input

The first line will contain a single integer n. $(1 \leq n \leq 5 * 10^5)$

The following n lines will each contain two integers a_i and b_i. $(1 \leq a, b \leq n)$ Note that b may be less than or equal to a, in which case the method will not do anything.

Output

Print a single line containing n space-separated integers: the array after it has been shandomly ruffled all n times.

Examples

input Copy

```
4
3 1
1 3
3 2
2 3
```

output Copy

```
3 1 4 2
```

input Copy

```
5
4 1
5 4
3 5
4 5
5 2
```

output Copy

```
1 2 5 3 4
```

Note

There's a much easier way to shandom_ruffle that takes $O(n)$, but that makes for a less interesting problem.

Algorithms Thread Treaps Contest

Finished

Practice

☆

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Algorithms Thread Treap Contest, written by SecondThread.

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Clone Contest

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Language: GNU G++20 13.2 (64 bit, win

Choose file: Choose File No file chosen

Submit

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Submission	Time	Verdict
304296468	Feb/03/2025 20:35	Accepted
304293435	Feb/03/2025 20:15	Accepted
303574593	Jan/29/2025 23:15	Accepted
303451579	Jan/29/2025 05:26	Accepted
303227038	Jan/27/2025 15:53	Accepted
303225845	Jan/27/2025 15:44	Accepted
303162618	Jan/27/2025 02:30	Runtime error on test 1
303149094	Jan/26/2025 22:48	Wrong answer on test 2
300762511	Jan/12/2025 22:30	Accepted
300749036	Jan/12/2025 20:14	Wrong answer on test 1