

MALI

Mirko and Slavko are playing a new game. Again. Slavko starts each round by giving Mirko two numbers A and B , both smaller than 100. Mirko then has to solve the following task for Slavko: how to pair all given A numbers with all given B numbers so that the **maximal sum of such pairs is as small as possible**.

In other words, if during previous rounds Slavko gave numbers $a_1, a_2, a_3 \dots a_n$ and $b_1, b_2, b_3 \dots b_n$, determine n pairings (a_i, b_j) such that each number in A sequence is used in exactly one pairing, and each number in B sequence is used in exactly one pairing and the maximum of all sums $a_i + b_j$ is minimal.

Input

The first line of input contains a single integer N ($1 \leq N \leq 100000$), number of rounds. Next N lines contain two integers A and B ($1 \leq A, B \leq 100$), numbers given by Slavko in that round.

Output

Output consists of N lines, one for each round. Each line should contain the smallest maximal sum for that round.

Example

Input1:

```
3
2 8
3 1
1 4
```

Output1:

```
10
10
9
```

Input2:

```
3
1 1
2 2
3 3
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Output2:

```
2
3
4
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