PROBLEM 2

Buried Treasure

Time and memory limits: 1 second, 256 MB

For generations, stories have been told of a hidden treasure buried beneath the shore of Bitwise Beach. You know that the treasure is hidden at one of L distinct locations, numbered 1 through L.

After speaking with the locals of Bitwise Beach, you've received N clues. The ith clue consists of two integers A_i and B_i (with $A_i \leq B_i$), indicating that the treasure lies somewhere between locations A_i and B_i (inclusive). For example, if $A_i = 3$ and $B_i = 6$, then the treasure must be at location 3, 4, 5 or 6.

To save time and beat the other treasure hunters, you want to dig at as few locations as possible. So you ask yourself, "How many locations are consistent with all N clues?". It is possible that the answer is 0, meaning that the locals have tricked you!

Subtasks and constraints

Your program will be graded using many secret tests. Every test follows some rules:

- $2 \leq N \leq 200\,000$.
- $1 \leq L \leq 1\,000\,000$.
- $1 \leq A_i \leq B_i \leq L$ for all i.

The secret tests are divided into subtasks. Your program must correctly solve **every test** within a subtask to earn the marks for that subtask:

- For Subtask 1 (40 marks), $N = 2$ and $L \leq 1000$.
- For Subtask 2 (40 marks), $N \leq 1000$ and $L \leq 1000$.
- For Subtask 3 (20 marks), no special rules apply.

Input

Your solution must read input and print output. We recommend using the solution templates (which you can find on the competition website) to help you with input and output.

The input follows a specific format:

- The 1st line contains the integers N and L.
- The next N lines describe the clues. The ith of these contains the two integers A_i and B_i.

Output

Your program must output the number of locations that are consistent with all N clues.

Sample input 1

```
2 10
3 6
5 8
```

Sample output 1

```
2
```

Sample input 2

```
2 6
1 6
2 5
```

Sample output 2

```
4
```

Sample input 3

```
2 8
7 8
1 3
```

Sample output 3

```
0
```

Sample input 4

```
5 20
3 13
7 15
6 14
2 12
1 20
```

Sample output 4

```
6
```

Explanation

- In the 1st sample case, there are $N = 2$ clues and Bitwise Beach has $L = 10$ locations. The 1st clue tells you that the treasure is buried at location 3, 4, 5 or 6. The 2nd clue tells you that the treasure is buried at location 5, 6, 7 or 8. Only locations 5 and 6 are consistent with both clues and so the answer is 2.
- In the 2nd sample case, there are $N = 2$ clues and Bitwise Beach has $L = 6$ locations. The 1st clue tells you that the treasure is buried at location 1, 2, 3, 4, 5 or 6. The 2nd clue tells you that the treasure is buried at location 2, 3, 4 or 5. Only locations 2, 3, 4 and 5 are consistent with both clues and so the answer is 4.
- In the 3rd sample case, there are $N = 2$ clues and Bitwise Beach has $L = 8$ locations. The 1st clue tells you that the treasure is buried at location 7 or 8. The 2nd clue tells you that the treasure is buried at location 1, 2 or 3. No locations are consistent with both clues and so the answer is 0.
- In the 4th sample case, there are $N = 5$ clues and Bitwise Beach has $L = 20$ locations. There are 6 locations that are consistent with all clues: 7, 8, 9, 10, 11 and 12.