B. Young Photographer

time limit per test: 2 seconds
memory limit per test: 64 megabytes
input: standard input
output: standard output

Among other things, Bob is keen on photography. Especially he likes to take pictures of sportsmen. That was the reason why he placed himself in position x_0 of a long straight racetrack and got ready to take pictures. But the problem was that not all the runners passed him. The total amount of sportsmen, training at that racetrack, equals n. And each of them regularly runs distances within a particular segment of the racetrack, which is the same for each sportsman. For example, the first sportsman runs from position a_1 to position b_1, the second — from a_2 to b_2

What is the minimum distance that Bob should move to have a chance to take pictures of each sportsman? Bob can take a picture of a sportsman, if he stands within the segment that this sportsman covers on the racetrack.

Input

The first line of the input file contains integers n and x_0 ($1 \le n \le 100$; $0 \le x_0 \le 1000$). The following n lines contain pairs of integers a_i, b_i ($0 \le a_i, b_i \le 1000$; $a_i \ne b_i$).

Output

Output the required minimum distance in the same units as the positions on the racetrack. If there is no such a position, output -1.

Examples

input
3 3 0 7 14 2 4 6
output
1