



Problem Choose Interval

Input file `stdin`
Output file `stdout`

You are given an *infinite* array of zeros with positions indexed by the integers and N intervals of positions of the form $[A, B]$. For every given interval, you have to use one of the following two operations to execute on the array:

Normal. Add 1 to all positions in the array from A to B .

Flipped. Add 1 to all positions in the array *except* those from A to B .

You want to choose a type of operation to execute for each interval so that the maximum value stored in the array after applying all operations is minimized.

Input data

The first line of the input contains the number of intervals N . The next N lines each contain two space-separated integers, A and B , representing the endpoints of an interval.

Output data

The first line of the output should contain the maximum value in the array after executing the N operations optimally.

The second line should contain a binary string of length N , with the i th character being 0 if the i th used operation was flipped and 1 if it was normal.

If there are multiple ways of choosing the operations optimally, any valid solution is accepted.

Restrictions

- $1 \leq N \leq 200\,000$
- $1 \leq A \leq B \leq 2N$

#	Points	Restrictions
1	7	$N \leq 20$
2	24	$N \leq 150$
3	21	$N \leq 1\,000$
4	34	$N \leq 50\,000$
5	14	No further restrictions.

Examples

Input file	Output file	Explanations
5 10 10 6 6 1 7 2 5 2 7	2 11110	Another valid answer would be: 2 11011