Problem I. Ineq

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	512 mebibytes

Given a set of integer pairs $S = \{(x_1, y_1), \ldots, (x_n, y_n)\}$, determine if a set of integer triples $T = \{(a_1, b_1, c_1), \ldots, (a_m, b_m, c_m)\}$ exists such that $a_i x_j + b_i y_j < c_i$ for all i and j, and there doesn't exist an integer pair (x', y') not belonging to S such that $a_i x' + b_i y' < c_i$ for all i.

Input

The first line contains a single integer t ($1 \le t \le 10^5$), denoting the number of test cases.

Each test case is described with an integer n ($1 \le n \le 10^5$), followed by n lines containing two integers x_i and y_i each ($-10^9 \le x_i, y_i \le 10^9$). All pairs (x_i, y_i) within one test case are distinct.

The sum of n over all test cases does not exceed 10^5.

Output

For each test case, display a separate line with 1 if the answer is positive, and 0 otherwise.

Example

standard input	standard output
4 1 0 0 5 2 1 0 0 1 1 1 0 2 2 3 1 3 5 1 4 2 3 1 3 6 1 4 2	1 1 0 1

Note

In the first test case, one possible set of triples is $\{(1, 0, 1), (0, 1, 1), (-1, 0, 1), (0, -1, 1)\}$.