Problem C. CodeCoder vs TopForces

Input file:	codecoder.in
Output file:	codecoder.out
Time limit:	2 seconds
Memory limit:	256 megabytes

Competitive programming is very popular in Byteland. In fact, every Bytelandian citizen is registered at two programming sites — CodeCoder and TopForces. Each site maintains its own proprietary rating system. Each citizen has a unique integer rating at each site that approximates their skill. Greater rating corresponds to better skill.

People of Byteland are naturally optimistic. Citizen A thinks that he has a chance to beat citizen B in a programming competition if there exists a sequence of Bytelandian citizens $A = P_0, P_1, \ldots, P_k = B$ for some $k \geq 1$ such that for each i $(0 \leq i < k)$, P_i has higher rating than P_{i+1} at one or both sites.

Each Bytelandian citizen wants to know how many other citizens they can possibly beat in a programming competition.

Input

The first line of the input contains an integer n — the number of citizens ($1 \leq n \leq 100\,000$). The following n lines contain information about ratings. The i-th of them contains two integers CC_i and TF_i — ratings of the i-th citizen at CodeCoder and TopForces ($1 \leq CC_i, TF_i \leq 10^6$). All the ratings at each site are distinct.

Output

For each citizen i output an integer b_i — how many other citizens they can possibly beat in a programming competition. Each b_i should be printed in a separate line, in the order the citizens are given in the input.

Example

codecoder.in	codecoder.out
4 2 3 3 2 1 1 4 5	2 2 0 3