

---

## Problem A. Longest Increasing Subsequence

Input file:            **standard input**  
Output file:          **standard output**  
Time limit:           1 second  
Memory limit:        1024 megabytes

Bobo is tired of all kinds of hard LIS (Longest Increasing Subsequence) problems, so he decides to make himself some easier one.

Bobo wants to build a sequence of integers  $\{x_1, x_2, \dots, x_n\}$ , where  $x_i$  lies in the range  $[a_i, b_i]$  (that is,  $a_i \leq x_i \leq b_i$ ).

Let  $\text{LIS}(X)$  be the length of longest increasing subsequence of  $\{x_1, x_2, \dots, x_n\}$ . It's clear that  $1 \leq \text{LIS}(X) \leq n$ . Bobo would like to find  $g_k$  which is the number of sequences whose  $\text{LIS}(X) = k$  for  $k = 1, 2, \dots, n$ .

Note that a sequence  $\{i_1, i_2, \dots, i_k\}$  is a increasing sequence of  $\{a_1, a_2, \dots, a_n\}$  only if:

- $1 \leq i_1 < i_2 < \dots < i_k \leq n$
- $a_{i_1} < a_{i_2} < \dots < a_{i_k}$

### Input

The first line contains an integer  $n$  ( $1 \leq n \leq 5$ ).

The  $i$ -th of the following  $n$  lines contains 2 integers  $a_i, b_i$  ( $1 \leq a_i \leq b_i \leq 10^3$ ).

### Output

$n$  integers  $g_1, g_2, \dots, g_n$ .

### Examples

standard input	standard output
2 1 2 1 2	3 1
3 1 1 2 2 3 3	0 0 1