

Find Local Peak

time limit per test: 10 seconds
memory limit per test: 976.6 megabytes
input: standard input
output: standard output
points: 100 · problem code: localpeak · author: inj

You have an $n \times n$ matrix and you are tasked with finding a local peak. A local peak is an element that is larger than all of its adjacent elements, (but not diagonals). It is guaranteed that all n^2 elements of the matrix are distinct. You can only query an element in the matrix $10n$ times.

Interaction

The first line of input contains an integer n , the size of the matrix.

You can make a query of the form `? x y`, which queries the element at position (x, y) (0 indexed). The judge will respond with that element, which you can read as a line of input.

You can make a final answer in the form `! x y`, stating that there is a local peak at position (x, y)

Constraints

- $2 \leq n \leq 2000$
- $-10^{18} \leq a_{i,j} \leq 10^{18}$