Problem J. Joy with Permutations

Input file:	*standard input*
Output file:	*standard output*
Time limit:	5 seconds
Memory limit:	512 mebibytes

This is an interactive problem.

Alice secretly invents a permutation of first N integers $a_1, a_2, \ldots a_N$ and tells N to Bob.

Bob asks questions to identify this permutation.

He may ask questions of two types:

- Type 1, formatted as "? 1 i j k": Bob chooses three different integers i, j, k ($1 \leq i, j, k \leq N$), Alice looks at the three integers a_i, a_j, and a_k, and tells Bob the **value** of their median (the one that is neither minimum nor maximum).

- Type 2, formatted as "? 2 i j": Bob chooses two different integers i, j ($1 \leq i, j \leq N$), and Alice answers i if $a_i < a_j$, or j otherwise.

The game seems to be too easy for Bob, so Alice invented new rules. First, Bob may ask only $2N$ questions of type 1 and only 2 questions of type 2. Second, Alice may change the permutation freely as long as it is consistent with all answers that were given before.

Help Bob to win and write the program that identifies the permutation.

Interaction Protocol

First, the jury program tells you one integer N on a separate line ($4 \leq N \leq 60\,000$).

Then you may ask questions.

A question of type 1 is a line formatted as "? 1 i j k" ($1 \leq i, j, k \leq N$; i, j, and k are pairwise distinct). The jury program then prints a line with a single integer: the median of the values a_i, a_j, and a_k. You may ask a question of this type no more than $2N$ times.

A question of type 2 is a line formatted as "? 2 i j" ($1 \leq i, j \leq N$; $i \neq j$). The jury program then prints a line with a single integer: i if $a_i < a_j$, or j if $a_i > a_j$. You may ask a question of this type no more than twice.

When the permutation is uniquely determined, print the answer on a line formatted as "! a_1 a_2 $\ldots$ a_N".

Note that interaction is **adaptive**: the jury program may change the permutation anytime as long as it is consistent with past answers. In particular, if you are trying to guess the answer when it is not yet uniquely determined, the jury program may immediately pick another one and say you were wrong.

Don't forget to print the newline character and flush the output buffer after printing a question or an answer, otherwise, you may get the "Idleness Limit Exceeded" error.

Example

standard input	standard output
5	
	? 1 1 2 3
4	
	? 2 2 4
4	
	? 1 1 5 4
2	
	! 3 5 4 1 2