

Problem B. Guess the Array

Time limit: 2 seconds
Memory limit: 512 megabytes

This is an interactive problem. Your program will interact with the jury program using standard input and output.

Alice and Bob have decided to play a game called “Guess the Array”. The rules of the game are very simple: Alice has an array of n integers, and Bob has to guess this array by making no more than n queries about the sums on the segments.

In one move Bob can make one of two types of queries to Alice:

1. “? l r” to find out the sum of numbers on the segment of the array from the l -th to the r -th element inclusive;
2. “!” to tell Alice that he is ready to give the answer. After this query Alice expects n integers from Bob: the initial array.

For each first type query, Alice tells Bob the sum of the numbers in the requested segment. But to make it harder to guess, after each query Alice makes one segment *blocked*. In further queries, Bob cannot ask for the sum of the numbers on the blocked segments.

Help Bob guess Alice’s array by making no more than n first type queries.

Interaction Protocol

The first line of input contains an integer n — the size of Alice’s array ($1 \leq n \leq 10^4$). It is guaranteed that all numbers in the array do not exceed 10^9 by their absolute values.

Next, a protocol for communicating with the jury program (interactor) is executed.

The interactor expects two types of requests from your program: “? l r” and “!”, where l, r are integer boundaries of the segment that you want to know the sum at ($1 \leq l \leq r \leq n$). Each query must be followed by a line break. If your program does not follow the query format, your solution may get any verdict (other than OK).

After the first type of query, you must read three integers s, l_b and r_b from the standard input — the sum on the requested segment s and the boundaries of the new *blocked* segment $[l_b, r_b]$, that can no longer request a sum for ($|s| \leq 10^{18}$; $1 \leq l_b \leq r_b \leq n$).

The query of the second type means that your program is ready to give the answer. After the second type query, you should print n integer guessing the initial array.

Note that your program can make no more than n queries of the first type. If this limit is exceeded, or if you try to query the sum of the previously blocked segment, the interactor will print “-1 -1 -1” and will exit with the verdict WA. To avoid getting a TL or IL verdict, your program must terminate with zero exit code after reading “-1 -1 -1” from the input.

Example

standard input	standard output
3	? 1 1
1 2 2	? 3 3
3 2 3	? 1 3
6 1 2	! 1 2 3