

## Problem E. Not Everything Is So Ambiguous

Time limit: 2 seconds  
Memory limit: 512 megabytes

This is an interactive problem.

The jury's program has chosen an integer  $x$  between 1 and  $10^9$  and a base  $b$  for the numeral system ( $2 \leq b \leq 2023$ ), after which it told you the number of digits in the representation of the number  $x$  in the notation with base  $b$ .

You can make queries "how many digits are there in the number  $x + d$ ", where  $d$  is an integer from 1 to  $10^{18}$ . Your task is to guess both  $x$  and  $b$  in no more than 100 queries.

### Interaction Protocol

The interaction begins with the jury's program outputting  $n$  — the number of digits in the base- $b$  representation of the number  $x$ .

After that, your program makes queries in the form of "?  $d$ ", where  $1 \leq d \leq 10^{18}$ , and the jury's program outputs the answer — the number of base- $b$  digits in the representation of  $x + d$ .

If you are ready to output the answer, print "!  $x$   $b$ ", where  $x$  and  $b$  are the guessed values of the number and the base of the numeral system. Outputting the answer does not count as a query.

### Example

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

### Note

In the example of interaction, queries and responses are separated by empty lines to visually demonstrate the interaction process. In the actual interaction with the jury's program, there will be no empty lines; they should also not be printed, but after each query, as well as after outputting the answer, a newline must be printed.