

## Problem F. Secret Permutation

Input file: *standard input*  
Output file: *standard output*  
Time limit: 2 seconds  
Memory limit: 256 mebibytes

*This is an interactive problem.*

There is a secret permutation  $p$  of integers from 0 to  $n - 1$ . The permutation is indexed starting from 0. You have to guess it by asking questions of the form “?  $a_i$   $b_i$   $c_i$ ” ( $a_i$ ,  $b_i$  and  $c_i$  are integers from 0 to  $n - 1$ ). For each such question, you will get one number in response which equals  $p^{-1}(p(a_i) \cdot p(b_i) + p(c_i))$  (all operations are performed modulo  $n$ , and  $p^{-1}(x)$  is such  $y$  that  $p(y) = x$ ). In the end, you have to print the guessed permutation in the form “!  $p(0)$   $p(1)$  ...  $p(n - 1)$ ”.

### Input

The only line of the input contains an integer  $n$  ( $1 \leq n \leq 5 \cdot 10^3$ ).

In each test, the permutation is fixed in before the contest and does not change during the guessing process.

For each test, the length  $n$  was picked by the jury, but the permutation was then generated using a pseudorandom number generator. However, the problem has a deterministic solution which works for every possible permutation.

### Interaction Protocol

You can ask zero or more questions and make exactly one guess in the end. Print each query on a separate line and do not forget to flush the output buffer. The maximum allowed number of queries, **including** the final guess, is 12 512.

### Example

standard input	standard output
4	? 1 2 3
3	? 0 3 3
2	? 0 0 1
1	! 2 0 3 1