B. Interactive LowerBound

This is an interactive problem.

You are given a **sorted** in increasing order singly linked list. You should find the minimum integer in the list which is greater than or equal to x.

More formally, there is a singly liked list built on an array of n elements. Element with index i contains two integers: $value_i$ is the integer value in this element, and $next_i$ that is the index of the next element of the singly linked list (or -1, if the current element is the last). The list is sorted, i.e. if $next_i \neq -1$, then $value_{next_i} > value_i$.

You are given the number of elements in the list n, the index of the first element $start$, and the integer x.

You can make up to 2000 queries of the following two types:

- `? i` $(1 \leq i \leq n)$ — ask the values $value_i$ and $next_i$,
- `! ans` — give the answer for the problem: the minimum integer, greater than or equal to x, or `! -1`, if there are no such integers. Your program should terminate after this query.

Write a program that solves this problem.

Input

The first line contains three integers n, $start$, x $(1 \leq n \leq 50000, 1 \leq start \leq n, 0 \leq x \leq 10^9)$ — the number of elements in the list, the index of the first element and the integer x.

Output

To print the answer for the problem, print `! ans`, where `ans` is the minimum integer in the list greater than or equal to x, or -1, if there is no such integer.

Interaction

To make a query of the first type, print `? i` $(1 \leq i \leq n)$, where `i` is the index of element you want to know information about.

After each query of type `?` read two integers $value_i$ and $next_i$ $(0 \leq value_i \leq 10^9, -1 \leq next_i \leq n, next_i \neq 0)$.

It is guaranteed that if $next_i \neq -1$, then $value_{next_i} > value_i$, and that the array values give a valid singly linked list with $start$ being the first element.

Note that you can't ask more than 1999 queries of the type `?`.

If $next_i = -1$ and $value_i = -1$, then it means that you asked more queries than allowed, or asked an invalid query. Your program should immediately terminate (for example, by calling `exit(0)`). You will receive "`Wrong Answer`", it means that you asked more queries than allowed, or asked an invalid query. If you ignore this, you can get other verdicts since your program will continue to read from a closed stream.

Your solution will get "Idleness Limit Exceeded", if you don't print anything or forget to `flush` the output, including the final answer.

To `flush` you can use (just after printing a query and line end):

- `fflush(stdout)` in C++;
- `System.out.flush()` in Java;

- `stdout.flush()` in Python;
- `flush(output)` in Pascal;
- For other languages see documentation.

Hacks format

Example

input
5 3 80
97 -1
58 5
16 2
81 1
79 4

output
? 1
? 2
? 3
? 4
? 5
! 81

Note

You can read more about singly linked list by the following link: https://en.wikipedia.org/wiki/Linked_list#Singly_linked_list

The illustration for the first sample case. Start and finish elements are marked dark.