Problem I. Interesting Interactive Idea

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 megabytes

This is an interactive problem.

The jury has chosen two integers x_0 and m ($0 \le x_0 < m \le n$). You are given a number n: the upper limit for m.

Your task is to guess both integers x_0 and m.

In order to do that, your program will ask questions in the form "a_i" ($1 \le a_i \le n$) where $i = 1, 2, \ldots$ is the index of the question.

After each question, the jury calculates $x_i = (x_{i-1} + a_i) \mod m$ and tells you the result of comparison between x_i and x_{i-1} ('`>`', '`<`' or '`=`').

The last question must be in the form "`0` x_0 m".

Your program must guess the numbers x_0 and m by asking no more than 2016 questions.

Input

The first line of the input contains a single integer n ($1 \le n \le 10^{18}$). After that, for each new question in the form "a_i", the input will contain a line with a single character: the result of comparison between x_i and x_{i-1}. If $x_i > x_{i-1}$ then the result is '`>`', if $x_i < x_{i-1}$ then the result is '`<`', otherwise the result is '`=`'.

Output

Your program must output each question on a separate line. Each question except the last one must consist of a single integer a_i ($1 \le a_i \le n$). The last question must be in the form "`0` x_0 m" ($0 \le x_0 < m \le n$).

Example

standard input	standard output

2
 	
`<`
 	
`>`
 	
`<`
	1
	
	1
	
	1
	
	0 1 2

Note

The pipe from your program to the interactor program and the pipe back have limited size. Your program must read from the standard input to avoid deadlock. Deadlock condition is reported as "`Time Limit Exceeded`".

To flush the standard output stream, use the following statements:

In C, use `fflush(stdout)`; in C++, use `cout.flush()`; in Java, use `System.out.flush()`; in Python, use `sys.stdout.flush()`.

If your program receives an `EOF` (end-of-file) condition on the standard input, it MUST exit immediately with exit code 0. Failure to comply with this requirement may result in "`Time Limit Exceeded`" error.