Problem B. Compare Continued Fractions

Input file:	`ccf.in`
Output file:	`ccf.out`
Time limit:	2 seconds
Memory limit:	256 mebibytes

In this problem, you have to compare two rational numbers represented by their continued fractions.

A *finite continued fraction* is a sequence $[a_0; a_1, a_2, \ldots, a_n]$. The following restrictions are applied:

- n is a non-negative finite integer,
- the elements a_0, a_1, a_2, …, a_n are integers,
- $a_i > 0$ for each $i > 0$,
- $a_n > 1$ if $n > 0$.

These restrictions allow to establish a one-to-one correspondence between rational numbers and finite continued fractions: every rational number x corresponds to the unique continued fraction $[a_0; a_1, a_2, \ldots, a_n]$ such that

$$x = a_0 + \cfrac{1}{a_1 + \cfrac{1}{a_2 + \cfrac{1}{\ddots + \cfrac{1}{a_n}}}}.$$

Thus, the following notation is used: $x = [a_0; a_1, a_2, \ldots, a_n]$. For example,

$$\frac{17}{25} = 0 + \frac{1}{\frac{25}{17}} = 0 + \frac{1}{1 + \frac{8}{17}} = 0 + \frac{1}{1 + \frac{1}{\frac{17}{8}}} = \mathbf{0} + \frac{1}{\mathbf{1} + \frac{1}{\mathbf{2} + \frac{1}{\mathbf{8}}}},$$

so we write $\frac{17}{25} = [0; 1, 2, 8]$.

Given the continued fractions for two rational numbers x and y, find whether $x < y$, $x = y$, or $x > y$.

Input

The input consists of two lines. The first line contains the continued fraction for the rational number x. The second line contains the continued fraction for the rational number y.

Each continued fraction is given as a sequence of integers separated by single spaces. First goes an integer n, the length of the continued fraction ($0 \le n \le 100\,000$). It is followed by $(n + 1)$ integers which are the elements of the continued fraction: a_0, a_1, a_2, …, a_n ($|a_i| \le 10^9$). It is guaranteed that $a_i > 0$ for each $i > 0$ and $a_n > 1$ if $n > 0$.

Output

On the first line of output, print a single character: “<” if $x < y$, “=” if $x = y$, or “>” if $x > y$.

Examples

ccf.in	ccf.out	Notes
1 0 3 2 0 1 2	<	$x = 0 + \frac{1}{3} = \frac{1}{3},\ y = 0 + \frac{1}{1+\frac{1}{2}} = \frac{2}{3}$
0 1 0 1	=	$x = 1,\ y = 1$
1 -1 2 0 -1	>	$x = -1 + \frac{1}{2} = -\frac{1}{2},\ y = -1$