Assignment 3

Week 1

1.1 (2pts)

1.1 Addition and Subtraction

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	512 megabytes

Given two integers x and y, construct an infinite sequence of integers $A = \{a_0, a_1, a_2, \dots\}$ as follows: $a_0 = 0$ and for every $i \geq 1$, $a_{2i-1} = a_{2i-2} + x$ and $a_{2i} = a_{2i-1} - y$.

Given three integers x, y and z, find the index of the first occurrence of z in A or report that z does not appear in A.

For example, if $x = 2$, $y = 1$ and $z = 3$, then $A = (0, 2, 1, 3, 2, 4, 3, \dots)$ and the answer is 3 ($a_3 = 3$ and this is the first occurrence of 3 in A). If $x = 2$, $y = 0$ and $z = 3$, then $A = (0, 2, 2, 4, 4, 6, 6, \dots)$ and the answer is -1 (there is no occurrence of 3 in A).

Input

Three integers x, y and z ($0 \leq x, y, z \leq 1000$) separated by spaces.

Output

The first position of z in A or -1, if there is no occurrence of z in A.

Examples

standard input	standard output
2 1 3	3
2 0 3	-1

1.2 (2 pts)

1.2 Erasing Maximum

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	512 megabytes

Let $A[1..n]$ be an array of integers. Output the same array without its maximum element. If there are several maximum elements, get rid of the third. It is guaranteed that the input array A has either a unique maximum element or at least three maximum elements.

Input

The first line contains an integer n ($2 \le n \le 100$), the length of the array. The second line contains integers $A[1], A[2], \ldots, A[n]$ ($1 \le A[i] \le 100$, $1 \le i \le n$).

Output

Output $n - 1$ integers separated by spaces.

Examples

standard input	standard output
3 1 3 2	1 2
7 4 1 4 2 4 3 4	4 1 4 2 3 4

1.3 (2 pts)

1.3 Increment

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	512 megabytes

Given a large non-negative integer x, find the number of decimal digits in $x + 1$.

Input

A non-negative integer x ($0 \le x \le 10^{1\,000\,000}$) with no leading zeroes.

Output

The number of decimal digits in $x + 1$.

Examples

standard input	standard output
1	1
9	2

1.4 (2 pts)

1.4 Straight Flush

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	512 megabytes

The deck of 52 French playing cards is the most common deck of playing cards used today. It includes thirteen ranks of each of the four French suits: clubs (`C`), diamonds (`D`), hearts (`H`), and spades (`S`). Each suit includes an ace (`A`), a king (`K`), a queen (`Q`), and a jack (`J`), each depicted with a symbol of its suit; and ranks two (`2`) through ten (`T`), with each card depicting that many symbols (pips) of its suit.

A **straight flush** is a poker hand containing five cards of sequential rank, all of the same suit, such as `QH JH TH 9H 8H` (a "queen-high straight flush"). As part of a straight flush, an ace (`A`) can rank either above a king or below a two. So an ace can rank either high (e.g., `AH KH QH JH TH` is an ace-high straight flush) or low (e.g., `5D 4D 3D 2D AD` is a five-high straight flush), but cannot rank both high and low in the same hand (e.g. `QS KS AS 2S 3S` is not a straight flush). Thus, there are 40 possible straight flush hands when using a standard 52-card deck.

Given 5 different cards, check whether they constitute a straight flush.

Input

Five different cards separated by spaces. Each card is specified by two symbols: the first one is a rank and the second is a suit. Suites are marked with letters `C`, `D`, `H`, and `S`. Ranks are marked with symbols `2`, `3`, ..., `9`, `T`, `J`, `Q`, `K`, and `A`.

Output

Output `YES`, if the given cards form a straight flush, otherwise output `NO`.

Examples

standard input	standard output
`2D 5D 3D 4D 6D`	`YES`
`AD KH QH JS TC`	`NO`