

Martian Mathematics



When explorers from earth went to the planet Mars, they found that the Martians was really civilized in Mathematics. For example, a man is skilled in "adding numbers in base 10", but a martian can do well in any base in the range of 2 to 36.

The Martians use a symbol 0 to 9 to represent the value of zero to nine, and A to Z to represent the value of ten to thirty-five. The example of adding number in some base is shown in the following table:

Base	Symbol	Meaning	Sum
2	1011+1101	a summation of 1011_2 and 1101_2 which is equal to $11_{10}+13_{10} = 24_{10}$	11000
9	101+788	a summation of 101_9 and 788_9 which is equal to $82_{10}+647_{10} = 729_{10}$	1000
35	3Y+C5	a summation of $3Y_{35}$ and $C5_{35}$ which is equal to $139_{10}+425_{10} = 564_{10}$	G4

In this exploration, the explorer found an answer for a homework (from a Kindergarten school on Mars). Each question contains three number: two summands and a sum, but the base number was missing.

Task

Create a program to read two summands and a sum (with unknown base number). Then, output the smallest base number (in the range of 2 to 36) that make the summation possible. If no base number is possible, print "no".

Assume that, each summation will use the same base number for both summands and summation.

Input

- First line: a positive summand (unknown base number) within the range of 0 to 40000
- Second line: a positive summand (unknown base number) within the range of 0 to 40000
- Third line: a positive summation (unknown base number) within the range of 0 to 40000

Output

There is only one line: the smallest base number (output in base ten) that make the summation possible, or output "no" if no base number is possible.

Example

Input

1011
1101
11000

Output

2

Input

101
788
1000

Output

9

Input

3Y
C5
G4

Output

35