Problem_AD

Charis and Katerina are two young children that are in love, but they want to keep it secret. So, the emails they exchange, they try to encrypt them to avoid any person that might see the conversation. Let's see what they have come up with, to encrypt all emails.

Firstly, only latin letters are encrypted leaving other symbols untouched (spaces, etc).

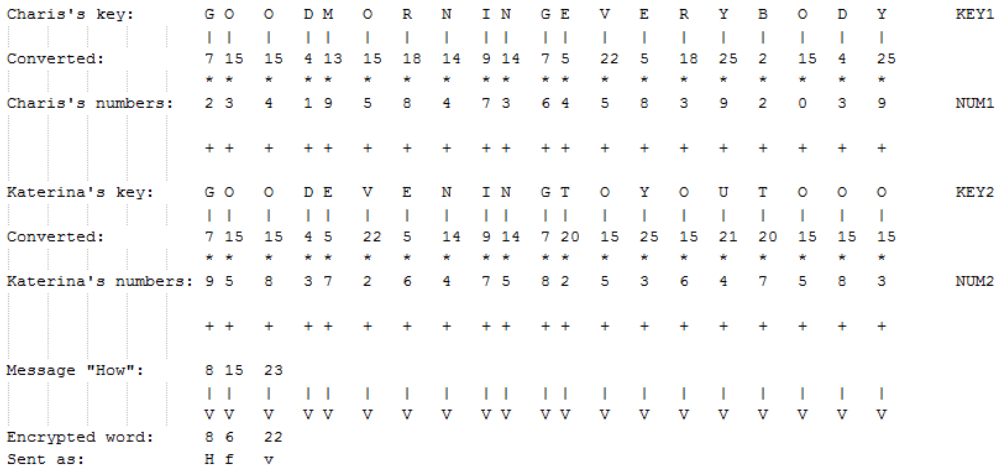
Each letter is assigned a number, A is 1, B is 2, C is 3, etc. The same goes also for small letters too, a is 1, b is 2, c is 3, etc.

Each partner has two strings, all of which are used to encrypt and decrypt each word (up to 30 letters) of the message.

The first string (KEY1) contains only capital letters, for example Charis has "GOODMORNINGEVERYBODY" (7, 15, 15, 4, 13, 15, 18, 14, 9, 14, 7, 5, 22, 5, 18, 25, 2, 15, 4, 25) while Katerina (KEY2) has "GOODEVENINGTOYOUTOOO" (7, 15, 15, 4, 5, 22, 5, 14, 9, 14, 7, 20, 15, 25, 15, 21, 20, 15, 15, 15) - both of which are of the same length.

The second string contains only numbers from 1 to 9. For example, Charis (NUM1) has the string "23419584736458392039" while Katerina (NUM2) has "95837264758253647583". All strings are of the same length.

For each word they want to send, they do the following. For example, for the word "How" we have:



For the letter “H” (position 1 of the current word) we do (7 * 2 + 7 * 9 + 8) modulo 26, from which we get as a result the letter “H” which is the 8th letter of the alphabet. Also, for the second letter, we have (15 * 3 + 15 * 5 + 15) modulo 26 results the letter “f”. Finally, for the last letter we have (15 * 4 + 15 * 8 + 23) modulo 26 to get the character “v”.

OK, OK! It can be easily shown that this encryption algorithm can be (easilly) cracked. Your task is to identify the first pair* of possible strings (KEY1, NUM1, KEY2 and NUM2), with minimum length needed, that can encrypt/decrypt all encrypted and decrypted words of the given list.

*If we concatenate KEY1 and NUM1 and KEY2 and NUM2 as one string in this order and without spaces, and sort all possible solutions in the same list alphabetically

However, if for some reason there is no way to identify the characters of a spesific position (maybe due to transmittion error), then character “?” should be placed in that position we are trying to crack. From the example, it is clear that small letter are encrypted as small letters and capital letters are encrypted as capital letters, and vice versa.

Input

A list of encrypted and decrypted words (up to 50000). A fullstop in a single line terminates the list

Output

A file with four lines containing in each line the following, KEY1, NUM1, KEY2, NUM2

Sampel Input 1: (No errors)

```
How Hfv
are aid
you yft
.
```

Sampel Output 1: (No errors)

```
AAA
111
CAE
875
```

Sampel Input 2:(An error occured in one of the words, at the last letter)

```
How Hfv
are aid
you yft
too tfp
.
```

Sampel Output 2:(An error occured in one of the words, at the last letter)

```
AA?
11?
CA?
87?
```

Problem Author: IEEE

Suggest Edits

Emacs | Normal | Vim

Select Language: C#

save code

```
using System;
using System.Collections.Generic;
using System.IO;
class Solution {
    static void Main(String[] args) {
        /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution */
    }
}
```

Line: 1 Col: 1 Count: 246

☐ **Use a custom test case**

Upload Code as File

Compile & Test | Submit Code