Legible Words II   X81292_en

In computer science we often consider *words* made of letters. Again, we define that a word is legible iff there are no three consecutive consonants.

You have already calculated the number of legible words of given length. But now you feel that simply counting the words is not enough. Your new challenge is to calculate the *i*-th of these words, according to the Measharan alphabet.

Input

Input consists of several cases. Each case consists of three lines: W (the string of all letters in the Measharan alphabet), T (the types of all letters in W), N I (where N the length of the words to consider, and I is the index of the word to output).

W_1 is the first letter in the alphabet, W_2 is the second, and so on. T_i is c iff W_i is a consonant, and v iff W_i is a vowel. Each letter is encoded as a lowercase letter of the English alphabet (a..z).

As in *Legible Words*, it is guaranteed that the total number of N-letter words will never be greater than 10^{18}, and $1 \le N \le 100$.

After the last case the input contains a line containing only 0.

Output

Output the *i*-th N-letter legible word, according to the lexicographic ordering (if we have two words u, v such that $u_1 u_2 \ldots u_k = v_1 v_2 \ldots v_k$, and $u_{k+1} \ne v_{k+1}$, and u_{k+1} comes before v_{k+1} in W, then u is before v in the lexicographic ordering).

Sample input

```
abcde
vcccv
3 25
abcde
vcccv
3 26
abcde
vcccv
3 30
abcde
vcccv
3 31
abcde
vcccv
3 32
abcde
vcccv
3 98
0
```

Sample output

```
aee
baa
bae
bba
bbe
eee
```

Problem information

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