Problem L. ABC

Time limit	1000 ms
Mem limit	262144 kB
OS	Windows

You are given a string consisting of letters 'a', 'b' and 'c', and there are 4 kinds of operations you can do on it:

1. Replace a character 'a' in the string with "ab".
2. Replace a character 'b' in the string with "bc".
3. Replace a character 'c' in the string with "ba".
4. Remove a substring(consecutive characters) "abc" from the string.

Let n be the length of the string, can you remove the whole string using at most $3n$ operations or state that it's impossible to do so?

Input

The first and only line contains the string $s(1 \leq n \leq 2 \times 10^5)$ consisting of characters 'a', 'b' and 'c'.

Output

If it's impossible to remove the whole string print -1, otherwise in the first line print $m(1 \leq m \leq 3n)$, the number of operations you will make.

In each of the next m lines print an operation of the form $type_i, index_i(1 \leq type_i \leq 4, 1 \leq index_i \leq |s|)$, the type of the ith operation and the index of the character you want to do the ith operation on, if the operation is of type 4, then $index_i$ should be the index of the first character of the substring "abc" that you want to remove. $Index_i$ is $1-$based and the string is updated after each operation, see example notes for better understanding.

Sample 1

Input	Output
acab	4 1 1 4 1 2 2 4 1

Sample 2

Input	Output
bac	-1

Note

This is how the string changes in the first example: acab$\rightarrow$abcab$\rightarrow$ab$\rightarrow$abc$\rightarrow$ ϕ, where ϕ is the empty string.