C. Diverse Substrings

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

String diversity is the number of symbols that occur in the string at least once. Diversity of s will be denoted by $d(s)$. For example , d("aaa")=1, d("abacaba")=3.

Given a string s, consisting of lowercase Latin letters. Consider all its substrings. Obviously, any substring diversity is a number from 1 to $d(s)$. Find statistics about substrings diversity: for each k from 1 to $d(s)$, find how many substrings of s has a diversity of exactly k.

Input

The input consists of a single line containing s. It contains only lowercase Latin letters, the length of s is from 1 to $3 \cdot 10^5$.

Output

Print to the first line the value $d(s)$. Print sequence $t_1, t_2, ..., t_{d(s)}$ to the following lines, where t_i is the number of substrings of s having diversity of exactly i.

Examples

input
abca

output
3 4 3 3

input
aabacaabbad

output
4 14 19 28 5

Note

Consider the first example.

We denote by $s(i,j)$ a substring of "abca" with the indices in the segment $[i,j]$.

- $s(1, 1) =$ "a", d("a") $= 1$
- $s(2, 2) =$ "b", d("b") $= 1$
- $s(3, 3) =$ "c", d("c") $= 1$
- $s(4, 4) =$ "a", d("a") $= 1$
- $s(1, 2) =$ "ab", d("ab") $= 2$
- $s(2, 3) =$ "bc", d("bc") $= 2$
- $s(3, 4) =$ "ca", d("ca") $= 2$
- $s(1, 3) =$ "abc", d("abc") $= 3$
- $s(2, 4) =$ "bca", d("bca") $= 3$

- $s(1, 4) =$ "abca", $d(\text{"abca"}) = 3$

Total number of substring with diversity 1 is 4, with diversity 2 equals 3, 3 diversity is 3.