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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 $t_1, t_2, \dots, t_{d(s)}$ 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 $[i, j]$.

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

Testing Round #9

[Finished](#)
[Practice](#)


→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ACM-ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

[Start virtual contest](#)

→ Practice

You are registered for practice. You can solve problems unofficially. Results can be found in the contest status and in the bottom of standings.

→ Submit?

Language: GNU G++ 5.1.0 ▼

Choose file: [Choose File](#) No file chosen

Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.

[Submit](#)

→ Problem tags

[dp](#) [two pointers](#)

No tag edit access

→ Contest materials

- Announcement

- $s(1, 3) = \text{"abc"}, d(\text{"abc"}) = 3$
- $s(2, 4) = \text{"bca"}, d(\text{"bca"}) = 3$
- $s(1, 4) = \text{"abca"}, d(\text{"abca"}) = 3$

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

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