D. Palindromic characteristics

time limit per test: 3 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Palindromic characteristics of string s with length $|s|$ is a sequence of $|s|$ integers, where k-th number is the total number of non-empty substrings of s which are k-palindromes.

A string is 1-palindrome if and only if it reads the same backward as forward.

A string is k-palindrome ($k > 1$) if and only if:

1. Its left half equals to its right half.
2. Its left and right halfs are non-empty (k - 1)-palindromes.

The left half of string t is its prefix of length $\lfloor |t| / 2 \rfloor$, and right half — the suffix of the same length. $\lfloor |t| / 2 \rfloor$ denotes the length of string t divided by 2, rounded down.

Note that each substring is counted as many times as it appears in the string. For example, in the string "aaa" the substring "a" appears 3 times.

Input

The first line contains the string s ($1 \le |s| \le 5000$) consisting of lowercase English letters.

Output

Print $|s|$ integers — palindromic characteristics of string s.

Examples

input
abba
output
6 1 0 0

input
abacaba
output
12 4 1 0 0 0 0

Note

In the first example 1-palindromes are substring «a», «b», «b», «a», «bb», «abba», the substring «bb» is 2-palindrome. There are no 3- and 4-palindromes here.