

Time limit: 1.00 s **Memory limit:** 512 MB

You are given a string of length n . For every integer between $1 \dots n$ you need to print the number of distinct substrings of that length.

Input

The only input line has a string of length n that consists of characters a-z.

Output

For each integer between $1 \dots n$ print the number of distinct substrings of that length.

Constraints

- $1 \leq n \leq 10^5$

Example

Input:
abab

Output:
2 2 2 1