

## Day 10, 2:00 PM, Winter Camp 2022, Suffix array

### A. Suffix array

2 seconds, 512 megabytes

Build a suffix array for a given string  $s$ , for each two adjacent suffixes find the length of longest common prefix.

#### Input

First line holds a single string  $s$  ( $1 \leq |s| \leq 400\,000$ ). String consists of small english letters.

#### Output

In first line output  $|s|$  distinct integers — numbers of first symbols of  $s$  suffixes in a way, that according suffixes will be lexicographically sorted in ascending order. In second line output  $|s| - 1$  integers — lengths of longest common prefixes.

input
ababb
output
1 3 5 2 4 2 0 1 1

### B. Longest common substring

2 seconds, 512 megabytes

Find the longest common substring of two given strings  $s$  and  $t$ .

#### Input

First line of the input has single string  $s$ , second —  $t$  ( $1 \leq |s|, |t| \leq 100\,000$ ). Strings are made of small latin letters.

#### Output

Output single line — the longest common substring of strings  $s$  and  $t$ . Output lexicographically minimal one, in case of multiple possible answers.

input
bababb zabacabba
output
aba

### C. Number of substrings

2 seconds, 512 megabytes

Count number of distinct substrings of string  $s$ .

Substring is a contiguous subsequence.

#### Input

The only line contains string  $s$  ( $1 \leq |s| \leq 400\,000$ ).

The string consists of small Latin letters.

#### Output

Output an answer.

input
ababb
output
11

### D. Repetition

2 seconds, 512 megabytes

Let's see a sequence of  $n$  integers from 1 to  $m$ . Subsequence of its consecutive integers is called a repetition, if the multiplication of its length on number of its appearances in the sequence is largest possible.

Output a repetition for a given sequence.

#### Input

First line holds two integers:  $n$  and  $m$  ( $1 \leq n \leq 150\,000$ ,  $1 \leq m \leq 10$ ).

Second line holds  $n$  integers from 1 to  $m$ .

#### Output

In first line of output multiplication of repetition on its number of appearances in sequence.

In second line print its length.

In third line print the repetition itself.

input
8 3 1 2 1 2 1 1 2 1
output
9 3 1 2 1