

# Quasi-template

A template of a word  $v$  is such a word  $s$  that all occurrences of  $s$  within  $v$  cover the whole word  $v$  (i.e. each letter of the word  $v$  appears within some fragment of consecutive letters of  $v$  equal to  $s$ ). By quasi-template of a word  $v$  we mean such a word  $s$  that  $s$  is a substring (i.e. a fragment of consecutive letters) of  $v$  and  $s$  is a template of some superstring of  $v$ . The figure below shows why the word `aabaa` is a quasi-template of the word `aaaabaabaaaba`:

```
      aabaa
     aabaa
    aabaa
   -----
  aaaabaabaaaba
```

For a given word  $v$  we would like to compute the number of its quasi-templates and the shortest one of them.

## Input

The only line of the standard input contains a non-empty word  $v$  that is not longer than 200000 letters. It consists of small letters of English alphabet.

## Output

The first line of the standard output should contain the number of quasi-templates of word  $v$ . The second line should contain the shortest word being a quasi-template of word  $v$ . If there is more than one such shortest word, output the lexicographically smallest from the shortest quasi-templates.

## Example

For the input data:

`aaaabaabaaaba`

the correct result is:

```
10
aabaa
```

The word from the sample input has 10 quasi-templates: `aaaabaabaaab`, `aaaabaabaaaba`, `aaabaaba`, `aaabaabaa`, `aaabaabaaa`, `aaabaabaaaba`, `aabaa`, `aabaabaa`, `aabaabaaa`, and `abaabaaa`.