Problem A

For a given string s and every ℓ between 1 and the length of s, determine how many distinct strings of length ℓ appear as a substring of s.

Input and output

The input has only one line, containing a non-empty string s of length at most $200\,000$ consisting only of lowercase letters. The output has $\mathtt{strlen}(s)$ lines, the i-th one containing the number of distinct substrings of s of length i.

Example

Input:

```
banana
```

Output:

```
3
3
3
3
2
1
```