

Problem 2063: Vowels of All Substrings

Problem Information

Difficulty: Medium

Acceptance Rate: 55.12%

Paid Only: No

Tags: Math, String, Dynamic Programming, Combinatorics

Problem Description

Given a string `word`, return the sum of the number of vowels ('a', 'e', 'i', 'o', and 'u') in every substring of `word`.

A **substring** is a contiguous (non-empty) sequence of characters within a string.

Note: Due to the large constraints, the answer may not fit in a signed 32-bit integer. Please be careful during the calculations.

Example 1:

Input: `word = "aba"` **Output:** 6 **Explanation:** All possible substrings are: "a", "ab", "aba", "b", "ba", and "a". - "b" has 0 vowels in it - "a", "ab", "ba", and "a" have 1 vowel each - "aba" has 2 vowels in it Hence, the total sum of vowels = $0 + 1 + 1 + 1 + 1 + 2 = 6$.

Example 2:

Input: `word = "abc"` **Output:** 3 **Explanation:** All possible substrings are: "a", "ab", "abc", "b", "bc", and "c". - "a", "ab", and "abc" have 1 vowel each - "b", "bc", and "c" have 0 vowels each Hence, the total sum of vowels = $1 + 1 + 1 + 0 + 0 + 0 = 3$.

Example 3:

Input: `word = "ltcd"` **Output:** 0 **Explanation:** There are no vowels in any substring of "ltcd".

Constraints:

* `1 <= word.length <= 105` * `word` consists of lowercase English letters.

Code Snippets

C++:

```
class Solution {  
public:  
    long long countVowels(string word) {  
  
    }  
};
```

Java:

```
class Solution {  
    public long countVowels(String word) {  
  
    }  
}
```

Python3:

```
class Solution:  
    def countVowels(self, word: str) -> int:
```