

2842. Count K-Subsequences of a String With Maximum Beauty

Description

You are given a string `s` and an integer `k`.

A **k-subsequence** is a **subsequence** of `s`, having length `k`, and all its characters are **unique**, i.e., every character occurs once.

Let `f(c)` denote the number of times the character `c` occurs in `s`.

The **beauty** of a **k-subsequence** is the **sum** of `f(c)` for every character `c` in the k-subsequence.

For example, consider `s = "abbbdd"` and `k = 2`:

- `f('a') = 1`, `f('b') = 3`, `f('d') = 2`
- Some k-subsequences of `s` are:
 - "ab b b d d" -> "ab" having a beauty of `f('a') + f('b') = 4`
 - "a b b b d d" -> "ad" having a beauty of `f('a') + f('d') = 3`
 - "a b b b d d" -> "bd" having a beauty of `f('b') + f('d') = 5`

Return *an integer denoting the number of k-subsequences whose beauty is the maximum among all k-subsequences*. Since the answer may be too large, return it modulo `109 + 7`.

A subsequence of a string is a new string formed from the original string by deleting some (possibly none) of the characters without disturbing the relative positions of the remaining characters.

Notes

- `f(c)` is the number of times a character `c` occurs in `s`, not a k-subsequence.
- Two k-subsequences are considered different if one is formed by an index that is not present in the other. So, two k-subsequences may form the same string.

Example 1:

```
Input: s = "bccca", k = 2
Output: 4
Explanation: From s we have f('a') = 1, f('b') = 1, and f('c') = 2.
The k-subsequences of s are:
bc ca having a beauty of f('b') + f('c') = 3
b c c a having a beauty of f('b') + f('c') = 3
b cc a having a beauty of f('b') + f('a') = 2
b c c a having a beauty of f('c') + f('a') = 3
bc ca having a beauty of f('c') + f('a') = 3
There are 4 k-subsequences that have the maximum beauty, 3.
Hence, the answer is 4.
```

Example 2:

```
Input: s = "abbcd", k = 4
Output: 2
Explanation: From s we have f('a') = 1, f('b') = 2, f('c') = 1, and f('d') = 1.
The k-subsequences of s are:
ab b cd having a beauty of f('a') + f('b') + f('c') + f('d') = 5
a b bcd having a beauty of f('a') + f('b') + f('c') + f('d') = 5
There are 2 k-subsequences that have the maximum beauty, 5.
Hence, the answer is 2.
```

Constraints:

- `1 <= s.length <= 2 * 105`
- `1 <= k <= s.length`
- `s` consists only of lowercase English letters.

