

1370. Increasing Decreasing String

Given a string `s`. You should re-order the string using the following algorithm:

1. Pick the **smallest** character from `s` and **append** it to the result.
2. Pick the **smallest** character from `s` which is greater than the last appended character to the result and **append** it.
3. Repeat step 2 until you cannot pick more characters.
4. Pick the **largest** character from `s` and **append** it to the result.
5. Pick the **largest** character from `s` which is smaller than the last appended character to the result and **append** it.
6. Repeat step 5 until you cannot pick more characters.
7. Repeat the steps from 1 to 6 until you pick all characters from `s`.

In each step, If the smallest or the largest character appears more than once you can choose any occurrence and append it to the result.

Return *the result string* after sorting `s` with this algorithm.

Example 1:

Input: `s = "aaaabbbbcccc"`

Output: `"abccbaabccba"`

Explanation: After steps 1, 2 and 3 of the first iteration, result = `"abc"`

After steps 4, 5 and 6 of the first iteration, result = `"abccba"`

First iteration is done. Now `s = "aabbcc"` and we go back to step 1

After steps 1, 2 and 3 of the second iteration, result = `"abccbaabc"`

After steps 4, 5 and 6 of the second iteration, result = `"abccbaabccba"`

Example 2:

Input: `s = "rat"`

Output: `"art"`

Explanation: The word "rat" becomes "art" after re-ordering it with the mentioned algorithm.

Example 3:

Input: `s = "leetcode"`

Output: `"cdelotee"`

Example 4:

Input: s = "ggggggg"

Output: "ggggggg"

Example 5:

Input: s = "spo"

Output: "ops"

```
def sortString(self, s: str) -> str:
    letterFreq = collections.Counter(s)
    letterFreq = dict(sorted(letterFreq.items(), key=lambda x: x[0]))
    flag = True
    letters = list(letterFreq.keys())
    res = ''
    while len(letterFreq):
        if flag:
            for ele in letters:
                if ele in letterFreq:
                    res = res+ele
                    if letterFreq[ele]==1:
                        del letterFreq[ele]
                    else:
                        letterFreq[ele] = letterFreq[ele]-1
            flag = not flag
        else:
            for ele in letters[::-1]:
                if ele in letterFreq:
                    res = res+ele
                    if letterFreq[ele]==1:
                        del letterFreq[ele]
                    else:
                        letterFreq[ele] = letterFreq[ele]-1
            flag = not flag

    return res
```