680. Valid Palindrome II

Approach #1: Brute Force [Time Limit Exceeded]

Intuition and Algorithm

For each index `i` in the given string, let's remove that character, then check if the resulting string is a palindrome. If it is, (or if the original string was a palindrome), then we'll return `true`

Java Python Copy

Complexity Analysis

- Time Complexity: $O(N^2)$ where N is the length of the string. We do the following N times: create a string of length N and iterate over it.
- Space Complexity: $O(N)$, the space used by our candidate answer.

Approach #2: Greedy [Accepted]

Intuition

If the beginning and end characters of a string are the same (ie. `s[0] == s[s.length - 1]`), then whether the inner characters are a palindrome (`s[1], s[2], ..., s[s.length - 2]`) uniquely determines whether the entire string is a palindrome.

Algorithm

Suppose we want to know whether `s[i], s[i+1], ..., s[j]` form a palindrome. If `i >= j` then we are done. If `s[i] == s[j]` then we may take `i++; j--`. Otherwise, the palindrome must be either `s[i+1], s[i+2], ..., s[j]` or `s[i], s[i+1], ..., s[j-1]`, and we should check both cases.

Java Python Copy

Complexity Analysis

- Time Complexity: $O(N)$ where N is the length of the string. Each of two checks of whether some substring is a palindrome is $O(N)$.
- Space Complexity: $O(1)$ additional complexity. Only pointers were stored in memory.

Analysis written by: @awice (https://leetcode.com/awice)

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(/jkvavadiya)

jkvavadiya (/jkvavadiya) ★ 0 October 3, 2018 4:58 PM

```
class Solution {
public boolean isPalindrome(CharSequence s, int low, int high) {
for (int i = low, j = high; i <= j; i++,j--) {
if (s.charAt(i) != s.charAt(j)) {
return false;
```

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somehow this test case
`"aguokepatgbnvfqmgmlcupuufxoohdfpgjdmysgvhmvffcnqxjjxqncffvmhvgsymdjgpfdhooxfuupuculmgmqfvnbgtapekouga"`
returns `true` for me.
I'm using csharp.

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(/crazypixel)

crazyPixel (/crazypixel) ★ 3 July 21, 2018 12:11 PM

I don't understand why the greedy solution is O(N), since the outer loop runs 1/2N and the checks are also some fraction of n that O(N^2)?

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