5. Longest Palindromic Substring
Medium

Given a string s, return the longest palindromic substring in s.

Example 1:

Input: s = "babad"
Output: "bab"
Explanation: "aba" is also a valid answer.

Example 2:

Input: s = "cbbd"
Output: "bb"

```
from typing import List

class Solution:
    def longestPalindrome(self, s: str) -> str:
        result = ""

        for i in range(len(s)):
            l, r = i, i
            while l >= 0 and r < len(s) and s[l] == s[r]:
                if (r - l + 1) > len(result):
                    result = s[l:r + 1]
                l -= 1
                r += 1

            l, r = i, i + 1
            while l >= 0 and r < len(s) and s[l] == s[r]:
                if (r - l + 1) > len(result):
                    result = s[l:r + 1]
                l -= 1
                r += 1
        return result
```

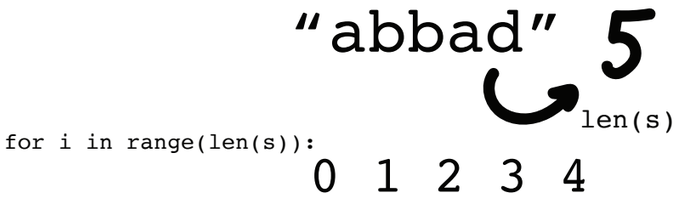
simplified

```
from typing import List

class Solution:
    def longestPalindrome(self, s: str) -> str:
        result = ""

        for i in range(len(s)):
            for l, r in ((i,i), (i,i+1)):
                while l >= 0 and r < len(s) and s[l] == s[r]:
                    if (r - l + 1) > len(result):
                        result = s[l:r + 1]
                    l -= 1
                    r += 1

        return result
```



first, check when l and r point to same index

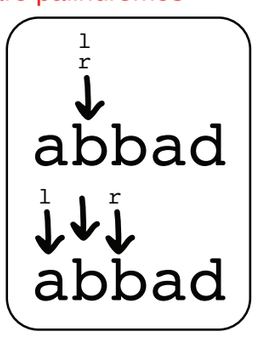
```
l, r = i, i
```

l and r pointers are in bound, and s[l] and s[r] are palindromes

```
while l >= 0 and r < len(s) and s[l] == s[r]:
```

(r-l+1) is the size of the substring,
if (r-l+1) is greater than length of result,
then save the new result

```
if (r - l + 1) > len(result):
    result = s[l:r + 1]
l -= 1
r += 1
```



next, check when l and r point to adjacent index

```
l, r = i, i + 1
```

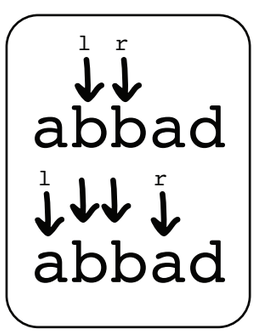
l and r pointers are in bound, and s[l] and s[r] are palindromes

```
while l >= 0 and r < len(s) and s[l] == s[r]:
```

(r-l+1) is the size of the substring,
if (r-l+1) is greater than length of result,
then save the new result

```
if (r - l + 1) > len(result):
    result = s[l:r + 1]

l -= 1
r += 1
```



checks for situation where
two adjacent letters are the same


```
for l, r in ((i,i), (i,i+1)):
```

l and r pointers are in bound, and s[l] and s[r] are palindromes

```
while l >= 0 and r < len(s) and s[l] == s[r]:
```

(r-l+1) is the size of the substring,
if (r-l+1) is greater than length of result,
then save the new result

```
if (r - l + 1) > len(result):
    result = s[l:r + 1]

l -= 1
r += 1
```