005. Longest Palindromic Substring

005 Longest Palindromic Substring

- **Dynamic Programming**+string

Description

Given a string **s**, find the longest palindromic substring in **s**. You may assume that the maximum length of **s** is 1000.

Example:

```
Input: "babad"

Output: "bab"

Note: "aba" is also a valid answer.
```

Example:

```
Input: "cbbd"

Output: "bb"
```

1. Thought Line

(1) To each element, set it as the middle elements and check from both left and right direction.

2. Dynamic Programming+string

```cpp
class Solution {
public:
    string longestPalindrome(string s) {
        int n = s.size();
        int len = 0; //len is the max length of Palindrome string.
        int start = 0;
        for(int i = 0; i < n; i++){

            // start to expend the interval
            int left = i, right = i;
            // consider duplicate characters.
            while(right < n && s[right+1] == s[right])
                right++;
            i = right;

            // keep expanding
            while(left > 0 && right < n-1 && s[left-1] == s[right+1]){
                left--;
                right++;
            }

            //update results
            if(len < right-left+1){
```

```
          len = right - left + 1;
          start = left;
        }
      }
      return s.substr(start, len);
  }
};
```