# 5. Longest Palindromic Substring

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"

## SOLUTION IN C++

class Solution {

public:

string longestPalindrome(string s) {

const string& t = join('@' + s + '$', '#');

const int n = t.length();

vector<int> maxExtends(n);

int center = 0;

for (int i = 1; i < n - 1; ++i) {

const int rightBoundary = center + maxExtends[center];

const int mirrorIndex = center - (i - center);

maxExtends[i] =

rightBoundary > i && min(rightBoundary - i, maxExtends[mirrorIndex]);

while (t[i + 1 + maxExtends[i]] == t[i - 1 - maxExtends[i]])

++maxExtends[i];

if (i + maxExtends[i] > rightBoundary)

center = i;

}

int maxExtend = 0;

int bestCenter = -1;

for (int i = 0; i < n; ++i)

if (maxExtends[i] > maxExtend) {

maxExtend = maxExtends[i];

bestCenter = i;

}

const int l = (bestCenter - maxExtend) / 2;

const int r = (bestCenter + maxExtend) / 2;

return s.substr(l, r - l);

}

private:

string join(const string& s, char c) {

string joined;

for (int i = 0; i < s.length(); ++i) {

joined += s[i];

if (i != s.length() - 1)

joined += c;

}

return joined;

}

};