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CSC-162-IN1

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Lab Assignment 3 – Palindrome Detector Reference Documents

Requirements

Requirements for PalindromeDetector

Requirement	Priority
Two variables to hold String and char array	High
Constructor to set variables	High
Method for user input	High
Method to remove whitespace and symbol characters from String	High
Method for returning String variable	Medium
Empty method to be called from program that returns boolean value	High
Method to check whether array of characters is a palindrome	High
Method to recursively check subarray	High

Requirements for TestPalindromeDetector

Requirement	Priority
Create new PalindromeDetector object	High
Initialize and set boolean variable to hold return value of isPalindrome() method	High
Display result	High

Pseudo-code

This program checks if a user input word, phrase, or sentence is a palindrome, meaning it reads the same forward and backward.

```
TestPalindromeDetector

Begin
    Create new PalindromeDetector object as test
    boolean c = test.isPalindrome()
    Print “Is “ + test.getInput() + “ a palindrome: “ + c
End
```

The variables, constructors, and methods the program depends on.

```
PalindromeDetector

String s, user input word, phrase or sentence

char[] c, array of only letters and digits from String

Begin PalindromeDetector()
    Set s to setInput()
    Set c to normalizeInput(s)
End

Begin setInput()
    Print “Enter a word or phrase: “
    Prompt user for input
    Return input
End

Begin normalizeInput(String s)
    Create temporary array with size of length of string input
    Initialize character counter, charCount = 0
    Begin for loop to loop through characters in string
      If character is letter or digit
        Add lowercase of character to temporary array
        Increment character counter
    Create new character array with size of character counter
    Begin for loop to copy non-empty elements from temporary array to character array
    Return character array
End
```

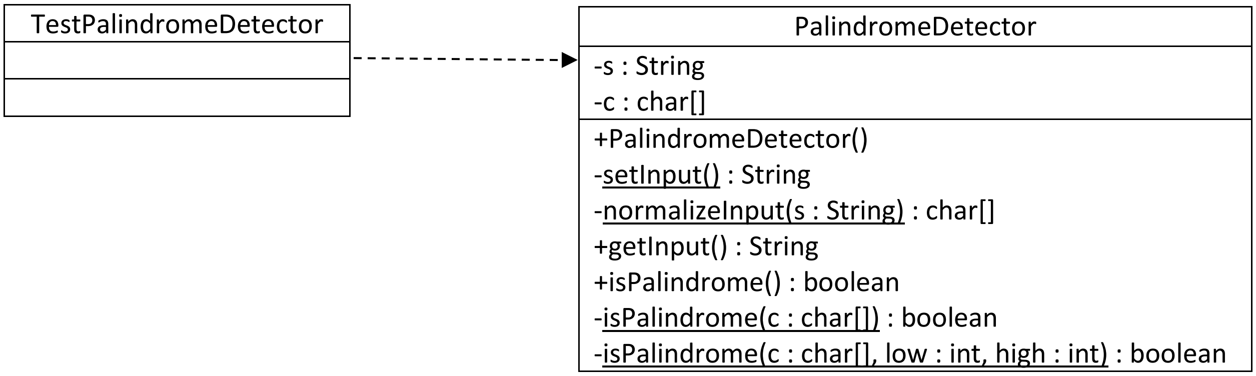
```
Begin getInput()
    Return s
End

Begin isPalindrome()
    Return isPalindrome(c)
End

Begin isPalindrome(char[] c)
    Return isPalindrome(c, 0, c.length – 1)
End

Begin inPalindrome(char[] c, int low, int high)
    If high <= low
      Return true
    Else if c[low] != c[high]
      Return false
    Else
      Return isPalindrome(c, low + 1, high – 1)
End
```

UML



TestPalindromeDetector

PalindromeDetector

-s : String
-c : char[]

+PalindromeDetector()
-setInput() : String
-normalizeInput(s : String) : char[]
+getInput() : String
+isPalindrome() : boolean
-isPalindrome(c : char[]) : boolean
-isPalindrome(c : char[], low : int, high : int) : boolean