

COP 3014 Honors: Spring 2017

Homework 6

Total Points: 100

Due: Thursday 03/23/2017 11:59:59 PM

1 Objective

The purpose of this assignment is to test your familiarity with C strings and C++ string objects. You'll also need to do fundamental algorithmic error checking. These programs have to be tested on `linprog` before they are turned in.

Email your file `stringops.cpp` and `palcheck.cpp` to `jayarama@cs.fsu.edu`

2 Program 1 - Basic String Operations

Dr. Insano is on a mission. He is approaching people on the street and asking them to speak a sentence of their choice into a recorder. He is then going to generate statistics on the string. He wants to know the number of words, the number of vowels, the number of numerals and to check if the string "ha ha ha" is found in the string. However, he is completely out of his depth with string processing and has just hired you to write a C++ program for him.

Specifications

- Write a function called `wordCounter` that takes in a string as a parameter and returns the number of words in the string (hint: you can count spaces). (10 points)
- Write a function called `vowelcounter` that takes in a string as a parameter and returns the total number of vowels in the string. You need to account for upper and lowercase letters. (10 points)
- Write a function called `numCount` that takes in a string as a parameter and returns the number of numeral characters in the string. (10 points)
- Write a function called `findHaHa` that takes in a string as a parameter and returns 1 if the string "ha ha ha" is a part of the string and 0 if it is not. (10 points)
- In the main function, accept a newline terminated string from the user. Then, print all the 4 statistics of the string. (5 points)
- Please comment your code appropriately. (5 points)
- You can use Cstrings or C++ string objects for your code.

Sample Run 1

Regular text is what's printed by your program. Underlined text is user input, shown here as a sample. You will not be printing the underlined parts in your program.

Enter the string: To s33 a w0rld in a grain of 5and, and a h3aven in a wild f10wer.
H0ld infinity in the palm Of your hand, and 3t3rn1ty in an hour.

Number of words: 29

Number of vowels: 29

Number of numerals: 14

"ha ha ha" is not a part of this string.

Sample Run 2

Enter the string: Birdemic is a painfully bad movie. Ha ha ha ha! And you actually
bought the DVD? You just wasted \$10

Number of words: 20

Number of vowels: 30

Number of numerals: 2

"ha ha ha" is a part of this string.

3 Program 2 - Palindrome Checker

You have somehow been sucked into a cliched 80's action movie, where you're Arnold Schwarzenegger's sidekick. You are approaching the final boss fight. However, he has locked himself into a vault which can only be opened by speaking a series of palindromic strings. Fortunately for you, the villain's sidekick is not very competent and has left a large binder of text lying around. 80's Arnold, recognizing his less than perfect English diction, has asked you to identify all the palindromes in the binder and read them to the lock. You decide to write a C++ program to make the job of identifying the palindromes easier for you.

A palindrome is defined as a string that reads the same forward and backward. For example, "Race car" is a palindrome.

Specifications

- The main function should have a maximum of 3 lines. A call to the function, which also stores the returned string in a variable, the print statement and the return statement. (5 points)
- In a function called `checkPalin`, prompt the user to enter a number N and then accept N strings from the user. These strings will consists only of letters (both uppercase and lowercase), numbers and spaces. (10 points)
- You can either use an array of strings or process the strings one by one.
- Check if the strings are palindromes (ignoring case and whitespace). If a string happens to be a palindrome, add it to the end of a result string. (20 points)
- After processing all the input, return the result string to main, where it is printed. (5 points)
- Prompts are the only print statements allowed outside the main function. In other words, you cannot print the palindrome strings in the `checkPalin` function.
- The output should be printed in a single line, and the case of the letters in the input should be preserved. (5 points)

- You need not check for any errors.
- Please include comments wherever appropriate. (5 points)

Sample Run

Regular text is what's printed by your program. Underlined text is user input, shown here as a sample. You will not be printing the underlined parts in your program.

```
Enter the number of strings: 9
Enter the strings:
Race Car
Get to the choppa
Mountain Dew
BATMAN
Taco Cat
Stressed Desserts
Is Mayonnaise an instrument
swap paws
A Toyotas a Toyota
```

The palindromes are: Race Car Taco Cat Stressed Desserts swap paws A Toyotas a Toyota

4 General Guidelines

1. Please make sure you're only using the concepts already discussed in class. That is, please try and restrict yourself to input/output statements, variables, selection statements and loops, functions, arrays, and strings.
2. Each program is worth 50 points.
3. Please make sure that you're conforming to specifications (program name, print statements, expected inputs and outputs etc.).
4. Please make sure your code is readable.
5. Please make sure you've compiled and run your program before you turn it in. Compilation errors can be quite costly.
6. The functions you have been asked to write are very standard things. Which means, you will find them on the Internet. I will be watching for this. so please do not get into trouble be copying stuff off the Internet or your friends.