**ECCS 1611 – Programming 1**

**Lab 8 – More Functions**

* For all programs you **MUST** write functions and you **MUST** use function prototypes.
* For all programs you **MUST** implement the functions **AS SHOWN** – you may not create new names and/or parameters.
* For all programs you **SHOULD** implement cout statements in main unless the function is displaying a “chunk” of output or getting user input.

**Individual Programming Practice with Functions.**

**P8-1** Write the function int countVowel(string str) that returns a count of all vowels in the string str. Vowels are the letters a, e, i, o, and u and their uppercase variants. Strings should be requested from the user via a loop construct for acquiring test data. HINT: please refer to the following demonstration program for reading in a string from the user:

// getline.cpp - John K. Estell - 07 October 2011

// demo of reading in a string from the keyboard

#include <iostream>

#include <string>

using namespace std;

int main(void) {

string input;

while ( true ) {

cout << "Enter a string or Q to quit: ";

getline( cin, input );

if ( input == "Q" )

break;

cout << "\"" << input << "\"" << endl; // do something with input

}

return 0;

}

Example run (with user input indicated with ***bold italics***):

Enter a string or Q to quit: ***The quick brown fox jumped over the lazy dog.***

Vowel count: 12

Enter a string or Q to quit: ***aeiouAEIOU***

Vowel count: 10

Enter a string or Q to quit: ***zxcvbnm***

Vowel count: 0

Enter a string or Q to quit: ***Q***

**P8-2** Write the function int countWords(string str) that returns a count of all words in the string str. Words are separated by one or more spaces. Strings should be requested from the user via a loop construct for acquiring test data. Please refer to the previous demonstration program for reading in a string from the user.

Example run (with user input indicated with ***bold italics***):

Enter a string or Q to quit: ***The quick brown fox jumped over the lazy dog.***

Word count: 9

Enter a string or Q to quit: ***aeiou AEIOU***

Word count: 2

Enter a string or Q to quit: ***zxcvbnm***

Word count: 1

Enter a string or Q to quit: ***Q***

**P8-3** Write a program that converts a Roman number such as MCMLXXVIII to its decimal number representation that uses the following functions:

* int romanCharValue(char r): yields the numeric value of the passed Roman numeral character.
* int convertRomanToInt(string s): this function converts the Roman number string into its equivalent integer value by implementing the following algorithm.

total = 0

While the roman number string is not empty

If the first character has a larger or equal value than the second, or the string has length 1

Add value(first character) to total.

Remove the character.

Else

Add the quantity: value(second character) - value(first character) to total.

Remove both characters.

Provide a program that tests your functions via a loop construct for acquiring testing data.

Example run (with user input indicated with ***bold italics***):

Enter Roman number or Q to quit: ***I***

I = 1

Enter Roman number or Q to quit: ***V***

V = 5

Enter Roman number or Q to quit: ***X***

X = 10

Enter Roman number or Q to quit: ***L***

L = 50

Enter Roman number or Q to quit: ***C***

C = 100

Enter Roman number or Q to quit: ***D***

D = 500

Enter Roman number or Q to quit: ***M***

M = 1000

Enter Roman number or Q to quit: ***MCMLXII***

MCMLXII = 1962

Enter Roman number or Q to quit: ***MDCCCLXXXVIII***

MDCCCLXXXVIII = 1888

Enter Roman number or Q to quit: ***Q***

