LAB #6

Each lab will begin with a brief demonstration by the TAs for the core concepts examined in this lab. As such, this document will not serve to tell you everything the TAs will in the demo. It is highly encouraged that you ask questions and take notes.

In order to get credit for the lab, you need to be checked off by the end of lab. You can earn a maximum of 3 points for lab work completed outside of lab time, but you must finish the lab before the next lab. For extenuating circumstances, contact your lab TAs and Jennifer Parham-Mocello.

Reminder: All of our labs involve paired programming. You do not have to keep the same partner for each lab, but you MUST work with someone in each lab!!! First, find a partner for this lab. It can be the same partner from the previous lab or a different partner.

(10 pts total) Design First (5 pts), Then Write Code (5 pts)!!!

To help you practice functions for Assignment #4, you will write a short program that asks the user to enter a string, and then ask if the user wants to determine if the sentence is a palindrome, search and replace part of the string, enter a new string, or quit. In this lab, none of the functions can have more than 10 lines of code, and you cannot use global variables!!! In addition, you will practice using C++’s string object, reading documentation, following function prototypes, and designing!

A palindrome is a string of characters that are arranged in the same order when read from left to right or right to left. http://www.fun-with-words.com/palin_explain.html

If the user chooses to determine if the string is a palindrome, then you need to print a message indicating whether it is or isn’t a palindrome. You can either use the at() function to look at a single character or you can use brackets, [ ], to access individual characters, and you can get the length of a string by using size() or length(). You will write a function called determine_palindrome() that checks to see if the string is a palindrome and returns true if it is and false if it is not.

If the user chooses to replace the string, you will also ask the user for a string to search and one to replace. This function is called get_search_replace_strings() and needs to get two inputs from the user, a search string and a replacement string. Now, create a function called search_replace() that takes three strings as input, string to search and replace, search string, and replacement string, and returns information about how many replacements were made and the new string with replacements. Lastly, print the number of replacements and new string for the user.

Read the string documentation to make this lab easy! http://www.cplusplus.com/reference/string/string/?kw=string
An Example Run:

Enter your string: Hello There
Determine if palindrome (1), replace string (2), enter new string (3), or quit (0)? 1
You have not entered a palindrome!!!
Determine if palindrome (1), replace string (2), enter new string (3), or quit (0)? 2
Enter a search string: Hello
Enter the replacement: Hi
You made 1 replacement, and your new string is Hi There
Determine if palindrome (1), replace string (2), enter new string (3), or quit (0)? 0

• (5 pts) You should design first...
  You can have more functions, but you must have at least the ones below.
  Each of your functions should have the proper function headers/descriptions

    void get_sentence(string &);
    bool determine_palindrome(string);
    void get_search_replace_strings(string *, string *);
    int search_replace(string &, string, string);

Write the function headers/descriptions for each of the functions above, as well as all the functions you create! This includes information about parameters, return values, and pre/post conditions.

Design – Give as much detail as possible for the main function and all the functions above.
  o Why do the function prototypes have the specific parameter types on them?
  o Why do the functions have void or a return value?
  o How do all the functions interact together?

Testing – Provide testing values with expected results.
  o What do you plan to use as bad values? Good values?
  o What do you expect to happen with bad values? Good values?

IF any of your functions are more than 10 lines of code, what can you do to make it smaller? If you are having difficulty thinking of how to make it smaller, then ask a TA to help you!!!

STOP!!! Get checked off by a TA before beginning to implement. This will help with logic and function mistakes.

• (5 pts) Now, INCREMENTALLY write your functions and program!!!!

Extended Learning:
Ignore the spaces, punctuation, and case in the string/sentence for determining if it is a palindrome, i.e. Madam I’m Adam.