Jason Dorweiler
CS165 Assignment 4

Requirements:

2.

a. For this part I will create a function that will reverse a string that is entered from the user. This function will reverse the string iteratively.

b. Same as part a but this time use a recessive function.

c. For this part I will make a function that checks to see if a string entered is a palindrome.

d. Same as part c but this time use a recursive funciton.

e. Set up a menu that asks the user if they want an iterative solution for the reverse and palindrome.

Possible solution:

For reversing a string using an iterative function it should be easy enough to just loop the the input string backwards one character at a time. Each time through the loop add the character to a new reverse string.

```
Loop over input_string starting from last char
        reverse_string += char_from_input_string
return reverse_string
```

To do the same with a recursive function I think I could recursively call the function again but using a shortened string. Each time through making the input string shorter and once the string is down to a single character I can just return the reversed string.

```
Check string length
        if length == 1
                return reversed string
reverse_string += last_char_from_input_string
call_func_again ( shorter_input_string)
```

I'm glad I implemented recursive palindrome checking function in lab 6 so making an iterative one should be too bad. A possible solution could be to loop over half the number of characters in the string. Only half because I don't need to check the string twice. The compare the two ends and return false if they're not equal. Then check the next to characters and so on until all have been tested.

For the recursive solution, which I did for lab6, I can do something similar to the iterative function. First check to see if the two end characters are equal. If they're not then call the function again but this time send it the next character to the right and the next character back from the end. Compare those to and repeat until half of the number of characters have been checked.

Implementation

See comments in the source file.

Testing and Debugging

I had to do all kinds of debugging to get the recursive reversing function to work correctly. I ended up doing some searching on how to use strings and I found that you can use string.erase() to remove specific characters from a string. The problem was that I kept trying to pull off characters based on string.length() when I needed to be sending it string.length()-1. I also kept running into a seg fault because I kept trying to access parts of the string that didn't exist.

I tested the program with strings and numbers. It will actually reverse and check for a palindrome and return the correct result either way. Adding in spaces or any special characters will break the palindrome function. It will still run but just give the wrong result.

Reflection

I learned that making recursive functions can be pretty tricky but also pretty neat when you get them to work. I had my computer running in an endless loop more than once but I finally worked out all the bugs.