CS 31 Worksheet Week 4

This worksheet is entirely optional, and meant for extra practice. Some problems will be more challenging than others and are designed to have you apply your knowledge beyond the examples presented in lecture, discussion or projects. All exams will be done on paper, so it is in your best interest to practice these problems by hand and not rely on a compiler.

Concepts: While Loops, Do While Loops, String Traversal, Functions (Only pass-by-value)

Reading Problems

1) What does the following code snippet output, AND what does each one return?

```c++
int mystery(int a, int b) {
    int count = 0;
    while (count < 2) {
        a = a + b/2;
        b = a + 5;
        cout << "a: " << a << " b: " << b << endl;
        count++;
    }
    return count;
}

int main() {
    int a = 5, b = 10;
    cout << "a: " << a << " b: " << b << endl;
    int c = mystery(a, b);
    cout << "a: " << a << " b: " << b << endl;

    if (a % c == 0) {
        return 1;
    }
    return 0;
}
```

Time: <10 min
2) What does the following code snippet output?

```cpp
#include <iostream>
using namespace std;

void mystery (char code, int j) {
    if (j % 3 == 0)
        cout << "I found " << code << " at index " << j;
    else
        cout << "meh too lazy rn" << endl;
    if (j % 1 == 0)
        cout << "!" << endl;
}

int main() {
    string message = "2319!:\(\)";
    for (int i = 0; i != message.length(); i++) {
        mystery(message[i], i);
    }
}
```

Time: <10 min
Programming Problems
Note: Now that you have had some more in-class practice with functions and strings, it might be a good idea to revisit the problems from last week if you haven't figured them out already! :)

1) Write a function called reverse(int n) that reverses the digits in the parameter and returns its result. For example, if n is 927, it should return 729. Then, in a main() function, take a number from user input, and call the function reverse using that number you just received.

Example test cases:
Enter number: 123
321
Enter number: 001
1
Enter number: 0
0

Time: ~20 min

2) Write a function max3 which uses 3 parameters and returns the value of the largest. Test the function in a program that determines the largest of 3 quiz scores. If the score is more than 100, print a congratulatory message!

Example test cases:
Enter student 1's score: 105
Enter student 2's score: 44
Enter student 3's score: 56

The highest score out of these was 105! Congratulations on your hard work!

Time: ~10 min

3. Given a string, write a function that can reverse the order of characters in each word
within a sentence while still preserving whitespace and initial word order. You can make it any kind of return value and have whatever parameters you need. However, explain your reasoning for your choices by using comments (remember, they are denoted with //)

Example:

Input: "Let's take LeetCode contest"

Output: "s'teL ekat edoCteeL tsetnoc"

Note: In the string, each word is separated by single space and there will not be any extra space in the string.

Time: ~20 min

4. Implement a function named ToLowerCase that has a string parameter str, and returns the same string in lowercase.

Example 1:
Input: "Hello"
Output: "hello"

Example 2:
Input: "here"
Output: "here"

Example 3:
Input: "LOVELY Day!"
Output: "lovely day!"

Time: ~10 min