HW5: Released Monday, week 6 and due Thursday, week 6

1. List any students you discussed with on this homework assignment: _____

These should still be your own answers, but it is ok to check answers and discuss your reasoning with your classmates.

Running code snippets from the homework is ok, but please take a moment to read through the code yourself first and figure out what you think it will do—you will learn how the code works much better if you think through it first before checking, *especially* if your initial assessment was wrong.

2. (5 points) For the following questions, the code is being applied to string x, which you can assume contains the string "Strings are fun!" before each piece of code is run. Report the value of string x after the code has been run (it may be unchanged).

   Watch the spaces carefully, and make sure your result includes the correct spacing.

   a.
   ```
   x.replace(6, 1, " instruments");
   ```

   b.
   ```
   x += "hello";
   ```

   c.
   ```
   x[15] = '?';
   ```

   d.
   ```
   for(int i = 0; i < x.length(); ++i){
         if(isalpha(x[i])){
               x[i] = toupper(x[i]);
         }
   }
   ```

   e.
   ```
   for(int i = 0; i < x.length(); ++i){
         x[i] = to_string(x[i] % 10)[0];
   }
   ```

3. (6 points) Given a string x containing an email address, x.find("@") will return the index of the at sign in the email to check if it is a valid email address.

   a. Assuming the results of x.find("@") have been stored in an integer variable named y, write an if statement to check if "@" is in the string at all, and give an error if not.

   b. Assuming the results of x.find("@") have been stored in an integer variable named y, write a line of code using substr() that stores the part of the address before the "@" into a string variable named `username`.

   c. Assuming the results of x.find("@") have been stored in an integer variable named y, write some brief code to make sure that there is only one "@" in the string.

4. (4 points) I have a text file called "`t.txt`" that contains two entries: “Computer Science Rules!” on one line, and “University of California” on the next line.

   Show the output produced when the following code (entire program not shown, so assume all the necessary set ups are done correctly) is executed and explain why that is. You are encouraged to try to compile this to verify your results.

```
ifstream tin;
char c;

tin.open("t.txt");

tin.get(c);
while (!tin.eof()) {
      if ((c != 'e') && (c != 'C')) {
            cout << c;
      }
      tin.get(c);
}
```

5. (5 points) Complete the code below (there are several missing lines) such that the program reads a text file called "`MyInputs.txt`", which only contains double-type numbers separated by whitespaces. Of course, you don't know ahead of time how many numbers are in the file. You must use all the variables declared below, and you may add more variables as needed. Your program should print the average of these numbers, as indicated below.

   For example, if the text file contains this single line:

   ```
   4.2 3.3 9.1 3.1 0 0 7.5 5.4 9.9 10
   ```

   Then the program should print out:

   ```
   The average is: 5.25
   ```

   The code is as follows:

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

   int main(){
         ifstream inf;
         double num, sum(0), average;
         // if you haven't seen this formatting before, the above line
         // declares variables num, sum, and average as doubles,
         // and also initializes sum to be 0
         int count = 0;









         cout << "The average is: " << average << endl;
         return 0;
   }
   ```

   You only need to submit the lines you have added to complete the program, which should all be between `int count = 0;` and the print statement. You can assume that the file given only contains valid numbers and whitespace.