Math 3300 - Homework 3

1. Create a **do-while** loop which would force the user to enter a character which represented an upper case letter (In class, we made a do-while loop which forced the user to enter a positive integer). **Hint:** You can use <= and >= for characters as well. All upper case letters are considered less than all lower case letters, like $B < a$, but when restricting to the same case, <= produces an alphabetical ordering. For example $A <= B <= C$, etc.

2. For the following, assume **str1="Hot Dog"**, **str2="French fries"**, **str3="hamburger"**. Answer the following questions without using your compiler:

   (a) What preprocessor command do you need to use strings in your program?

   (b) What is the value of **str2.at(4)** and**str3[5]**?

   (c) What string is represented by **str4=str3+str1**?

   (d) What is the value of **str1.length()**?

   (e) Is **str1<str3** a true statement? Why or why not?

   (f) What are the values of **str2.find("e")** and **str2.find("e",4)**?

   (g) What string is represented by **str1.erase(1,3)**?

   (h) What string is represented by **str3.replace(0,3,"cheese")**?

3. Create a **function** whose inputs are 3 strings. Your function will return a string which is the concatenation of the three strings. (For example: the concatenation of the strings "abc", "def", and "ghi" is "abcdefghi".)

4. Complete the following:

   (a) Create a function named factorial, which calculates the value of $n!$, given n as the input.

   (b) Create a function called round, which rounds a real number to the nearest integer.

5. Create a function whose input is an integer n which represents the number of days since the day you were born. The function should then return 3 integers corresponding to the month, day, and year of the date which occurs n days after you were born. (e.g. If you were born on 02/01/2011 and you enter $n = 5$ into the function, the function would return: 2 for the month, 6 for the day, and 2011 for the year). This is a very difficult problem if you try to do it exactly, so for simplicity, you can assume that each month has 30 days and that a year always has 365 days.

6. Create two functions, one called **findMax**, and one called **findMin**, which accept an integer array along with its size as two input variables, and returns the maximum or minimum value respectively of the array. In addition to writing down these two functions, show the function prototype each function would have.

7. Create a function called **openInput** whose input is a reference to an input file stream, which asks the user to enter a file name to open for input, then checks to see whether the file has opened successfully. This function returns nothing. You can now use this function any time you want to open a file for input in this class.

8. Create a function called **openOutput** whose input is a reference to an output file stream, which asks the user to enter a file name to open for output, and then checks to see whether the file already exists, then asks whether the user wants to overwrite it. This function returns nothing. You can now use this function any time you want to open a file for output in this class.

9. Create a function whose input is a string. Your function will create a new string from the old one by changing all lower case letters to upper case letters and vice versa. It leaves all other characters unchanged. Your function returns this string.

10. Create a function whose input is 2 strings (representing an existing filename and a new filename respectively). Your function will create the new file which is an exact replica of the existing file.