# CS 121Homework Assignment: Sorting Searching and Functions

**In the following programs provide screen shots of you program results. (On windows use ALT + PrtScreen to copy the window to the clipboard.) Paste the screen shots into a word document and upload it to Angel along with the source code.**

1. Write a program that will sort an input string in ascending and descending order. Use a bubble sort to sort in descending order and a selection sort to sort the same input string in ascending order. Count the number of comparisons used by each sort. Print the sorted strings and comparison counts to the screen. Any sequence of characters typed in will be OK. Not just letters and numbers.
2. Repeat of spell check program from earlier assignment. Using the dictionary of four letter words write a program that will check a sequence of 4 characters entered from the keyboard to determine if it is a word. Your program should use a binary search to look for the word. To do this all words must first be read into an array. There are 4030 words in the dictionary. Your output should indicate whether the word is valid or not. Count the number of comparisons and print that to the screen along with the validity of the word.
3. Using the functions shown in class write another function that will return the day of the year given the current date – MM DD YYYY. The day of the year can then be used to express the current date in the form YYYY.DDD. Print out the dates in normal MM DD YYYY and YYYY.DDD form.

**Functions**

**For the following problems write a main program to test each function. One main program can be used to test all three functions. Show the output of your test cases by capturing screen shots of the execution window.**

1. Write a function that converts a temperature from Celsius to Fahrenheit OR from Fahrenheit to Celsius. The function will have two parameters: The temperature (real number) and a letter. The letter will indicate if the input temperature is Celsius ‘C’ or Fahrenheit ‘F’. The function returns the converted temperature as a real number.
2. Write a function that will count the number of words in a string. The function will accept a string as input and will then count and return the number of words as an unsigned integer. A proxy for word count can be spaces, a period followed by a space, a question mark followed by a space or an exclamation mark followed by a space. The input string can contain multiple sentences.
3. Write a function that will count the number of occurrences of a given letter in an input string. The function will accept a string and a character as input. The function will then determine the number of times that character appears in the string. The test must be case sensitive. No need to convert to upper or lower case. The function returns the number of times the character appears.