Sonoma State University
Computer Science Department
CS 460 – Fall 2017 – Watts

Homework 2

For this assignment, you are to write a C++ program that will:

1. Read a list of binomials from a text file. Consecutive input binomials will be separated by white space. There will be no white space within the string of characters representing a single binomial. The name of the input file should be accepted as a command line argument.

2. For this assignment, a binomial consists of a floating point x-coefficient and a constant. The x-coefficients and constants may be positive or negative. For example,

2.1x+1	x-15.5
3x-5.31	-12.3x
-24.1x+24.68	15.2

   are all valid binomials.

3. All binomial strings will consist of a real x coefficient, the character x and a real constant value. The x coefficients may or may not be preceded by a sign. The constant values will be preceded by a plus or minus sign. All input real numbers will be expressed with a single decimal of precision. For example, the binomials listed above will be represented in the input file as:

   ```
   2.1x+1.0 3.0x-5.3 -24.1x+24.7 1.0x-15.5
   -12.3x+0.0 0.0x+15.2
   ```

4. Find the sum of the binomials in their original input order and print the sum at the beginning of the standard output in the format:

   ```
   The sum of the unsorted binomials is: -30.3x+20.1
   ```

5. Sort the binomials into ascending order. The x-coordinate should be the primary key, the constant the secondary key.

6. Find the sum of the binomials in their sorted order and print the sum at the beginning of the standard output in the format:

   ```
   The sum of the sorted binomials is: -30.3x+20.1
   ```

7. Write a list of the sorted binomials to standard output. Binomials should be written using the same format as the input, one binomial per line. All decimal values should be written to a precision of 1/10; one position after the decimal point.

If the input file contains:

```
2.1x+1.0 3.0x-5.3 -24.1x+24.7 1.0x-15.5
-12.3x+0.0 0.0x+15.2
```

The output should be:

```
The sum of the unsorted binomials is: -30.3x+20.1
The sum of the sorted binomials is: -30.3x+20.1
-24.1x+24.7
-12.3x+0.0
0.0x+15.2
1.0x-15.5
2.1x+1.0
3.0x-5.3
```

Please record your development time for this program and include it in the comments at the beginning of your .cpp file.

Your well documented C++ program should be submitted as a single file called *yourlastname*H2.cpp. C++ files should be copied to the course dropbox.

The execution script will tack some time and space limiting code to the beginning of your program.

The execution script will use the g++ compiler with no flags to compile your code.

The execution script will provide the name of the input file as a command line argument when it executes your compiled program.

Date Due: Tuesday, 12 September 2017, 11:59 pm.
To Turn In: *yourlastname*H2.cpp