Course	**CSC 215 – Programming Techniques**
Name	**Homework 8**
Due Date	**February 14 at classtime**
Repository	**Place in homeworks repository**
Solution Name	**hw8.sln**
Project Files	**hw8.cpp**

Setup:
Download both files from d2l. (hw8dataset1.txt and hw8datase2.txt). Place these files in your hw8 folder.

Problem:
You are to write a program with three command line arguments. The first argument (argv[1]) will be the name of the input file. This file is full of integers. The next argument (argv[2]) will be the name of a file for outputting the processed data. The third and final argument will be the name of a file for outputting specific information about the data set. All three files will be specified using the command prompt.

Ex. hw8.exe dataset#.txt processed.txt stats.txt

You will read the integers from the file placing them into a vector until you reach END-OF-FILE. You cannot read directly into the vector because the [] does not automatically increase in size. You must use a method listed in the "ReadingUntilEOF.cpp" found on d2l. If you use .eof(), .good(), .bad(), .fail(), .bad() you will receive no credit. LOOK AT THE CPP FILE.

The first output file (processed.txt)
This file will contain all the unique values from the dataset listed in decreasing order with 5 numbers per line.

The second output file (stats.txt)
Output the number of items that were in the original data set and the number of unique values in your dataset. Following this will be the 5 largest values and 5 smallest values. Then sum the numbers in the data set and compute the average with 4 digits of precision. You are guaranteed that the sum of the vector will fit within a long long integer. These values will also be added to this file. Be sure and place good labels on the data. Unlabeled data or unformatted data will receive no credit.

Sample output for stats.txt: (made up values)
Original data set size: 34987
Unique numbers: 29875
Largest data values: 995642 995642 938489 938486 938483
Smallest data values: 1 2 3 9 11
Sum of unique numbers: 938392019
Average of unique numbers: 341298.4598

Requirements:
You must use the algorithms libraries to sort the vector, find the unique items.
You must use the numeric library function accumulate to sum the vector (unique numbers only).
To output the five largest numbers, you must use a forward iterator. (largest to smallest)
To output the five smallest numbers, you must use a reverse iterator (smallest to largest)
To output the unique values you must use the .at(i) function.
YOU MAY NOT REVERSE THE VECTOR OR RESORT THE VECTOR

Hints:
Output the original size of the dataset before removing duplicate values.
Work on just sorting the vector and outputting it to the file first. Then work on removing duplicate values to get to unique values to be outputted.
Then work on one item at a time. 5 smallest, 5 largest, sum and finally the average.

Examples:
Using hw8dataset1.txt stats file

Original data set size: 78
Number of unique values: 73
Largest data values: 9843 9790 9732 9473 9468
Smallest data values: 1029 1086 1096 1223 1344
Sum of unique numbers: 381259
Average of unique numbers: 5222.7261

Using hw8dataset2.txt – stats file

Original data set size: 987342
Number of unique values: 9000
Largest data values: 9999 9998 9997 9996 9995
Smallest data values: 1000 1001 1002 1003 1004
Sum of unique numbers: 49495500
Average of unique numbers: 5499.5000

Grading:
Correct stats file: 6 pts
Mostly correct: 3 pts. (used specified functions but got the wrong answer)
Incorrect: 0 pts (didn't use specified functions or answers were too far off)