

COSC 4301 – MODERN PROGRAMMING

Program 4 – Data Analysis

The attached text file, **Program4.txt**, contains the weekly average prices for a gallon of gas in the United States, beginning on **April 5, 1993**, and ending on **August 26, 2013**.

Each line in the file contains the average price for a gallon of gas on a specific date. Each line is formatted in the following way:

MM-DD-YYYY:Price

MM is the two-digit month, **DD** is the two-digit day, and **YYYY** is the four-digit year. Price is the average price per gallon of gas on the specified date.

For this programming assignment you are to write the test class in a file named **Program4.java** and multiple classes, that reads the **contents of the file, only once**, and perform the following calculations:

Average Price per Year: Calculate the average price of gas per year, for each year in the file. (The file's data starts in April 1993, and it ends in August 2013. Use the data that is present for the years 1993 and 2013.) Display the year and average in a two-column format with headings.

Average Price per Month: Calculate the average price for each month in the file and display the month, year, and average price in a three-column format with headings.

Highest and Lowest Prices per Year: For each year in the file, determine the date and amount for the lowest price, and the highest price. Display the year, date, lowest price, date, and highest price in a five-column format with headings.

List of Prices, Lowest to Highest: Generate a text file that lists the dates and prices, sorted from the lowest price to the highest.

List of Prices, Highest to Lowest: Generate a text file that lists the dates and prices, sorted from the highest price to the lowest.

Read the input file, **Program4.txt**, **only once and do not use any static data structures in the program.** **You will not get credit for the program if you do.**

Write a public test class, named Program4.java to test your other classes. No input, processing or output should happen in the main method. All work should be delegated to other non-static methods.

Run your program and copy and paste the output to a file named **Program4-Output.txt**. Create a folder named, **<YourLastNameFirstName>_Program4**. Copy your source

codes and the output files to the folder. **Zip the folder, as a “.zip” file, and upload it to Blackboard.**

All classes in this program must be public, non-static and not nested in other classes. Do not use more than three classes for the program.

Every method in your program should be limited to performing a single, well-defined task, and the name of the method should express that task effectively. All methods should be non-static unless it is absolutely necessary for it to be static.

Before you upload your program to Blackboard:

- Ensure that your code conforms to the style expectations set out in class and briefly discussed below.
- Make sure your variable names and methods are descriptive and follow standard capitalization conventions.
- Put comments wherever necessary. Comments at the top of each module should include your name, file name, and a description of the module. Comments at the beginning of methods describe what the method does, what the parameters are, and what the return value is. Use comments elsewhere to help your reader follow the flow of your code. **See the Program1.java file for more details.**
- *Program readability and elegance are as important as correctness.* After you have written your method, read and re-read it to eliminate any redundant lines of code, and to make sure variables and methods names are intuitive and relevant.

Read the assignment very carefully to ensure that you have followed all instructions and satisfied all requirements. **You will not get full credit for this program if it is not written as instructed even if it works as expected.**