

Project 1: File I/O and ArrayList**Due Date:** Sunday, May 24, 2020 at 11:59 pm eastern time.**Deliverables:** Online your entire zipped Netbeans project to canvas*Note, I will not except late assignments and assignments not emailed through Canvas.***Objective**

To master working with File handlers and ArrayLists

Overview

You are to read and parse the contents of the Stock_Data.txt. The Stock_Data.txt comma delimited file contains historical data on five stocks:

Date	X	GE	APPL	GOOG	F
8/9/17	23.93	24.69	158.59	922.9	10.36
8/10/17	23.69	24.29	153.54	907.24	10.22
8/11/17	23.01	24.2	155.68	914.39	10.22
8/14/17	23.18	24.35	158.02	922.67	10.35

You are to store the data for each stock into an ArrayList for example

```
ArrayList<Double> x_stockPrices = new ArrayList<Double>();
```

Then you need to calculate the correlation matrix and display it in the console. Note the correlation matrix is a 2D ArrayList i.e

```
ArrayList<ArrayList<Double>> correlationMatrix = new ArrayList<ArrayList<Double>>();
```

Here are some useful formulas you need to complete the project. If you have any questions, please ask me. I am here to help you.

Standard Deviation

$$s_x = \sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}$$

Correlation

$$r = \frac{1}{n-1} \left(\frac{\sum_x \sum_y (x - \bar{x})(y - \bar{y})}{s_x s_y} \right)$$

What you need to do

1) You need to read store the stock price contents Stock_Data.txt for each stock into an ArrayList. Heads up remembered that the stock data file has a header that you need to deal with. Note, you will find the Stock_Data.txt file in the data folder of the Netbeans skeleton project provided to you.

Example:

```
ArrayList<Double> x_stockPrices = new ArrayList<Double>();
```

2) Implement the following methods:

- public static double findAverage(ArrayList<Double> prices)
- public static double findStandardDeviation(ArrayList<Double> prices)
- public static double findCorrelation(ArrayList<Double> firstPrices, ArrayList<Double> secondPrices)

3) Create ArrayList that store each stock correlation values against the other stocks.

Example:

```
ArrayList<Double> xCorrelations = new ArrayList<Double>();
```

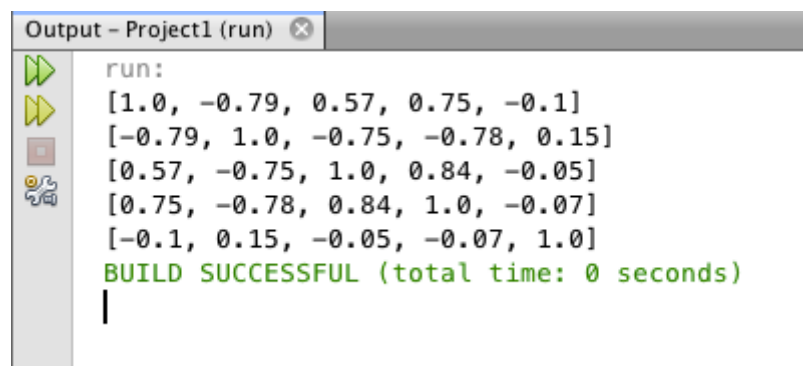
4) Create a 2D ArrayList called correlationMatrix at stores all the stock correlations

Example:

```
ArrayList<ArrayList<Double>> correlationMatrix = new ArrayList<ArrayList<Double>>();
```

5) Output the contents of the correlationMatrix to the console and print out the values:

Examples:



```
Output - Project1 (run) x
run:
[1.0, -0.79, 0.57, 0.75, -0.1]
[-0.79, 1.0, -0.75, -0.78, 0.15]
[0.57, -0.75, 1.0, 0.84, -0.05]
[0.75, -0.78, 0.84, 1.0, -0.07]
[-0.1, 0.15, -0.05, -0.07, 1.0]
BUILD SUCCESSFUL (total time: 0 seconds)
|
```