Homework 4

Deadline: 2015/04/17 09:00

Shin-Jie Lee（李信杰）
Assistant Professor
Computer and Network Center
Department of Computer Science and Information Engineering
National Cheng Kung University

Problem Description

- A comma-separated values (CSV) file is a simple text format used to store a list of records. A comma is used as a delimiter to separate the fields for each record. This format is commonly used to transfer data between a spreadsheet or database.
- In this programming project, consider a coffee store that sells some products. Customers can rate each product from 1–5, where 1 is poor and 5 is excellent.
- The ratings are stored in a CSV file where each row contains the customer's rating for each product. Here is a sample file with 4 products and 3 customer ratings:

```
Caffé Latte,Java Chip Frappuccino,Espresso,Cappuccino
2,5,1,3
3,5,,4
4,5,2,1
```

In this file format, the first line gives the product names. In this case, the first customer rated each product as 2, 5, 1, and 3, respectively. The second customer rated the first two product as 3, 5, and rated the last product as 4. The second customer did not rate the third product.

Problem Description

- Write a program that reads in such CSV file and output the average, maximum, minimum, and standard deviation of ratings for each product. You should round the result to two decimal places, and sort the result by the average value of each product in descending order.
- Your output should be exactly in the format:

  $[Product_1, Ave_1, Max_1, Min_1, Std.dev_1]$
  $[Product_2, Ave_2, Max_2, Min_2, Std.dev_2]$
  ...
  $[Product_n, Ave_n, Max_n, Min_n, Std.dev_n]$

  where $Ave_1 \geq Ave_2 \geq \ldots \geq Ave_n$. Left-align the Product name with width 25 (including comma).
- For example, in the previous case, you should output

```
[Java Chip Frappuccino,    5.00, 5, 5, 0.00]
[Caffé Latte,              3.00, 4, 2, 1.00]
[Cappuccino,               2.67, 4, 1, 1.53]
[Espresso,                 1.50, 2, 1, 0.71]
```

Problem Description

- You can assume that
  - there are at most 10 products and 10 customers.
  - the average values are all distinct.
  - the sample number for computing standard deviation is at least 2.
- Input files:
  - The input files are given by the arguments of the main method. That is, you should use a loop and write `FileInputStream(args[i])` to read the files in the main method in your program.
  - Put a number with format `--###--` above each file's output. Please see the sample input and output for reference.
- Program requirements:
  - You should write at least one non-static method and call the method in your program.
  - If you define your own classes, put all the classes in one file. That is, the public class name should be your student ID, and other classes are non-public.

Sample Input and Output

File name	`hw4_file1.csv`

File content	`Caffé Latte,Java Chip Frappuccino,Espresso,Cappuccino`
	`2,5,1,3`
	`3,5,,4`
	`4,5,2,1`

File name	`hw4_file2.csv`

File content	`Signature Hot Chocolate,Caramel Frappuccino,Ristretto Bianco`
	`1,2,3`
	`3,5,5`
	`4,3,1`
	`2,4,2`

Output	`--001--`
	`[Java Chip Frappuccino,  5.00, 5, 5, 0.00]`
	`[Caffé Latte,  3.00, 4, 2, 1.00]`
	`[Cappuccino,  2.67, 4, 1, 1.53]`
	`[Espresso,  1.50, 2, 1, 0.71]`
	`--002--`
	`[Caramel Frappuccino,  3.50, 5, 2, 1.29]`
	`[Ristretto Bianco,  2.75, 5, 1, 1.71]`
	`[Signature Hot Chocolate, 2.50, 4, 1, 1.29]`

Scoring Criteria

- Correctness: 80%
  - Note that TA will test your program with more than one test case.
- Coding standards: 20%
- Plagiarism is strictly forbidden

Submission

- Please upload your source code to Moodle
- The file name should be `{STUDENT_ID}_hw4.java`
- Deadline: 2015/04/17 09:00
- No late submission is accepted

If you have any problem about this homework,
please email to: p96024029@mail.ncku.edu.tw（林昆輝）

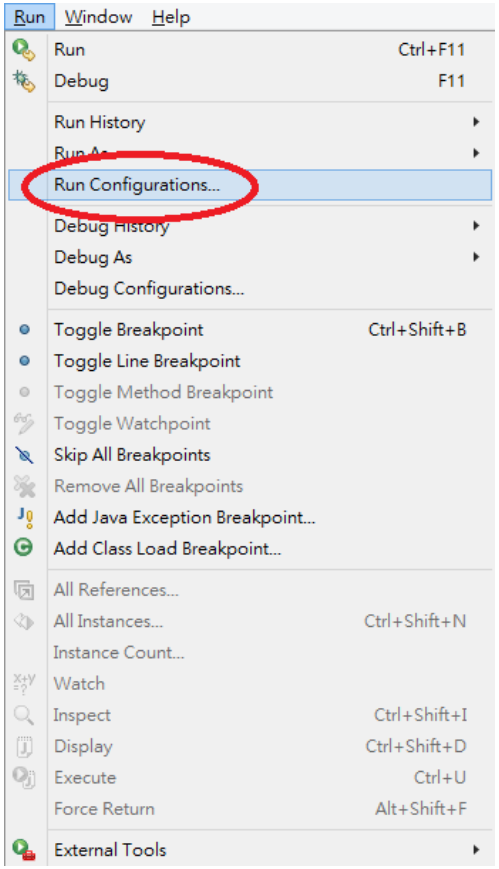
Hints

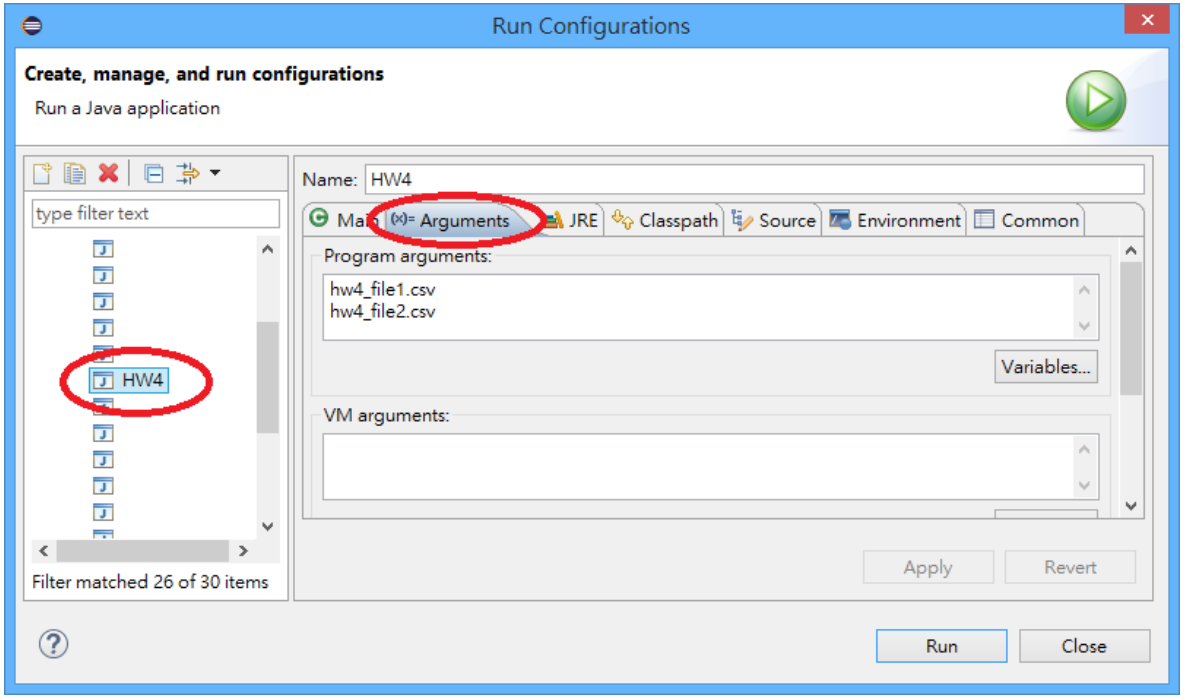
- Useful APIs:
  - StringTokenizer
  - String.split
  - String.format
  - PrintStream.printf
  - Collections
  - Math
- http://en.wikipedia.org/wiki/Standard_deviation

$$s = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(x_i - \overline{x})^2}.$$

Program Arguments

- For eclipse users:





- For command line users:

```
(srlin@alumni)-[~/test]
→ java HW4 hw4_file1.csv hw4_file2.csv                    ψ (04/10 01:19)
```