Due Date: 08.11.2020 23:59

CENG211 – Programming Fundamentals
Homework #1

In this homework you are expected to implement an "Chain Store App" in Java.
You should fulfill the concepts of:

- Defining Classes
- CSV file I/O
- Arrays
- 2-dimensional Arrays
- Constructors, Getters & Setters

In the Chain Store Application, purchase and sale information of 4 stores are stored and queried. You are expected to implement necessary classes to load data from given CSV files and create desired queries. The given CSV files are listed below:

- In "HW1_Items.csv", the information is as follows:
  `Name,ID,Category`
- In "HW1_Transactions_Store1.csv", the information is as follows:
  `ID,PurchasePriceFor1stMonth,SalePriceFor1stMonth,NumberOfSalesFor1stMonth,PurchasePriceFor2ndMonth,SalePriceFor2ndMonth,NumberOfSalesFor2ndMonth,…`
  (Note: Transaction files contain purchase price, sale price and sale count of an item for 12 month)
- Format of other CSV files for the remaining 3 stores are the same with the first one.
- Note that the IDs in the Items file and Transactions files are referring the same item.

You are expected to implement classes for **Item**, **Transaction**, **ItemTransaction**, **AnnualSale**, **StoreQuery**, **ChainStoreApp (the class with main method)** and other helper classes (e.g. **FileIO**) with the information given below:

Item:

- ID
- Name
- Category

Transaction:

- Purchase Price
- Sale Price
- Number of Sales

ItemTransaction:

- Item
- Transactions
  - ✓ **Note:** Two-dimensional array that holds **Transaction** objects for each Store for each Month.
  - ✓ **Ex:** For 3rd store - September, it is [2][8]

AnnualSale

- ItemTransaction→ [0, 32]
  - ✓ **Note:** One-dimensional array that holds 33 **ItemTransaction** objects.

Implement necessary methods to respond the following queries in **StoreQuery** class:

1- Most profitable item for the whole year
   - ✓ **Note:** Most profitable item is the item that have a maximum profit. Profit of an item is (Sale Price – Purchase Price) x Number of Sales
2- Most profitable category for the whole year
   - ✓ **Note:** Not all categories have the same amount of items
3- Least profitable item for the whole year
4- Least profitable category for the whole year
5- Most profitable item for a single sale
6- Best-selling item for the whole year
7- Most profitable store for each month

Important Notes:

1. Do NOT request inputs in your app. Printing the results of the queries will be enough. You should print names of the results instead of printing IDs or indices.

2. You are NOT allowed to use **List** / **ArrayList** interfaces in this homework. You can implement helper methods to increase the capacity of arrays when it is needed.

3. You can use standard **java.io** packages to read files. Do NOT use other 3rd party libraries.

4. You should use relative paths (e.g. `Files/sample.csv`) instead of absolute paths (e.g. `C:\\user\\eclipse-workspace\\MyProject\\Files\\sample.csv`).

5. To support **Turkish characters** you may need to change your project's text file encoding to UTF8: Right click on your project (in package explorer) → Properties → Text file encoding → Other → UTF8 → Apply.

6. You are expected to write clean, readable, and tester-friendly code. Please try to maximize reusability and prevent from redundancy in your methods.

Assignment Rules:

1. In this lecture's homework, there are no cheating allowed. If any cheating has been detected, they will be graded as 0 and there will be no further discussion on this.
2. You are expected to submit your homework in groups. Therefore, only one of you will be sufficient to submit your homework.
3. Make sure you export your homework as an Eclipse project. You can use other IDEs as well, however, you must test if it supported by Eclipse.
4. Submit your homework through LMS.
5. Export your Java Project with your assigned group ID (which will be announced on LMS) as the given format below:

   G05_CENG211_HW1.zip

6. Please be informed that your submissions may be anonymously used in software testing and maintenance research studies. Your names and student IDs will be replaced with non-identifying strings. If you do not want your submissions to be used in research studies, please inform the instructor (Dr. Tuglular) via e-mail.