CENG211 – Programming Fundamentals
Homework #1

In this homework you are expected to implement a "Drop-shipping App" in Java.
You should fulfill the concepts of:

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

Drop shipping is defined as "a type of retail fulfillment method for online stores, where instead of warehousing inventory, sellers purchase products from third-party suppliers as customers make orders." [1]. In this method, the products are shipped directly to the customers therefore the seller doesn't have to handle the product directly [1]. Let's say a customer orders a handbag, the drop-shipper purchases the bag from the supplier for 100 TLs and ships the bag to the customer for 105 TLs. By this way, the drop-shipper makes a small profit without storing or packaging the products.

In the Drop-shipping App, there are the records of the suppliers that are in different countries. The suppliers are called S1 which sells electronic products from China, S2 which sells cosmetic products from Brazil and, S3 which sells fashion products from Malesia.

In this homework, you are expected to implement necessary classes to load the data from the given CSV files and create the desired queries. The given CSV files are listed below.

- In "S1_Products.csv", the information is as follows:
  ID,Title,Rate,Number of Reviews,Price

- In "Customers.csv" the information is as follows:

  ID,Name,Email,Country,Address

  In "S1_Sales.csv", the information is as follows:
  ID,Customer ID,Product ID,Sales Date

- Format of other CSV files for the remaining 2 suppliers and sales are the same with the first ones.

- The IDs in the Products files are referring the same product in the Sales files. Similarly, it holds for Customer IDs and Sales files as well.

You are expected to implement classes for **Customer, Product, Sales, Supplier, SalesManagement, SalesQuery, DropshippingApp (the class with main method)** and other helper classes (e.g. **FileIO**) with the information given below:
Customer:
- ID
- Name
- Email
- Country
- Address

Product:

- ID
- Title
- Rate
- Number of Reviews
- Price

Note that the rate is out of 5.0. The currency of the price is TL.

Sales:

- ID
- Customer
- Product
- Sales Date
- Sales Price

In this application the seller should make a profit by selling the product for a price a bit higher than the supplier. The sales price is therefore calculated as below:

$$SalesPrice = Price + \left(Rate/_{5.0} \times 100 \right) \times NumberOfReviews$$

Note that, each Product object has the Price, Rate and Number of Reviews data.

Supplier:

- **Product**
  - ✓ **Note:** One-dimensional array that holds **Product** objects.

SalesManagement:

- **Sales**
  - ✓ **Note:** Two-dimensional array that holds **Sales** objects for each Supplier.
  - ✓ **Ex:** For 3rd supplier's 7th Sales, it is [2][6].

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

1- The most profitable product among the three suppliers. (Please include the amount of profit to output.)
2- The most expensive product in terms of Sales Price. (Please include the amount of Sales Price to output.)
3- The customer who purchases the most products for all three suppliers. (Please include the number of purchases to output.)
4- The total profit that is made from all sales.
5- The least-profit product of S1. (Please include the amount of profit to output.)

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. An example output is given below:

```
1-) C4 Goodal Vita C 4.7 97 489 -> 250 TL profit
2-) O2 Atmospherebasic Fitness Bag 4.2 350 109 -> with sales price 135000 TL
3-) ESU42YOF7SX Ariana Bullock rutrum.non@aol.edu India 227-7329 Aliquam Ave -> 15 purchases
4-) 10000 TL
5-) E11 Canon Inkjet Printer 4.4 1328 940 -> 5 TL profit
```

You can apply this style to your output or create your own style. If you prefer your own style, please be sure that you add all necessary information.

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). Please be sure of it, otherwise there will be **no output** of your application and you certainly will **lose points**.

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.

References

1. https://www.oberlo.com/blog/what-is-dropshipping

Assignment Rules:

1. In this lecture's homework, there are no cheating allowed. If any cheating has been detected, they will be <u>graded as 0</u> and there will be no further discussion on this.

2. You are expected to submit your homework in groups. Therefore, <u>only one of you</u> will be sufficient to submit your homework.

3. Make sure you export your homework as an <u>Eclipse project</u>. You can use other IDEs as well, however, you must test if it **can be executed** in Eclipse.

4. Submit your homework through Cloud-LMS.

5. Your exported Java Project should have the following naming format with your assigned group ID (which will be announced on MS Teams) as the given below:

<p style="color:red">G05_CENG211_HW1</p>

Also the zip folder that your project in should have the same name

<p style="color:red">G05_CENG211_HW1.zip</p>

6. Please beware that if you do not follow the assignment rules for exporting and naming conventions, you will lose points.

7. 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.