Due Date: 30.10.2021 23:55

CENG211 – Programming Fundamentals
Homework #1

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

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

In the Library Management App, there are the records of the three libraries that are located in different areas in a university campus. The libraries are called L1 which is the Central Library, L2 which is the School of Foreign Languages Library and L3 which is the Computer Science Library.

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 "L1_Books.csv", the information is as follows:
  ID,Title,Author,Publisher,Edition,Genre,Quantity
- In "Members.csv" the information is as follows:

  ID,Name,Email

  In "L1_Issues.csv", the information is as follows:
  ID,Member ID,Book ID,Issue Date,Returning Date
- Format of other CSV files for the remaining 2 libraries are the same with the first one.
- The IDs in the Books files are referring the same book in the Issues files. Similarly, it holds for Members IDs and Issues as well.

You are expected to implement classes for **Member, Book, Issue, Library, LibraryManagement, LibraryQuery, LibraryManagementApp (the class with main method)** and other helper classes (e.g. **FileIO**) with the information given below:

Member:

- ID
- Name
- Email

Book:

- ID
- Title
- Author
- Publisher
- Edition
- Genre
- Quantity

Issue:

- ID

- Member
- Book
- Issue Date
- Returning Date

Library:

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

LibraryManagement:

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

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

1- The most issued book (among the three libraries).
2- The member who issues the most books (for all three libraries and all years).
3- Highest penalty for late returning (Note that borrowing period of a book is 14 days. After 14 days, 0.50 TL penalty for each day is charged).
4- The book with the most copies (among the three libraries).
5- The book with the fewest copies of previously issued books.
6- The member who issues the least number of books from the Computer Science Library.

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) Introduction to Algorithms
2) Jane Doe
3) 136 TL
4) Operating System Concepts
5) Elements of Success with Essential Online Practice
6) John Doe
```

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 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:

   G05_CENG211_HW1

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

   G05_CENG211_HW1.zip

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.