College of AI, Cyber, and Computing
Department of Computer Science

Fundamentals of Object-Oriented Programming
CS 2113 (Section 3)

Project 2 – Media Mania Inventory

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You are part of a team that has been hired by a company called Media Mania. They buy and sell physical media such as: Movies, TV Shows, Video Games, and Music Albums. Due to their recent popularity, they are in need of some digital solutions to their inventory and product management problems. You are tasked with creating an inventory management sub-system (i.e., this is a small part of the overall system). You have been given some example data in a csv (comma-separated value) file for some products that the company has. They would like to be able to access this data for browsing, sales, and business statistical analysis.

Your ultimate goal for this project is to be able to read in the example data into an ArrayList and then perform some simple analysis.

Classes

You will need to create a class for each of the different types of product categories (Movies, TV Shows, Video Games, and Music Albums) and all the attributes that represent them (note, you do not have to store the "type" of the media since the Class itself will define that for you), as well as a generalized class that they all inherit from so they can be easily managed through a single ArrayList. You may make additional generalized Classes if you feel that would be useful to you (e.g., Movie and TV Show seem to have a lot of similar data). You may assume that all data attributes are available/defined for every product. Please make sure to look at the data in the given file and choose appropriate types for them; do not assume all data attributes will be the same, even if they have the same name (e.g., Movie duration and Music Album duration are both in minutes, but Movies use an integer while Music Albums use a double; you may choose to use an integer for Movies and a double for Music Album or a double for both Movies and Music Albums, but you shouldn't/can't use an integer for Music Album).

You will also create a Class that will manage the ArrayList of all media and perform some analysis on it. Finally, you will create a Driver class that will use the manager Class to print out the analysis as a report.

Manager Class

The manager Class must store/access ALL media through a SINGLE ArrayList (i.e., you are not allowed to have 4 separate ArrayLists, one for each media type). You may create additional ArrayLists on the fly if you feel it is easier to manage (i.e., you can take the single ArrayList with all the media and create another local ArrayList of just Movies to do an analysis on), but the class itself can only have a single ArrayList as a Class member/attribute. Note: you are not required to use the ArrayList's generics, but it will likely make things easier for you (i.e., you won't have to do nearly as much casting to different types if you use the generics).

The manager Class will be responsible for loading in the data from the given csv file. Please make this a method that will accept a String as a parameter which will be the file name that contains the product data you are reading into your program (i.e., the Driver will call the manager Class method responsible for loading the product data giving it the file name); in this way, you will be able to load product data from any file, as long as the file utilizes the same format as your current file (which is an assumption we are comfortable making). Note: please make sure to put your file in the correct location in your project in Eclipse (or whatever IDE you are using) for easy access/reading.

The manager Class will also be responsible for performing different analyses on the product data:

- Count the total number of products
- Count the total number of Movies
- Count the total number of TV Shows
- Count the total number of Video Games
- Count the total number of Music Albums
- Find the oldest product (by release_year)
- Find the most popular Music Album (i.e., the one that had the highest sales)
- Find the most popular Video Game (i.e., the one that sold the most copies)
- Find the most common age rating among all film products (i.e., Movies and TV Shows)
- Find the shortest Movie
- Find the shortest Music Album

Note: NONE of the manager Class methods should print out anything directly (i.e., should not call any form of System.out.print(ln)), they should only return the data/analyses; the Driver will be responsible for formatting/printing the data. Additional Note: The data file you have been given is an example or test file, make sure these analyses are calculated through generalized solutions/algorithms as the graders will test your code on a DIFFERENT dataset than the one you are using; the other dataset will have the exact same format as the one you have, but all the data will be different.

Data Attributes

The following are the data attributes for each product type. They are listed in the file in the exact order as shown:

- Movie: id,type,title,director,country,release_year,rating,duration_(minutes),description
- TV Show: id,type,title,director,country,release_year,rating,number_of_seasons,description
- Video Games: id,type,title,platform,release_year,genre,publisher,copies_sold_(millions)
- Music Albums: id,type,release_year,artist,title,global_sales,tracks,duration_(minutes),genre

To look/browse through the data you may use Excel, Google Sheets, or any other similar product; however, it is recommended to open the data in notepad/wordpad (or a similar application) to better understand how to read the file into your program. Each product appears on its own line and the data is separated by commas. You should be able to read in the data one line at a time and separate it using String's "split" method. This should give you an array of the data for easy processing and Class creation/instantiation. It is recommended to use the FileReader and BufferedReader Classes for reading the file data, but it is not necessary; you may use whatever approach you wish to read

in the data. At the end of reading/loading the data into the program, you should have one Object for each product listed in the file (i.e., you should have a total of 41 Objects in your ArrayList at the end of processing the data file, each of which should be instantiated as one of the specialized product Classes: Movie, TV Show, Video Game, or Music Album).

Driver

Finally, the Driver class will be responsible for instantiating a single manager Class and giving it the filename for it to load in all of the product data. Have Driver then call each of the analyses listed above in the order they are listed and print out each result that is returned on a separate line. Make sure to print out a message/label with the result and not just the value (e.g., for the first calculation, there should be 41 total products, do not just print out "41", instead print out something like "Total number of products: 41").

Submission

Submission Instructions: Please export your ENTIRE project from Eclipse (or whatever IDE you are using) as an archive zip file. Upload the file to the Project 2 submission in Canvas.

Create a `REPORT.txt` file to answer the following questions:

1. List all of the people that you have collaborated with on this assignment (discussing high-level ideas are OK, but never share implementation details or code). For each person indicate the level of collaboration (small, medium, large). Also write a few sentences describing what was discussed. Indicate whether you were mainly giving help or receiving help.
2. Do you think everything you did is correct? If not, give a brief description of what is working and what progress was made on the part that is not working.
3. Comments (e.g., what were the challenges, how to make this assignment more interesting etc.).

Also, you will have a presentation for this project. The format and details of the presentation will be announced later.

Note: You may complete this project individually or in a group with **a maximum of 2 members**. Your code should be well-commented, as this will be part of the grading.