Object Oriented Programming **Final Exam, Spring 2021**

Due: 12. 06.2021 by 23:59pm through UBIS system (no late or through email submissions)

Note: This is an individual project. Please check the syllabus on what is allowed and what is not.

Final exam programming project is about a shopping application. You will have the following classes (the bare essentials):

1. Product, Customer, TV, Phone, and DrawingTablet where TV, Phone and DrawingTablet is a product that you are selling.

2. You will create and use three files: customer.txt file for storing customer information (for login), purchases.txt (for storing customer purchases information) and products.bin for products (storing products information).

3. The customers.txt file will store the customer information in a text-based format. The minimum you should have is the customer name, password, and customer Id. Since this is a text-based file think of delimiters (separators) that separates each customer and his/her info.

4. Similarly the purchases.txt file contains customer Id and the products' ids that the customer bought where each product bought will be separated by some delimiter and each customer's purchase information is separated by a *new line* (reasons for new line will be clear in the following statement). If a customer has multiple purchases (at different times) then they should be on separate lines in this purchases.txt file.

5. Product will have productName, product ID, how many of it is in stock, type (TV, Phone, etc..), and price data fields. Product class has read and write methods that will read and write a product's data from/to the products.bin file. Each subclass should override the read and write methods. Each product Id is used for dual purposes. First this unique number is the first byte written to the products.bin file as the first piece of data for every product. Reading this number first we can call the right product object type reference to read the rest of the product information in the products.bin file. Second purpose of this unique number is that it connects the product to the customer in the purchases.txt file.

6. TV should have the screensize additionally, Phone should have camera resolution and DrawingTablet should have whether its pen is using a battery or not.

7. The products.bin file should contain information about all the products.

   a. Productname is a string of length 256 bytes (pad with space if needed)

   b. Product ID is a byte,

   c. Its stock count is an integer,

   d. Its price is float,

   e. its type is String of length 32 bytes (pad with space if needed)

For a TV its

a. screen size is a string in the form “26inch” of 8 bytes (pad it with spaces if needed),

For a Phone its

a. camera resolution is a string of the from “8megapixels” of 16 bytes (pad with spaces if needed)

For a DrawingTablet its

a. whether the pen batteryless or not, a single byte.

Note: You will use FileOutputStream and FileInputStream classes for dealing with the products.bin file. Products.bin file should still contain a product’s information even if its stock count drops down to zero.

For each subtype of Product (TV, Phone, etc…) will override the read and write methods.

8. Once your console-based application starts it will ask the customer to log in. After login The customer can see all the products’ names. Selecting that product name (how the customer selects depends on you), the application should give all the details to the customer about that product. All the products selected by a customer for purchase should be placed in the customer’s shopping cart. What you use for the shopping cart depends on you. Once the user purchases the products in the shopping cart, the products should be appended to the purchases.txt file and the quantities should be subtracted from the products.bin file (no purchase of a product is allowed if its stock count is 0 (zero)). Also the shopping cart should be emptied after a purchase. The customer should also be able to discard his/her shopping cart at any time or delete a product from it.

After login a customer should be able to see all his/her previous purchases.

9. A customer should be able to do a search by type, for example, searching for TVs or Phones etc.

10. Each subclass of Product should override the toString method which will be called when printing the product information to the screen for customers’ needs.

11. Have a main method (and a class) to test your program. In the main, do reading/writing of the products.bin file polymorphically. Have a default parameterless and with parameter constructors for each Product subtype. The default parameterless constructors could be used to create an instance of the subtype object whose references could be stored in an array of type Product. This way if the product Id is 0, you should read for example the TV product (index 0 in this array has a reference to the TV object), if the product Id is 1 and the index 1 object in this array could be used to read the rest of the data from the products.bin file and so on. Writing is done similarly.

Deliverables:

1. All your source code as pdf file.
2. A run of your program (the screen shot) that shows your input (in your source code) and the output in the console.
3. A readme.txt file that explains what you accomplished and what not (hopefully nothing) very briefly.