CMSC203
Assignment #6

Bradley Beverage Shop

Bradley shop is a family-owned store that sells beverages. The store offers 3 types of beverages: Coffee, Alcohol, and Smoothie. The store is open from 8 in the morning to 11 pm in the afternoon. The owner of the shop likes to automate the order transactions and reports and purchase a software for testing order activities for one month. You are asked to implement this software based on the following requirements.

Assignment Description

BevShop (The Data Manager Class)

The BevShop offers 3 types of beverages: Coffee, Alcoholic and Smoothie. Beverages can be ordered in 3 different sizes: Small, medium and large. All the beverage types have a base price. In addition there are additional charges depending on the size and specific add-ons for each type of beverage.

The BevShop has the following functionality:

- Create and process orders of different types of beverages
- Provide information on all the orders
- Total amount on a specific order
- Monthly total number of orders
- Monthly sale report

Concepts tested by this assignment

- Aggregation
- Searching an Arraylist
- Selection sort
- Enumeration
- Inheritance
- Interface
- Polymorphism
- Abstract classes
- Overriding methods

Interfaces

OrderInterface
This interface is provided for you and is implemented by the **Order** class.

BevShopInterface
This interface is provided for you and is implemented by the **BevShop** class.

Classes

Enumerated Type – DAY

Create an enumerated type called **DAY**. The valid values will be MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, SATURDAY, SUNDAY.

Enumerated Type – SIZE

Create an enumerated type called **SIZE**. The valid values will be SMALL, MEDIUM, LARGE.

Enumerated Type – TYPE

Create an enumerated type called **TYPE**. The valid values will be COFFEE, SMOOTHIE, ALCOHOL

Data Element - Beverage
Create an abstract class called **Beverage** with:

- Instance variables for beverage name, beverage type, size, and constant attributes for the base price ($2.0) and size price (additional $1 to go a size up).
- A parametrized constructor to create a Beverage object given its name, type and size
- An abstract methods called **calcPrice** that calculates and returns the beverage price**.**
- An Overridden **toString** method: String representation for Beverage including the name and size
- An Overridden **equals** method: checks equality based on name, type, size of the beverage
- getters and setters and any other methods that are needed for your design.
- Use finals to represent constants.

Data Element – subclasses of Beverage
Create the following subclasses of Beverage for the 3 types of beverages:

Coffee

- Contains additional instance variables of type boolean to indicate if it contains extra shot of coffee (additional cost of 50 cents) and extra syrup (additional cost of 50 cents).
- A parametrized constructor
- An Overridden **toString** method: String representation of Coffee beverage, including the name , size , whether it contains extra shot, extra syrup and the price of the coffee
- An Overridden **calcPrice** method.
- An Overridden **equals** method: checks equality based on the Beverage class **equals** method and additional instance variables for this class.
- getters and setters and any other methods that are needed for your design.

- Use finals to represent constants.

Smoothie

- Contains additional instance variables for number of fruits and boolean variable to indicate if protein powder is added to the beverage. The cost of adding protein is $1.50 and each additional fruit costs 50 cents.
- A parametrized constructor
- An Overridden **toString** method: String representation of a Smoothie drink including the name , size, whether or not protein is added , number of fruits and the price
- An Overridden **equals** method: checks equality based on the Beverage class **equals** method and additional instance variables for this class.
- An Overridden **calcPrice** method.
- getters and setters and any other methods that are needed for your design.
- Use finals to represent constants.

Alcohol

- Contains additional instance variable for weather or not it is offered in the weekend. The additional cost for drinks offered in the weekend is 60 cents.
- A parametrized constructor
- An Overridden **toString** method: String representation of a alcohol drink including the name, size, whether or not beverage is offered in the weekend and the price.
- An Overridden **equals** method: checks equality based on the Beverage class **equals** method and additional instance variables for this class.
- An Overridden **calcPrice** method.
- getters and setters and any other methods that are needed for your design.
- Use finals to represent constants.

Data Element – Customer

Create a class to represent a customer.

- Instance variables for name and age
- A parametrized constructor
- A Copy constructor
- An Overridden **toString** method: String representation for Customer including the name and age
- getters and setters and any other methods that are needed for your design.

Data Element – Order

Create a class to represent an order. This class implements two interfaces: **OrderInterface** and **Comparable.**

- Instance variables for order number, order time, order day and customer and a list of beverages within this order
- A method to generate a random number within the range of 10000 and 90000
- A parametrized constructor
- A method called **addNewBeverage** that adds a beverage to the order. This is an overloaded method to add different beverages to the order. Refer to the interface OrderInterface provided for you,

- An Overridden **toString** method: Includes order number, time, day, customer name, customer age and the list of beverages (with information of the beverage).
- Override the **compareTo** method to compare this order with another order based on the order number. Returns 0 if this order number is same as another order's order number, 1 if it is greater than another order's order number, -1 if it smaller than another order's order number.
- getters and setters and any other methods that are needed for your design. **Note: The getter method for the customer returns a Deep copy of the customer.**
- Refer to provided **OrderInterface** interface for additional methods.
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Data Manager – BevShop

Create a class to represent a beverage shop. This class implements **BevShopInterface** provided to you.

- Instance variable for the number of Alcohol drinks ordered for the **current order**. The current order in process can have at most **3** alcoholic beverages.
- An instance list to keep track of orders
- The minimum age to order alcohol drink is 21
- time, order day and customer and a list of beverages **Order** within this order
- An Overridden **toString** method: The string representation of all the orders and the total monthly sale.
- Refer to provided **BevShopInterface** interface for additional methods.

Data Structure

- You will be using an ArrayList within your Order to hold beverages of the order and BevShop class to hold orders.

External Documentation

- Provide a UML diagram with all classes and their relationships.

Testing

There is no GUI provided for this project. To test your project, you may (recommended but not required) to create your own driver file for each class as you gradually implement code.

- Ensure that BevShopNoGUITest.java produces the following output:

```
3
21
Start a new order
Total on the Order:0.0
John
23
true
Add alcohol drink
Total on the Order:2.0
true
Add second alcohol drink
Total on the Order:6.0
2
Add third alcohol drink
Total on the Order:8.0
3
Maximum alcohol drink for this order
Add a COFFEE to order
3
Total on the Order:11.0
Total on the Order:11.0
Start a new order
Total on the Order:0.0
Add a SMOOTHIE to order
Total on the Order:6.5
Add a COFFEE to order
Total on the Order:9.5
0
Age not appropriate for alcohol drink!!
Total on the Order:9.5
Maximum number of fruits

Total on the Order:16.0
Total amount for all orders:27.0
```

- Ensure that all the given JUnit tests .java succeed.

Deliverables

Deliverables / Submissions:

GitHub: Upload all input files and all implemented files into GitHub in the repo you created in Lab 1 in a directory named CMSC203_Assignment6.

Design: UML class diagram.

Implementation: Submit a compressed file containing the follow (see below): The Java application (it must compile and run correctly); a write-up as specified below. Be sure to review the project rubric provided to understand project expectations. The write-up will include:

- UML diagram – latest version
- Any assumptions that you are making for this project
- Lessons Learned: highlights of your learning experience (see notes)

Deliverable format: The above deliverables will be packaged as follows. Two compressed files in the following formats:

Notice: Only submit the files that you implemented/Modified.

- LastNameFirstName_Assignment6_Complete.zip, a compressed file in the zip format, with the following:
    - Lessons Learned - reflection paragraphs
    - UML Diagram - latest version (Word or jpg document)
        - subdirectories and other files
        - File1.html (example)
        - File2.html (example)
    - src (directory) – Java and JUnit tests files
- LastNameFirstName_Assignment6_Moss.zip, a compressed file containing all your Java files:

This folder should contain Java source files only.

Deliverable format: The above deliverables will be packaged as follows. Two compressed files in the following formats.

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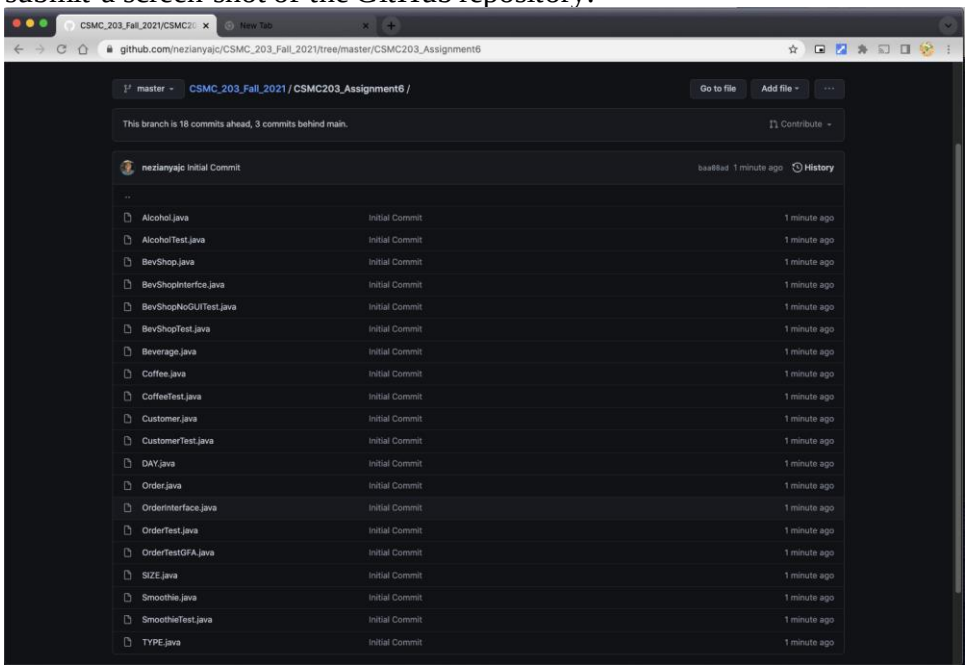
- LastNameFirstName_Assignment6_Complete.zip, a compressed file in the zip format, with the following:
    - Lessons Learned (Word document) see Notes
    - UML Diagram - latest version (Word or jpg document)
    - doc (directory) - Javadoc
        - File1.html (example)
        - File2.html (example)
    - src (directory) Java and JUnit tests files
- LastNameFirstName_Assignment6_Moss.zip, a compressed file containing all your Java files:

This folder should contain Java source files that you created or edited only

Notes:

- Lessons Learned: highlight your lessons learned and learning experience from working on this project.
  - What have you learned?
    - **I learned how to use interfaces and abstract classes much better. The concepts weren't solidified before this project.**
  - What did you struggle with?
    - **I initially struggled with the abstract method concepts.**
  - What will you do differently on your next project?
    - **I would've spent more time to make the GUI.**
  - Include what parts of the project you were successful at, and what parts (if any) you were not successful at.
    - **I believe I was successful at putting each class and methods together fairly quickly.**
- GitHub: In your repository (see Assignment0), upload your Word file and java file. You will want to upload these files as contents of a directory so that future uploads can be kept separate. Take and submit a screen shot of the GitHub repository.
- 

- Proper naming conventions: All constants, except 0 and 1, should be named. Constant names should be all upper-case, variable names should begin in lower case, but subsequent words should be in title case. Variable and method names should be descriptive of the role of the variable or method. Single letter names should be avoided.

- Documentation: The documentation requirement for all programming projects is one block comment at the top of the program containing the course name, the project number, your name, the date and platform/compiler that you used to develop the project. If you use any code or specific algorithms that you did not create, a reference to its source should be made in the appropriate comment block. Additional comments should be provided as necessary to clarify the program.
  Indentation: It must be consistent throughout the program and must reflect the control structure
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Grading Rubric

See attachment: CMSC203 Assignment 6 Rubric.xlsx