ITSE 2417
Java Programming

Programming Assignment 4

Problem

This program will have a total of 7 java files. You will create 4 classes and 3 will be provided for you. In your project you should create a package called bank. You will place all your source code in this package. You will be provided with a class called Account, Transaction, and TransactionType. AccountTest will be partially complete. The AccountTest class will be the driver class and will contain your main function. You will need to complete this file.

The classes that you will create are Transaction, AccountPersonal, AccountChecking, and AccountSaving. AccountPersonal will extend Account. AccountChekcing and AccountSaving will both extend AccountPersonal.

Account

The account class has been provided for you. This will be the parent class for the AccountPersonal class.

TransactionType

TransactionType is an enum. It has two values: Deposit and Withdrawal. TransactionType is used to determine the type of transaction in Transaction.

Transaction

A transaction is either a deposit or a withdrawal. The Transaction class is used to record the data that is pertinent to a single transaction.

AccountPersonal

AccountPersonal is a child class of Account. You should create a new class called AccountPersonal that extends Account. Make sure AccountPersonal is created in its own file called AccountPersonal.java. AccountPersonal should have the following characteristics.

- A private data field of type String called customerName to store the name of the account holder.
- A private data field called transactions. This field should be an ArrayList of Transaction. This will hold all the transactions for the account. Each transaction is an instance of the Transaction class.
- A constructor that takes a specified customer name, id, balance, annual interest rate, and date created. Make sure that you call the constructor in the Account class. Do not forget to instantiate the transactions ArrayList.
- A constructor that takes a specified customer name, id, and balance. This constructor should simply call the above constructor passing the received information along with default values for the remaining information. Pass 0.0 for the annual interest rate and the current date for date created.

- A getter and setter for the customer name.
- A getter for the ArrayList. Make sure you return an unmodifiable ArrayList.
- Override both the withdraw and deposit methods to correctly record a transaction and then store the transaction in the transactions ArrayList.
- Overload both the withdraw and deposit methods so that a description of the transaction can be passed in as well as the amount. Correctly record a transaction and then store the transaction in the tranactions ArrayList.
- Override the toString method. The toString method should output everything the Account toString method does plus the name of the account holder. This should be all on one line.

AccountChecking

Create a class called AccountChecking that extends AccountPersonal. AccountChecking should be in its own file called AccountChecking.java. A checking account has an overdraft limit that allows the account holder to withdraw the amount of the overdraft limit beyond their checking account balance. AccountChecking should have the following characteristics.

- A private field of type double for the overdraft limit.
- A constructor that takes the specified customer name, id, balance, annual interest rate, date created, and overdraft limit. Make sure that you call the constructor in the AccountPersonal.
- A constructor that takes the specified customer name, id, balance, and overdraft limit. This constructor should simply call the above constructor passing the received information along with default values for the remaining information. Pass 0.0 for the annual interest rate and the current date for the date created.
- Override the toString method. The toString method should output everything the AccoutPersonal toString method does plus the Account type and the Overdraft Limit.

AccountSaving

Create a class called AccountSaving that extends AccountPersonal. AccountSaving should be in its own file called AccountSaving.java. A saving account cannot withdraw more than its balance. AccountSaving should have the following characteristics.

- A constructor that takes the specified customer name, id, balance, annual interest rate, and date created. Make sure that you call the constructor in the AccountPersonal.
- A constructor that takes the specified customer name, id, and balance. This constructor should simply call the above constructor passing the received information along with default values for the remaining information. Pass 0.0 for the annual interest rate and the current date for the date created.
- Override the toString method. The toString method should output everything the AccoutPersonal toString method does plus the Account type.

AccountTest

AccountTest has been provided. You should study this code to determine how it works.

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Input

Input will be from a file and from code..

Output

The output will be the displayed to the monitor.

Requirements

Make sure you create a package called piggame and place all your classes in that package. You should have two classes. You should have a class called Die that is provided for you and a class called Pig that you will write.

What to submit

Create a folder called lastname_firstname_PA4 where lastname is your actual last name and firstname is your actual first name. Copy your package directory (bank) with all your java source files (should be a total of 7 files) into the folder you created above. Compress the folder and submit it on Blackboard.

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UML Class Diagram

Sample Output (to monitor)

```
ID: 1111, Balance: $951.98, Annual Interest Rate: 2.50%, Date Created: 06/12/2016
 Customer Name: Jack Sprat
 Account Type: Saving

ID: 2222, Balance: $1,035.12, Annual Interest Rate: 2.20%, Date Created: 08/10/2017
 Customer Name: Tanya Elliott
 Account Type: Checking, Overdraft Limit: $250.00

ID: 3333, Balance: $237.88, Annual Interest Rate: 3.10%, Date Created: 11/26/2012
 Customer Name: Herman Matthews
 Account Type: Checking, Overdraft Limit: $150.00

ID: 4444, Balance: $575.96, Annual Interest Rate: 2.00%, Date Created: 11/06/2019
 Customer Name: Jennifer Lopez
 Account Type: Saving
```

Sample Output (to file)

```
1111
4
D | 2019-11-06 | 100.00 | 500.00
D | 2019-11-06 | 200.00 | 600.00
D | 2019-11-06 | 150.00 | 800.00
D | 2019-11-06 | 1.98 | 950.00
2222
5
D | 2019-11-06 | 500.00 | 758.23
W | 2019-11-06 | 100.00 | 1258.23
W | 2019-11-06 | 50.00 | 1158.23
W | 2019-11-06 | 75.00 | 1108.23
D | 2019-11-06 | 1.89 | 1033.23
3333
4
W | 2019-11-06 | 50.00 | 637.27
W | 2019-11-06 | 600.00 | 587.27
D | 2019-11-06 | 250.00 | -12.73
D | 2019-11-06 | 0.61 | 237.27
4444
4
W | 2019-11-06 | 125.00 | 250.00
D | 2019-11-06 | 100.00 | 125.00
D | 2019-11-06 | 350.00 | 225.00
D | 2019-11-06 | 0.96 | 575.00
```