

CIS 1068

Assignment 5

First National Bank

You are to write a program that will create a set of bank account objects, and keep track of these object using an **array**. Your program will allow us to perform specific operations on the bank accounts stored in the array. Your program will have 2 classes defined as follows:

BankAccount.java

- 3 instance variables:
private String accountNumber
private double balance
private String accountHolderName
- 1 static variable:
private static int numberOfAccounts keep track of the number of accounts opened so far
- 8 non-static methods:
public void deposit(double amount)- this method must only accept the balance if it is a non-negative number
public void withdraw(double amount) - this method must ensure that no withdrawal will leave a negative balance
public double getBalance()
public void setAccountHolderName(String accountHolderName)
public String getAccountHolderName()
public void setAccountNumber(String accountNumber)
public String getAccountNumber()
public void printReport() - this method prints a report for the account including the account number, the owner of the account, and the balance.
- 1 static method:
public static int getNumberOfAccounts() - returns the number of accounts opened so far.
- 2 constructors:
BankAccount (String accountNumber, double balance, String accountHolderName) – This constructor must call the various setters of the class (including **deposit()**) in order to initialize the object's values. It should not directly initialize any variables (e.g. **this.balance = balance** is not allowed. Instead, use **deposit(balance)** to initialize the value).
BankAccount(String accountNumber, String accountHolderName) – This constructor must call the first constructor with a default balance of **0.0**.

Bank.java

This class will contain your main method, along with a method to perform each of the following subtasks:

1. Add a new account – This will create a new BankAccount object and add it to the array. If the array is full, the program should:
 1. create a new array that is twice the size of the current array
 2. copy all the objects from the old array into the new array
 3. set the newly created array as the main array for storing BankAccount objects (point the original array variable to the new array object)It should ask the user to enter an account number, a name, and a balance. If all 3 values are entered, your program should use the appropriate constructor to create the object. If the balance is entered as 0 or less, your program should use the BankAccount(String, String) constructor. If any other value is entered incorrectly (e.g. no name or account number) the program should print an error and no object should be created.
2. Deposit to an account – This subtask will ask the user to enter the account number that should receive the deposit, as well as the deposit amount. It will cycle through the array containing the BankAccount objects until it finds one that matches the account number entered by the user. Once the correct object has been found, it should make the deposit by calling that object's **deposit()** method. If the account is not found, it should print an error message.
3. Withdraw from an account – Similar to the deposit subtask above.
4. Sort all accounts entered so far and print a report for each – This method will sort each bank account based on their current balance in descending order. Once sorted, it will cycle through the array and call the printReport() method of each object. It must also print the total number of accounts, as well as the total and average balance of all accounts (Please note that you do not have a static variable in the BankAccount class to keep track of the total balance. You must therefore calculate it each time this subtask is executed.).
5. Search for a Bank Account – This subtask will ask the user to enter a full or partial name, and then search the array for a bank account whose accountHolderName matches the entered name. It must call the printReport() method for each bank account that it finds that is a match.

When the program first runs, the array variable used to store BankAccount objects should be initialized with an array of size 1. Afterwards, use JOptionPane to ask the user which of the aforementioned tasks she would like to perform, along with an option to exit. When an option is selected, invoke the appropriate method in your main class to perform the given subtask. The user should be continuously prompted until they choose to exit.

Upload a zip file containing both classes.

DUE DATE: November 20th, at 11:59 PM