

Diana Licon
March 14, 2021
CS 3331 – Advanced Object-Oriented Programming – Spring 2021
Dr. Daniel Mejia
Programming Assignment #3
Demo with: Nadia Atiyeh

I confirm that the work of this assignment is completely my own. By turning in this assignment, I declare that I did not receive unauthorized assistance. Moreover, all deliverables including, but not limited to the source code, lab report and output files were written and produced by me alone.

1. Program Explanation

The assignment is to build on the functionality of PA#2 while adding one additional BankStatements class. I modified the functionality of creating the hashtable containing all the customers and writing to the new and updated csv file by making them dynamic. That is, making sure the methods will work even if the csv columns are in different order. I also added the bank manager ability to add a new user and generate a bank statement for a customer. The customer can now also make a new account for themselves. I tackled this problem by taking it one piece at a time and spacing the pieces out throughout the weeks. I first made sure I had a very good Idea of how I wanted to execute each functionality. Thinking through exactly how the classes and methods would work with one another was very helpful since it prevented me from starting to execute one idea only to realize it is not possible.

2. What did I learn?

As a result of this assignment, I learned how beneficial it is to plan out the structure of the program first before going into coding. I did this in both PA1 and PA2 but I have noticed these skills get better with more practice. I now feel more confident in correctly executing an idea I have. I also got a better understanding of coding different relationships between classes. My solution can be improved by getting rid of some repeating code such as verifying if a user is in the hashTable among other things. As of now it is hardcoded in one aspects. It only works if the columns for the transaction actions are in a specific way and I can correct that in the next PA. One approach of improvement I have is to include the account numbers inside of the Hashtable key. This way I could access a customer object by knowing an account number. This would be helpful in the bank manager functionality. This programming assignment took me around 7-9 hours to complete throughout the 3 weeks.

3. Solution Design

In this programming assignment, I created the functionality for the user to create a new account. I did this in the main by simply asking if they would like a new checking/savings/credit account, only if they did not already have one and asking for the necessary arguments. I also allowed the bank manager to create a new user. The assumption I made was that in order to become a user, one must open a saving account. I also did this in the main by asking the user for the necessary arguments. I read the BankUsers csv file now as well. My approach was to first get the important indices such as name and account balances. And then once the customer object is created, I use a switch case to find the correct fields in the file and match them to the corresponding attributes. I also added the Bank statement class which generates a Bank statement for a specific person. My approach was creating an ArrayList of transactions, which is an attribute of Account. Each time the balance of an account changes, I add a transaction string which describes what happened to the ArrayList. In the BankStatement Class, customer is an attribute so I have access to each ArrayList and can write them to a txt file if a bank statement is requested.

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4. Testing

I tested my program using black-box and white-box testing. I used both to ensure that my code was running as expected and that it made sense to the user who knows nothing about the inner workings of the program. My testing practices can be improved by testing more often because When I wait too long in between tasting, the problems get bigger. I tested by running the program and inputting things myself and by testing some methods using junit.

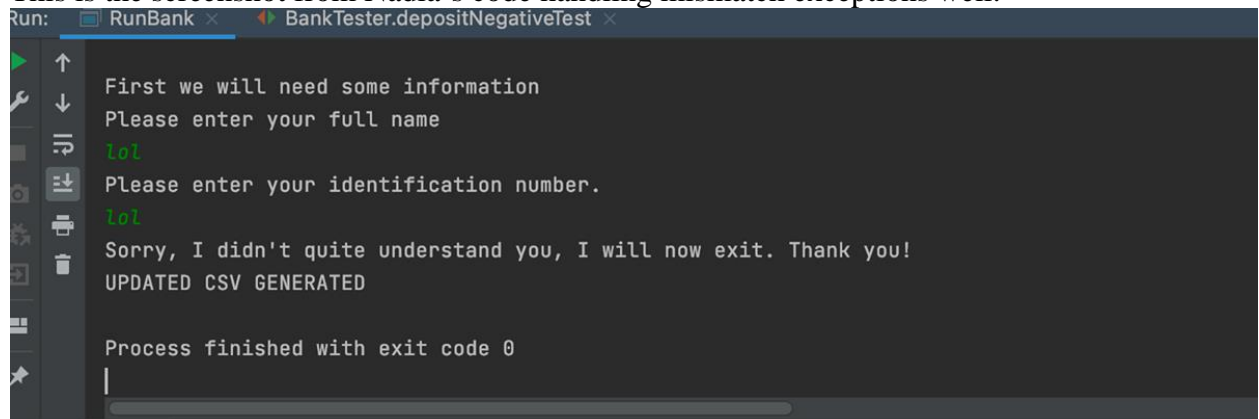
The latest test I did are below. The log.txt file generated by my program and the BankUsersUpdated.csv file reflect this testing.

5. Test results

How does she handle input mismatch?

I tested this by inputting the incorrect format of information into the console. This is black box testing since I did not know how Nadia coded these exception handlings. When inputting random things. I did not see any exceptions thrown by java, Only Nadia's message indicting that the program could not understand my input

This is the screenshot from Nadia's code handling mismatch exceptions well.



```
Run: RunBank x BankTester.depositNegativeTest x
First we will need some information
Please enter your full name
lol
Please enter your identification number.
lol
Sorry, I didn't quite understand you, I will now exit. Thank you!
UPDATED CSV GENERATED

Process finished with exit code 0
```

Do transaction actions account for errors? Wil it go on to next transaction action is one does not work?

I tested this by making sore an error would occur in the transaction actions(e.g. an account going bellow 0) and running transaction actions and seeing is all actions in the file are run or of it stops at some point because of one error. This is a combination of white box and back box since I know how the code will most probably break since I did the project myself, but black box since I did not see Nadia's code and did not know for sure how it would respond to my attempts of breaking it. When running it I noticed not all of the transaction actions were logged, so there was some issue there and it did not work as expected.

6. Test results

These are screenshots of what I inputted in the console and the corresponding logs the program produced.

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```
Hello! Thank you for choosing Disney Bank!
Are you a bank manager y/n
n
First name: Diana
last Name: Licon
Would you like to
  1)View your balance
  2)Transfer to someone
  3)Deposit
  4)Withdraw
  5)Transfer
1
Which account would you like to view?
1)Checking
2)Savings
3)Credit
1
your balance for Checkings account is 1140.14
would you like to inquire another account y/n?
n
would you like to use again?
y
```

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```
Hello! Thank you for choosing Disney Bank!
Are you a bank manager y/n
n
First name: Diana
last Name: Licon
Would you like to
  1)View your balance
  2)Transfer to someone
  3)Deposit
  4)Withdraw
  5)Transfer
2
Who would you like to send money to?
First Name: Madison
Last Name: Anderson
what account would you like to use
  1)Checking
  2)Savings
  3)Credit
2
How much money would you like to send to Madison Anderson?
100
Succesfully payed $100.0 to Madison Anderson
would you like to transfer again y/n?
n
would you like to use again?
n
```

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```
Diana Licon made a balance inquiry on Checkings-1056. Diana Licon's Balance for Checking-1056: $1140.14.  
Diana Licon paid $100.0 from Savings-2056 to Madison Anderson. Diana Licon's new balance for Savings-2056: $1040.14  
Madison Anderson received $100.0 from Diana Licon. Madison Anderson's New Balance for Checking-1039: $1971.94
```

Are you a bank manager y/n

y

would you like to...

- 1)Inquire account by name
- 2)Inquire account by type/number
- 3)create a new bank user
- 4)run transaction actions
- 5)Generate Bank Statement

3

Please input the following information about the new bank user

First name: *Chula*

Last name: *Licon*

Date of birth(mm/dd/yyyy): *04/02/2009*

Address: *123 DR*

Phone number: would you like to use again?

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```
Are you a bank manager y/n
n
First name: Chula
last Name: Licon
Would you like to
  1)View your balance
  2)Transfer to someone
  3)Deposit
  4)Withdraw
  5)Transfer
  6)create a checking Account
  7)create a credit Account
6
new checking account created successfully
would you like to use again?
y
```

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```
Are you a bank manager y/n
n
First name: Diana
last Name: Licon
Would you like to
  1)View your balance
  2)Transfer to someone
  3)Deposit
  4)Withdraw
  5)Transfer
2
Who would you like to send money to?
First Name: Chula
Last Name: Licon
what account would you like to use
1)Checking
2)Savings
3)Credit
1
How much money would you like to send to Chula Licon?
100
Succesfully payed $100.0 to Chula Licon
Diana Licon paid $100.0 from Checkings-1056 to Chula Licon. Diana Licon's new balance for Checkings-1056: $1040.14
Chula Licon received $100.0 from Diana Licon. Chula Licon's New Balance for Checking-1107: $100.0
```