CSCI 1411: Fundamentals of Computing
Lab 14
Due Date: 8:30 AM December 01, 2020

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Goals:

- Classes
- Objects
- List and List Functions
- Menu driven application

Development Environment: IDLE

Deliverables:

1. This lab handout with 4 screen shots
2. Your completed Python code (Transaction.py and BankAccount.py).
3. Data file (bank_account_data.txt)

How to take a **screen shot**:

- For a Windows 10: Use Snipping Tool to copy and CTRL + V to paste screen shot.
- For Mac: Shift + Command + 4 to copy and CTRL + V to paste screen shot.

Bank Account Register (25 points)

In this lab we will create an application to keep track of our bank transactions. This will be menu driven application which will display a menu of tasks and user will be able to select the task that they want to perform. User will have following choices:

1. Read data from the data file
2. List all transactions
3. Add a new transaction
4. Get current balance
5. Save the data to the data file.

There are three files included with this lab. These files are as follows:

1. **Transaction.py** file contains the Python code for Transaction class. It has three instance fields: date (for storing date of transaction), transaction_type (for storing type of transaction) and amount (for storing amount of transaction). There are four valid types of transactions: deposit, bank charge, and interest (interest paid to you by the bank).
2. **bank_account_data.txt** file which contains sample data that you can use to test your program. The file contains data for bank transactions, one transaction per line. The format of each line is as follows: date:transaction type:amount

3. **BankAccount.py** contains the main function, which displays the main menu and helper functions.

Start with opening each of the above files and review the code before you start writing the required code. **You do not have to add any code to the Transaction.py file**. **You will write all your code in BankAccount.py file**.

Load the `BankAccount.py` file (click `Run -> Run Module` in the `BankAccount.py` window) and run the program by typing `main()` in shell. It will display the following menu.

```
Welcome to Bank Account Application
====================================
A - Read data from the file
B - Display list of transactions
C - Add a new transaction
D - Calculate current balance
E - Save data to a file
Q - Quit
====================================
Please select an action by typing A, B, C, D, E, or Q
?
```

It will wait for you to select an action. Note that the menu is in a while loop so it will redisplay the menu when it is done with the selected action. You can quit the application by selecting quit (type q or Q). main function uses if-elif-else control structure and calls appropriate functions based on the selected action (A, B, C, D, or E). Right now the only thing that the function will do is print the name of the function. **Your task is to add code to each of the following functions to make them do their work:**

- **`read_data (list_of_transactions)`** will read transaction data from the data file and add the transactions to the `list_of_transactions`.
- **`display_list (list_of_transactions)`** will display list of all transactions sorted by date.
- **`add_transaction (list_of_transactions)`** will let you add a new transaction to the list.
- **`calculate_balance (list_of_transactions)`** will calculate the current balance and will display it on the screen
- **`save_data (list_of_transactions)`** will save the all transaction data to the data file.

Read the comments in each of the functions before writing code for that function. Also review sample interaction (given at end of this lab handout) before you write the code for any of the functions. Write the code in the following order:

1. Write code for `read_data` function and `display_list` function. Once these two functions are completed, run the program to test and make sure that all transactions

included in the data file are being displayed correctly on the screen. **If it is working correctly then take a screenshot and paste it below**.

```
==================================
Please select an action by typing A, B, C, D, E, or Q
? b
Display List Function
Read Data Function
What is the name of the file you wish to enter?: bank_account_data.txt

Date     Type    Amount($)
_____________________________
None
20201101 bank charge 12.0
20201101 interest 1.0
20201105 deposit 1000.0
20201106 withdraw 149.95
_____________________________

End of List
```

2. Write the code for `calculate_balance` and run your program to make sure that it calculates the balance correctly. **If it is working correctly then take a screenshot and paste it below**.

```
==================================
Please select an action by typing A, B, C, D, E, or Q
? d
Calculate Balance Function
Read Data Function
What is the name of the file you wish to enter?: bank_account_data.txt
Your balance is: $1162.95
```

3. Write the code for `add_transaction` function. Run your program and test it by adding a new transaction and displaying the list on the screen to verify that new transaction was added correctly to the list of transactions. **If it is working correctly then take a screenshot and paste it below.**

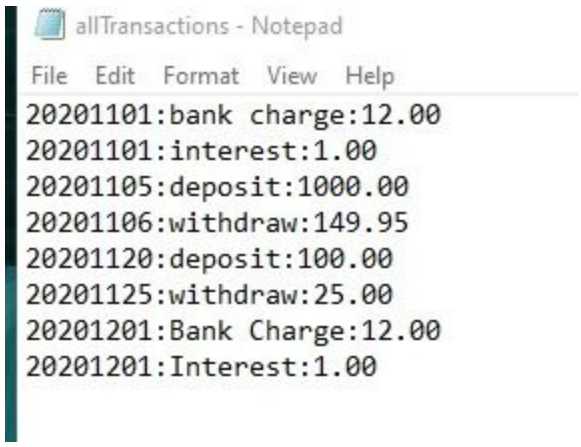
```
Please select an action by typing A, B, C, D, E, or Q
? b
Display List Function

Date      Type     Amount($)
_____________________________
20201101 bank charge 12.0
20201101 interest 1.0
20201105 deposit 1000.0
20201106 withdraw 149.95
20201120 deposit 100.00
20201120 withdraw 300.00
20201201 Bank Charge 12.00
20201204 Interest 1.00

_____________________________

End of List
```

4. Write the code for `save_data` function. You can test it by completing the following tasks: read data from data file, add a new transaction, save data to the data file. Open the data file to make sure that it contains all the original transactions as well as new transaction. **Take a screenshot of the data file and paste it below**.



5.

Paste your screen shots below this line

- **Upload this lab handout with required screenshots and your code files to Canvas to submit the lab.**

Sample Interaction

Sample Data File:

```
20201105:deposit:1000.00
20201106:withdraw:149.95
20201101:bank charge:12.00
20201101:interest:1.00
```

Sample I/O:

```
 >>> main()
Welcome to Bank Account Application

===================================
A - Read data from the file
B - Display list of transactions
C - Add a new transaction
D - Calculate current balance
E - Save data to a file
Q - Quit
===================================
Please select an action by typing A, B, C, D, E, or Q
? a

===================================
A - Read data from the file
B - Display list of transactions
C - Add a new transaction
D - Calculate current balance
E - Save data to a file
Q - Quit
===================================
Please select an action by typing A, B, C, D, E, or Q
? b
List of Transactions
Date       Type                 Amount
=========================================
20201101     bank charge         $     12.00
20201101     interest            $      1.00
20201105     deposit             $   1000.00
20201106     withdraw            $    149.95
=========================================
```

```
End of the list


==================================
A - Read data from the file
B - Display list of transactions
C - Add a new transaction
D - Calculate current balance
E - Save data to a file
Q - Quit
==================================
Please select an action by typing A, B, C, D, E, or Q
? c
Enter date using the format yyyymmdd: 20201120
Enter transaction type: deposit
Enter transaction amount: 100

==================================
A - Read data from the file
B - Display list of transactions
C - Add a new transaction
D - Calculate current balance
E - Save data to a file
Q - Quit
==================================
Please select an action by typing A, B, C, D, E, or Q
? b
List of Transactions
Date       Type                 Amount
=========================================
20201101     bank charge         $     12.00
20201101     interest            $      1.00
20201105     deposit             $   1000.00
20201106     withdraw            $    149.95
20201120     deposit             $    100.00
=========================================
End of the list
```

```
==================================
A - Read data from the file
B - Display list of transactions
C - Add a new transaction
D - Calculate current balance
E - Save data to a file
Q - Quit
==================================
Please select an action by typing A, B, C, D, E, or Q
? c
Enter date using the format yyyymmdd: 20201125
Enter transaction type: withdraw
Enter transaction amount: 25

==================================
A - Read data from the file
B - Display list of transactions
C - Add a new transaction
D - Calculate current balance
E - Save data to a file
Q - Quit
==================================
Please select an action by typing A, B, C, D, E, or Q
? b
List of Transactions
Date       Type                 Amount
=========================================
20201101     bank charge         $     12.00
20201101     interest            $      1.00
20201105     deposit             $   1000.00
20201106     withdraw            $    149.95
20201120     deposit             $    100.00
20201125     withdraw            $     25.00
=========================================
End of the list
```

```
==================================
A - Read data from the file
B - Display list of transactions
C - Add a new transaction
D - Calculate current balance
E - Save data to a file
Q - Quit
==================================
Please select an action by typing A, B, C, D, E, or Q
? c
Enter date using the format yyyymmdd: 20201201
Enter transaction type: bank charge
Enter transaction amount: 12

==================================
A - Read data from the file
B - Display list of transactions
C - Add a new transaction
D - Calculate current balance
E - Save data to a file
Q - Quit
==================================
Please select an action by typing A, B, C, D, E, or Q
? c
Enter date using the format yyyymmdd: 20201201
Enter transaction type: interest
Enter transaction amount: 1
```

```
==================================
A - Read data from the file
B - Display list of transactions
C - Add a new transaction
D - Calculate current balance
E - Save data to a file
Q - Quit
==================================
Please select an action by typing A, B, C, D, E, or Q
? b
List of Transactions
Date       Type                 Amount
=========================================
20201101     bank charge         $     12.00
20201101     interest            $      1.00
20201105     deposit             $   1000.00
20201106     withdraw            $    149.95
20201120     deposit             $    100.00
20201125     withdraw            $     25.00
20201201     bank charge         $     12.00
20201201     interest            $      1.00
=========================================
End of the list


==================================
A - Read data from the file
B - Display list of transactions
C - Add a new transaction
D - Calculate current balance
E - Save data to a file
Q - Quit
==================================
Please select an action by typing A, B, C, D, E, or Q
? d
Current balance is $903.05
```

```
==================================
A - Read data from the file
B - Display list of transactions
C - Add a new transaction
D - Calculate current balance
E - Save data to a file
Q - Quit
==================================
Please select an action by typing A, B, C, D, E, or Q
? e
Data saved

==================================
A - Read data from the file
B - Display list of transactions
C - Add a new transaction
D - Calculate current balance
E - Save data to a file
Q - Quit
==================================
Please select an action by typing A, B, C, D, E, or Q
? q

Thank you for using Bank Account Application
```

Sample Data File (after above interactions):

```
20201101:bank charge:12.00
20201101:interest:1.00
20201105:deposit:1000.00
20201106:withdraw:149.95
20201120:deposit:100.00
20201125:withdraw:25.00
20201201:bank charge:12.00
20201201:interest:1.00
```