CSCI 1411: Fundamentals of Computing
Lab 14
Due Date: December 8, 2023

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

Development Environment: IDLE

Deliverables:
1. This completed document with required screen shots.
2. Your completed Python code (Transaction.py and BankAccount.py).
3. Data file (bank_account_data.txt)

How to take a **<u>screen shot</u>**:
- For a Windows 10: Use Snipping Tool to copy and press CTRL + V to paste screen shot.
- For Mac: Press Shift + Command (⌘) + 4 to copy and press Command (⌘) + V to paste screen shot.

Bank Account Register

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. Add a new transaction.
2. Get current balance.
3. List all transactions.

There are two files included with this labs. 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, withdraw, bank charge, and interest (interest paid to you by the bank).
2. BankAccount.py contains the main function, which displays the main menu and has helper functions.

Start with opening each of the above file 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 - Add a new transaction
B - Calculate current balance
C - Display list of transactions
Q - Quit
===================================
Please select an action by typing A, B, C, 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, or Q). 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:

- `display_list (list_of_transactions)` will display list of all transactions.
- `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

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 `add_transaction` function and `display_list` function. Once these two functions are completed 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 screen shot and paste it below.

Screen Shot 1

```
>>>
    = RESTART: C:\Users\Brandon\workspace\bachelors\sem-1\fund-of-computing\BrandonPerez\completed-assignments\lab-14\BankAccount.py
>>> main()
    Welcome to Bank Account Application

    ====================================
    A - Add a new transaction
    B - Calculate current balance
    C - Display list of transactions
    Q - Quit
    ====================================
    Please select an action by typing A, B, C,or Q
    ? a
    Date: 12/1/2023
    Type: deposit
    Amount: $100

    ------------------------------------
    A - Add a new transaction
    B - Calculate current balance
    C - Display list of transactions
    Q - Quit
    ====================================
    Please select an action by typing A, B, C,or Q
    ? a
    Date: 11/25/2023
    Type: withdraw
    Amount: $25

    ====================================
    A - Add a new transaction
    B - Calculate current balance
    C - Display list of transactions
    Q - Quit
    ------------------------------------
    Please select an action by typing A, B, C,or Q
    ? a
    Date: 11/30/2023
    Type: bank charge
    Amount: $12
```

```
    ====================================
    Please select an action by typing A, B, C,or Q
    ? a
    Date: 12/1/2023
    Type: interest
    Amount: $1

    ------------------------------------
    A - Add a new transaction
    B - Calculate current balance
    C - Display list of transactions
    Q - Quit
    ====================================
    Please select an action by typing A, B, C,or Q
    ? c

     ID| Date      | Amount | Type of Transaction
    ------------------------------------------------
      1| 12/1/2023 | $100.00| deposit
      2| 11/25/2023| $25.00 | withdraw
      3| 11/30/2023| $12.00 | bank charge
      4| 12/1/2023 | $1.00  | interest

    ------------------------------------
    A - Add a new transaction
    B - Calculate current balance
    C - Display list of transactions
    Q - Quit
    ====================================
    Please select an action by typing A, B, C,or Q
    ? b

    Your current balance is $64.00

    ------------------------------------
    A - Add a new transaction
    B - Calculate current balance
    C - Display list of transactions
    Q - Quit
    ====================================
    Please select an action by typing A, B, C,or Q
    ? q

    Thank you for using Bank Account Application
```

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 screen shot and paste it below.

Screen Shot 2

```
>>>
    = RESTART: C:\Users\Brandon\workspace\bachelors\sem-1\fund-of-computing\BrandonPerez\completed-assignments\lab-14\BankAccount.py
>>> main()
    Welcome to Bank Account Application

    ------------------------------------
    A - Add a new transaction
    B - Calculate current balance
    C - Display list of transactions
    Q - Quit
    ====================================
    Please select an action by typing A, B, C,or Q
    ? a
    Date: 12/1/2023
    Type: deposit
    Amount: $100

    ------------------------------------
    A - Add a new transaction
    B - Calculate current balance
    C - Display list of transactions
    Q - Quit
    ====================================
    Please select an action by typing A, B, C,or Q
    ? a
    Date: 11/25/2023
    Type: withdraw
    Amount: $25

    ------------------------------------
    A - Add a new transaction
    B - Calculate current balance
    C - Display list of transactions
    Q - Quit
    ====================================
    Please select an action by typing A, B, C,or Q
    ? a
    Date: 11/30/2023
    Type: bank charge
    Amount: $12
```

```
    ====================================
    Please select an action by typing A, B, C,or Q
    ? a
    Date: 12/1/2023
    Type: interest
    Amount: $1

    ====================================
    A - Add a new transaction
    B - Calculate current balance
    C - Display list of transactions
    Q - Quit
    ====================================
    Please select an action by typing A, B, C,or Q
    ? c

     ID| Date      | Amount | Type of Transaction
    ------------------------------------------------
      1| 12/1/2023 | $100.00| deposit
      2| 11/25/2023| $25.00 | withdraw
      3| 11/30/2023| $12.00 | bank charge
      4| 12/1/2023 | $1.00  | interest

    ------------------------------------
    A - Add a new transaction
    B - Calculate current balance
    C - Display list of transactions
    Q - Quit
    ====================================
    Please select an action by typing A, B, C,or Q
    ? b

    Your current balance is $64.00

    ------------------------------------
    A - Add a new transaction
    B - Calculate current balance
    C - Display list of transactions
    Q - Quit
    ====================================
    Please select an action by typing A, B, C,or Q
    ? q

    Thank you for using Bank Account Application
```

Sample Interaction

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

===================================
A - Add a new transaction
B - Calculate current balance
C - Display list of transactions
Q - Quit
===================================
Please select an action by typing A, B, C, or Q
? a
Enter date using the format yyyymmdd: 20231112
Enter transaction type: deposit
Enter transaction amount: 100


===================================
A - Add a new transaction
B - Calculate current balance
C - Display list of transactions
Q - Quit
===================================
Please select an action by typing A, B, C, or Q
? c
Date         Type                 Amount
==========================================
20231112     deposit          $    100.00
==========================================
End of the list


===================================
A - Add a new transaction
B - Calculate current balance
C - Display list of transactions
Q - Quit
===================================
Please select an action by typing A, B, C, or Q
?a
```

```
Enter date using the format yyyymmdd: 20231113
Enter transaction type: withdraw
Enter transaction amount: 25


====================================
A - Add a new transaction
B - Calculate current balance
C - Display list of transactions
Q - Quit
====================================
Please select an action by typing A, B, C, or Q
?c
List of Transactions
Date          Type                Amount
==========================================
20231112      deposit             $    100.00
20231113      withdraw            $     25.00
==========================================
End of the list


====================================
A - Add a new transaction
B - Calculate current balance
C - Display list of transactions
Q - Quit
====================================
Please select an action by typing A, B, C, or Q
?a

Enter date using the format yyyymmdd: 20231101
Enter transaction type: bank charge
Enter transaction amount: 12


====================================
A - Add a new transaction
B - Calculate current balance
C - Display list of transactions
Q - Quit
====================================
Please select an action by typing A, B, C, or Q
?c
```

```
List of Transactions
Date          Type                    Amount
========================================
20231112     deposit             $      100.00
20231113     withdraw            $       25.00
20231101     bank charge         $       12.00
========================================
End of the list


==================================
A - Add a new transaction
B - Calculate current balance
C - Display list of transactions
Q - Quit
==================================
Please select an action by typing A, B, C, or Q
?a
Enter date using the format yyyymmdd: 20231101
Enter transaction type: interest
Enter transaction amount: 1


==================================
A - Add a new transaction
B - Calculate current balance
C - Display list of transactions
Q - Quit
==================================
Please select an action by typing A, B, C, or Q
?c
List of Transactions
Date          Type                    Amount
========================================
20231112     deposit             $      100.00
20231113     withdraw            $       25.00
20231101     bank charge         $       12.00
20231101     interest            $        1.00
========================================
End of the list
```

```
====================================
A - Add a new transaction
B - Calculate current balance
C - Display list of transactions
Q - Quit
====================================
Please select an action by typing A, B, C, or Q
? b
Current balance is $64.00
```

Rubric for Lab 14:

Criteria	Rating
Part 1: Screen shot 1	Screen shot included – 5 points No screen shot included – 0 points
Part 1: Screen shot 2	Screen shot included – 5 points No screen shot included – 0 points
add_transaction method	Prompts for the required information – 5 points Does not prompt for the required information – 0 points
add_transaction method	Adds the new transction to list of transactions – 5 points Does not add the new transaction to the list of transactions – 0 points
display_list method	Displays the list of transactions in form of a table using f string – 20 points Displays the list of transactions in form of a table without using f string – 10 points Displays the list of transactions without using the table format – 5 points Does not display the list of transactions – 0 points
calculate_balance method	Calculates and displays the correct balance – 20 points Does not calculate the correct balance – 0 points
Total	60