A·P·U
ASIA PACIFIC UNIVERSITY
OF TECHNOLOGY & INNOVATION

ASSIGNMENT

TECHNOLOGY PARK MALAYSIA
CT088-0-M
Programming in Python
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COURSEWORK TITLE: ONLINE BANKING SYSTEM

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1 INTRODUCTION

Keeping track of numerous customer's transactions can be quite a difficult task in every banking sector; therefore, a good online banking system is important to allow user to effectively manage all transactions of customers easily.

The main purpose of the system is to simulate customer's transaction management for bank to maintain the transaction records. The system should also provide two login portal each for admin and customer, respectively.

Admin portal in the system should be able to create new customer's profile and provide them login id and password to access the system, view, and search for specific customer's profile and able to view all transactions of specific customer.

Customer portal in the system should be able to login to the system, conduct transactions action such as deposit and withdrawal and view their own past transactions.

2 ASSUMPTION

a. I assume system can register customer.
b. I assume that with the help of this system user can login with username and password.
c. I assume both admin and customer portal can view transaction details.
d. I assume admin portal can search for specific customer's profile.
e. I assume that customer can perform deposit and withdrawal action.
f. I assume that customer can view their own transaction details.
g. I assume that user can click "q" to terminate the system.

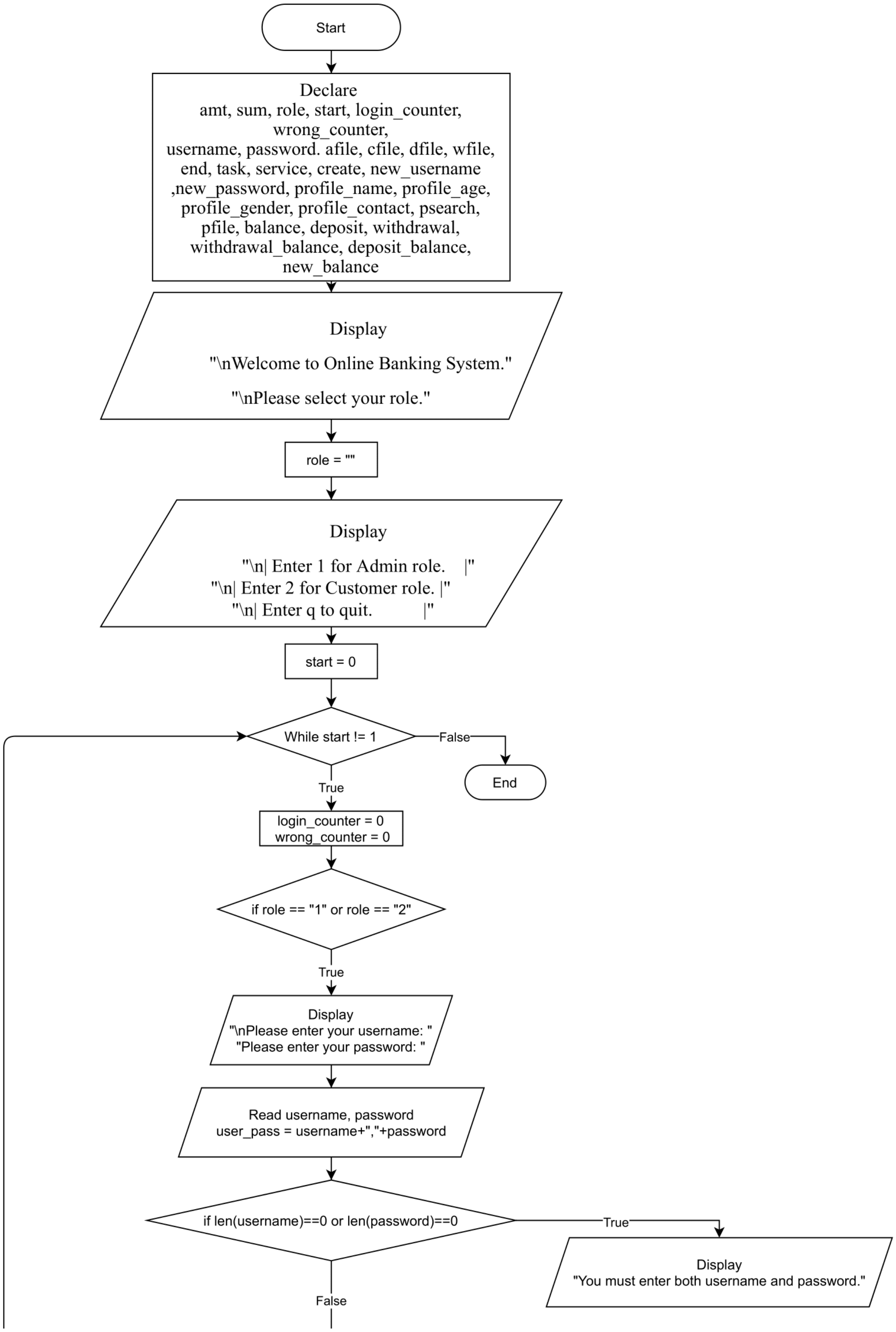
3 DESIGN - PSEUDOCODE

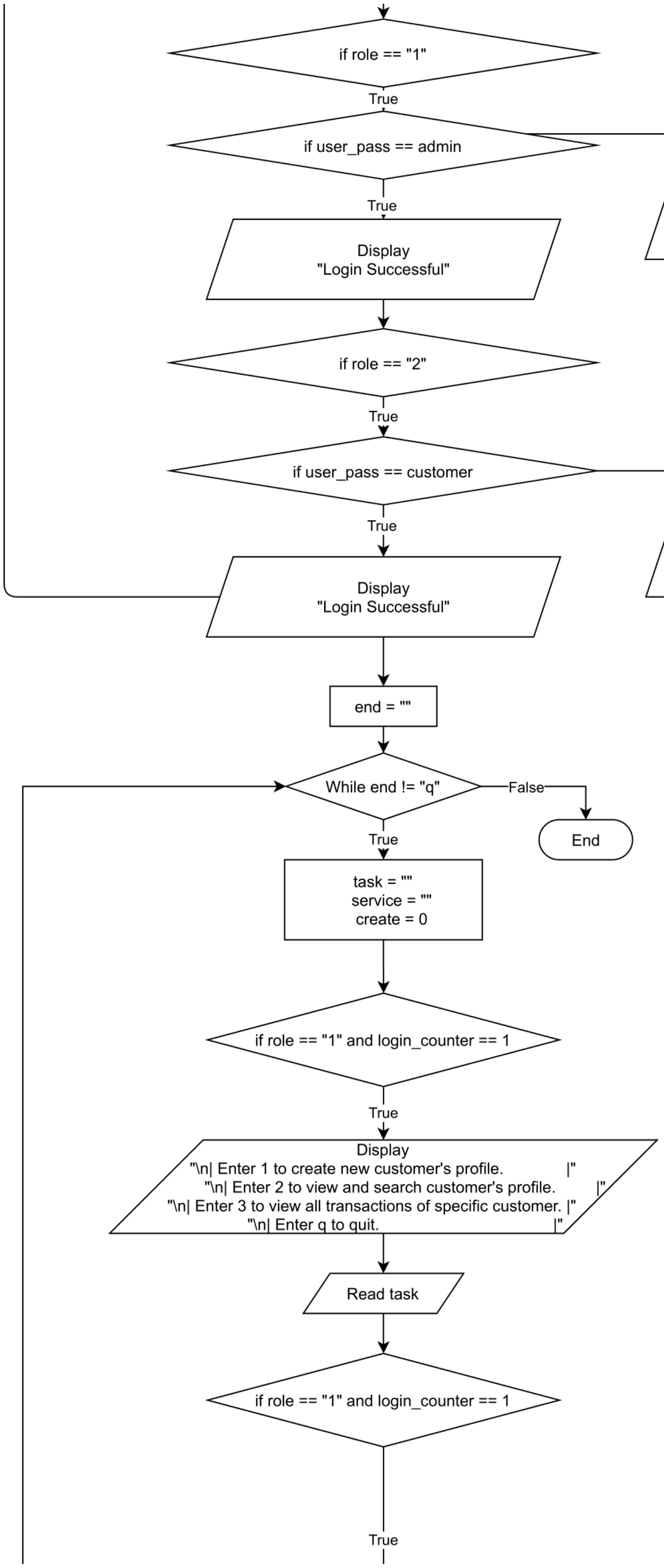
```
Function view
    Pass In: username, category(deposit/withdrawal)
    Direct the operating system to read respective text file and sum up the records
    Pass Out: sum of the value
End function

Function record
    Pass In: username, category(deposit/withdrawal)
    Read amt (value to withdraw/deposit)
    Direct the operating system to read respective text file and sum up the record
    Pass Out: sum of the value, amt input by user
End function

START
    DECLARE amt, sum, role, start, login_counter, wrong_counter, username, password. afile,
    cfile, dfile, wfile, end, task, service, create, new_username ,new_password, profile_name,
    profile_age, profile_gender, profile_contact, psearch, pfile, balance, deposit, withdrawal,
    withdrawal_balance, deposit_balance, new_balance
    DISPLAY ("----------------------------------"
        "\nWelcome to Online Banking System."
        "\nPlease select your role."
        "\n----------------------------------")
    role = “”
    DISPLAY("\n ----------------------------"
        "\n| Enter 1 for Admin role.    |"
        "\n| Enter 2 for Customer role. |"
        "\n| Enter q to quit.           |"
        "\n ----------------------------\n")
    INPUT role
    start = 0
    WHILE start != 1
        login_counter = 0
        wrong_counter = 0
        IF role == "1" or role == "2"
            DISPLAY ("\nPlease enter your username: ")
            READ username
            DISPLAY ("Please enter your password: ")
            READ password
            user_pass = username+","+password
            IF len(username)==0 or len(password)==0
                DISPLAY ("You must enter both username and password.")
            ELSE
                IF role == "1"
        READ afile
        FOR admin in afile
            IF user_pass == admin
                DISPLAY ("Login Successful")
                login_counter = 1
                start = 1
            ENDIF
        ENDFOR

        IF login_counter != 1
            READ afile
            FOR admin in afile
                IF admin.startswith(username+",")
                    DISPLAY ("Wrong Password. Please login again.\n")
                    wrong_counter = 1
                ENDIF
            ENDFOR
            IF login_counter != 1 and wrong_counter!=1
                DISPLAY ("Account not exist. Please contact bank for account creation.\n")
            ENDIF
        ENDIF
    ENDIF
    IF role == "2"
        READ cfile
        FOR customer in cfile
            IF user_pass == customer
                DISPLAY ("Login Successful")
                login_counter = 2
                start = 1
            ENDIF
        ENDFOR
        IF login_counter != 2
            READ cfile
            FOR customer in cfile
                IF customer.startswith(username+",")
                    DISPLAY ("Wrong Password. Please login again.\n")
                    wrong_counter = 2
                ENDIF
            ENDFOR
            IF login_counter != 2 and wrong_counter!=2
                DISPLAY ("Account not exist. Please contact bank for account creation.\n")
            ENDIF
```

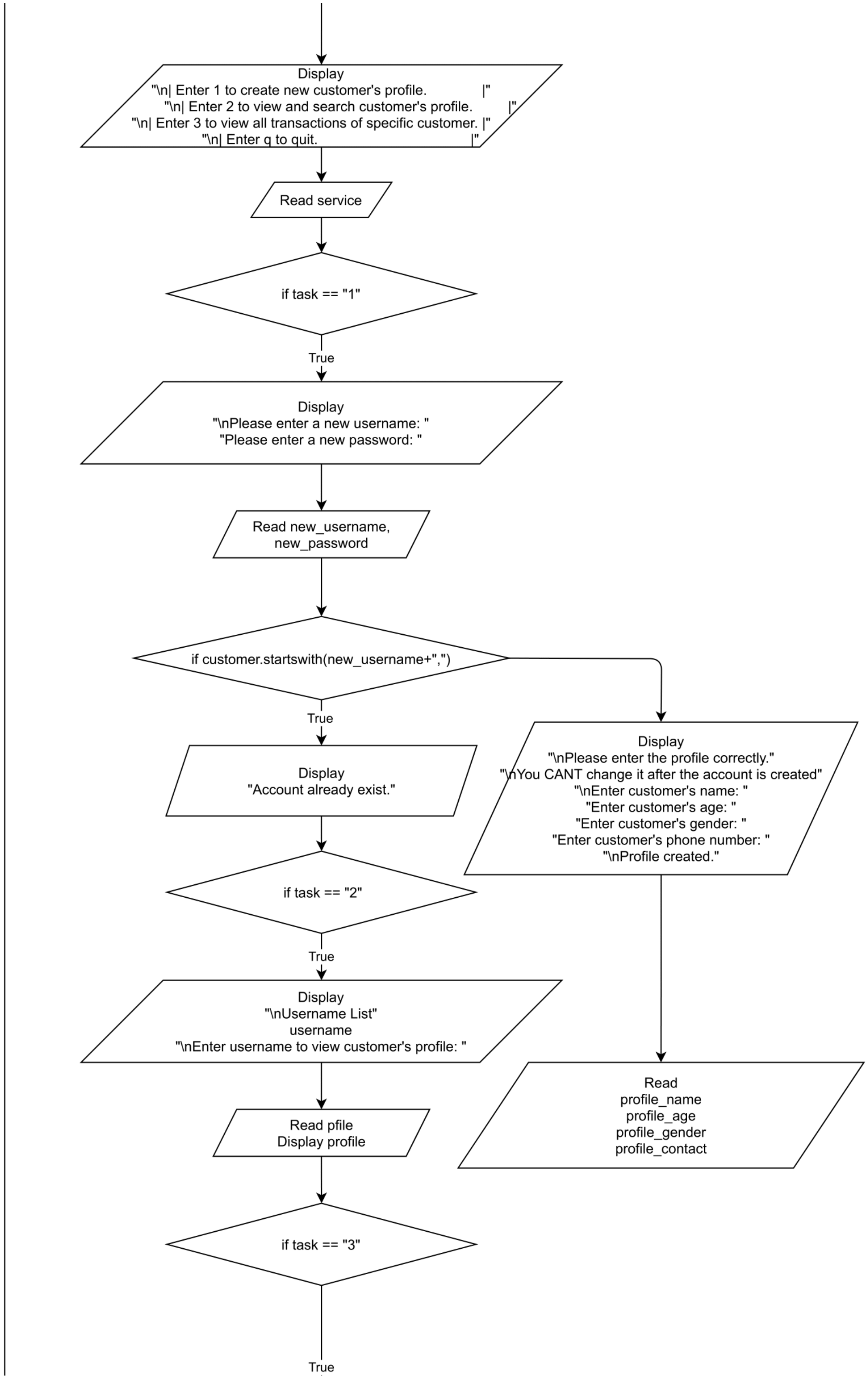
```
                ENDIF
            ENDIF
        ENDIF
    ENDIF
ENDWHILE
end = “”
WHILE end != "q"
    task = ""
    service = ""
    create = 0
    IF role == "1" and login_counter == 1
        DISPLAY("\n -------------------------------------------------------"
        "\n| Enter 1 to create new customer's profile.              |"
        "\n| Enter 2 to view and search customer's profile.         |"
        "\n| Enter 3 to view all transactions of specific customer. |"
        "\n| Enter q to quit.                                       |"
        "\n -------------------------------------------------------\n")
        INPUT task
    ENDIF
    IF role == "2" and login_counter == 2
        DISPLAY ("\n -------------------------------"
        "\n| Enter 1 to Deposit.           |"
        "\n| Enter 2 to Withdrawal.        |"
        "\n| Enter 3 to view transactions. |"
        "\n| Enter q to quit.              |"
        "\n -------------------------------\n")
        INPUT service
    ENDIF
    IF role == "q" or task == "q" or service == "q"
        end = "q"
    ENDIF
    IF task == "1"
        DISPLAY ("\nPlease enter a new username: ")
        INPUT new_username
        DISPLAY ("Please enter a new password: ")
        INPUT new_password
        FOR customer in cfile
            IF customer.startswith(new_username+",")
                DISPLAY ("Account already exist.")
                create = 1
            ENDIF
        ENDFOR
        IF create != 1
            DISPLAY ("\nPlease enter the profile correctly."
            "\nYou CANT change it after the account is created")
            DISPLAY ("\nEnter customer's name: ")
        INPUT profile_name
        DISPLAY ("Enter customer's age: ")
        INPUT profile_age
        DISPLAY ("Enter customer's gender: ")
        INPUT profile_gender
        DISPLAY ("Enter customer's phone number: ")
        INPUT profile_contact
        DISPLAY ("\nProfile created.")
        INPUT (new_username+" profile.txt")
    ENDIF
ENDIF
IF task == "2"
    READ ufile
    DISPLAY ("\nUsername List"
             "\n-------------")
    FOR username in ufile
        DISPLAY username
    ENDFOR
    DISPLAY ("\nEnter username to view customer's profile: ")
    INPUT pfile
    FOR profile in pfile
        DISPLAY profile
    ENDFOR
ENDIF
IF task == "3"
    READ ufile
    DISPLAY ("\nUsername List"
             "\n-------------")
    FOR username in ufile
        DISPLAY username
    ENDFOR
    DISPLAY ("\nEnter username to view customer's transaction: ")
    INPUT psearch
    READ tfile
    DISPLAY ("\nCustomer's Transaction"
                "\n---------------------")
    FOR transaction in tfile
        IF (transaction.startswith(psearch+",")
            DISPLAY transaction
        ENDIF
    ENDFOR
ENDIF
IF service == "1"
    call: view
    balance = view(username,"deposit") - view(username,"withdrawal")
    DISPLAY ("Your account balance is",balance)
```

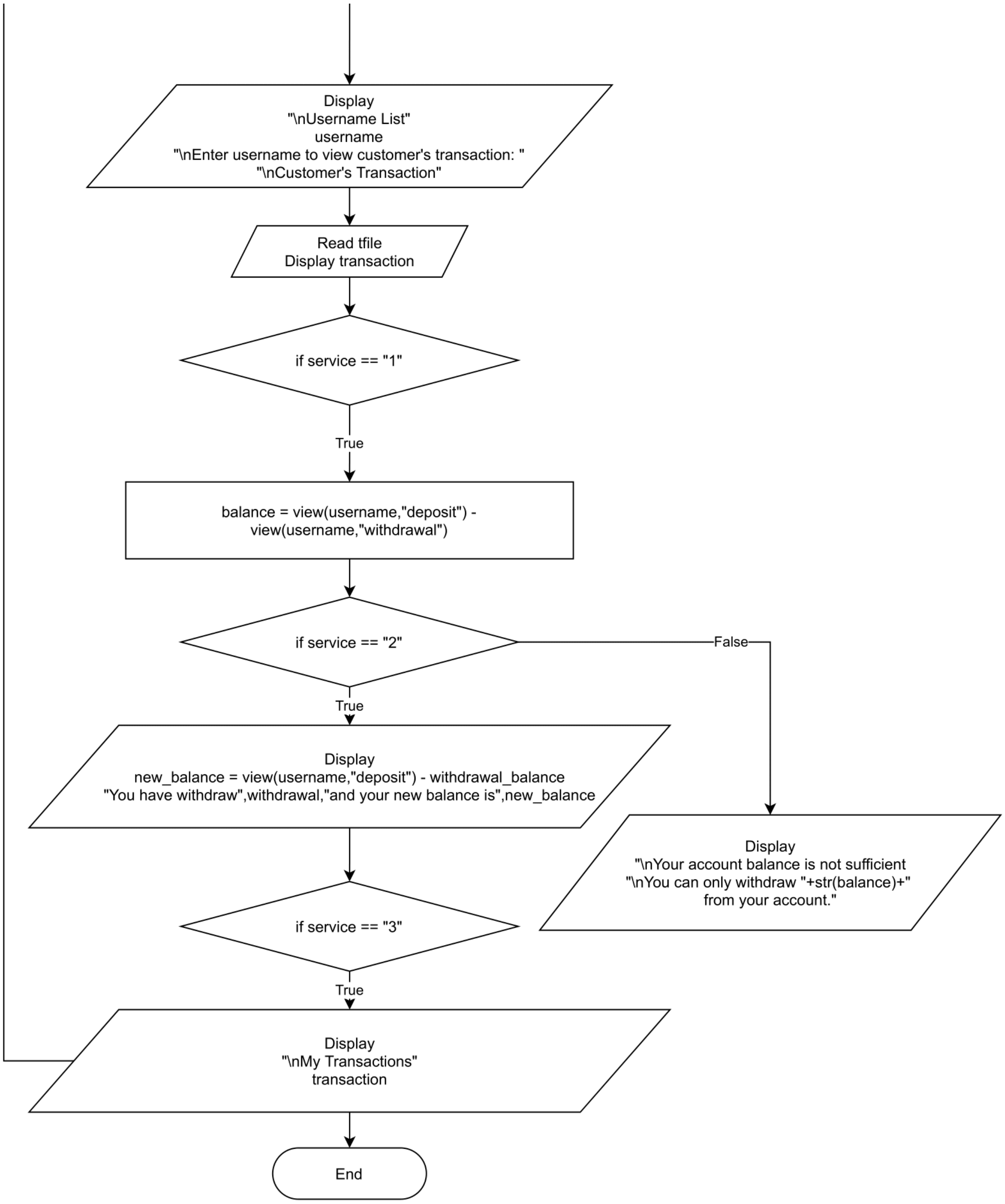
```
            call: record
            deposit , deposit_balance = record(username,"deposit")
            new_balance = deposit_balance - view(username,"withdrawal")
            READ ("transaction list.txt")
            DISPLAY ("You have deposit",deposit,"and your new balance
                    is",new_balance)
        ENDIF
        IF service == "2"
            call: view
            balance = view(username,"deposit") - view(username,"withdrawal")
            IF balance > 0
                DISPLAY ("Your account balance is "+str(balance)+"."
                      "\nYou can withdraw "+str(balance)+" from your account.")
                call: record
                withdrawal , withdrawal_balance = record(username,"withdrawal")
                IF withdrawal <= balance
                    new_balance = view(username,"deposit") - withdrawal_balance
                    READ ("transaction list.txt")
                    DISPLAY ("You have withdraw",withdrawal,"and your new
                    balance is",new_balance)
                ELSE
                    DISPLAY ("\nYour account balance is not sufficient."
                    "\nYou can only withdraw "+str(balance)+" from your account.")
                ENDIF
            ELSE
                DISPLAY ("Your account balance is not sufficient.")
        ENDIF
        IF service == "3"
            READ tfile
            DISPLAY ("\nMy Transactions"
                    "\n---------------")
            FOR transaction in tfile
                IF (transaction.startswith(username+",")
                    DISPLAY transaction
                ENDIF
            ENDFOR
        ENDIF
    ENDWHILE
END
```

4 DESIGN - FLOWCHART


Start
Declare
amt, sum, role, start, login_counter, wrong_counter,
username, password. afile, cfile, dfile, wfile, end, task, service, create, new_username ,new_password, profile_name, profile_age, profile_gender, profile_contact, psearch, pfile, balance, deposit, withdrawal, withdrawal_balance, deposit_balance, new_balance
Display
"\nWelcome to Online Banking System."
"\nPlease select your role."
role = ""
Display
"\n| Enter 1 for Admin role. |"
"\n| Enter 2 for Customer role. |"
"\n| Enter q to quit. |"
start = 0
While start != 1
False
End
True
login_counter = 0
wrong_counter = 0
if role == "1" or role == "2"
True
Display
"\nPlease enter your username: "
"Please enter your password: "
Read username, password
user_pass = username+","+password
if len(username)==0 or len(password)==0
True
Display
"You must enter both username and password."
False

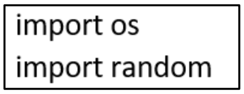

if role == "1"
True
if user_pass == admin
False
Display
"Wrong Password. Please login again.\n"
True
Display
"Login Successful"
if role == "2"
True
if user_pass == customer
False
Display
"Wrong Password. Please login again.\n"
True
Display
"Login Successful"
end = ""
While end != "q"
False
End
True
task = ""
service = ""
create = 0
if role == "1" and login_counter == 1
True
Display
"\n| Enter 1 to create new customer's profile. |"
"\n| Enter 2 to view and search customer's profile. |"
"\n| Enter 3 to view all transactions of specific customer. |"
"\n| Enter q to quit. |"
Read task
if role == "1" and login_counter == 1
True


Display
"\n| Enter 1 to create new customer's profile. |"
"\n| Enter 2 to view and search customer's profile. |"
"\n| Enter 3 to view all transactions of specific customer. |"
"\n| Enter q to quit. |"
Read service
if task == "1"
True
Display
"\nPlease enter a new username: "
"Please enter a new password: "
Read new_username,
new_password
if customer.startswith(new_username+",")
True
Display
"Account already exist."
Display
"\nPlease enter the profile correctly."
"\nYou CANT change it after the account is created"
"\nEnter customer's name: "
"Enter customer's age: "
"Enter customer's gender: "
"Enter customer's phone number: "
"\nProfile created."
if task == "2"
True
Display
"\nUsername List"
username
"\nEnter username to view customer's profile: "
Read
profile_name
profile_age
profile_gender
profile_contact
Read pfile
Display profile
if task == "3"
True


Display
"\nUsername List"
username
"\nEnter username to view customer's transaction: "
"\nCustomer's Transaction"
Read tfile
Display transaction
if service == "1"
True
balance = view(username,"deposit") - view(username,"withdrawal")
if service == "2"
False
True
Display
new_balance = view(username,"deposit") - withdrawal_balance
"You have withdraw",withdrawal,"and your new balance is",new_balance
Display
"\nYour account balance is not sufficient
"\nYou can only withdraw "+str(balance)+"
from your account."
if service == "3"
True
Display
"\nMy Transactions"
transaction
End

5 SAMPLE PYTHON CODE

5.1 Import file

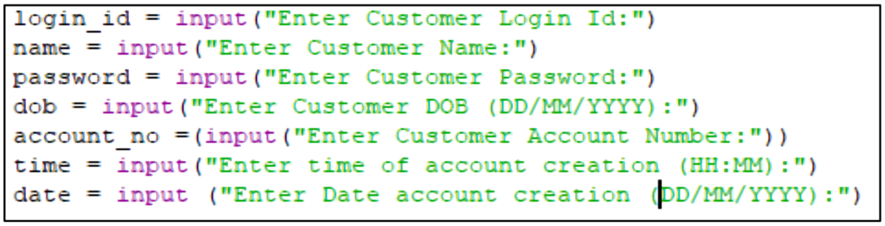


```
import os
import random
```

Import os imports os module which is a part of the standard library within Python. Even though it comes with Python installation, but it still needs to be imported.

Import random imports random module which relate with random number generation such as random () function that can generates random numbers between 0 and 1.

5.2 Variable

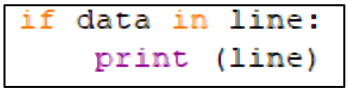


```
login_id = input("Enter Customer Login Id:")
name = input("Enter Customer Name:")
password = input("Enter Customer Password:")
dob = input("Enter Customer DOB (DD/MM/YYYY):")
account_no =(input("Enter Customer Account Number:"))
time = input("Enter time of account creation (HH:MM):")
date = input ("Enter Date account creation (DD/MM/YYYY):")
```

Variable is a named placeholder where programmer can store data and later retrieve the data using the variable name. Programmers can name the variables and change the contents of a variable in a later statement.

5.3 Control Structure

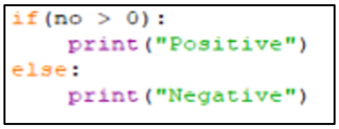
5.3.1 If



```
if data in line:
    print (line)
```

If statement is one-way decision-making operations. It runs only when the if statement is true. If the condition is false, since there is no else statement, it will proceed with next codes.

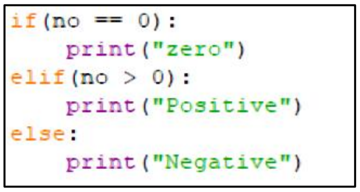
5.3.2 If-else



```
if(no > 0):
    print("Positive")
else:
    print("Negative")
```

If-else statement is two-way decision-making operations. It runs only when the if statement is true. If the condition is false, then the else statement runs before proceeding to next codes.

5.3.3 Nested if-else

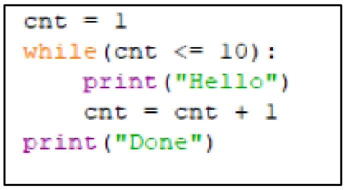


```
if(no == 0):
    print("zero")
elif(no > 0):
    print("Positive")
else:
    print("Negative")
```

Nested if-else statement is multi-way decision-making operations. A nested if-else is an if-else statement embed inside another if-else statement. It is possible to nested multiple if-else statement inside an if-else statement.

5.4 Looping Structure

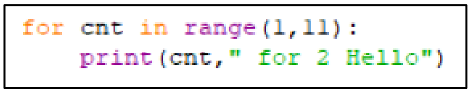
5.4.1 While loop



```
cnt = 1
while(cnt <= 10):
    print("Hello")
    cnt = cnt + 1
print("Done")
```

While loop support a set of statements is to be repeated for several times. While loops are controlled by an initialized loop variables and usually loop variables are initialized right before the loop itself.

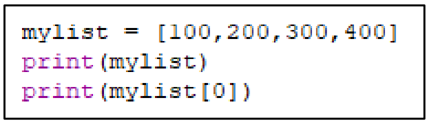
5.4.2 For loop



```
for cnt in range(1,11):
    print(cnt," for 2 Hello")
```

For loop repeats the of statement for each element by sequence. For loop end when it reaches the end of the sequence.

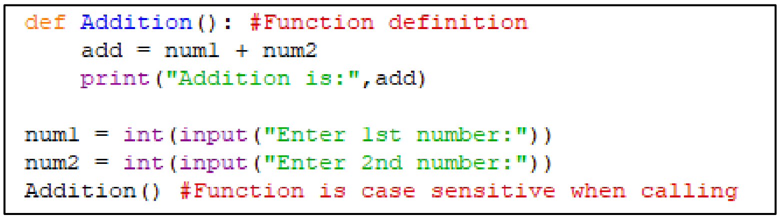
5.5 List Variable



```
mylist = [100,200,300,400]
print(mylist)
print(mylist[0])
```

List group similar items in a square bracket. Lists are heterogeneous which means the elements in a list need not be of the same type and can contain both integers and strings.

5.6 Function

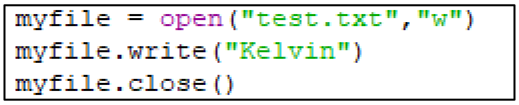


```
def Addition(): #Function definition
    add = num1 + num2
    print("Addition is:",add)

num1 = int(input("Enter 1st number:"))
num2 = int(input("Enter 2nd number:"))
Addition() #Function is case sensitive when calling
```

Function is a piece of code used to deal with a specific task. Function break programs into manageable small chunks of code. Huge programs are difficult to manage it is better to split them with the help of functions.

5.7 File

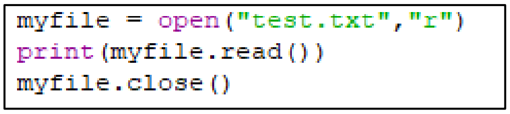
5.7.1 Write data in text file



```
myfile = open("test.txt","w")
myfile.write("Kelvin")
myfile.close()
```

Before writing data into text file, system need to open the text file with the name provided by user. “w” in the open file function will create a new text file if the text file with name provided by user is not exist. After writing data into the text file, user need to use the close file function to close the text file so the data will be saved in the text file.

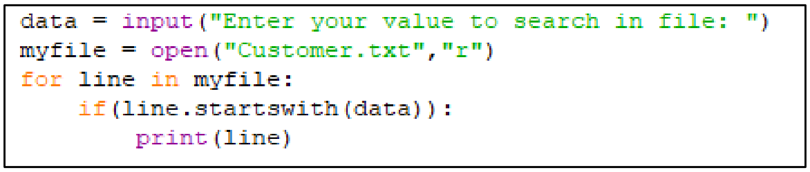
5.7.2 Read data in text file



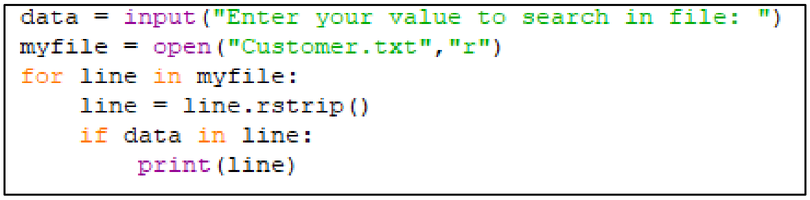
```
myfile = open("test.txt","r")
print(myfile.read())
myfile.close()
```

Before reading data from text file, system need to open the text file with the name provided by user. “r” in the open file function will only allow system to read the text file with name provided by user. After reading data from the text file and display it, user need to use the close file function to close the text file.

5.7.3 Search or modify data of text file



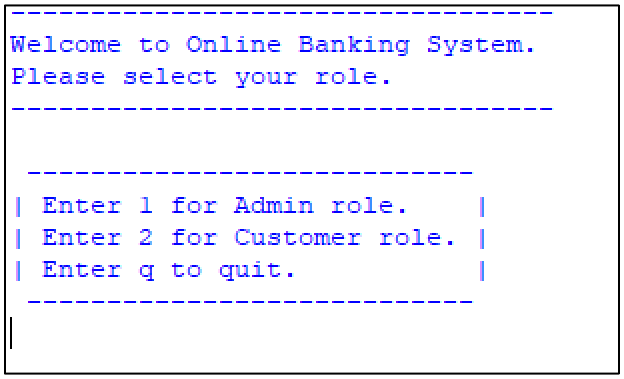
```
data = input("Enter your value to search in file: ")
myfile = open("Customer.txt","r")
for line in myfile:
    if(line.startswith(data)):
        print(line)
```



```
data = input("Enter your value to search in file: ")
myfile = open("Customer.txt","r")
for line in myfile:
    line = line.rstrip()
    if data in line:
        print(line)
```

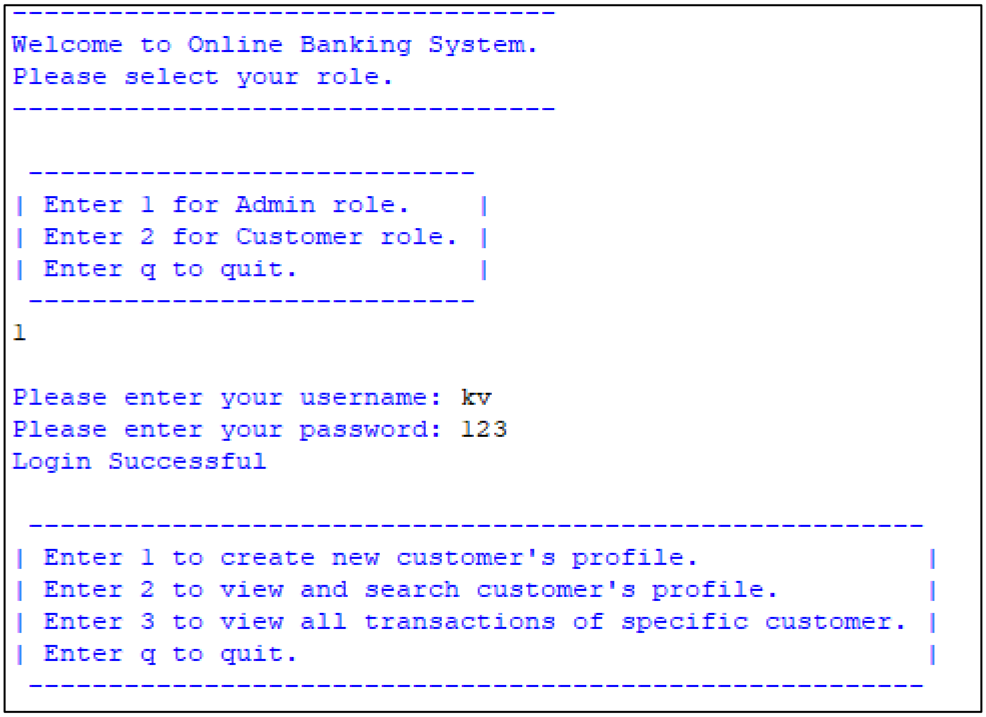
Before searching or modify data from text file, system need to open the text file with the name provided by user. “r” in the open file function will only allow system to read the text file with name provided by user. After reading data from the text file, a for loop is use to search and modify each and every line in the text file.

6 SCREENSHOT OF INPUT / OUTPUT



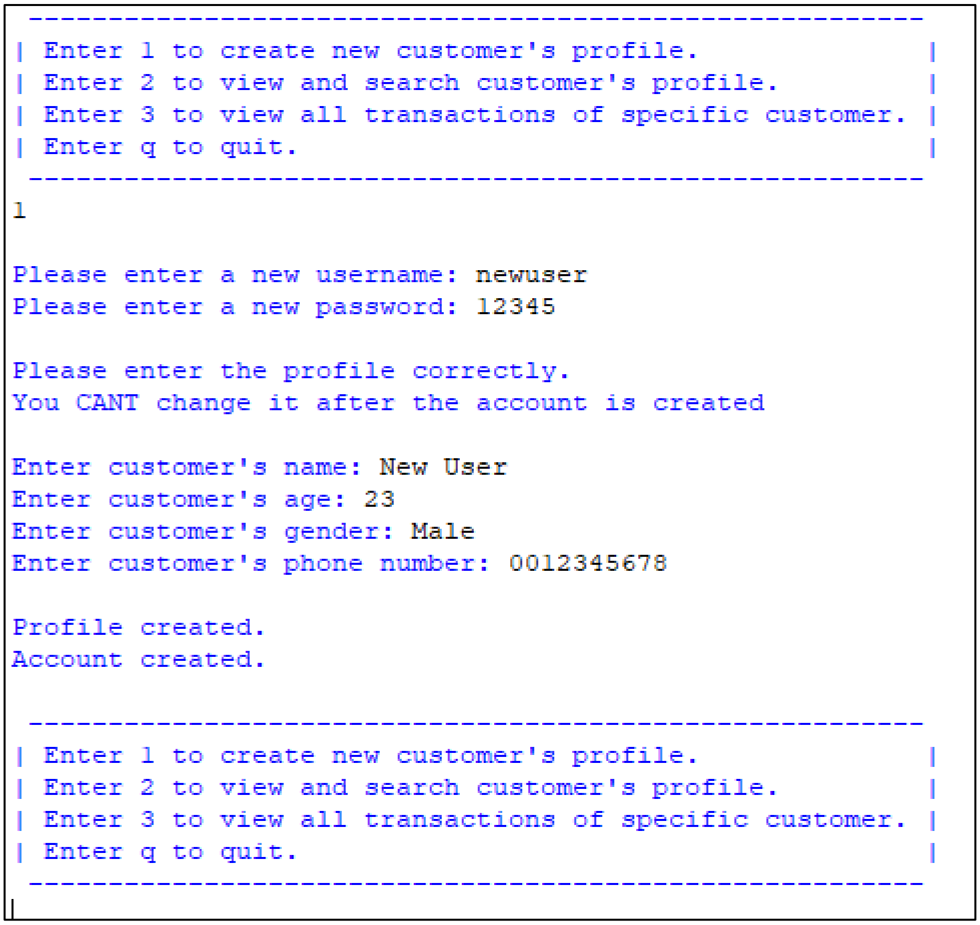
```
-----------------------------------
Welcome to Online Banking System.
Please select your role.
-----------------------------------


 ----------------------------
| Enter 1 for Admin role.    |
| Enter 2 for Customer role. |
| Enter q to quit.           |
 ----------------------------
```

As soon as user execute the system, it will lead user to the starting interface and require user to input their selection on role.



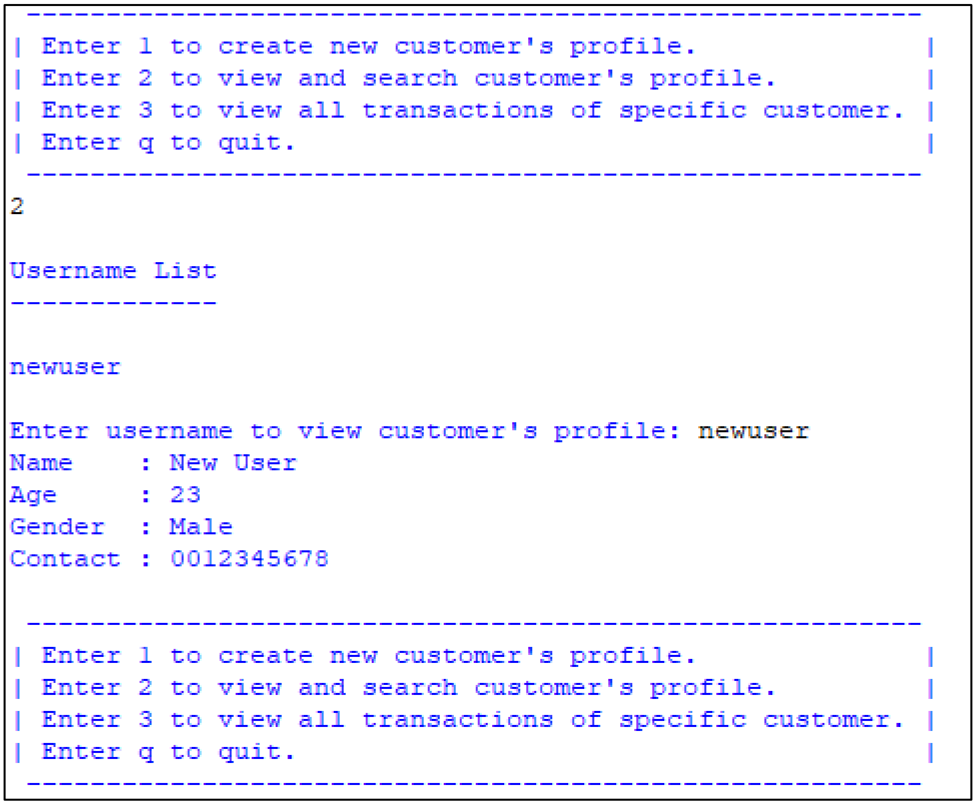
```
-----------------------------------
Welcome to Online Banking System.
Please select your role.
-----------------------------------


 ----------------------------
| Enter 1 for Admin role.    |
| Enter 2 for Customer role. |
| Enter q to quit.           |
 ----------------------------
1

Please enter your username: kv
Please enter your password: 123
Login Successful

 ---------------------------------------------------------
| Enter 1 to create new customer's profile.               |
| Enter 2 to view and search customer's profile.          |
| Enter 3 to view all transactions of specific customer.  |
| Enter q to quit.                                        |
 ---------------------------------------------------------
```

Once user select 1 for admin role, it will prompt user to enter their username and password. If the username and password is correct, the system will show the task for admin role to be selected by user.



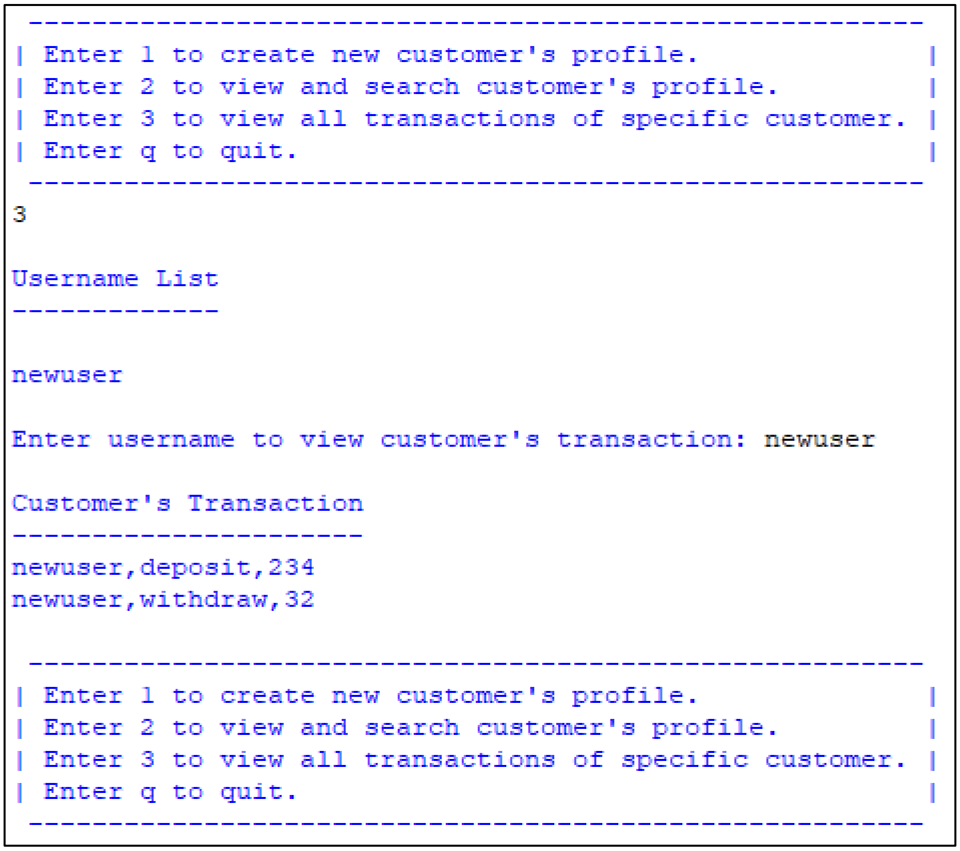
```
 --------------------------------------------------------
| Enter 1 to create new customer's profile.              |
| Enter 2 to view and search customer's profile.         |
| Enter 3 to view all transactions of specific customer. |
| Enter q to quit.                                       |
 --------------------------------------------------------
1

Please enter a new username: newuser
Please enter a new password: 12345

Please enter the profile correctly.
You CANT change it after the account is created

Enter customer's name: New User
Enter customer's age: 23
Enter customer's gender: Male
Enter customer's phone number: 0012345678

Profile created.
Account created.

 --------------------------------------------------------
| Enter 1 to create new customer's profile.              |
| Enter 2 to view and search customer's profile.         |
| Enter 3 to view all transactions of specific customer. |
| Enter q to quit.                                       |
 --------------------------------------------------------
```

If user selected 1 to create new customer's profile, the system will prompt use to enter new username and new password. Next, system will request user to enter the customer's detail correctly. Once all the details are entered and the username is first time creation, system will stored the newly created profile and account details in the text file and back to task selection page.



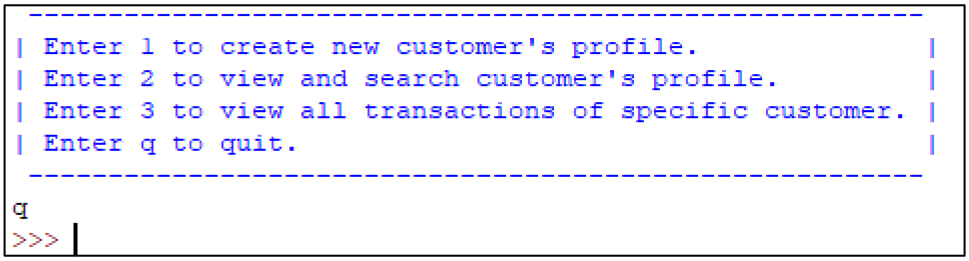
```
 ---------------------------------------------------------
| Enter 1 to create new customer's profile.              |
| Enter 2 to view and search customer's profile.         |
| Enter 3 to view all transactions of specific customer. |
| Enter q to quit.                                       |
 ---------------------------------------------------------
2

Username List
-------------


newuser

Enter username to view customer's profile: newuser
Name    : New User
Age     : 23
Gender  : Male
Contact : 0012345678

 ---------------------------------------------------------
| Enter 1 to create new customer's profile.              |
| Enter 2 to view and search customer's profile.         |
| Enter 3 to view all transactions of specific customer. |
| Enter q to quit.                                       |
 ---------------------------------------------------------
```

If user select 2 to view and search customer's profile, system will show all existing username in text file and user may enter username that want to be searched and the profile details of the selected username will be shown. Once the details is shown, system will back to task selection page.



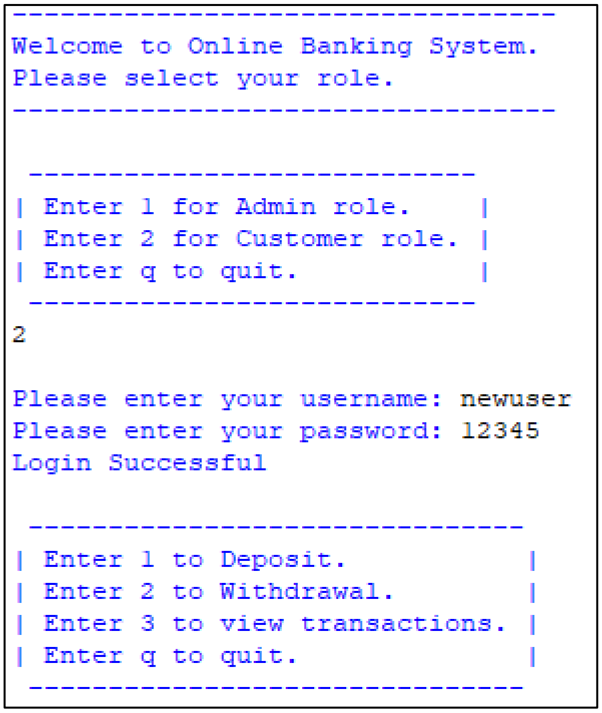
```
 --------------------------------------------------------
| Enter 1 to create new customer's profile.              |
| Enter 2 to view and search customer's profile.         |
| Enter 3 to view all transactions of specific customer. |
| Enter q to quit.                                       |
 --------------------------------------------------------
3

Username List
-------------

newuser

Enter username to view customer's transaction: newuser

Customer's Transaction
----------------------
newuser,deposit,234
newuser,withdraw,32

 --------------------------------------------------------
| Enter 1 to create new customer's profile.              |
| Enter 2 to view and search customer's profile.         |
| Enter 3 to view all transactions of specific customer. |
| Enter q to quit.                                       |
 --------------------------------------------------------
```

If user select 3 to view all transactions of specific customer, system will show all existing username to user and once user enter the specific username, system will show all the transaction details of the selected username and back to the task selection page.



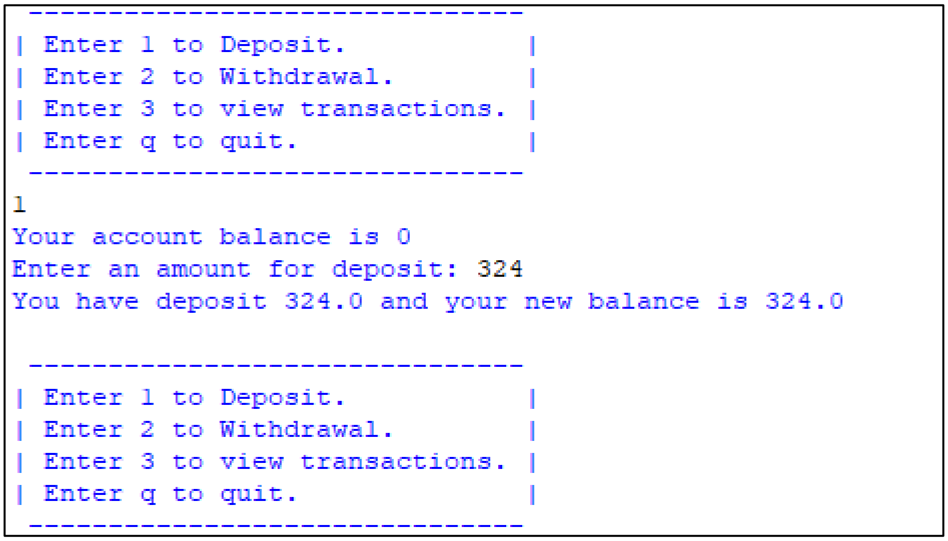
```
 --------------------------------------------------------
| Enter 1 to create new customer's profile.              |
| Enter 2 to view and search customer's profile.         |
| Enter 3 to view all transactions of specific customer. |
| Enter q to quit.                                       |
 --------------------------------------------------------
q
>>> 
```

If user select q, system will terminate.



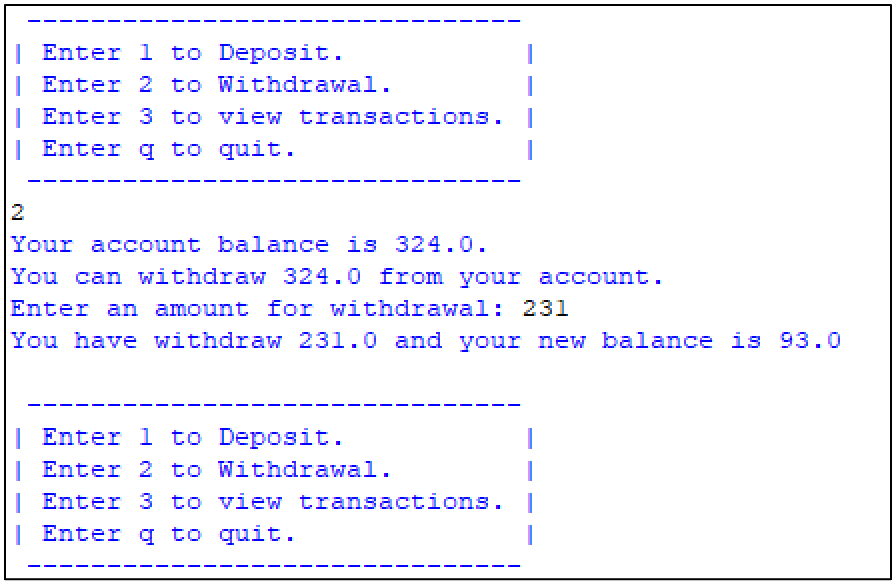
```
----------------------------------
Welcome to Online Banking System.
Please select your role.
----------------------------------


 ----------------------------
| Enter 1 for Admin role.     |
| Enter 2 for Customer role.  |
| Enter q to quit.            |
 ----------------------------
2

Please enter your username: newuser
Please enter your password: 12345
Login Successful

 -------------------------------
| Enter 1 to Deposit.            |
| Enter 2 to Withdrawal.         |
| Enter 3 to view transactions.  |
| Enter q to quit.               |
 -------------------------------
```

Once user select 2 for customer role, it will prompt user to enter their username and password. If the username and password is correct, the system will show the services for customer role to be selected by user.



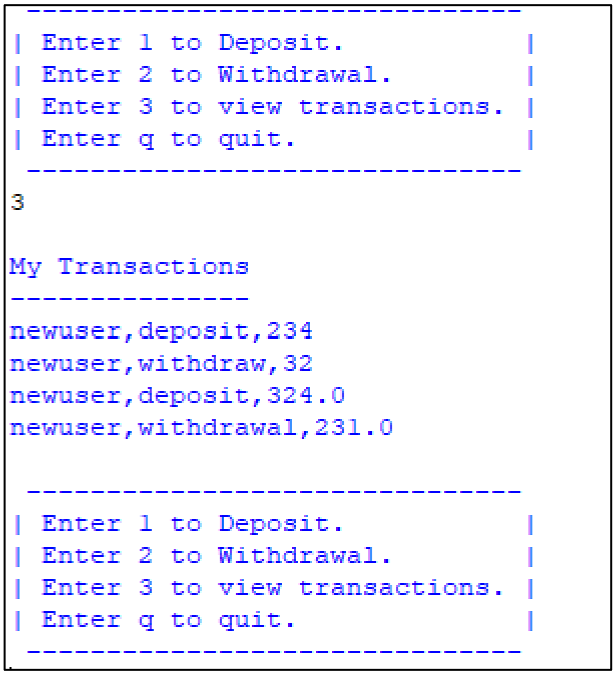
```
 -------------------------------
| Enter 1 to Deposit.            |
| Enter 2 to Withdrawal.         |
| Enter 3 to view transactions.  |
| Enter q to quit.               |
 -------------------------------
1
Your account balance is 0
Enter an amount for deposit: 324
You have deposit 324.0 and your new balance is 324.0

 -------------------------------
| Enter 1 to Deposit.            |
| Enter 2 to Withdrawal.         |
| Enter 3 to view transactions.  |
| Enter q to quit.               |
 -------------------------------
```

If user select 1 to deposit, system will show the account balance of user and prompt user to enter an amount for deposit. Once a deposit amount is entered, the value will be stored in text file and system will display the amount stored by user and the new account balance. Then, system will back to services selection page.



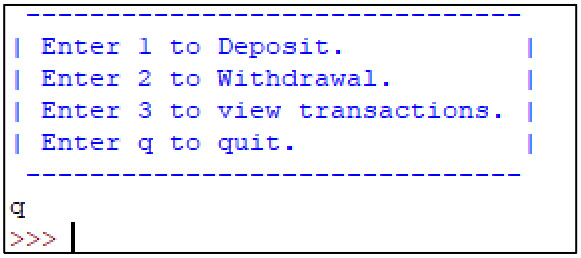
```
 -------------------------------
| Enter 1 to Deposit.           |
| Enter 2 to Withdrawal.        |
| Enter 3 to view transactions. |
| Enter q to quit.              |
 -------------------------------
2
Your account balance is 324.0.
You can withdraw 324.0 from your account.
Enter an amount for withdrawal: 231
You have withdraw 231.0 and your new balance is 93.0

 -------------------------------
| Enter 1 to Deposit.           |
| Enter 2 to Withdrawal.        |
| Enter 3 to view transactions. |
| Enter q to quit.              |
 -------------------------------
```

If user select 2 to withdrawal, system will show the account balance of user and prompt user to enter an amount for withdrawal. Once a withdrawal amount is entered, system will check whether there's sufficient account balance to withdraw. If the account balance is sufficient, the withdrawal value will be stored in text file and system will display the amount withdraw by user and the new account balance. Then, system will back to services selection page.



```
 -------------------------------
| Enter 1 to Deposit.           |
| Enter 2 to Withdrawal.        |
| Enter 3 to view transactions. |
| Enter q to quit.              |
 -------------------------------
3

My Transactions
---------------
newuser,deposit,234
newuser,withdraw,32
newuser,deposit,324.0
newuser,withdrawal,231.0

 -------------------------------
| Enter 1 to Deposit.           |
| Enter 2 to Withdrawal.        |
| Enter 3 to view transactions. |
| Enter q to quit.              |
 -------------------------------
```

If user select 3 to view all transactions, system will search for same username and display all the transaction details of user and back to the task selection page.



```
 -------------------------------
| Enter 1 to Deposit.           |
| Enter 2 to Withdrawal.        |
| Enter 3 to view transactions. |
| Enter q to quit.              |
 -------------------------------
q
>>> 
```

If user select q, system will terminate.

7 CONCLUSION

a. I conclude that system can register customer successfully.
b. I conclude that with the help of this system user can login with username and password.
c. I conclude that both admin and customer portal can view transaction details.
d. I conclude that admin portal can search for specific customer’s profile.
e. I conclude that customer can perform deposit and withdrawal action successfully.
f. I conclude that customer can view all their own transaction details.
g . I conclude that user can click “q” to terminate the system successfully.

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