

OS Project Report

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Description:

This is an online banking management system. The “Client.c” program represents a client-side application that possesses password-protected administrative access; thus preventing the whole management system from unauthorised access. The “Server.c” program represents the server which maintains the database and services multiple clients concurrently.

Three types of sign-up have been implemented for three types of users (i.e. for normal user, joint account user, and administrator):

- **Normal user sign-up:** This adds a record to the “Customers.dat” database file. Also, a record is added to the “Accounts.dat” database file corresponding to the account of the newly added Customer.
- **Joint account user sign-up:** This adds a record to the “Customers.dat” database file. This newly added Customer shares an already existing account of some other user.
- **Administrator sign-up:** There is only one administrator for this system. This feature is automatically used when the banking management system is being used for the first time. This signs-up the administrator using his/her Name and Password and writes the Admin record into the “Administrator.dat” database file.

Three types of login have been implemented for three types of users (i.e. for normal user, joint account user, and administrator). Depending on the type of user, different menus of operations are displayed after login. The user can choose the required operation from the menu.

Instructions to run:

1. In the terminal, use the command “**make executables**” to create the executable files: “**server**”(for the server) and “**client**”(for the client).
2. Next, use the command “**./server**” to run the executable file corresponding to the server.
3. Next, in another terminal window, use the command “**./client**” to run the executable file corresponding to the client. We can use the “**./client**” command in more terminal windows to simulate multiple clients.
4. At the end, to delete all executable files and .o files we can use the command “**make clean**”.

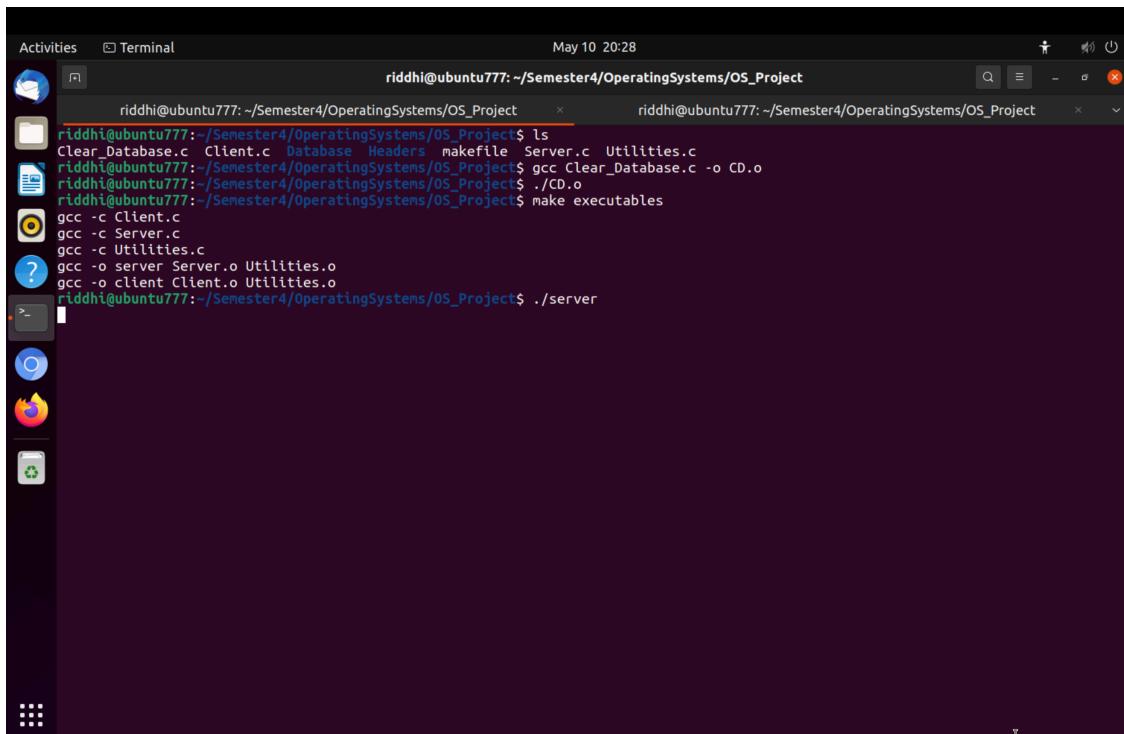
NOTE:

- IN THE SUBMISSION, THE **DATABASE FILES ARE EMPTY**. PLEASE PERFORM SIGNUP OPERATIONS ON AS MANY USERS AS YOU WANT TO FILL UP THE DATABASE FILES.
- IN THE SUBMISSION, THE **“Administrator.dat” DATABASE FILE IS ALSO EMPTY**. THUS YOU CAN PROVIDE ANY PASSWORD YOU LIKE FOR THE ADMINISTRATOR (because initially an administrator sign up will take place and thus we can provide any password of our choice initially).

- We can clear/empty the three database files by using the “Clear_Database.c” program. To run this, first compile it using command “`gcc Clear_Database.c -o CD.o`” and then run the executable file using the command “`./CD.o`”.

Output screenshots:

Operations of a Customer:

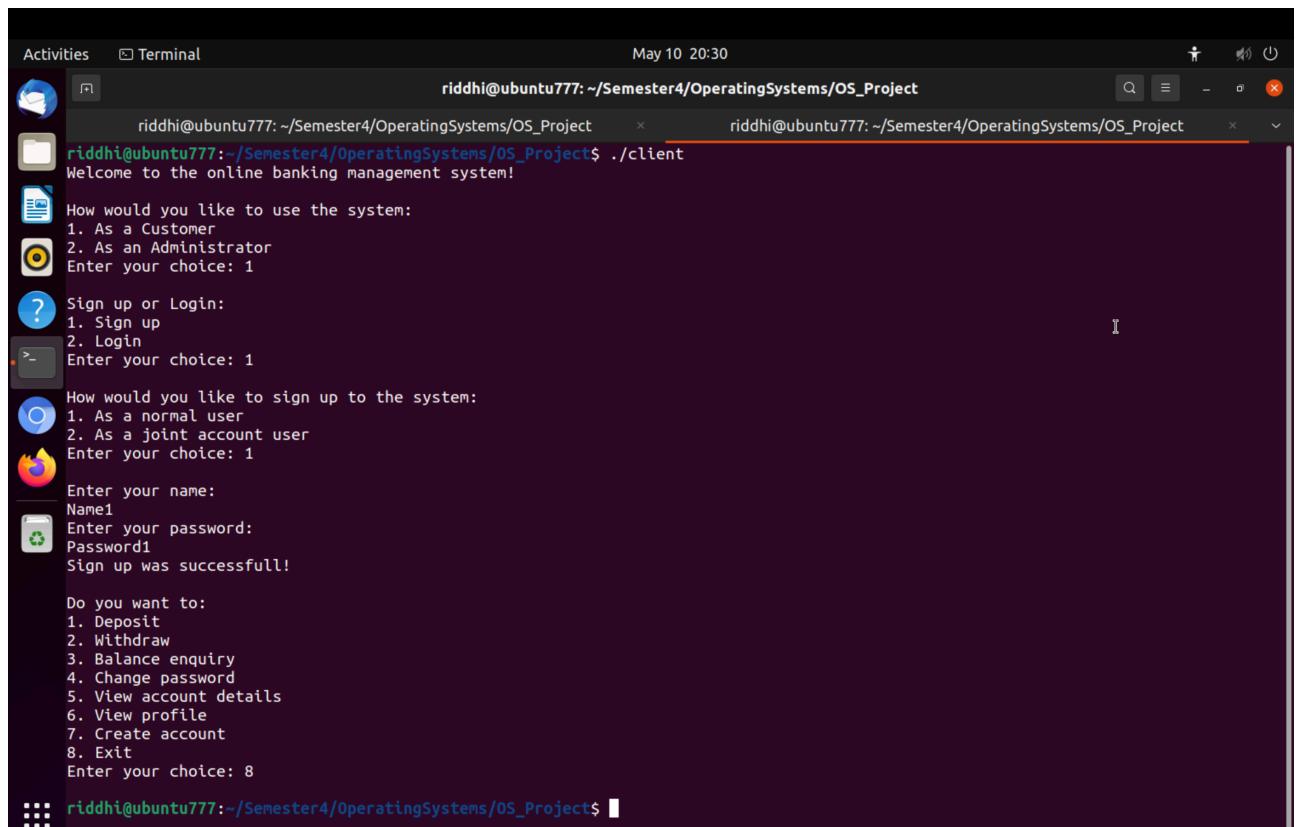


```

Activities Terminal May 10 20:28
riddhi@ubuntu777: ~/Semester4/OperatingSystems/OS_Project
riddhi@ubuntu777:~/Semester4/OperatingSystems/OS_Project$ ls
Clear_Database.c Client.c Database Headers makefile Server.c Utilities.c
riddhi@ubuntu777:~/Semester4/OperatingSystems/OS_Project$ gcc Clear_Database.c -o CD.o
riddhi@ubuntu777:~/Semester4/OperatingSystems/OS_Project$ ./CD.o
riddhi@ubuntu777:~/Semester4/OperatingSystems/OS_Project$ make executables
gcc -c Client.c
gcc -c Server.c
gcc -c Utilities.c
gcc -o server Server.o Utilities.o
gcc -o client Client.o Utilities.o
riddhi@ubuntu777:~/Semester4/OperatingSystems/OS_Project$ ./server

```

Sign up as a Single account user:



```

Activities Terminal May 10 20:30
riddhi@ubuntu777: ~/Semester4/OperatingSystems/OS_Project
riddhi@ubuntu777:~/Semester4/OperatingSystems/OS_Project$ ./client
Welcome to the online banking management system!
How would you like to use the system:
1. As a Customer
2. As an Administrator
Enter your choice: 1
Sign up or Login:
1. Sign up
2. Login
Enter your choice: 1
How would you like to sign up to the system:
1. As a normal user
2. As a joint account user
Enter your choice: 1
Enter your name:
Name1
Enter your password:
Password1
Sign up was successfull!
Do you want to:
1. Deposit
2. Withdraw
3. Balance enquiry
4. Change password
5. View account details
6. View profile
7. Create account
8. Exit
Enter your choice: 8

```

Sign up as a Joint account user (explained in the following three images):

```
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: 6  
  
Your profile details are:  
ID: 1  
Name: Name1  
Password: New_Password1  
AccountID: 1  
Account type: Single account
```

```
Sign up or Login:  
1. Sign up  
2. Login  
Enter your choice: 1  
  
How would you like to sign up to the system:  
1. As a normal user  
2. As a joint account user  
Enter your choice: 2  
  
Enter the ID of the account you want to share:  
1  
Enter your name:  
NameJ  
Enter your password:  
PasswordJ  
Sign up was successfull!  
  
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: 6  
  
Your profile details are:  
ID: 4  
Name: NameJ  
Password: PasswordJ  
AccountID: 1  
Account type: Joint account
```

```
1. As a Customer
2. As an Administrator
Enter your choice: 1

Sign up or Login:
1. Sign up
2. Login
Enter your choice: 2

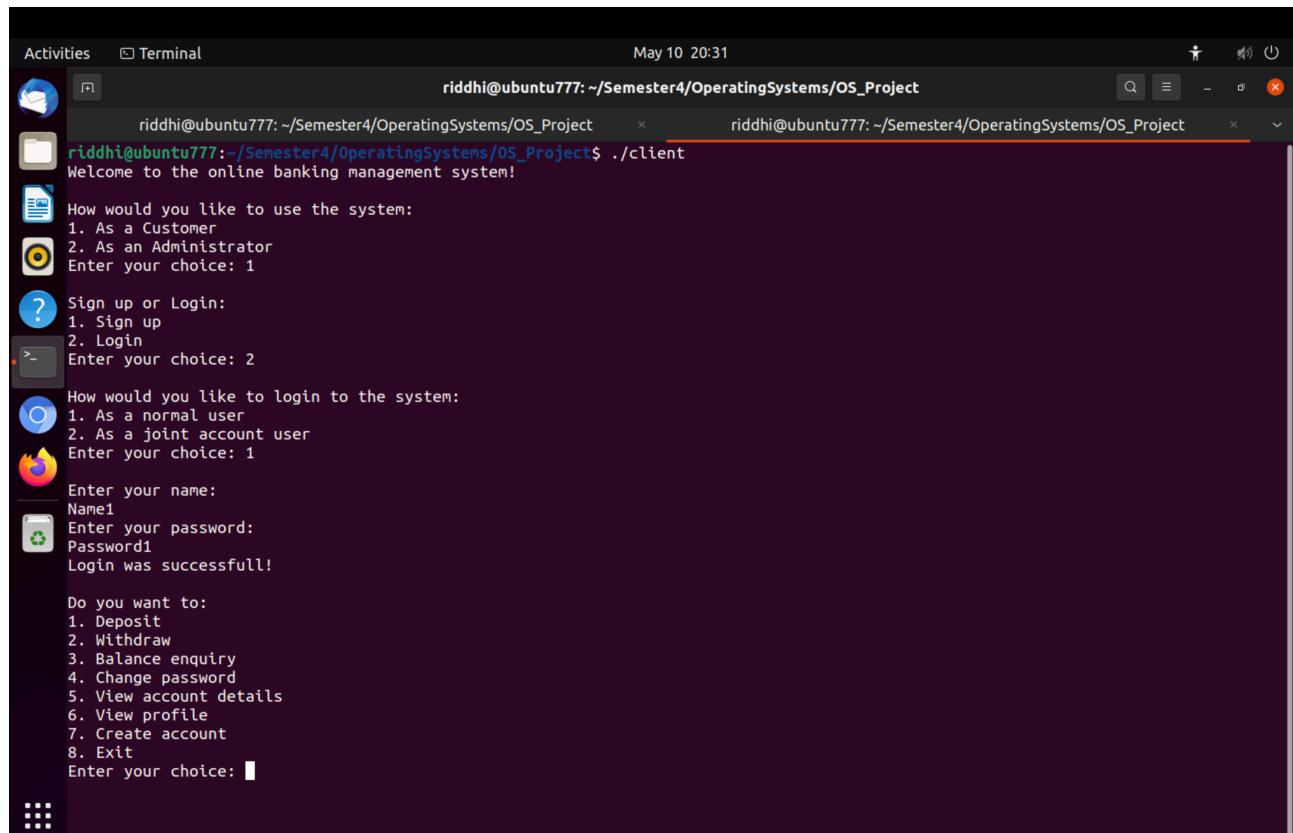
How would you like to login to the system:
1. As a normal user
2. As a joint account user
Enter your choice: 2

Enter your name:
Name1
Enter your password:
New_Password1
Login was successfull!

Do you want to:
1. Deposit
2. Withdraw
3. Balance enquiry
4. Change password
5. View account details
6. View profile
7. Create account
8. Exit
Enter your choice: 6

Your profile details are:
ID: 1
Name: Name1
Password: New_Password1
AccountID: 1
Account type: Joint account
```

Login and other operations of a Customer:



A screenshot of a Linux desktop environment showing a terminal window. The terminal window is titled 'riddhi@ubuntu777: ~/Semester4/OperatingSystems/OS_Project' and has two tabs. The current tab shows the output of the command 'riddhi@ubuntu777:~/Semester4/OperatingSystems/OS_Project\$./client'. The output is identical to the one shown in the previous code block, indicating a successful login and account creation for a customer named 'Name1'.

```
riddhi@ubuntu777:~/Semester4/OperatingSystems/OS_Project$ ./client
Welcome to the online banking management system!
How would you like to use the system:
1. As a Customer
2. As an Administrator
Enter your choice: 1

Sign up or Login:
1. Sign up
2. Login
Enter your choice: 2

How would you like to login to the system:
1. As a normal user
2. As a joint account user
Enter your choice: 1

Enter your name:
Name1
Enter your password:
Password1
Login was successfull!

Do you want to:
1. Deposit
2. Withdraw
3. Balance enquiry
4. Change password
5. View account details
6. View profile
7. Create account
8. Exit
Enter your choice: 6
```

```
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: 6  
  
Your profile details are:  
ID: 1  
Name: Name1  
Password: Password1  
AccountID: 1  
Account type: Single account  
  
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: ■
```

```
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: 3  
  
The balance of your account is: Rs 0.000000  
  
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: 1  
  
Enter the amount to be deposited:  
2000  
The required amount was deposited successfully!
```

```
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: 3
```

```
The balance of your account is: Rs 2000.000000
```

```
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: █
```

```
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: 2  
  
Enter the amount to be withdrawn:  
500  
The required amount was withdrawn successfully!  
  
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: 3  
  
The balance of your account is: Rs 1500.000000  
  
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: █
```

```
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: 5  
  
The requested account details are:  
Account ID: 1  
Account balance: 1500.000000  
  
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: ■
```

```
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: 4  
  
Enter your new password:  
New_Password1  
Your password was changed successfully!  
  
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: 6  
  
Your profile details are:  
ID: 1  
Name: Name1  
Password: New_Password1  
AccountID: 1  
Account type: Single account  
  
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry
```

Operations of the administrator:

```
riddhi@ubuntu777:~/Semester4/OperatingSystems/OS_Project$ ./client
Welcome to the online banking management system!

How would you like to use the system:
1. As a Customer
2. As an Administrator
Enter your choice: 2

Enter your name:
Admin
Enter your password:
AdminPass
Login was successfull!

Do you want to:
1. Add account
2. Delete account
3. View account details
4. Modify account details
5. Change password
6. View profile
7. Exit
Enter your choice: 6

Your profile details are:
Name: Admin
Password: AdminPass

Do you want to:
1. Add account
2. Delete account
3. View account details
4. Modify account details
5. Change password
6. View profile
7. Exit
Enter your choice: ■
```

```
Do you want to:
1. Add account
2. Delete account
3. View account details
4. Modify account details
5. Change password
6. View profile
7. Exit
Enter your choice: 1

Enter the Account Balance:
10000
An account with Account ID = 4 was added successfully!

Do you want to:
1. Add account
2. Delete account
3. View account details
4. Modify account details
5. Change password
6. View profile
7. Exit
Enter your choice: ■
```

```
Do you want to:  
1. Add account  
2. Delete account  
3. View account details  
4. Modify account details  
5. Change password  
6. View profile  
7. Exit  
Enter your choice: 2  
  
Enter the ID of the account to be deleted:  
4  
The account was successfully deleted!  
  
Do you want to:  
1. Add account  
2. Delete account  
3. View account details  
4. Modify account details  
5. Change password  
6. View profile  
7. Exit  
Enter your choice:
```

```
Do you want to:  
1. Add account  
2. Delete account  
3. View account details  
4. Modify account details  
5. Change password  
6. View profile  
7. Exit  
Enter your choice: 3  
  
Enter the ID of the account whose details is to be viewed:  
1  
The requested account details are:  
Account ID: 1  
Account balance: 1500.000000  
  
Do you want to:  
1. Add account  
2. Delete account  
3. View account details  
4. Modify account details  
5. Change password  
6. View profile  
7. Exit  
Enter your choice: █
```

```
Do you want to:  
1. Add account  
2. Delete account  
3. View account details  
4. Modify account details  
5. Change password  
6. View profile  
7. Exit  
Enter your choice: 4  
  
Enter the ID of the account whose details are to be modified:  
1  
Enter the modified balance of this account:  
1200  
The account details were modified successfully!  
  
Do you want to:  
1. Add account  
2. Delete account  
3. View account details  
4. Modify account details  
5. Change password  
6. View profile  
7. Exit  
Enter your choice: █
```

```
Do you want to:  
1. Add account  
2. Delete account  
3. View account details  
4. Modify account details  
5. Change password  
6. View profile  
7. Exit  
Enter your choice: 3  
  
Enter the ID of the account whose details is to be viewed:  
1  
The requested account details are:  
Account ID: 1  
Account balance: 1200.000000  
  
Do you want to:  
1. Add account  
2. Delete account  
3. View account details  
4. Modify account details  
5. Change password  
6. View profile  
7. Exit  
Enter your choice: ■
```

```
Do you want to:  
1. Add account  
2. Delete account  
3. View account details  
4. Modify account details  
5. Change password  
6. View profile  
7. Exit  
Enter your choice: 5  
  
Enter your new password:  
New_AdminPass  
Your password was changed successfully!  
  
Do you want to:  
1. Add account  
2. Delete account  
3. View account details  
4. Modify account details  
5. Change password  
6. View profile  
7. Exit  
Enter your choice: 6  
  
Your profile details are:  
Name: Admin  
Password: New_AdminPass  
  
Do you want to:  
1. Add account  
2. Delete account  
3. View account details  
4. Modify account details  
5. Change password  
6. View profile  
7. Exit  
Enter your choice: ■
```

The following three images explains the “Create account” menu option for a Customer:

```
Enter your name:  
Name1  
Enter your password:  
New_Password1  
Login was successfull!  
  
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: 7  
  
Sorry! This account was not created as you already have an account.  
  
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: ■
```

```
How would you like to use the system:  
1. As a Customer  
2. As an Administrator  
Enter your choice: 2  
  
Enter your name:  
Admin  
Enter your password:  
New_AdminPass  
Login was successfull!  
  
Do you want to:  
1. Add account  
2. Delete account  
3. View account details  
4. Modify account details  
5. Change password  
6. View profile  
7. Exit  
Enter your choice: 2  
  
Enter the ID of the account to be deleted:  
1  
The account was successfully deleted!  
  
Do you want to:  
1. Add account  
2. Delete account  
3. View account details  
4. Modify account details  
5. Change password  
6. View profile  
7. Exit  
Enter your choice: ■
```

```
How would you like to use the system:  
1. As a Customer  
2. As an Administrator  
Enter your choice: 1  
  
Sign up or Login:  
1. Sign up  
2. Login  
Enter your choice: 2  
  
How would you like to login to the system:  
1. As a normal user  
2. As a joint account user  
Enter your choice: 1  
  
Enter your name:  
Name1  
Enter your password:  
New_Password1  
Login was successfull!  
  
Do you want to:  
1. Deposit  
2. Withdraw  
3. Balance enquiry  
4. Change password  
5. View account details  
6. View profile  
7. Create account  
8. Exit  
Enter your choice: 7  
  
Your account was created successfully!  
  
Do you want to:  
1. Deposit  
2. Withdraw
```