



Online Banking System

FINAL REPORT

Project Description

- An online banking system provides the following features to its client:

1. Create a new Bank Account providing Full Name, account password, initial amount of money to deposit then generate a unique Account ID for this user.
2. Login using the unique account ID and account password.
3. Check on Current Balance.
4. Deposit Cash to your account.
5. Withdraw Cash from your account.
6. Transfer Money to another account within the same bank.
7. Transfer Money to another account in another bank.
8. View Transaction History.

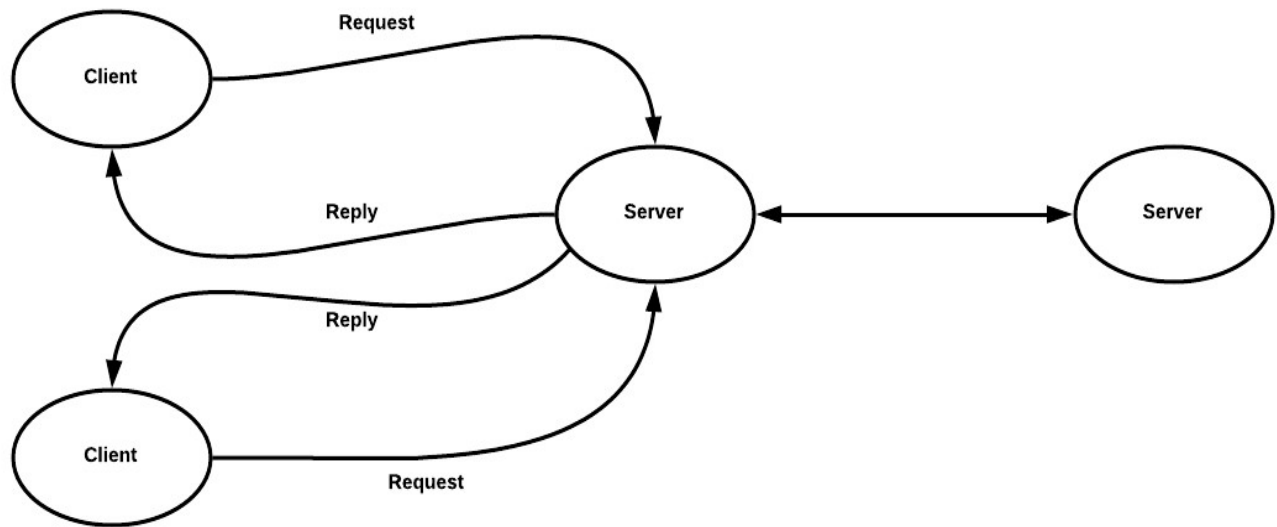
- Graphical user interface for the client side application.

- Database for the system.

- Encryption and Decryption techniques to save password in database.

SYSTEM DESIGN

System Architectural Model



" Client - Server "

" Peer - To - Peer "

Client – Server Model

“Server”

Communication Tasks

1. It creates socket with client.
2. It read client choice whether he wants to login or create account.
3. Login -> It reads ID and Password from the client.
4. Create Account -> It reads user information from the client.
5. It reads client choice that determine which service he wants to get.
6. Account Info -> It sends the balance to the client.
7. Deposit -> It sends the updated balance to the client.
8. Withdraw -> It sends the updated balance to the client.
9. Transfer money to another account -> It sends the updated balance to the client.
10. Transaction history -> It sends the history to the client.

Computational Tasks

1. It connects to database.
2. Login -> It checks in database if the Client enters the right ID and Password.
3. Create Account It saves user information in database.
4. Account Info -> It get the balance from database.
5. Deposit -> It get the balance.
6. Withdraw -> It checks the amount of money. if it's valid, it updates the balance.
7. Transfer money to another account -> It checks the account ID and amount of money. if they are valid, it updates the balance of the two users.
8. It saves the history in database.
9. Transaction history -> It gets the history from the database.

“Client”

Communication Tasks

1. It invokes the server.
2. It sends his choice to choose login/create account.
3. Login -> It sends account ID and his password.
4. Create Account -> It sends user information then read account ID.
5. It sends choice that determine which service he wants to get.
6. Account Info -> -> It reads the balance from server.
7. Deposit and Withdraw -> It sends the amount of money then reads the updated balance from server.
8. Transfer money to another account -> It sends the account ID and the amount of money then reads the updated balance from the server.
9. Transaction history -> It reads the history from the server.
10. It ends connection.

Computational Tasks

1. It provides gui to the user.
2. Login -> It takes the ID and Password from user.
3. Create Account -> It takes the user information from user then checks if the two passwords are matched and checks if the amount of money is valid (≥ 0).
4. Deposit and Withdraw -> It takes the amount from user and checks if it's valid (≥ 0).
5. Transfer money to another account -> It takes the account ID and amount of money from user then checks if it's valid (≥ 0).
6. It informs the user if there is any error.

Peer – To – Peer Model

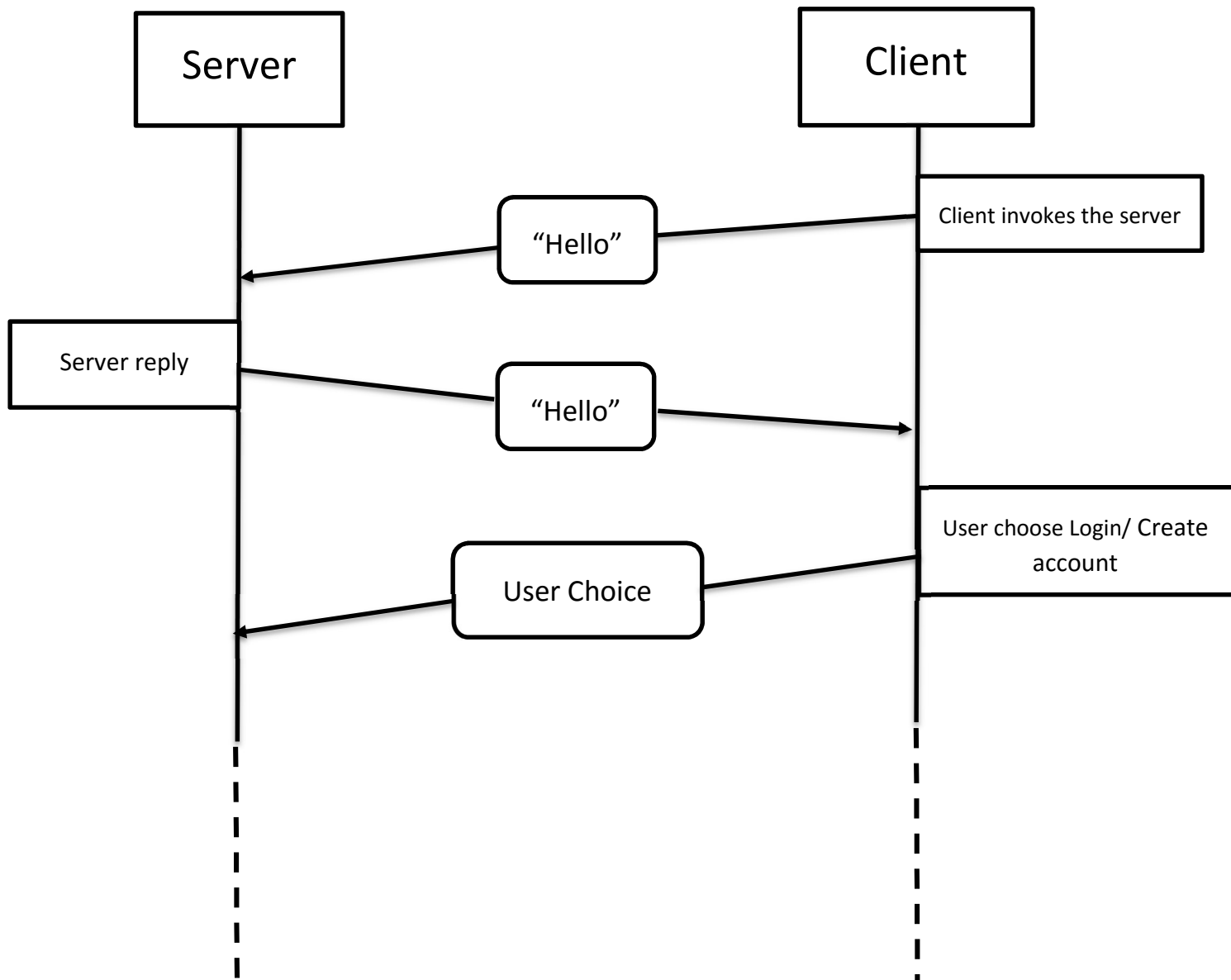
Communication Tasks

1. It invokes another Server.
2. It sends or reads the account ID of the client and the amount of money to be transferred.
3. It sends confirmation message to another Server (That transfer is done).
4. It ends the connection.

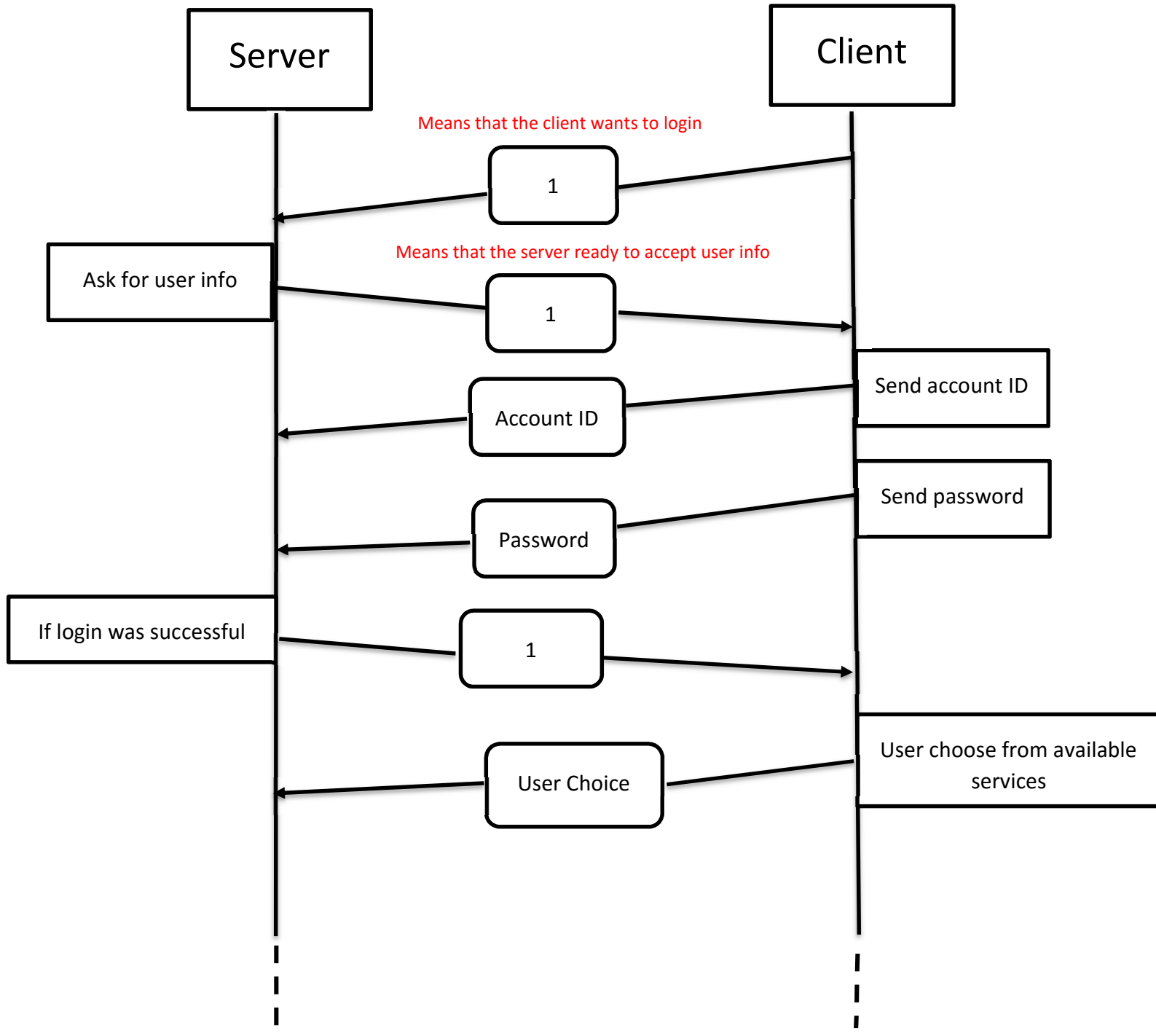
Computational Tasks

1. It checks for the account ID in database.
2. If account ID is valid it updates the balance in database.

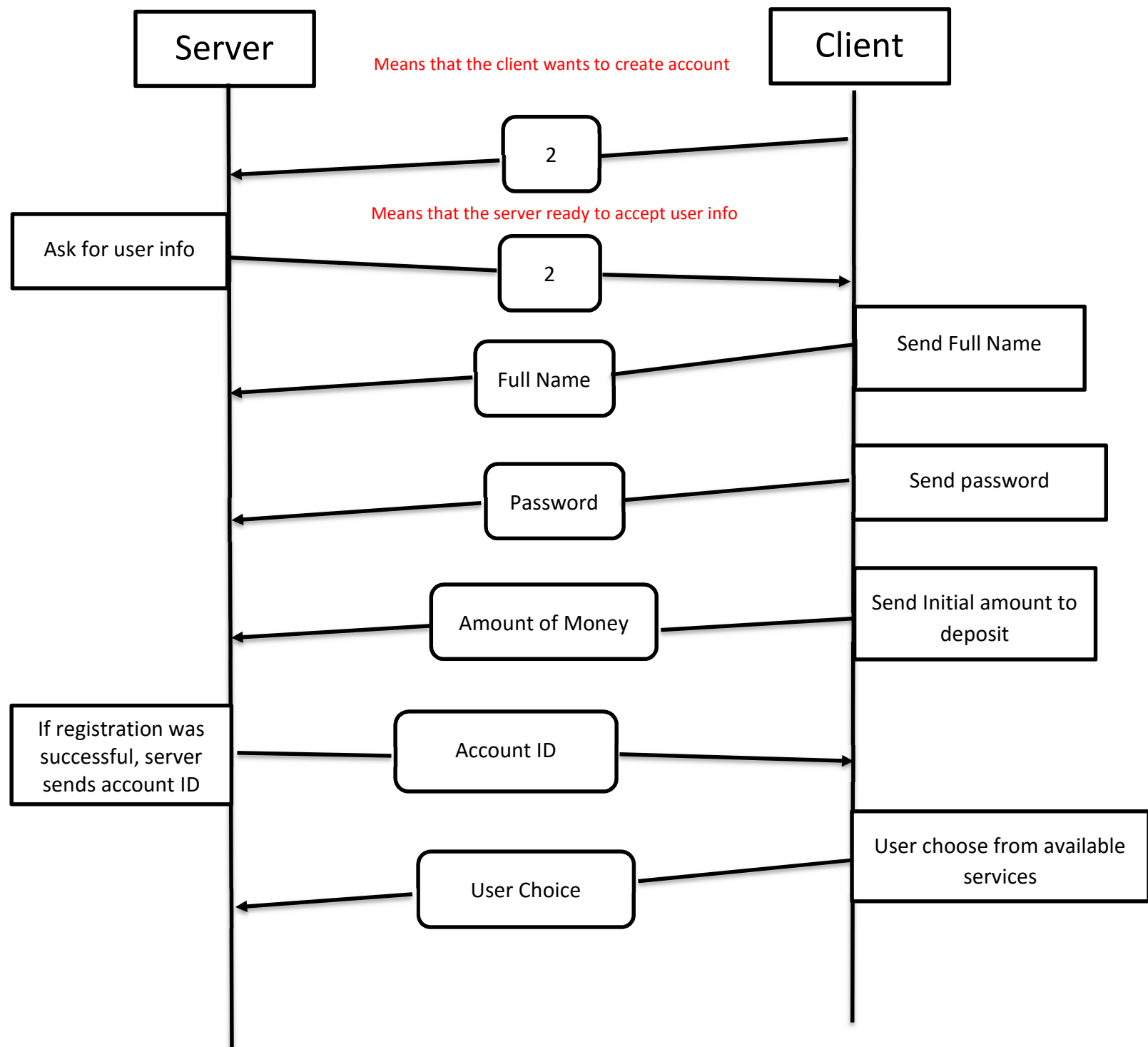
The Application Level Protocol



1. Login Case:

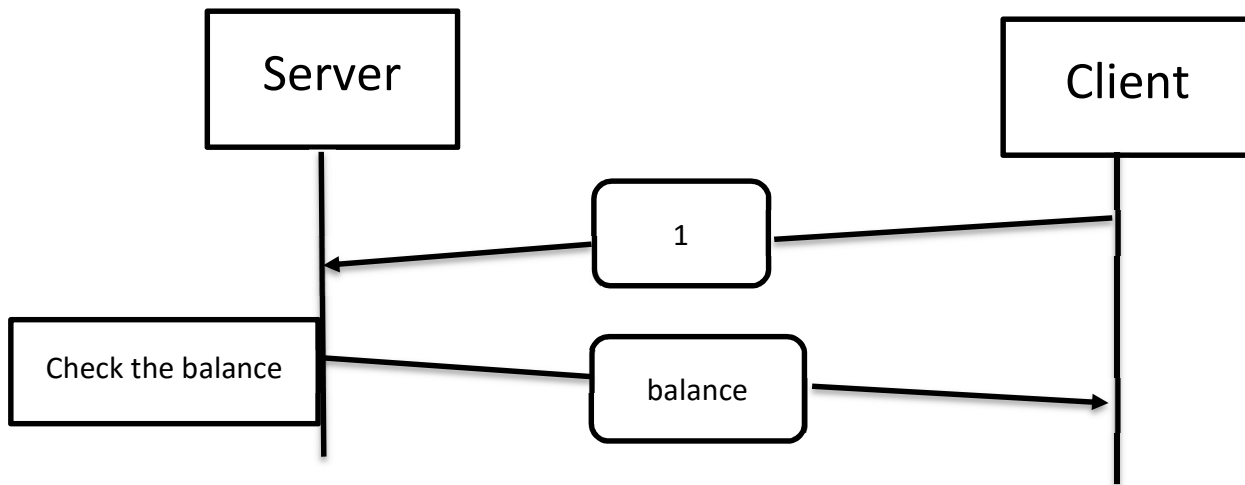


2.Create Account Case:

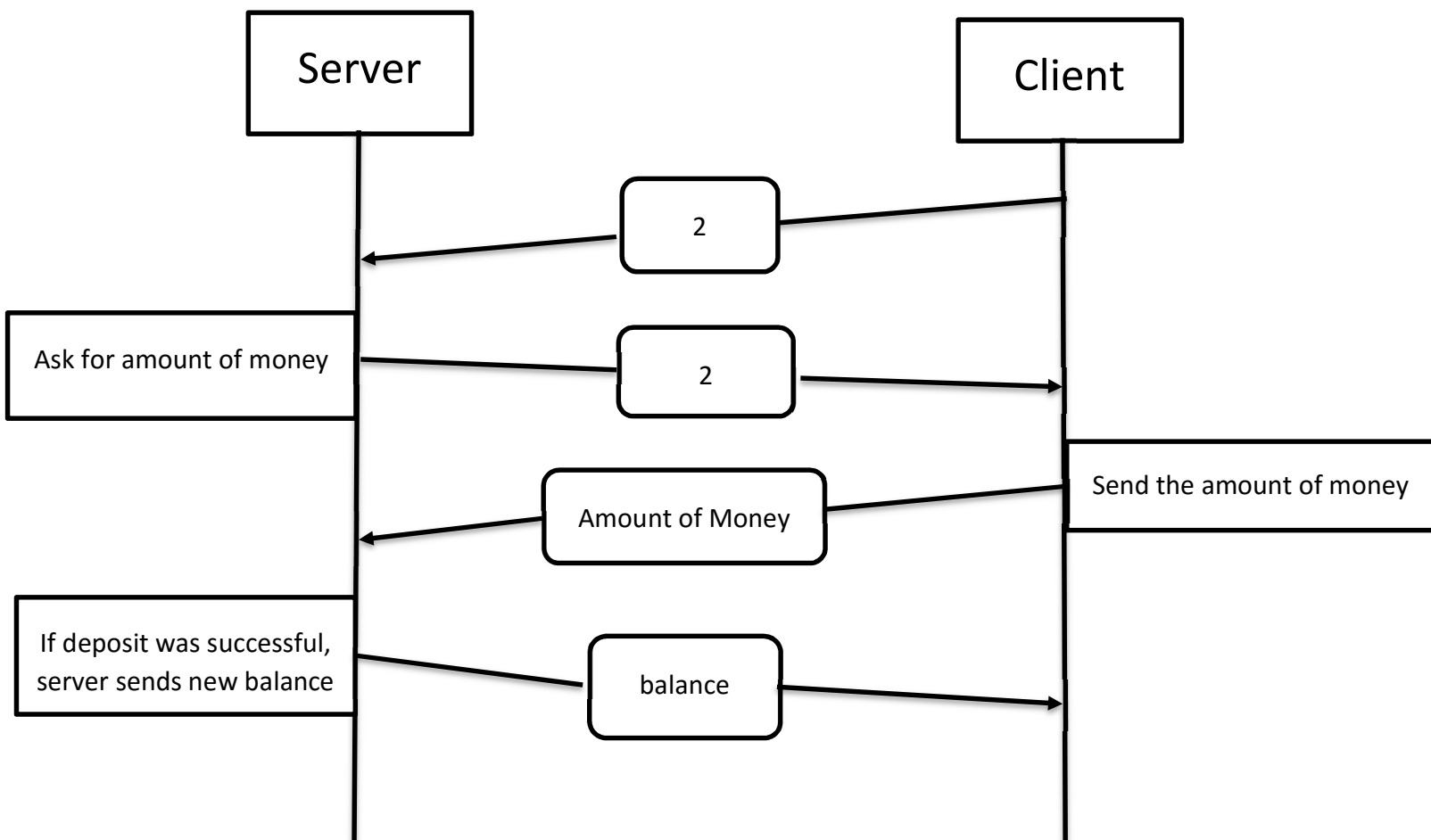


Services

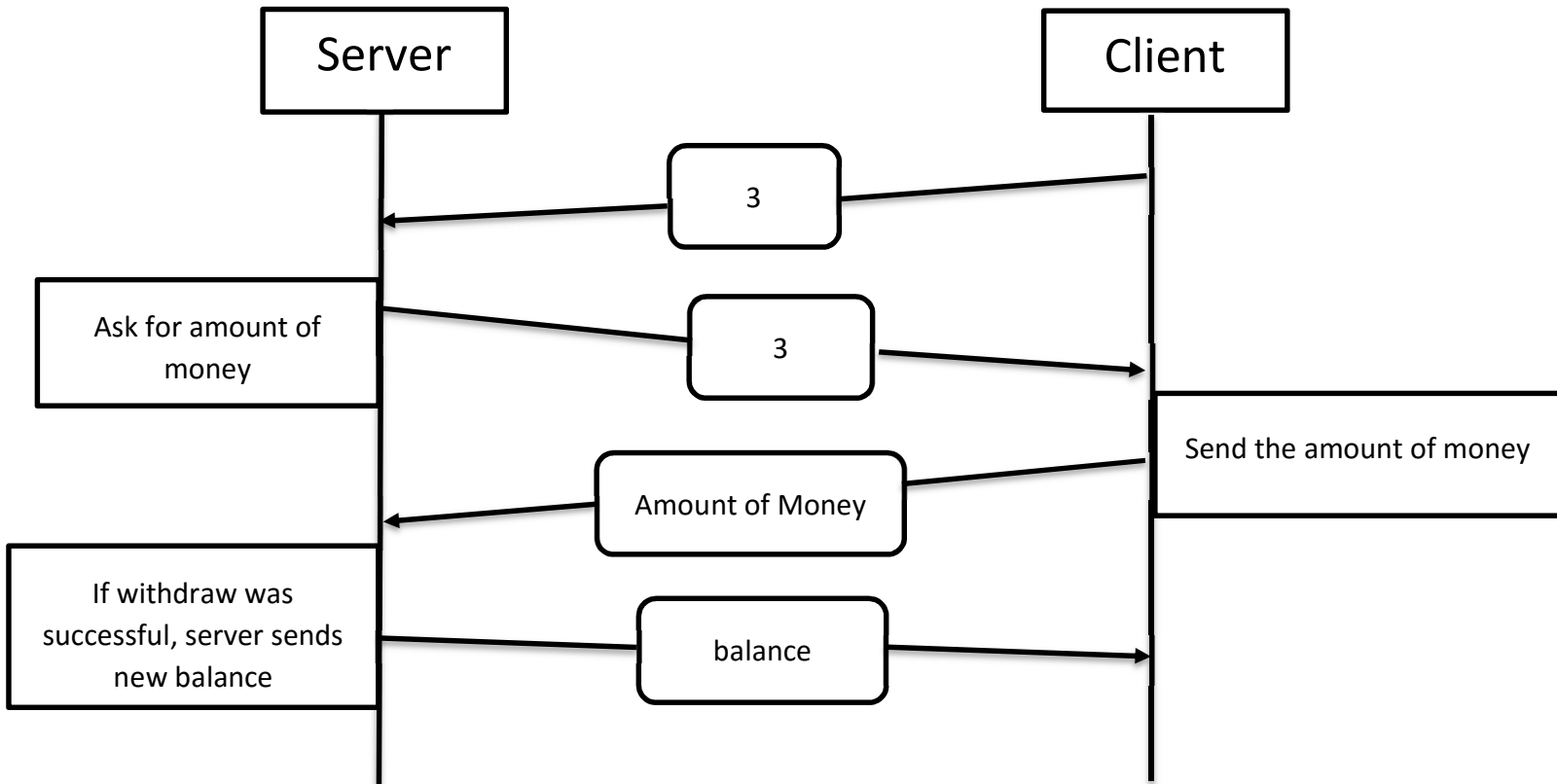
1) Check on current balance:



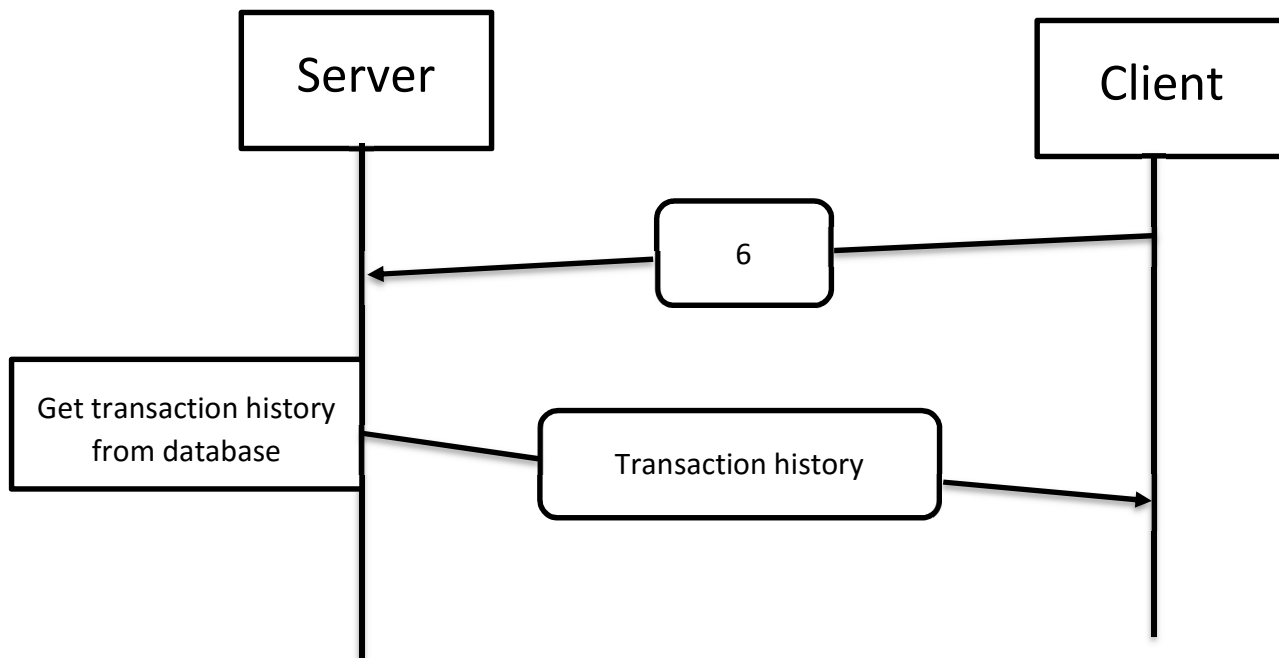
2) Deposit:



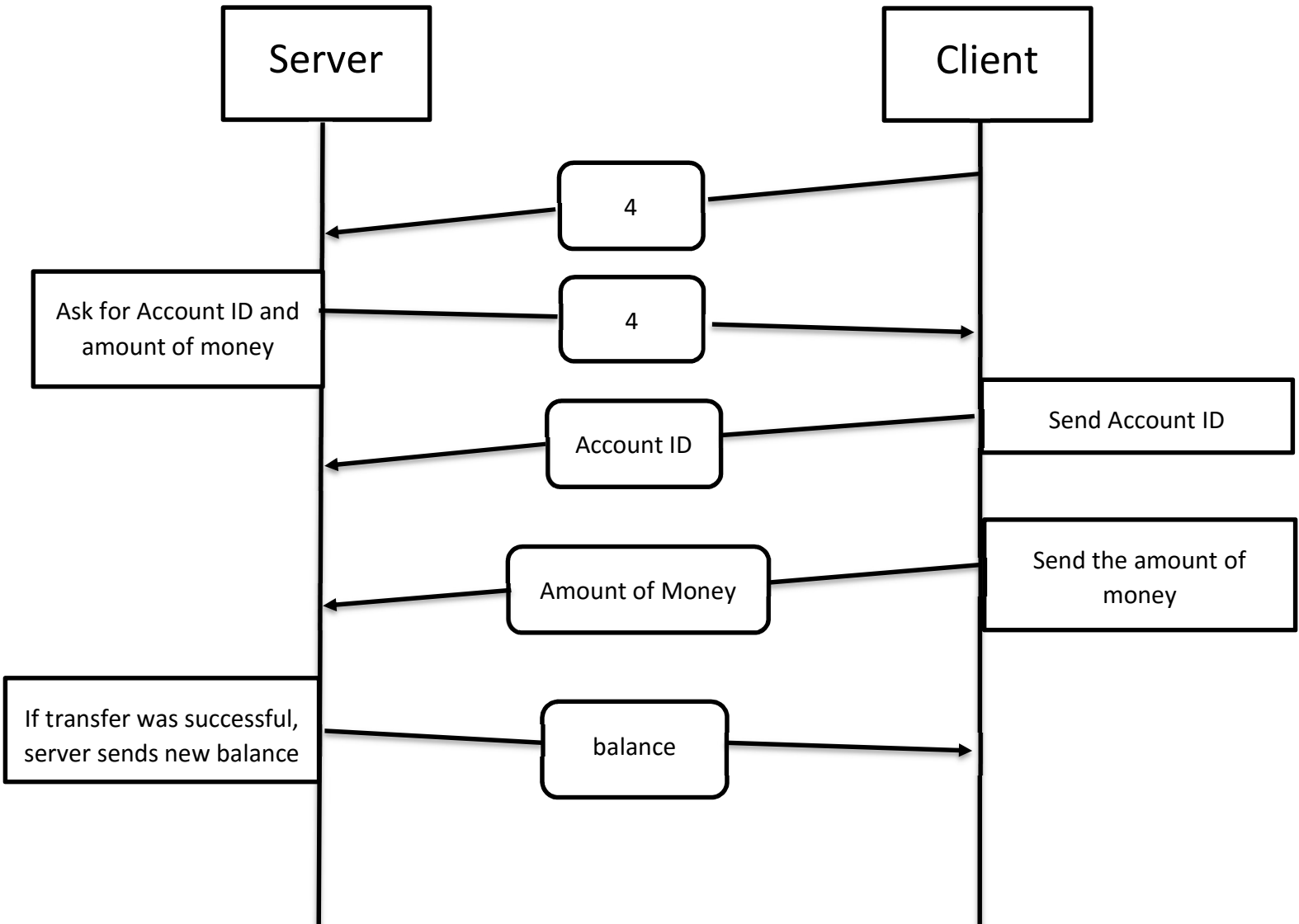
3) Withdraw:



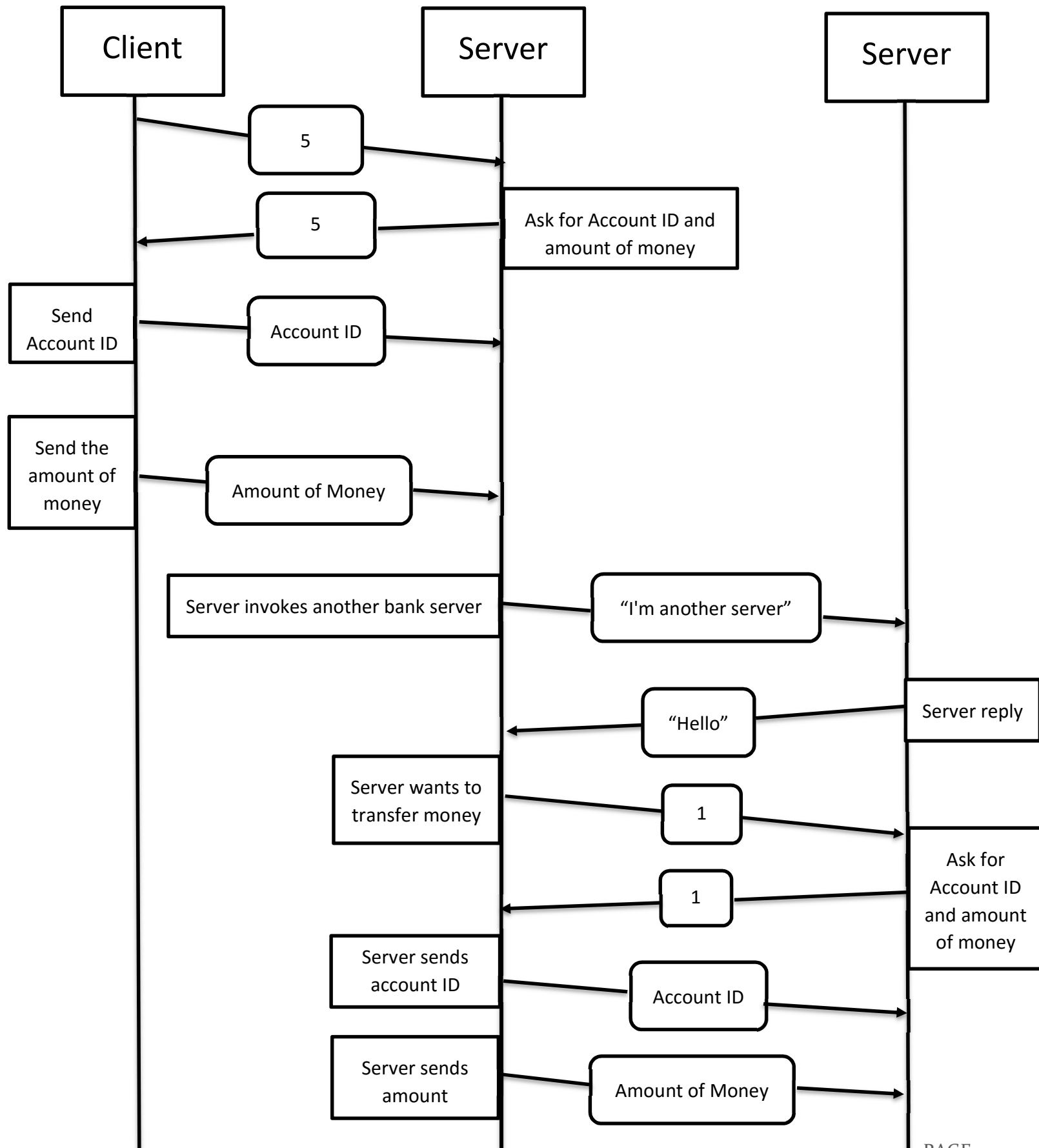
4) View transaction history:

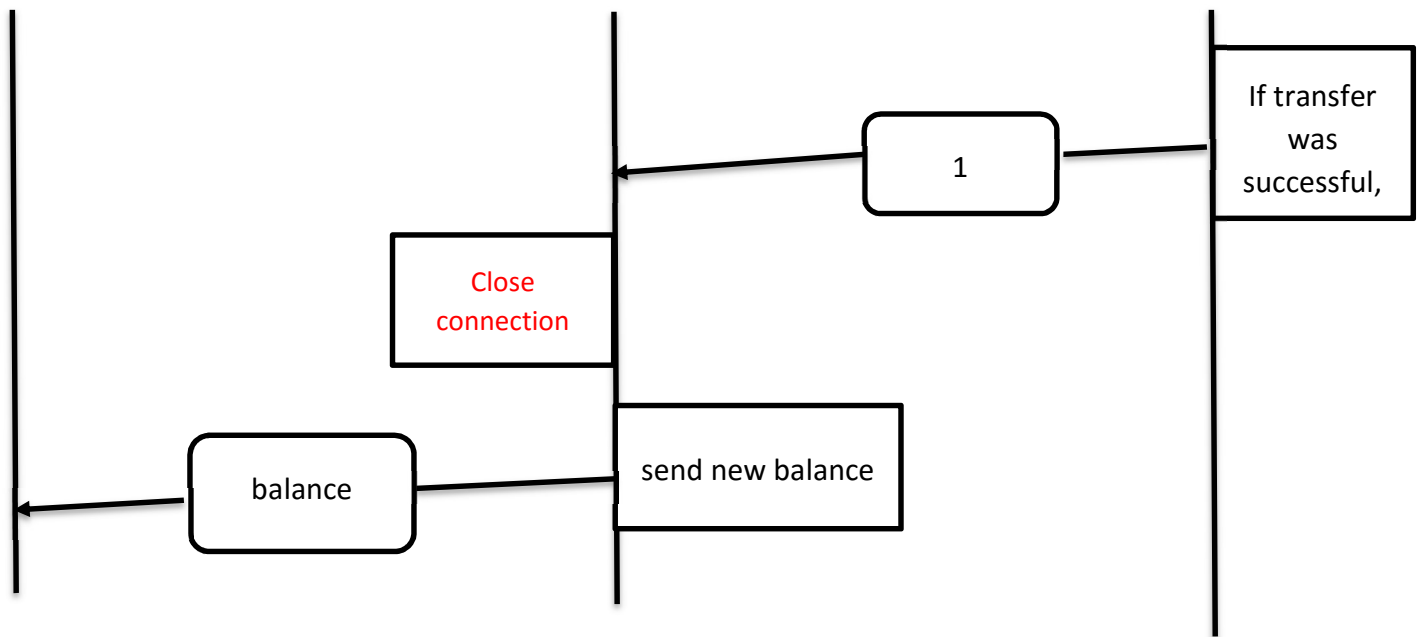


5) Transfer Money to another account within the same bank:

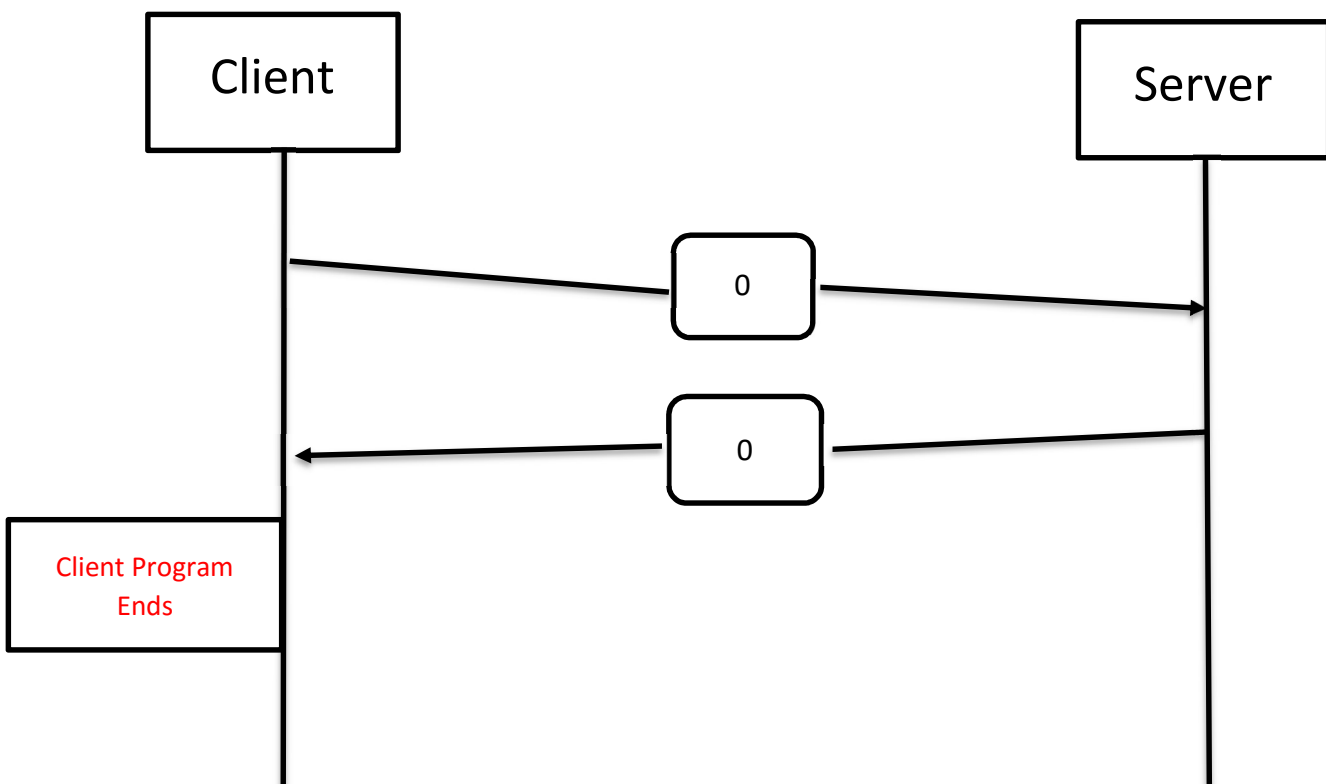


6) Transfer Money to another account in another bank:



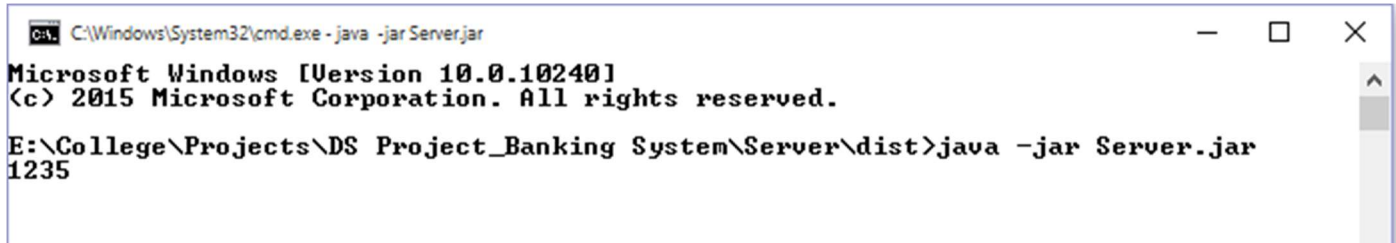


Quit



User Guide

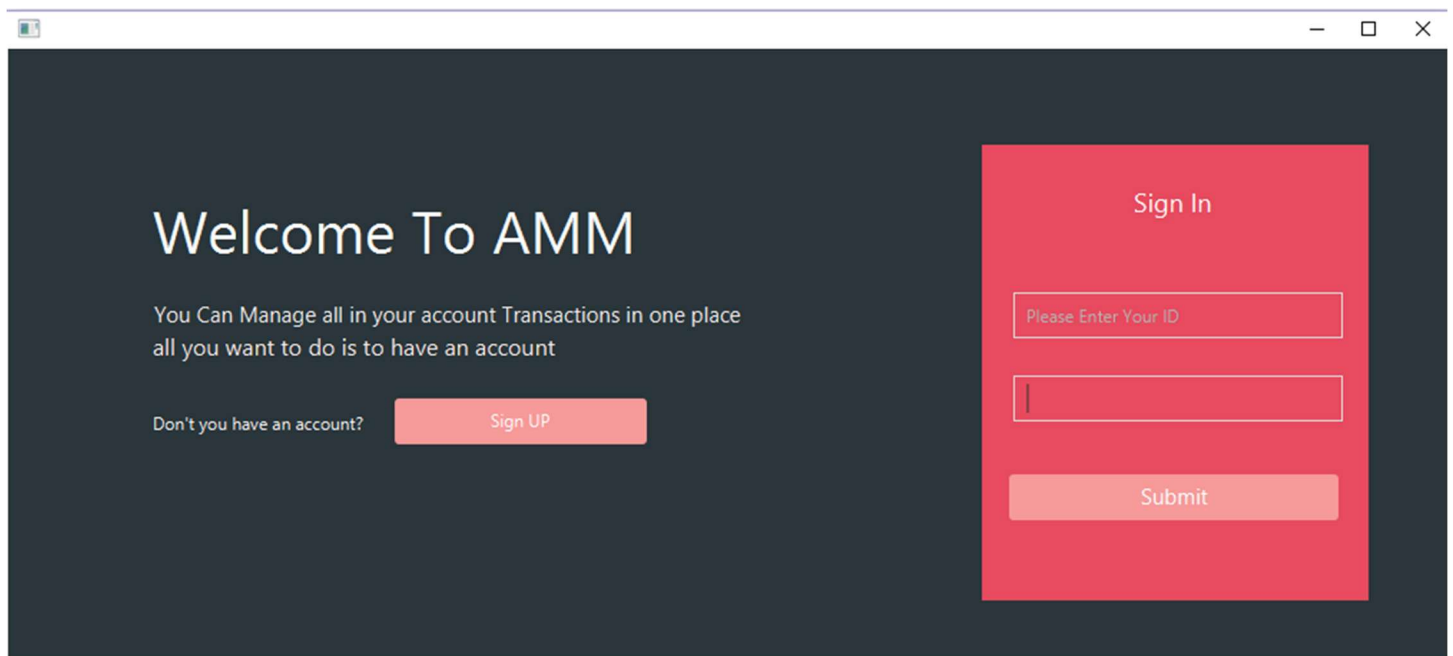
1) First you need to run server program Server.jar file with Server_config.txt file next to it that contains the port number that will be used in server socket.



```
C:\Windows\System32\cmd.exe - java -jar Server.jar
Microsoft Windows [Version 10.0.10240]
(c) 2015 Microsoft Corporation. All rights reserved.

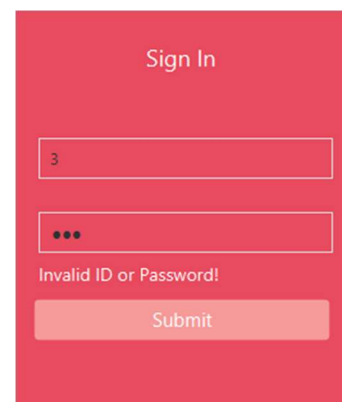
E:\College\Projects\DS Project_Banking System\Server\dist>java -jar Server.jar
1235
```

2) Run Client.jar file with Client_config.txt file next to it that contains the server IP and port number that will be used to connect to server.



3) You can sign in with your account ID and password.

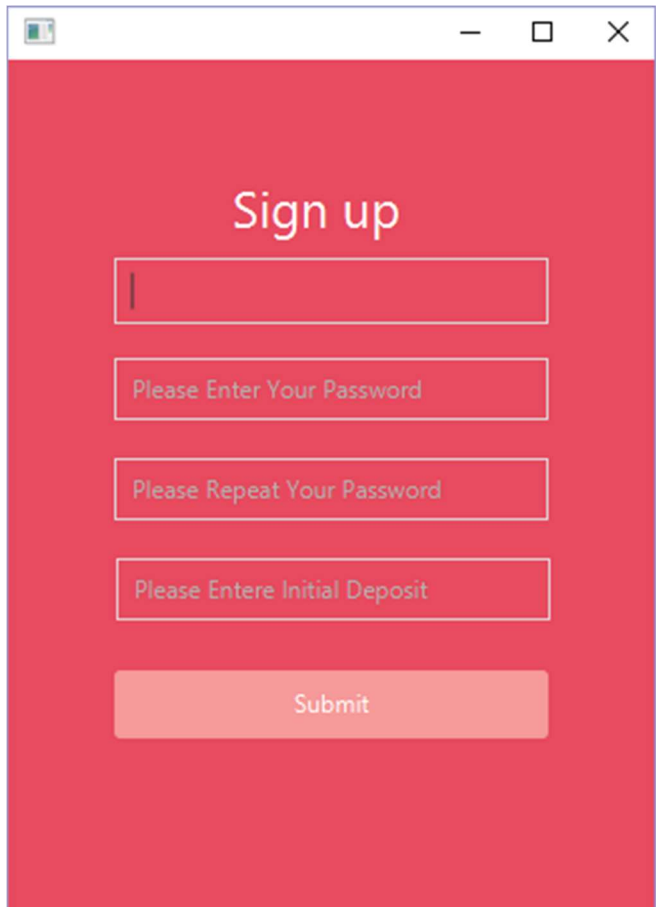
- If ID or password are wrong an error will appear.



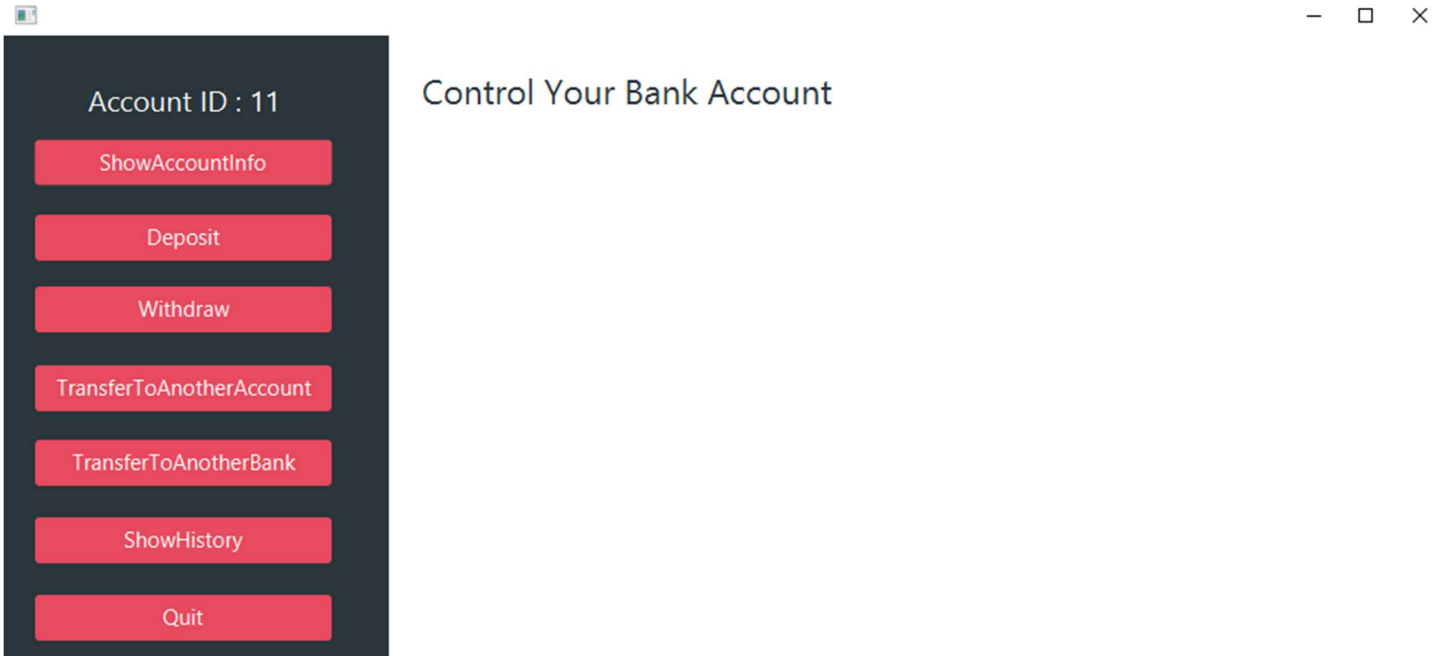
4) You can create a new account.

- you must enter all fields.

- All error cases are handled.

A screenshot of a web browser window displaying a "Sign up" form. The form is set against a solid red background. At the top, the text "Sign up" is centered in white. Below it, there are four input fields, each with a white border and placeholder text: "Please Enter Your Username", "Please Enter Your Password", "Please Repeat Your Password", and "Please Enter Initial Deposit". At the bottom of the form is a large, light red "Submit" button. The browser window has a standard title bar with a small icon on the left and minus, maximize, and close buttons on the right.

5) After Logged in, you can choose from available system services.

A screenshot of a web browser window showing a user interface for controlling a bank account. The interface is split into two main sections. On the left, a dark grey sidebar contains the text "Account ID : 11" at the top, followed by a vertical list of seven red buttons with white text: "ShowAccountInfo", "Deposit", "Withdraw", "TransferToAnotherAccount", "TransferToAnotherBank", "ShowHistory", and "Quit". On the right, the main content area has a light grey background and the title "Control Your Bank Account" at the top. The browser window has a title bar with a small icon on the left and minus, maximize, and close buttons on the right.

Show Account Info

Account ID : 11

ShowAccountInfo

Deposit

Withdraw

TransferToAnotherAccount

TransferToAnotherBank

ShowHistory

Quit

Control Your Bank Account

Your Current Balance is : 1111

Deposit

Account ID : 11

ShowAccountInfo

Deposit

Withdraw

TransferToAnotherAccount

TransferToAnotherBank

ShowHistory

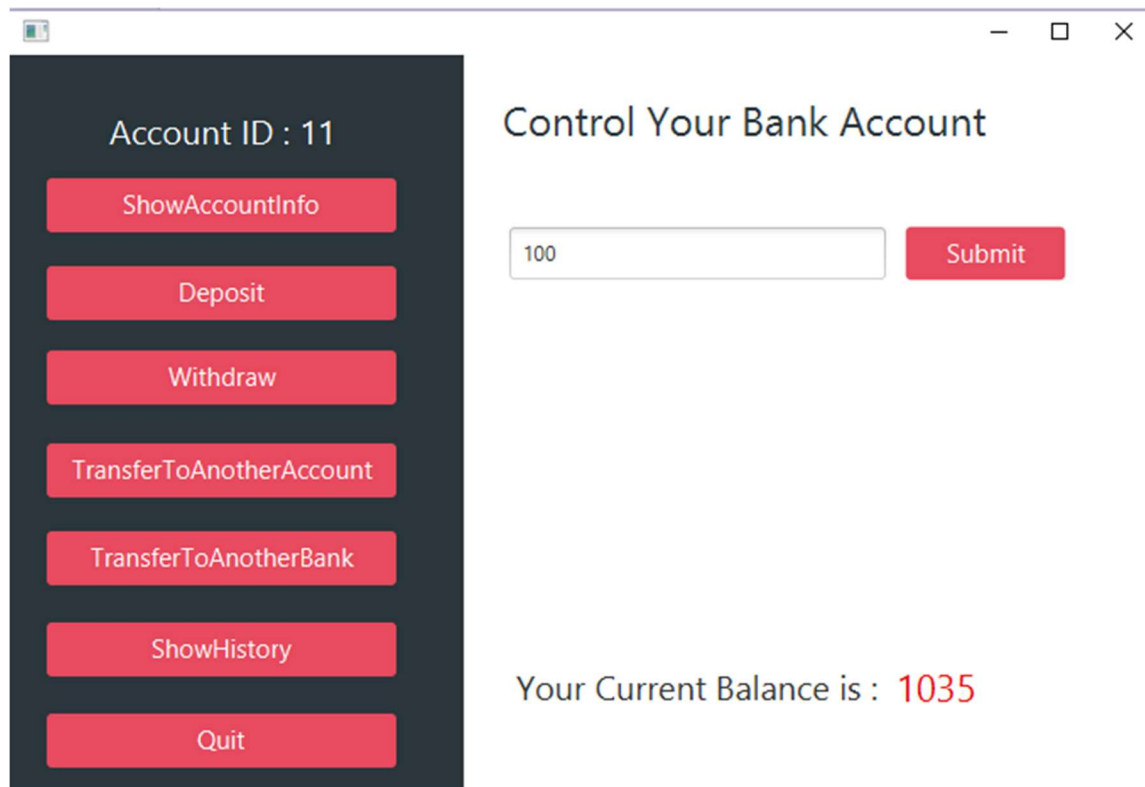
Quit

Control Your Bank Account

Submit

Your Current Balance is : 1135

Withdraw



Account ID : 11

ShowAccountInfo

Deposit

Withdraw

TransferToAnotherAccount

TransferToAnotherBank

ShowHistory

Quit

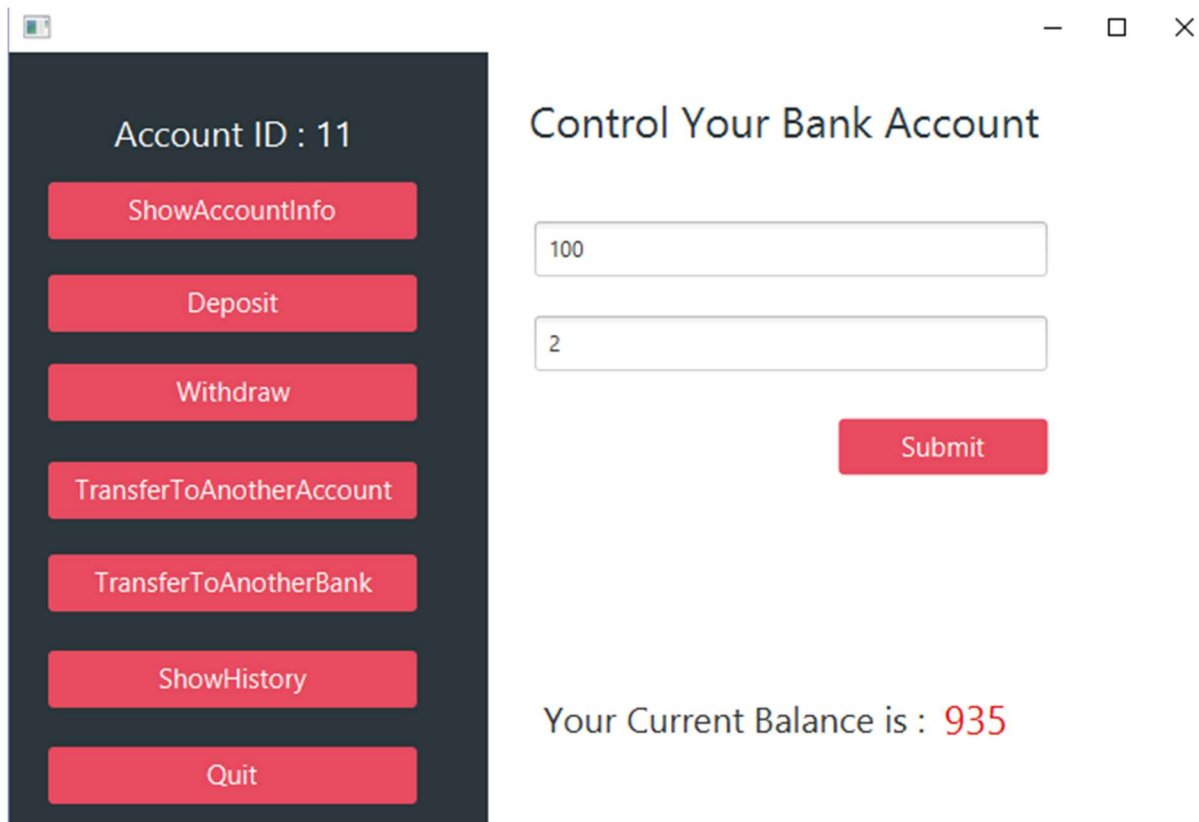
Control Your Bank Account

100

Submit

Your Current Balance is : 1035

Transfer money to another account (in the same bank)



Account ID : 11

ShowAccountInfo

Deposit

Withdraw

TransferToAnotherAccount

TransferToAnotherBank

ShowHistory

Quit

Control Your Bank Account

100

2

Submit

Your Current Balance is : 935

Transfer money to another account (another bank)

Account ID : 11

ShowAccountInfo

Deposit

Withdraw

TransferToAnotherAccount

TransferToAnotherBank

ShowHistory

Quit

Control Your Bank Account

127.0.0.1

1234

1

100

Submit

Your Current Balance is : 835

History

Account ID : 3

ShowAccountInfo

Deposit

Withdraw

TransferToAnotherAccount

TransferToAnotherBank

ShowHistory

Quit

Control Your Bank Account

Create account with initial amount 100 LE, at 2018-11-24T14:44:01.176Z
Deposit 100 LE, at 2018-11-24T15:32:33.360Z
Withdraw 100 LE, at 2018-11-24T15:39:52.809Z
Withdraw 100 LE, at 2018-11-24T15:39:57.243Z
Deposit 1000 LE, at 2018-11-24T15:40:02.344Z
Transfer 10 LE to Account ID : 2, at 2018-11-24T15:48:05.664Z
Transfer 10 LE to Account ID : 2, at 2018-11-24T15:48:06.022Z
Transfer 10 LE to Account ID : 2, at 2018-11-24T15:49:30.449Z
Transfer 6 LE, at 2018-11-24T17:11:43.628Z
Withdraw 100 LE, at 2018-11-25T23:26:32.893Z
Deposit 140 LE, at 2018-11-25T23:26:35.338Z
Deposit 140 LE, at 2018-11-25T23:26:41.873Z
Deposit 140 LE, at 2018-11-25T23:26:45.550Z
Withdraw 10 LE, at 2018-11-26T02:29:55.054Z
Withdraw 10 LE, at 2018-11-26T02:29:55.470Z
Deposit 30 LE, at 2018-11-26T02:29:58.005Z
Deposit 30 LE, at 2018-11-26T02:29:58.939Z
Deposit 30 LE, at 2018-11-26T02:29:59.505Z
Deposit 30 LE, at 2018-11-26T02:29:59.906Z