

A SIMPLE BANK SYSTEM

User manual

APPLICATION SCENARIO

The system offers three types of account:

1. **Saver Account:** For Junior and Saver accounts, no withdraw more funds than their limit permits.
2. **Junior Account:** Only customers under the age of 16 may open a Junior account
3. **Current Account:** A customer may withdraw additional funds, up to, but not exceeding, their overdraft limit.

Each account has a unique account number. A customer is also issued a separate personal identification number (PIN) for that account.

When you open an account, the PIN is set the same as your birthday.

Currently, the system doesn't offer functions to:

1. register a customer.

If you want to add a customer, please add it in the file:

`"BankSystem/src/File/CreditAgency.txt"`

in format:

`(name,address,birth,credit).`

2. change PIN/ overdraft limit or other details of your account.

If you want to change the them, please change it in the file:

`"BankSystem/src/File/Accounts.txt"`

in format:

`(accID,type,PIN,balance,overdraftlimit,clearing,account_status,noticed)`

note:

1. If you have trouble in finding your account ID, please check the file:
`"BankSystem/src/File/AccountFinder.txt"`
2. More details of the 3 text files above: please see `"BankSystem/Readme.txt"`
3. JavaDoc: see `"BankSystem/JavaDoc"`

DEVELOPING ENVIRONMENT

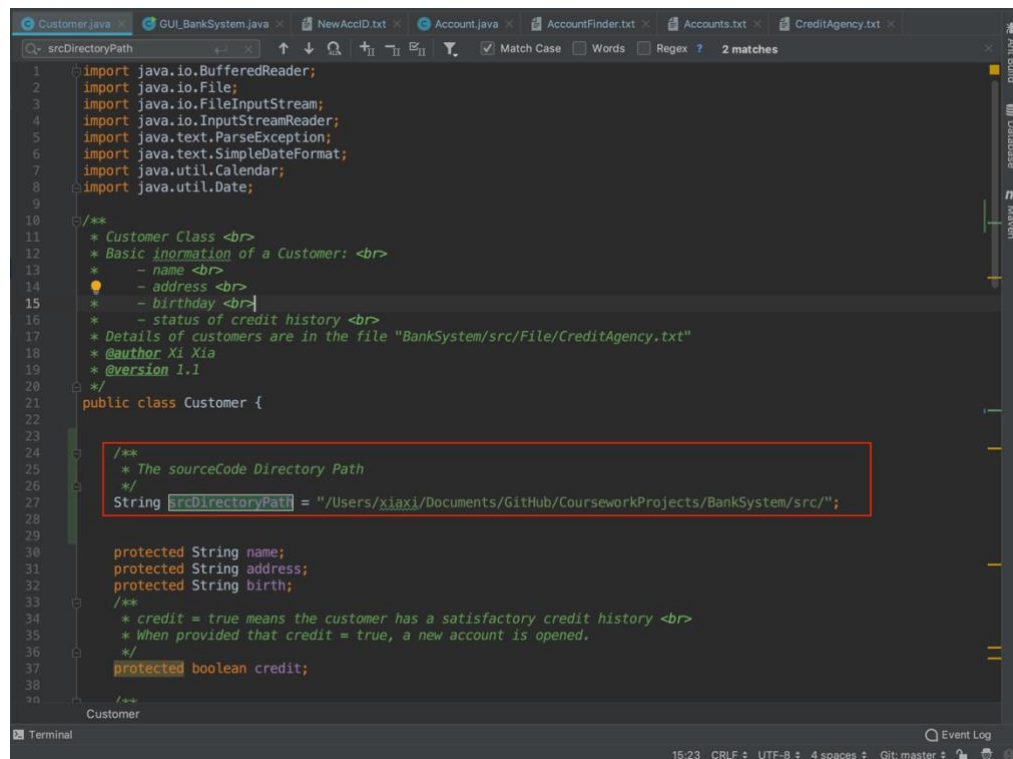
1. **IDE:** IntelliJ IDEA 2019.1 (Ultimate Edition)
2. **JRE:** 1.8.0_202-release-1483-b39 x86_64
3. **JVM:** OpenJDK 64-Bit Server VM by JetBrains s.r.o
4. **Operating System:** macOS 10.14.4
5. **Project SDK:** 11
6. **Copyright:** © 2019 🧑 Xi XIA

HOW TO START

1. Save the folder “BankSystem” on your computer.
2. According to your own preference, change the src directory path in java files

Please make sure you that you have change the **srcDirectoryPath** simultaneously in the java file “Customer.java” and “Account.java”.

- a. In Customer. java

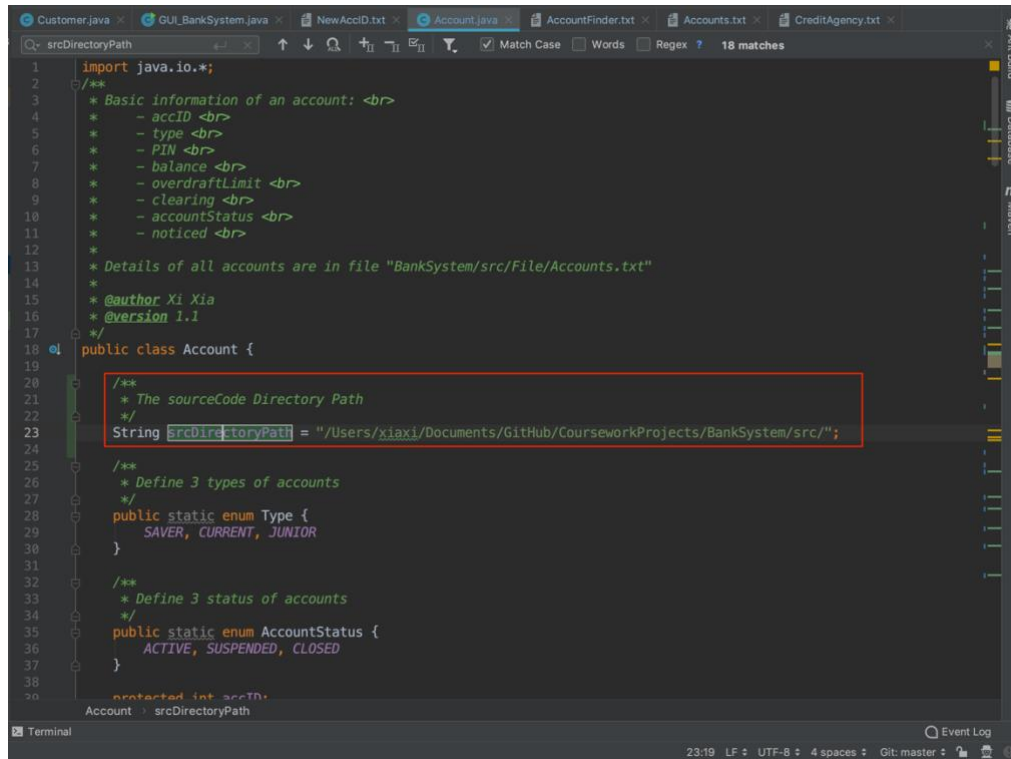


The screenshot shows the IntelliJ IDEA IDE with the 'Customer.java' file open. A search bar at the top indicates 'srcDirectoryPath' with 2 matches. The code in the editor shows the 'Customer' class with various imports and annotations. A red box highlights the line: `String srcDirectoryPath = "/Users/xiaxi/Documents/GitHub/CourseworkProjects/BankSystem/src/";`. The IDE interface includes a terminal at the bottom and a sidebar on the right with 'Art Build', 'Database', and 'Maven' tabs.

Figure 1. srcDirectoryPath in Customer.java

(srcDirectoryPath = /Users/xiaxi/Documents/GitHub/CourseworkProjects/BankSystem/src/)

b. In Account.java



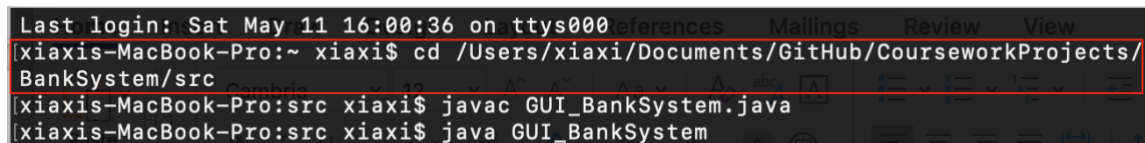
```
1 import java.io.*;
2 /**
3  * Basic information of an account: <br>
4  * - accID <br>
5  * - type <br>
6  * - PIN <br>
7  * - balance <br>
8  * - overdraftLimit <br>
9  * - clearing <br>
10 * - accountStatus <br>
11 * - noticed <br>
12 *
13 * Details of all accounts are in file "BankSystem/src/File/Accounts.txt"
14 *
15 * @author Xi Xia
16 * @version 1.1
17 */
18 public class Account {
19
20     /**
21     * The sourceCode Directory Path
22     */
23     String srcDirectoryPath = "/Users/xiaxi/Documents/GitHub/CourseworkProjects/BankSystem/src/";
24
25     /**
26     * Define 3 types of accounts
27     */
28     public static enum Type {
29         SAVER, CURRENT, JUNIOR
30     }
31
32     /**
33     * Define 3 status of accounts
34     */
35     public static enum AccountStatus {
36         ACTIVE, SUSPENDED, CLOSED
37     }
38
39     protected int accID;
40 }
```

Figure 2. srcDirectoryPath in Account.java

(srcDirectoryPath = /Users/xiaxi/Documents/GitHub/CourseworkProjects/BankSystem/src/)

3. Enter instructions in the Terminal as shown in Fig. 3.

Please make sure **cd** is followed by the same path as the **srcDirectoryPath** missing the final '/'.



```
Last login: Sat May 11 16:00:36 onattys000
xiaxis-MacBook-Pro:~ xiaxi$ cd /Users/xiaxi/Documents/GitHub/CourseworkProjects/BankSystem/src
xiaxis-MacBook-Pro:src xiaxi$ javac GUI_BankSystem.java
xiaxis-MacBook-Pro:src xiaxi$ java GUI_BankSystem
```

Figure 3. How to Start in the Terminal

(cd is followed by /Users/xiaxi/Documents/GitHub/CourseworkProjects/BankSystem/src)

4. Then you will be welcomed by a message window shown as Fig. 4.



Figure 4. Welcome Message

5. Press the button “OK”, then you can see the Home Page as shown in Fig. 5.

SYSTEM FUNCTIONS

The Bank System offers 6 functions. Home page is shown as Fig. 5. You can choose one function by pressing the corresponding button.

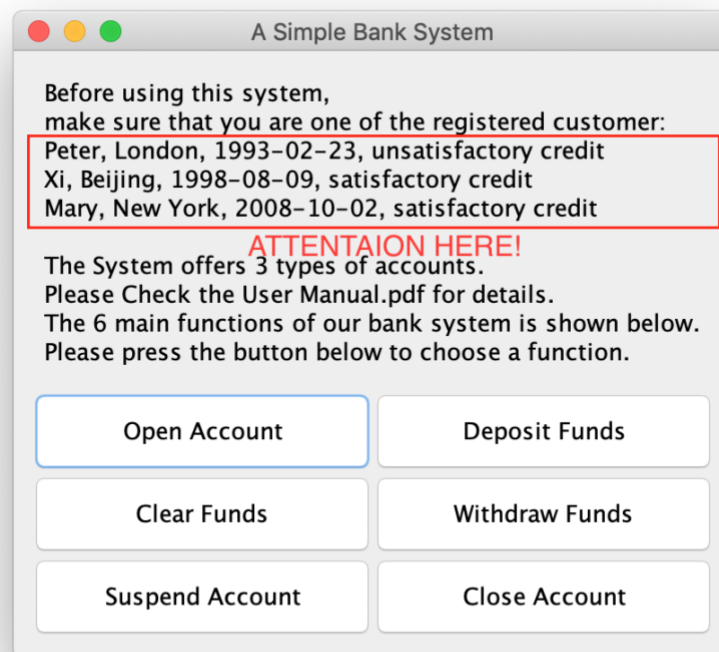


Figure 5. Bank System Home Page

Note:

1. We had only Registered 3 customers as noted in Fig. 5. Details are in the file: **“BankSystem/src/File/CreditAgency.txt”**
2. Reaction to all kinds of invalid inputs or operations is similar to Fig. 6.
3. Reaction to all kinds of successful operations is shown as Fig. 7.



Figure 6. Invalid Input/Operation Notice

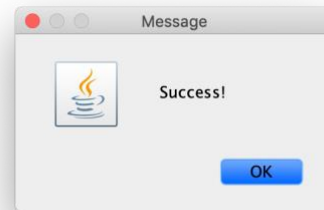


Figure 7. Successful Operation Notice

DESCRIPTIONS OF THE SIX FUNCTIONS

1. Open Account

In order to open an account, the customer must provide the following information: ① **name**, ② **address**, ③ **date of birth**, ④ **type of account to be opened**. shown as Fig. 8.

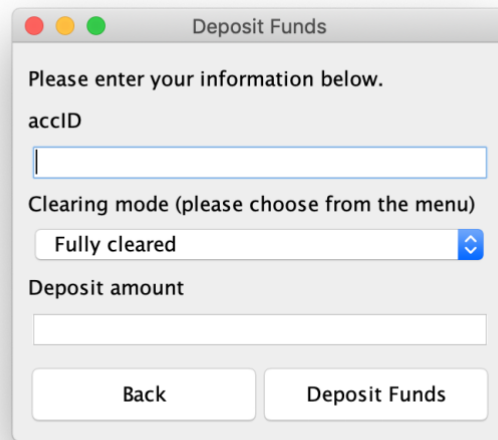
Figure 8. Open Account page

Note:

- a. Only customer with satisfactory credit history can open an account
- b. Only customers under the age of 16 may open a Junior account
- c. All current accounts' overdraft limit is set as 2000
- d. When opening an account, the PIN is set the same as the customer's birthday.

2. Deposit Funds

The depositor should provide ① an account number, ② the amount to be deposited shown as Fig. 9.



Deposit Funds

Please enter your information below.

accID

Clearing mode (please choose from the menu)

Fully cleared

Deposit amount

Back Deposit Funds

Figure 9. Deposit Funds page

Note:

- a. The input "Deposit amount" should be a number. (integer/ decimal)
- b. When funds are deposited, they are either cleared (the funds have been fully credited, e.g. Cash), or un-cleared (transfer of funds is pending, e.g. using Cheque). Cleared funds are immediately credited to the account.
- c. Un-cleared funds can be cleared by the "Clear Funds" function in the Home Page.
- d. If the account is suspended, depositing is not allowed.

3. Clear Funds

An external bank clearing system periodically clears un-cleared funds. Once cleared, they are immediately credited to the account. Customers can credit un-cleared funds to an account by entering ① appropriate account number and ② PIN shown as Fig. 10.

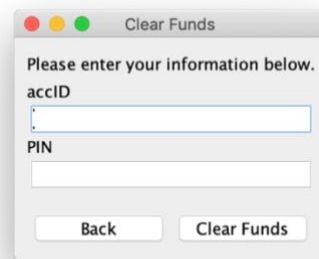
A dialog box titled "Clear Funds" with a standard macOS-style title bar (red, yellow, green buttons). The text inside says "Please enter your information below." followed by two input fields: "accID" and "PIN". Below the input fields are two buttons: "Back" and "Clear Funds".

Figure 10. Clear Funds page

Note:

- a. You should provide a correct PIN matching to the account ID.

4. Withdraw Funds

Customers may withdraw funds from an account by supplying ① their account number, ② an appropriate identification (in this case, their PIN), and ③ the amount to be withdrawn shown as Fig. 11

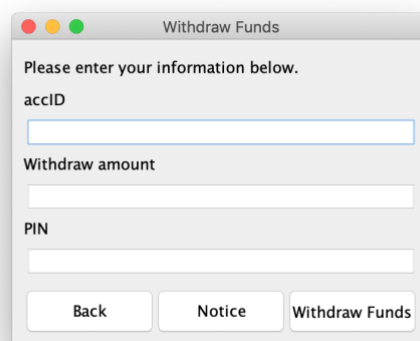
A dialog box titled "Withdraw Funds" with a standard macOS-style title bar (red, yellow, green buttons). The text inside says "Please enter your information below." followed by three input fields: "accID", "Withdraw amount", and "PIN". Below the input fields are three buttons: "Back", "Notice", and "Withdraw Funds".

Figure 11. Withdraw Funds page

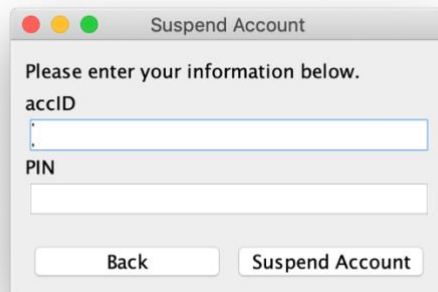
A customer cannot withdraw more funds than their limit permits (determined by the type of account).

Note:

- a. The input “Withdraw amount” should be a number. (integer/decimal)
- b. You should provide a correct PIN matching to the account ID.
- c. For a Saver account, a minimum period of notice (in days) must be given before any withdrawal.
- d. Here, we haven’t defined the days required to notice, you can simply click on the button “Notice” to give a notice before withdrawal.
- e. When giving notice by pressing the button “notice”, we don’t check whether your balance and overdraft limit is enough. These will be check when you withdraw.
- f. For Saver/Junior Accounts, withdrawal amount should not exceed your balance. For Current Account, withdrawal amount should not exceed your (balance + overdraft limit)
- g. If the account is suspended, withdrawing is not allowed.

5. Suspend Account

Customers can suspend an account by entering ① appropriate account number and ② PIN shown as Fig. 12.



The image shows a macOS-style dialog box titled "Suspend Account". It contains the text "Please enter your information below." followed by two input fields labeled "accID" and "PIN". At the bottom, there are two buttons: "Back" and "Suspend Account".

Figure 12. Suspend Account page

Note:

- a. You should provide a correct PIN matching to the account ID.

- b. After the account is suspended, no further transaction (Deposit, Withdraw) is allowed.

6. Close Account

Customers can close the cleared account by entering ① **appropriate account number** and ② **PIN** shown as Fig. 13.

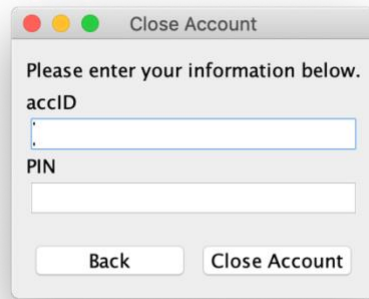
A screenshot of a 'Close Account' dialog box. The dialog has a title bar with three colored buttons (red, yellow, green) and the text 'Close Account'. Inside, it says 'Please enter your information below.' followed by two input fields. The first field is labeled 'accID' and the second is labeled 'PIN'. At the bottom, there are two buttons: 'Back' and 'Close Account'.

Figure 13. Close Account page

Note:

- a. You should provide a correct PIN matching to the account ID.
- b. Only when the balance has been cleared, can this account be closed.
- c. After the account is closed, no further operation on this account is allowed.
- d. Closed accounts are not deleted. Just the status of accounts are changed to "CLOSED", and you can still see the records in text files.

REFERENCE

- 1. [CaseStudy: a simple banking system](#)
- 2. [Code for calculating age using birthday in format "yyyy-MM-dd"](#)