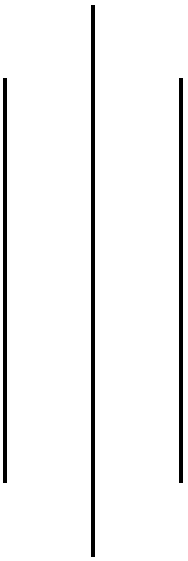
ORCHID INTERNATIONAL College

(Affiliated to Tribhuvan University)

Advanced Java Programming

Lab 003

Object Oriented Programming in Java



Submitted by:

Abhinna Ojha, 20788/075

BSc. CSIT - VII

Submitted to:

Mr. Krishna Pandey

Department of CSIT

1. **Write classes to hold Account, SB-Account and Current-Account details. [Here, implement the concept of inheritance.]**
   The common properties of the account are Account number, name and amount.
   Specifics of SB account is 4% interest to be paid per month.

- **Implement the run-time polymorphism by creating base class variable and derived class object.**
- **Ask the user for which type of account to be created then create the corresponding account (Note: Use scanner class).**
- **Implement function overriding by having deposit and withdraw functions and perform the required action accordingly.**
  Ensure base class can't be instantiated. (Note: Abstract keyword can be used).

2. **Define the minimum balance for the both the type of accounts. Use final keyword to create constants.**
   Ensure sb account class and current account class will cannot be used as base classes (Note:You can use final classes).

```
/*
*   Title:
*   1.  Write classes to hold Account, SB-Account and Current-Account details. [Here
implement
*       the concept of inheritance.]
*       The common properties of the account are Account number, name and amount.
*       Specifics of SB account is 4% interest to be paid per month.
*
*       ð   Implement the run-time polymorphism by creating base class variable and derived
class object.
*       ð   Ask the user for which type of account to be created then create the corresponding
account
*           (Note: Use scanner class).
*       ð   Implement function overriding by having deposit and withdraw functions and
perform the
*           required action accordingly.
*
*       Ensure base class can't be instantiated. (Note: Abstract keyword can be used).
*   2.  Define the minimum balance for the both the type of accounts. Use final keyword to
*       create constants.
*       Ensure sb account class and current account class will cannot be used as base classes
*       (Note:You can use final classes).
*
*
*   Date modified; Author(s); Modification details
*       2022-12-19; abhinna; Created the program
*       2022-12-22; abhinna; Added the classes, finals, and abstract methods
*       2022-12-23; abhinna; Implemented deposit and withdraw methods through override
* */

import java.util.Scanner;

public class Main
{
    public static void main(String[] args)
    {
        int accountType = 0;
        boolean infiniteFlag = true;
        Account account = null;
//        infiniteFlag for allowance of only 3 choices
        while (infiniteFlag)
        {
            System.out.println("Enter the account type to open new account");
            System.out.println("1. SB Account");
            System.out.println("2. Current Account");
            System.out.println("0. Exit");
            System.out.println("Choice: ");

            Scanner scanner = new Scanner(System.in);
            accountType = Integer.parseInt(scanner.nextLine());
```

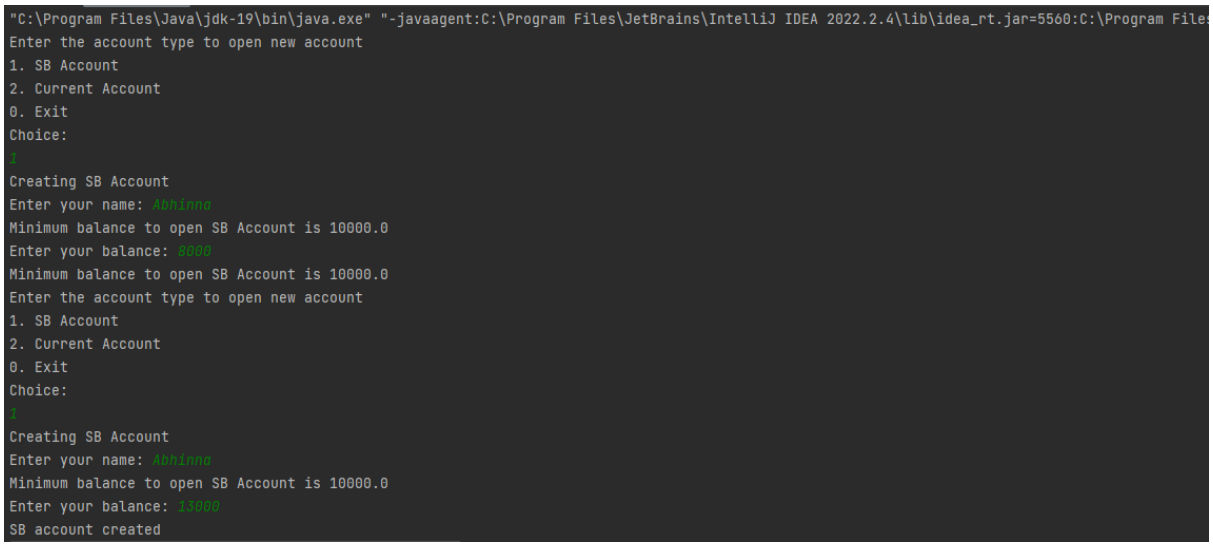
```
//          when 0 is hit, terminate
            if (accountType == 0)
            {
               infiniteFlag = false;
            }
            else
            {
               String x = "";
               switch (accountType) {
//                   when 1 is hit, create SB account
                  case 1 ->
                  {
                     x = "SB";
                     account = new SBAccount();
                  }
//                  when 2 is hit, create current account
                  case 2 ->
                  {
                     x = "Current";
                     account = new CurrentAccount();
                  }
               }
               System.out.print("Creating " + x + " Account");
               System.out.print("\nEnter your name: ");
               account.name = scanner.nextLine();

               System.out.print("Minimum balance to open " + x + " Account is " +
account.getMinimumBalance());
               System.out.print("\nEnter your balance: ");
               double amt = Double.parseDouble(scanner.nextLine());
               if(account.amount + amt < account.getMinimumBalance())
               {
                  System.out.println("Minimum balance to open " + x + " Account is " +
account.getMinimumBalance());
               }
               else
               {
                  account.amount += amt;
                  System.out.println( x + " account created");
                  infiniteFlag = false;
               }
            }
         }

         Scanner scanner = new Scanner(System.in);
         infiniteFlag = true;
         while (infiniteFlag)
         {
            System.out.println("Enter the choice");
```

```
            System.out.println("1. Deposit");
            System.out.println("2. Withdraw");
            System.out.println("0. Exit");
            System.out.println("Choice: ");
            int choice = Integer.parseInt(scanner.nextLine());
            switch (choice)
            {
                case 1-> account.deposit();
                case 2-> account.withdraw();
                case 0-> infiniteFlag = false;
                default -> System.out.println("Invalid choice");
            }
        }
    }
}

// base class to be inherited
// base class made abstract so that it cannot be instantiated
abstract class Account
{
    int accountNumber;
    String name;
    double amount;
//    constructor to initialise amount = 0
    Account()
    {
        amount = 0;
    }
//    abstract methods so that it can be overridden later
    public abstract void deposit();
    public abstract void withdraw();
    public abstract double getMinimumBalance();
}

// derived classes made final so they cannot be inherited
final class SBAccount extends Account
{
    double interest;
    final double minimumBalance = 10000;

//    constructor to instantiate 4% interest per month and minimum balance
    SBAccount()
    {
        interest = 4.0;
    }
//    overriding abstract deposit()
    @Override
     public void deposit()
    {
//        using try catch as there may be runtime error where double value may not be inputted
```

```
        try
        {
            System.out.println("Enter amount to deposit to your SB account: ");
            Scanner scanner = new Scanner(System.in);
            double amt = Double.parseDouble(scanner.nextLine());
            amount += amt;
            System.out.println("Deposit successful, your new balance is " + amount);
        }
        catch (Exception e)
        {
            System.out.println("Deposit unsuccessful, some error occurred, please try again");
        }
    }
//    overriding abstract withdraw()
    @Override
    public void withdraw()
    {
//        using try catch as there may be runtime error where double value may not be inputted
        try
        {
            System.out.println("Enter amount to withdraw from your SB account: ");
            Scanner scanner = new Scanner(System.in);
            double amt = Double.parseDouble(scanner.nextLine());
//            minimumBalance is 10000, and thus the minimum amount of withdrawal is amount
- minimumBalance
            if (amt > (amount - getMinimumBalance()))
            {
                System.out.println("Withdraw unsuccessful, insufficient balance");
            }
            else
            {
                amount -= amt;
                System.out.println("Withdraw successful, your new balance is " + amount);
            }
        }
        catch (Exception e)
        {
            System.out.println("Withdraw unsuccessful, some error occurred, please try again");
        }
    }
//    method to get the value of constant minimumBalance
    @Override
    public double getMinimumBalance()
    {
        return minimumBalance;
    }
}

final class CurrentAccount extends Account
{
```

```
    final double minimumBalance = 7000;
//    overriding abstract deposit()
    @Override
    public void deposit()
    {
//        using try catch as there may be runtime error where double value may not be inputted
        try
        {
            boolean flag = true;
            while (flag)
            {
                System.out.println("Enter amount to deposit to your Current account (min 1000):
");
                Scanner scanner = new Scanner(System.in);
                double amt = Double.parseDouble(scanner.nextLine());
                if (amt < 1000)
                {
                    System.out.println("Please deposit at least 1000");
                }
                else
                {
                    amount += amt;
                    System.out.println("Deposit successful, your new balance is " + amount);
                    flag = false;
                }
            }
        }
        catch (Exception e)
        {
            System.out.println("Deposit unsuccessful, some error occurred, please try again");
        }
    }
//    overriding abstract withdraw()
    @Override
    public void withdraw()
    {
//        using try catch as there may be runtime error where double value may not be inputted
        try
        {
            System.out.println("Enter amount to withdraw from your Current account, minimum
1000: ");
            Scanner scanner = new Scanner(System.in);
            double amt = Double.parseDouble(scanner.nextLine());
            if (amt < 1000)
            {
                System.out.println("Minimum withdrawable amount is 1000");
            }
            else
            {
```

```
//              minimumBalance is 7000, and thus the minimum amount of withdrawal is amount
- minimumBalance
            if (amt > (amount - getMinimumBalance()))
            {
               System.out.println("Withdraw unsuccessful, insufficient balance");
            }
            else
            {
               amount -= amt;
               System.out.println("Withdraw successful, your new balance is " + amount);
            }
         }
      }
      catch (Exception e)
      {
         System.out.println("Withdraw unsuccessful, some error occurred, please try again");
      }
   }
//    method to get the value of constant minimumBalance
   @Override
   public double getMinimumBalance()
   {
      return minimumBalance;
   }
}
```



```
SB account created
Enter the choice
1. Deposit
2. Withdraw
0. Exit
Choice:
1
Enter amount to deposit to your SB account:
300
Deposit successful, your new balance is 13300.0
Enter the choice
1. Deposit
2. Withdraw
0. Exit
Choice:
3
Invalid choice
Enter the choice
1. Deposit
2. Withdraw
0. Exit
Choice:
2
```

```
Choice:
2
Enter amount to withdraw from your SB account:
5000
Withdraw unsuccessful, insufficient balance
Enter the choice
1. Deposit
2. Withdraw
0. Exit
Choice:
3000
Invalid choice
Enter the choice
1. Deposit
2. Withdraw
0. Exit
Choice:
2
Enter amount to withdraw from your SB account:
3000
Withdraw successful, your new balance is 10300.0
Enter the choice
1. Deposit
```

```
2. Withdraw
0. Exit
Choice:
3000
Invalid choice
Enter the choice
1. Deposit
2. Withdraw
0. Exit
Choice:
2
Enter amount to withdraw from your SB account:
3000
Withdraw successful, your new balance is 10300.0
Enter the choice
1. Deposit
2. Withdraw
0. Exit
Choice:
0

Process finished with exit code 0
```

```
"C:\Program Files\Java\jdk-19\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2022.2.4\lib\idea_rt.jar=6039:C:\Program File
Enter the account type to open new account
1. SB Account
2. Current Account
0. Exit
Choice:
2
Creating Current Account
Enter your name: Abhinna
Minimum balance to open Current Account is 7000.0
Enter your balance: 5000
Minimum balance to open Current Account is 7000.0
Enter the account type to open new account
1. SB Account
2. Current Account
0. Exit
Choice:
2
Creating Current Account
Enter your name: Abhinna
Minimum balance to open Current Account is 7000.0
Enter your balance: 9000
Current account created
```

```
Current account created
Enter the choice
1. Deposit
2. Withdraw
0. Exit
Choice:
1
Enter amount to deposit to your Current account (min 1000):
100
Please deposit at least 1000
Enter amount to deposit to your Current account (min 1000):
10000
Deposit successful, your new balance is 19000.0
Enter the choice
1. Deposit
2. Withdraw
0. Exit
Choice:
2
Enter amount to withdraw from your Current account, minimum 1000:
15000
Withdraw unsuccessful, insufficient balance
Enter the choice
1. Deposit
```

```
Withdraw unsuccessful, insufficient balance
Enter the choice
1. Deposit
2. Withdraw
0. Exit
Choice:
2
Enter amount to withdraw from your Current account, minimum 1000:
100
Minimum withdrawable amount is 1000
Enter the choice
1. Deposit
2. Withdraw
0. Exit
Choice:
2
Enter amount to withdraw from your Current account, minimum 1000:
10000
Withdraw successful, your new balance is 9000.0
Enter the choice
1. Deposit
2. Withdraw
0. Exit
```

```
2. Withdraw
0. Exit
Choice:
0

Process finished with exit code 0
```