

Name: AKELLA VENKATA SURYANARAYANA MURTHY

Email_id: murthyakella2003@gmail.com

Day_3 Assignment

Case Study Title: Banking System Application Using OOPs

```
package Day2java;
```

```
import java.util.*;
```

```
// Interface
```

```
interface BankOperations {  
    void deposit(double amount);  
    void withdraw (double amount);  
    void transfer(Account target, double amount);  
    double checkBalance();  
    void showTransactionHistory();  
}
```

```
// Abstract class
```

```
abstract class Account implements BankOperations {  
    protected String accountNumber;  
    protected double balance;  
    protected List<String> transactionHistory = new ArrayList<>();  
    public Account(String accountNumber, double balance) {  
        this.accountNumber = accountNumber;  
        this.balance = balance;  
    }  
    public abstract void deposit(double amount);  
    public abstract void withdraw(double amount);
```

```
public void transfer(Account target, double amount) {  
    if (this.balance >= amount) {  
        this.withdraw(amount);  
        target.deposit(amount);  
        addTransaction("Transferred to Account " + target.accountNumber + ": " + amount);  
        target.addTransaction("Received from Account " + this.accountNumber + ": " + amount);  
    } else {  
        System.out.println(" Insufficient funds for transfer.");  
    }  
}  
  
public double checkBalance() {  
    return balance;  
}  
  
public void addTransaction(String info) {  
    transactionHistory.add(info);  
}  
  
public void showTransactionHistory() {  
    System.out.println(" Transaction History for Account: " + accountNumber);  
    for (String t : transactionHistory) {  
        System.out.println(" - " + t);  
    }  
}  
  
public String getAccountNumber() {  
    return accountNumber;  
}  
}
```

// SavingsAccount class

```
class SavingsAccount extends Account {  
    private final double MIN_BALANCE = 1000.0;  
    public SavingsAccount(String accountNumber, double balance) {  
        super(accountNumber, balance);  
    }  
    public void deposit(double amount) {  
        balance += amount;  
        addTransaction("Deposited: " + amount);  
    }  
    public void withdraw(double amount) {  
        if (balance - amount >= MIN_BALANCE) {  
            balance -= amount;  
            addTransaction("Withdrawn: " + amount);  
        } else {  
            System.out.println(" Cannot withdraw. Minimum balance requirement not met.");  
        }  
    }  
}
```

// CurrentAccount class

```
class CurrentAccount extends Account {  
    private final double OVERDRAFT_LIMIT = 2000.0;  
    public CurrentAccount(String accountNumber, double balance) {  
        super(accountNumber, balance);  
    }  
    public void deposit(double amount) {
```

```
balance += amount;
addTransaction("Deposited: " + amount);
}

public void withdraw(double amount) {
    if (balance - amount >= -OVERDRAFT_LIMIT) {
        balance -= amount;
        addTransaction("Withdrawn: " + amount);
    } else {
        System.out.println(" Overdraft limit exceeded.");
    }
}
}
```

// Customer class

```
class Customer {
    private String customerId;
    private String name;
    private List<Account> accounts = new ArrayList<>();
    public Customer(String customerId, String name) {
        this.customerId = customerId;
        this.name = name;
    }
    public void addAccount(Account acc) {
        accounts.add(acc);
    }
    public List<Account> getAccounts() {
        return accounts;
    }
}
```

```
}  
  
public String getCustomerId() {  
    return customerId;  
}  
  
public String getName() {  
    return name;  
}  
}
```

// BankBranch class

```
class BankBranch {  
    private String branchId;  
    private String branchName;  
    private List<Customer> customers = new ArrayList<>();  
    public BankBranch(String branchId, String branchName) {  
        this.branchId = branchId;  
        this.branchName = branchName;  
        System.out.println(" Branch Created: " + branchName + " [Branch ID: " + branchId + "]);  
    }  
    public void addCustomer(Customer c) {  
        customers.add(c);  
        System.out.println(" Customer added to branch.");  
    }  
    public Customer findCustomerById(String id) {  
        for (Customer c : customers) {  
            if (c.getCustomerId().equals(id)) {  
                return c;  
            }  
        }  
    }  
}
```

```

    }
    }
    return null;
}

public void listAllCustomers() {
    for (Customer c : customers) {
        System.out.println("- " + c.getName() + " [ID: " + c.getCustomerId() + "]");
    }
}
}
}

```

// Main Class

```

public class BankingSystem {
    public static void main(String[] args) {
        // Step 1: Create branch
        BankBranch branch = new BankBranch("B001", "Main Branch");

        // Step 2: Create customer
        Customer c1 = new Customer("C001", "Alice");

        System.out.println(" Customer Created: " + c1.getName() + " [Customer ID: " +
            c1.getCustomerId() + "]");

        branch.addCustomer(c1);

        // Step 3: Create accounts
        SavingsAccount sa = new SavingsAccount("S001", 5000.0);
        CurrentAccount ca = new CurrentAccount("C001", 2000.0);

        c1.addAccount(sa);
        c1.addAccount(ca);

        System.out.println(" Savings Account [S001] opened with initial balance: ₹5000.0");
    }
}

```

```
System.out.println(" Current Account [C001] opened with initial balance: ₹2000.0 and  
overdraft limit ₹2000.0");  
  
// Step 4: Deposit to savings  
sa.deposit(2000.0);  
  
System.out.println(" Deposited 2000.0 to Savings Account [S001]");  
  
System.out.println(" Current Balance: " + sa.checkBalance());  
  
// Step 5: Withdraw from current using overdraft  
ca.withdraw(2500.0);  
  
System.out.println(" Withdrawn 2500.0 from Current Account [C001]");  
  
System.out.println(" Current Balance: " + ca.checkBalance());  
  
// Step 6: Transfer from savings to current  
sa.transfer(ca, 1000.0);  
  
System.out.println("Transferred 1000.0 from Savings Account [S001] to Current Account  
[C001]");  
  
System.out.println(" Savings Balance: " + sa.checkBalance());  
  
System.out.println(" Current Balance: " + ca.checkBalance());  
  
// Step 7: Show transaction history  
sa.showTransactionHistory();  
ca.showTransactionHistory();  
  
}  
  
}
```