

SCHOOL : INFORMATION SCIENCE AND TECHNOLOGY

DEPARTMENT : SOFTWARE ENGINEENING

NAME : MHURU TIMUKUDZEISHE

REG NUMBER : H230469G

COURSE NAME : OBJECT ORIENTED PROGRAMMING

PART : 2.1

ASSIGNMENT : 2

QUESTION 1

**Account.java**

public class Account extends Bank {

    public Account(String *accountName*, double *balance*) {

        super(*accountName*, *balance*);

    }

    @Override

    public void deposit(double *amount*) {

        if (*amount* > 0) {

            balance += *amount*;

            recordTransaction("Deposited " + *amount* + " into " + accountName);

        } else {

            System.out.println("Invalid deposit amount. Amount must be greater than 0.");

        }

    }

    @Override

    public void withdraw(double *amount*) {

        if (*amount* > 0 && *amount* <= balance) {

            balance -= *amount*;

            recordTransaction("Withdrew " + *amount* + " from " + accountName);

        } else if (*amount* > balance) {

            System.out.println("Withdrawal amount exceeded account balance.");

        } else {

            System.out.println("Invalid withdrawal amount. Amount must be greater than 0.");

        }

    }

    @Override

    public double getBalance() {

        return balance;

    }

}

**Bank.java**

import java.io.FileWriter;

import java.io.IOException;

import java.io.PrintWriter;

public abstract class Bank {

    protected String accountName;

    protected double balance;

    public Bank(String *accountName*, double *balance*) {

        this.accountName = *accountName*;

        this.balance = *balance*;

    }

    public abstract void deposit(double *amount*);

    public abstract void withdraw(double *amount*);

    public abstract double getBalance();

    protected void recordTransaction(String *transaction*) {

        try (PrintWriter out = new PrintWriter(new FileWriter("Bank.txt", true))) {

            out.println(*transaction*);

        } catch (IOException *e*) {

            System.err.println("Error writing to file: " + e.getMessage());

        }

    }

}

**Accounttest.java**

import java.util.Scanner;

public class Accounttest {

    public static void main(String[] *args*) {

        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter account name: ");

        String accountName = scanner.nextLine();

        System.out.print("Enter initial balance: ");

        double initialBalance = scanner.nextDouble();

        Account account = new Account(accountName, initialBalance);

        while (true) {

            System.out.println("1. Deposit");

            System.out.println("2. Withdraw");

            System.out.println("3. Check Balance");

            System.out.println("4. Exit");

            System.out.print("Choose an option: ");

            int option = scanner.nextInt();

            switch (option) {

                case 1:

                    System.out.print("Enter deposit amount: ");

                    double depositAmount = scanner.nextDouble();

                    account.deposit(depositAmount);

                    break;

                case 2:

                    System.out.print("Enter withdrawal amount: ");

                    double withdrawalAmount = scanner.nextDouble();

                    account.withdraw(withdrawalAmount);

                    break;

                case 3:

                    System.out.println("Current Balance: " + account.getBalance());

                    break;

                case 4:

                    System.out.println("Exiting...");

                    return;

                default:

                    System.out.println("Invalid option. Please try again.");

            }

        }

    }

}

QUESTION 2

Stream.java

package qn2;

import java.util.ArrayList;

import java.util.List;

public class stream {

    public static void main(String[] *args*) {

        List<Integer> numbers = new ArrayList<>();

        numbers.add(1);

        numbers.add(4);

        numbers.add(5);

        numbers.add(20);

        numbers.add(30);

        numbers.add(6);

        numbers.stream()

                .filter(*n* -> *n* % 5 == 0)

                .forEach(System.out::println);

    }

}

QUESTION 3

package qn3;

import java.util.InputMismatchException;

import java.util.Scanner;

class AgeOutOfRangeException extends Exception {

    public AgeOutOfRangeException(String *message*) {

        super(*message*);

    }

}

public class overage {

    public static void main(String[] *args*) {

        Scanner scanner = new Scanner(System.in);

        try {

            System.out.print("Enter your age: ");

            int age = scanner.nextInt();

            validateAge(age);

        } catch (InputMismatchException *e*) {

            System.out.println("Error: Invalid input. Please enter a valid age.");

        } catch (AgeOutOfRangeException *e*) {

            System.out.println("Error: " + e.getMessage());

        } finally {

            scanner.close();

        }

    }

    public static void validateAge(int *age*) throws AgeOutOfRangeException {

        if (*age* < 18 || *age* > 65) {

            throw new AgeOutOfRangeException("INVALID! Age must be between 18 and 65!");

        }

        System.out.println("Age is valid!");

    }

}