LAB 4 and LAB 5

LAB 4 CODE AND OUTPUT:

Develop a Java program to create an abstract class named Shape that contains two integers and an empty method named printArea( ). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contain only the method printArea( ) that prints the area of the given shape.

```
import java.util.*;
abstract class Shape
{
int a,b;
abstract void printArea();
}

class Rectangle extends Shape
{
void printArea()
{
Scanner ss=new Scanner(System.in);
System.out.println("Enter length and breadth of the rectangle");
a=ss.nextInt();
b=ss.nextInt();
double area;
area=(double)a*b;
System.out.println("The area of Recatngle is "+area);
}
}
class Triangle extends Shape
{
void printArea()
{
Scanner ss=new Scanner(System.in);
System.out.println("Enter base length and height of the triangle");
a=ss.nextInt();
b=ss.nextInt();
double area;
area=(double)0.5*a*b;
System.out.println("The area of Triangle is "+area);
}
}
class Circle extends Shape
{
void printArea()
```

```
{
Scanner ss=new Scanner(System.in);
System.out.println("Enter radius of the circle");
a=ss.nextInt();
double area;
area=(double)3.14*a*a;
System.out.println("The area of Circle is "+area);
}
}

class Shapemain
{
public static void main(String args[])
{
int ch;
Scanner ss=new Scanner(System.in);
Rectangle r=new Rectangle();
Triangle t=new Triangle();
Circle c=new Circle();
while(true){
System.out.println("Enter the choice of shape whose area has to be calculated");
System.out.println("1.Rectangle\n2.Triangle\n3.Circle\n4.Exit");
ch=ss.nextInt();
switch(ch)
{
case 1:
r.printArea();
break;
case 2:
t.printArea();
break;
case 3:
c.printArea();
break;
case 4:
System.exit(0);
break;
default:
System.out.println("Invalid choice!");
}
}
}
}
```

OUTPUT:

```
D:\Kusum\III SEMESTER\OOJ2020>javac lab4.java

D:\Kusum\III SEMESTER\OOJ2020>java Shapemain
Enter the choice of shape whose area has to be calculated
1.Rectangle
2.Triangle
3.Circle
4.Exit
1
Enter length and breadth of the rectangle
2
3
The area of Rectangle is 6.0
Enter the choice of shape whose area has to be calculated
1.Rectangle
2.Triangle
3.Circle
4.Exit
2
Enter base length and height of the triangle
1
2
The area of Triangle is 1.0
Enter the choice of shape whose area has to be calculated
1.Rectangle
2.Triangle
3.Circle
4.Exit
3
Enter radius of the circle
2
The area of Circle is 12.56
Enter the choice of shape whose area has to be calculated
1.Rectangle
2.Triangle
3.Circle
4.Exit
5
Invalid choice!
```

```
Enter the choice of shape whose area has to be calculated
1.Rectangle
2.Triangle
3.Circle
4.Exit
4

D:\Kusum\III SEMESTER\OOJ2020>
```

LAB 5: CODE AND OUTPUT

Develop a Java program to create a class Bank that maintains two kinds of account for its customers, one called savings account and the other current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed. Create a class Account that stores customer name, account number and type of account. From this derive the classes Curr-acct and Sav-acct to make them more specific to their requirements. Include the necessary methods in order to achieve the following tasks: •Accept deposit from customer and update the balance. • Display the balance. • Compute and deposit interest • Permit withdrawal and update the balance • Check for the minimum balance,impose penalty if necessary and update the balance

```
import java.util.Scanner;

abstract class Account {
   String cName, accType;
   long accNo;
   double bal;
   final double minBal = 1000.0;

   Account(String cName, long accNo, double bal, String accType) {
      this.accNo = accNo;
      this.cName = cName;
      this.bal = bal;
      this.accType = accType;
   }

   abstract void addBal(double amt);

   abstract void dispBal();

   abstract void withBal(double amt);
}

class Curr_acct extends Account {
   Curr_acct(String cName, long accNo, double bal) {
      super(cName, accNo, bal, "Current");
      System.out.println("Name: "+cName+"\taccno: "+accNo+"\tbal: "+bal+"\ttype: "+accType);
   }

   void addBal(double amt){
      this.bal  += amt;
```

```
    }

    void dispBal(){
        System.out.println("Your balance is: " + this.bal);
    }
            void checkBal() {
        if (this.bal < minBal) {
                                System.out.println("Insufficient balance, penalty imposed");
            this.bal -= this.bal * 0.02;
        }
}

    void withBal(double amt){
        this.bal -= amt;
        checkBal();
    }

}

class Sav_acct extends Account {
    Sav_acct(String cName, long accNo, double bal) {
        super(cName, accNo, bal, "Savings");
        System.out.println("name: " + cName + "\taccno: " + accNo + "\tbal: " + bal + "\ttype: " +
accType);
    }

    void addBal(double amt){
        this.bal  += amt;
        addIntr();
    }

    void addIntr() {
        this.bal += this.bal * 0.07;
    }

    void dispBal(){
        System.out.println("Your balance is: " + this.bal);
    }


    void withBal(double amt){
        this.bal -= amt;
```

```
    }


    }


class Bank {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        Double amt;
                    System.out.println("Enter your details:");
                    System.out.println("Name:");
                    String x=sc.next();
                    System.out.println("Account Number:");
                    long y=sc.nextLong();
                    for(;;)
                    {
                    System.out.println("Type of account:\n1.Current account\n2.Savings
account\n3.Exit");
                    int t=sc.nextInt();


        if(t==1){
                                System.out.println("The current account provides cheque book facility but
no interest.");
                    Curr_acct c = new Curr_acct(x, y, 50000);
        for(;;)
                                {
            System.out.println("1:Deposit\n2:Display Balance\n3:Withdraw\n4:Exit");
            int ch = sc.nextInt();

            switch (ch) {
                case 1:
                    System.out.println("Enter the amount to be added:");
                    amt = sc.nextDouble();
                    c.addBal(amt);
                    break;

                case 2:
                    c.dispBal();
                    break;

                case 3:
```

```
            System.out.println("Enter the amount to be withdrawn:");
            amt = sc.nextDouble();
            c.withBal(amt);
            break;
                                case 4:System.exit(0);
                        default:System.out.println("Invalid choice! Try again");
        }
                            }

                }

    else if(t==2){
                            System.out.println("The savings account provides compound interest and
withdrawal facilities but no cheque book facility.");
                Sav_acct s = new Sav_acct(x, y, 5000);
    for(;;) {
        System.out.println("1:Deposit\n2:Display Balance\n3:Withdraw\n4:Exit");
        int ch = sc.nextInt();
        switch (ch) {
            case 1:
                System.out.println("Enter the amount to be added:");
                amt = sc.nextDouble();
                s.addBal(amt);
                break;

            case 2:
                s.dispBal();
                break;

            case 3:
                System.out.println("Enter the amount to be withdrawn:");
                amt = sc.nextDouble();
                s.withBal(amt);
                break;
            case 4:System.exit(0);
                        default:System.out.println("Invalid choice! Try again");
        }
    }
                }
                else if(t==3)
                        System.exit(0);
                else
                        System.out.println("Invalid choice! Try again");
```

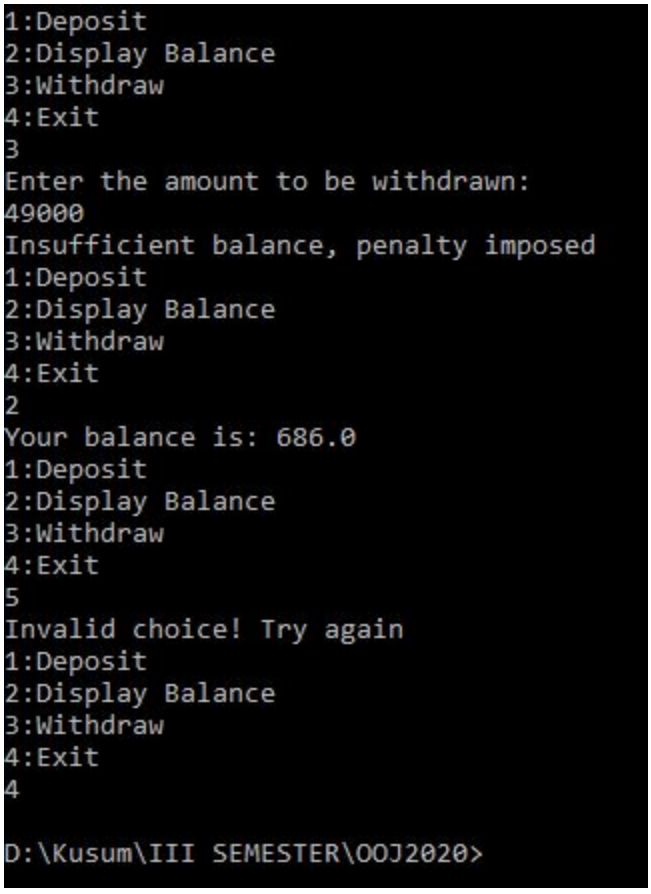
```
            }
            }
  }
```

OUTPUT:

CASE 1:Current Account(With deposit, display, withdraw, Penalty, Exit)

```
D:\Kusum\III SEMESTER\OOJ2020>javac lab5.java

D:\Kusum\III SEMESTER\OOJ2020>java Bank
Enter your details:
Name:
Kusum
Account Number:
38216481
Type of account:
1.Current account
2.Savings account
3.Exit
1
The current account provides cheque book facility but no interest.
Name: Kusum     accno: 38216481 bal: 50000.0    type: Current
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
1
Enter the amount to be added:
200
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
2
Your balance is: 50200.0
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
3
Enter the amount to be withdrawn:
500
```



CASE 2:Savings account(Deposit,Compound interest,Display,withdraw,Invalid choice,Exit)

```
D:\Kusum\III SEMESTER\OOJ2020>javac lab5.java

D:\Kusum\III SEMESTER\OOJ2020>java Bank
Enter your details:
Name:
Kusum
Account Number:
12487183
Type of account:
1.Current account
2.Savings account
3.Exit
2
The savings account provides compound interest and withdrawal facilities but no cheque book facility.
name: Kusum     accno: 12487183 bal: 5000.0     type: Savings
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
1
Enter the amount to be added:
300
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
2
Your balance is: 5671.0
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
3
Enter the amount to be withdrawn:
500
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
2
Your balance is: 5171.0
```

```
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
7
Invalid choice! Try again
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
4

D:\Kusum\III SEMESTER\OOJ2020>
```

Case 3:Invalid choice and exit

```
D:\Kusum\III SEMESTER\OOJ2020>javac lab5.java

D:\Kusum\III SEMESTER\OOJ2020>java Bank
Enter your details:
Name:
Kusum
Account Number:
491493257
Type of account:
1.Current account
2.Savings account
3.Exit
6
Invalid choice! Try again
Type of account:
1.Current account
2.Savings account
3.Exit
3

D:\Kusum\III SEMESTER\OOJ2020>
```