WEEK8-OOJ LAB PROGRAMS

PROGRAM-1

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.

CODE:

```
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.Recatngle\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!");
}
}
}
}
```

```
C:\Users\win10\Documents\Java lab programs>javac Shapemain.java

C:\Users\win10\Documents\Java lab programs>java Shapemain
Enter the choice of shape whose area has to be calculated
1.Recatngle
2.Triangle
3.Circle
4.Exit
1
Enter length and breadth of the rectangle
4 5
The area of Recatngle is 20.0
Enter the choice of shape whose area has to be calculated
1.Recatngle
2.Triangle
3.Circle
4.Exit
2
Enter base length and height of the triangle
7 9
The area of Triangle is 31.5
Enter the choice of shape whose area has to be calculated
1.Recatngle
2.Triangle
3.Circle
4.Exit
3
Enter radius of the circle
8
The area of Circle is 200.96
Enter the choice of shape whose area has to be calculated
1.Recatngle
2.Triangle
3.Circle
4.Exit
4
```

PROGRAM-2

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

CODE:

```
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");



                }
                }
}
```

```
C:\Users\win10\Documents\Java lab programs>java Bank
Enter your details:
Name:
abc
Account Number:
123
Type of account:
1.Current account
2.Savings account
3.Exit
1
The current account provides cheque book facility but no interest.
Name: abc       accno: 123      bal: 50000.0    type: Current
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
1
Enter the amount to be added:
1000
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
2
Your balance is: 51000.0
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
3
Enter the amount to be withdrawn:
50500
Insufficient balance, penalty imposed
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
2
Your balance is: 490.0
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
4
```

```
C:\Users\win10\Documents\Java lab programs>java Bank
Enter your details:
Name:
fgh
Account Number:
789
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: fgh       accno: 789      bal: 5000.0     type: Savings
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
1
Enter the amount to be added:
1000
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
2
Your balance is: 6420.0
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
3
Enter the amount to be withdrawn:
100
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
2
Your balance is: 6320.0
1:Deposit
2:Display Balance
3:Withdraw
4:Exit
4
```