Course Title: CSE110

Section: 06

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LAB-06

SUBMITTED TO

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```java
import java.util.ArrayList;
import java.util.Scanner;
import java.util.Random;

class Account
{
    private int id;
    private double balance;
    private double annualInterestRate;

    public Account(){}
    public Account(int id, double balance, double annualInterestRate)
    {

        this.id = id;
        this.balance = balance;
        this.annualInterestRate = annualInterestRate;
    }

void display()
{
    System.out.println("ID: "+this.id+"\nBalance: "+this.balance+"\nAnnual interest
rate: "+this.annualInterestRate);
}
    public int getId()
    {
        return id;
    }

    public void setId(int id)
    {
        this.id = id;
    }

    public double getBalance()
    {
        return balance;
    }

    public void setBalance(double balance)
    {
        this.balance = balance;
    }

    public double getAnnualInterestRate()
    {
        return annualInterestRate;
    }

    public void setAnnualInterestRate(double annualInterestRate)
    {
        this.annualInterestRate = annualInterestRate;
    }

    double getMonthlyInterestRate()
    {
```

```java
        double res = (this.annualInterestRate/100)/12;
        return res;
    }
    double getMonthlyInterestAmount(){
        double res = this.balance*this.getMonthlyInterestRate();
        return res;
    }

    void withdraw(double y)
    {
        double x = this.getBalance()-y;
        this.setBalance(x);
    }

    void deposit(double y)
    {
        double x = this.getBalance()+y;
        this.setBalance(x);
    }
}

class CheckingAccount extends Account
{
    double overDraftLimit;

    public CheckingAccount(int id, double balance, double annualInterestRate,double
overDraftLimit)
    {
        super(id,balance,annualInterestRate);
        double p=250000;
        this.overDraftLimit = p;
    }

    public double getOverDraftLimit()
    {
        return this.getBalance();
    }
    void display()
    {
        System.out.println("ID: "+ this.getId() +"\nBalance:
"+this.getBalance()+"\nAnnual interest rate: "+this.getAnnualInterestRate()+"\nOver
draft limit: "+this.overDraftLimit);
    }
}

class  SavingsAccount extends Account
{
    double creditCard;
    public SavingsAccount(int id, double balance, double annualInterestRate,double
creditCard)
    {
        super(id,balance,annualInterestRate);
        this.creditCard = creditCard;

    }

    void display()
    {
        System.out.println("ID: "+ this.getId() +"\nBalance:
"+this.getBalance()+"\nAnnual interest rate:
"+this.getAnnualInterestRate()+"\ncreditCard: "+this.creditCard);
    }
}
```

```java
public class AccountTest {

    public static void main(String[] args)
    {
        Scanner in= new Scanner(System.in);
        Random ran= new Random();
        double p=250000;
        double y=ran.nextDouble(999999999);
        ArrayList<Account> account = new ArrayList<Account>();

        /*
        account.add (new SavingsAccount(1122, 20000, 4.5, "1234567891111111"));
        account.add (new CheckingAccount(1123, 25000, 3.5,2000000));
        account.add  (new SavingsAccount(1124, 30000, 2.5,"1234567891111122"));
        account.add (new SavingsAccount(1125, 35000, 5.5,"1234567891111133"));
        */

        System.out.println("How many accounts you want to create:");
        int n=in.nextInt();
        for(int i=0;i<n;i++)
        {
            System.out.println("Press (1) for creating a Checking Account");
            System.out.println("Press (2) for creating a Savings Account");
            int x=in.nextInt();
            System.out.println("Enter ID:");
            int a=in.nextInt();
            System.out.println("Enter Balance:");
            double b=in.nextDouble();
            System.out.println("Enter Annual Interest Rate:");
            double c=in.nextDouble();

            switch(x)
            {
                    case 1:
                        account.add(new CheckingAccount( a, b, c, p));
                    break;

                    case 2:
                    account.add(new SavingsAccount( a, b, c, y));
                    break;
            }

        }

        for (int i = 0; i < account.size(); i++)
        {
            System.out.println("");
            account.get(i).display();
            System.out.println("");
        }

        account.get(0).withdraw(2500);
        System.out.println("Balance after withdraw : "+account.get(0).getBalance());
        account.get(0).deposit(3000);
        System.out.println("Balance after deposit : "+account.get(0).getBalance());
    }
}
```

```java
import java.util.Scanner;

class Person {

    String Name;
    int Age;

    public Person(String N, int A) {
        this.Name = N;
        this.Age = A;
    }

    public void display1() {
        System.out.println("Name:"+Name+ "\nAge:"+Age);
        System.out.println("This is parent class");
    }
}

class Student extends Person {

    String ID;

    public Student(String N, int A, String ID)
    {
        super(N, A);
        this.ID=ID;
```

```java
    }

    public void display2()
    {
        System.out.println("Name:"+Name+ "\nAge:"+Age+"\nID: "+ID);
        System.out.println("This is child class");
    }
}

public class NewClass1
{

    public static void main(String[] args) {
        Person p1 = new Person("Alve", 20);
        Student s1 = new Student("Shahria", 20, "2021-3-60-016");


        p1.display1();
        s1.display2();
    }
}
```

Q (ii)

```java
import java.util.Scanner;

class Parent
{
    public void display1()
```

```java
    {
        System.out.println("This is parent class");
    }
}


class Child extends Parent
{
    void display2()
    {
        System.out.println("This is child class");
    }
}


public class NewClass1 {

    public static void main(String[] args) {
        Parent p1 = new Parent();
        Child s1 = new Child();

        p1.display1();
        s1.display2();
        s1.display1();
    }
}
```

<mark>Q (iii)</mark>

```java
class Member
{
    String name;

    int age;

    String phoneNumber;

    String address;

    int salary;


    public Member(){}
    public Member(String N, int A, String PN, String Add, int S)
    {
        this.name = N;

        this.age = A;

        this.phoneNumber = PN;

        this.address = Add;

        this.salary = S;

    }


    void printSalary()
    {
        System.out.println("Salary is : "+salary);

    }
}


class Employee extends Member
{
    String specialization;
```

```java
        String department;

    public Employee(){}

    public Employee(String N, int A, String PN, String Add, int S, String Sp,String Dep)
    {
        super(N, A, PN, Add, S);
        this.specialization = Sp;
        this.department = Dep;
    }
}

class Manager extends Member
{
    String specialization;
    String department;
    public Manager(){}

    public Manager(String N, int A, String PN, String Add, int S, String Sp,String Dep)
    {
        super(N, A, PN, Add, S);
        this.specialization = Sp;
        this.department = Dep;
    }
}

public class Q3
{
    public static void main(String[] args)
```

```java
    {
        Employee e1 = new Employee("Alve",20,"012345678","Dhaka",250000,"Computer", "IT");

        Manager m1 = new Manager("Shahria",
22,"0123456789","Dhaka",300000,"Management","Accounting");

        e1.printSalary();

        m1.printSalary();

    }
}
```

Q (iv)

```java
class Rectangle
{
    double height;
    double breadth;
    public Rectangle(){}

    public Rectangle(double h, double b){
        this.height = h;
        this.breadth = b;

    }

    double area(){
        double area = this.height*this.breadth;
        return area;
    }
```

```java
    double perimeter(){

        double perimeter = 2*(this.height+this.breadth);

        return perimeter;

    }

}


class Square extends Rectangle{

    public Square(){}


    public Square(double h, double b){

        super(h,b);

    }


}


public class Q4

{

    public static void main(String[] args)

    {

        Rectangle r1 = new Rectangle(3,4);

        Square s1 = new Square(2,2);

        System.out.println("The area of a rectangle is: "+r1.area());

        System.out.println("The perimeter of a rectangle is: "+r1.perimeter());

        System.out.println("The area of a square is: "+s1.area());

        System.out.println("The perimeter of a square is: "+s1.perimeter());

    }

}
```

Q (V)

```
package lab6Q5;

import java.util.Scanner;


class Rectangle
{
    double height;
    double breadth;
    public Rectangle(){}

    public Rectangle(double h, double b)
    {
        this.height = h;
        this.breadth = b;


    }


    double area()
    {
        double area = this.height*this.breadth;
        return area;
    }


    double perimeter()
    {
        double perimeter = 2*(this.height+this.breadth);
        return perimeter;
```

```java
      }
}


class Square extends Rectangle{

    public Square(){}


    public Square(double h, double b)

    {

       super(h,b);

    }



}


public class Q5{

    public static void main(String[] args)

    {

       Scanner in = new Scanner(System.in);

       Square[] sArray = new Square[10];



       for(int i = 0;i<10;i++)

       {

          System.out.println("Enter side of Square "+(i+1)+":");

          double side = in.nextDouble();

          sArray[i] = new Square(side,side);

       }


       for(int i = 0;i<10;i++)
```

```java
        {
            System.out.println("Area of square: "+sArray[i].area());

        }
    }
}
```

```java
package lab6Q6;

class Shape
{
    public Shape(){}
    void print()
    {
        System.out.println("This is a shape.");
    }
}


class Rectangle extends Shape
{
    public Rectangle(){}


    void print1()
    {
        System.out.println("This is rectangular shape");
    }
}
```

```java
class Circle extends Shape
{
    public Circle(){}
    void print2()
    {
        System.out.println("This is circular shape");
    }
}


class Square extends Rectangle
{
    public Square(){}
    void print3()
    {
        System.out.println("Square is a rectangle");
    }
}


public class Q6
{
    public static void main(String[] args)
    {
        Square s1 = new Square();
        s1.print();
        s1.print1();
    }
}
```