

OOP LAB # 12

Objective: To study Method Overriding, and inheritance concept.

Task#01: Create a class called computers and two classes MyComputer and YourComputer which inherits computer class. Define appropriate fields for the three classes. Create another class processor as a composite class of computer. Write a method which prints the differences between the processors of two computers.

Source code:

```
package lab12t1;
public class Computer {
    String processor;
    int speed;
    int L2size;
    String L2type;
    String L2Speed;
    Computer(String pr,int sp,int si,String ty,String spe){
        processor=pr;
        speed=sp;
        L2size=si;
        L2type=ty;
        L2Speed=spe;
    }
}
package lab12t1;
public class MyComputer extends Computer {
    public MyComputer(){
        super("pentiumpro", 256,160,"External" , "Full_Core");
    }
}
package lab12t1;
public class YourComputer extends Computer {
    public YourComputer(){
        super("k6-3",350,256,"ondie","Full_core");
    }
}
package lab12t1;
public class Processor {
    MyComputer mc=new MyComputer();
    YourComputer yc=new YourComputer();
    public void difference(){
        if(mc.processor=="pentiumpro"&&yc.processor=="k6-3"){
            System.out.println("Your computer processor K6-3 is best:");
        }
        else{
            System.out.println("My computer processor K6-3 is best:");
        }
        if(mc.speed==256&&yc.speed==350){
            System.out.println("Your computer speed is best:");
        }
        else{
            System.out.println("My computer speed is best:");
        }
    }
}
```

```

}
if(mc.L2size==160&&yc.L2size==256){
System.out.println("Your computer l2size is best:");
}
else{
System.out.println("My computer L2size is best:");
}
if(mc.L2type=="ondie"&&yc.L2type=="External"){
System.out.println("Your computer l2type is best:");
}
else{
System.out.println("My computer L2type is best:");
}
}
}
}
}

package lab12t1;
public class Lab12T1 {
public static void main(String[] args) {
Processor pc=new Processor();
pc.difference();
}
}

```

Output:

Your computer processor K6-3 is best:

Your computer speed is best:

Your computer l2size is best:

My computer L2type is best:

Task#02: Create a hierarchy of Liquid types. The parent class is Liquid, and its children classes are Coffee and Milk. A Liquid object will have an Add() method that takes some amount of liquid from user and adds it to the original amount of liquid, a remove () method that remove some amount of liquid, and a removeAll() method that removes all amount of liquid. Each subtype of Liquid overrides the three methods of liquid class. Coffee class have some specialize behavior that is it has a Swirl() method that prints “Swirling coffee” Create a test class that create an array of Liquid class having ten elements and populate it randomly with objects (all classes) and Call there method to show polymorphic behavior. Note: Each of the methods in the hierarchy classes has to be called in the Test class.

Using for loop and use the InstanceOf() method to show Coffee class specialized Behavior.

Source code:

```

package lab12t2;
public class Liquid {
double liq_in_ml=250;
public void Add(double liq){
liq_in_ml=liq_in_ml+liq;
}
public void remove(double liq){
liq_in_ml=liq_in_ml-liq;
}
public void removeAll(){
liq_in_ml=0;
}
}
package lab12t2;
public class COffee extends Liquid {
public void Add(double liq){
liq_in_ml=liq_in_ml+liq;
}
System.out.println("Its coffee method:");

```

```
}

public void remove(double liq){
liq_in_ml=liq_in_ml-liq;
}

public void removeAll(double liq){
liq_in_ml=0;
}

public static void Swirl(){
System.out.println("Swirling Coffee:");
}

package lab12t2;
public class Milk extends Liquid{
public void Add(double liq){
liq_in_ml=liq_in_ml+liq;
}

public void remove(double liq){
liq_in_ml=liq_in_ml-liq;
}

public void removeAll(double liq){
liq_in_ml=0;
}

package lab12t2;
import java.util.Scanner;
public class Lab12t2 {
public static void main(String[] args) {
Scanner sc=new Scanner(System.in);
Liquid lq=new COffee();
COffee cf=new COffee();
Liquid arr[]=new Liquid[10];
System.out.println("Enter the amount to add:");
double ad=sc.nextDouble();
lq.Add(ad);
System.out.println("Amount of liquid becomes:"+lq.liq_in_ml);
System.out.println("Enter the amount to remove:");
double rm=sc.nextDouble();
lq.remove(rm);
System.out.println("Amount of liquid becomes:"+lq.liq_in_ml);
lq.removeAll();
System.out.println("After calling removeall method liquid becomes:"+lq.liq_in_ml);
for(int i=0;i<arr.length;i++){
int random=(int)Math.random()*2;
if(random==0){
Liquid obj= new Liquid();
arr[i]=obj;
}
if(random==1){
COffee obj= new COffee();
arr[i]=obj;
}
if(random==2){
Milk obj= new Milk();
arr[i]=obj;
}
}
}
```

```

if(cf instanceof COffee){
    System.out.println("Swirl method output:");
    cf.Swirl();
}
else{
    System.out.print("Coffee class have no special behaviour");
}
System.out.println("Populated objects in liquid array:");
for(int i=0;i<arr.length;i++){
    System.out.println(arr[i]);
}
}

```

Output:

Enter the amount to add:

50

Its coffee method:

Amount of liquid becomes:300.0

Enter the amount to remove:

100

Amount of liquid becomes:200.0

After calling removeall method liquid becomes:0.0

Swirl method output:

Swirling Coffee:

Populated objects in liquid array:

```

lab12t2.Liquid@3d4eac69
lab12t2.Liquid@42a57993
lab12t2.Liquid@75b84c92
lab12t2.Liquid@6bc7c054
lab12t2.Liquid@232204a1
lab12t2.Liquid@4aa298b7
lab12t2.Liquid@7d4991ad
lab12t2.Liquid@28d93b30
lab12t2.Liquid@1b6d3586
lab12t2.Liquid@4554617c

```

Task#03: Create a class purse, which contains hidden data, rupees and paisas. The class contains 2 constructors, one with zero argument that set the data to Zero, and others set the data provided by the arguments. Instance method that reset data to Zero should be provided. Method for conversion of rupees into paisas should be provided. Also it must contain addmoney, deletemoney methods.

Source code:

```

package lab12t3;
public class Purse {
    private double ruppees,paisa;
    Purse(){
        ruppees=0;
        paisa=0;
        System.out.println(ruppees);
        System.out.println(paisa);
    }
    Purse(double rp,double ps){
        ruppees=rp;
        paisa=ps;
        System.out.println(ruppees);
        System.out.println(paisa);
    }
}

```

```

public void resetdata(){
    ruppees=0;
    paisa=0;
    System.out.println(ruppees);
    System.out.println(paisa);
}
public double rstops(){
    return ruppees*100;
}
public void addmoney(double ad){
    ruppees=ruppees+ad;
    System.out.println("Your balance is:"+ruppees);
}
public void deletemoney(double ad){
    ruppees=ruppees-ad;
    System.out.println("Your balance is:"+ruppees);
}
}

package lab12t3;
import java.util.Scanner;
public class Lab12t3 extends Purse {
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        Purse obj=new Purse();
        Purse obj1=new Purse(4.5,4500);
        obj.resetdata();
        Purse obj2=new Purse(7.5,4500);
        double rs=obj2.rstops();
        System.out.println("Your balance in paisa is:"+rs);
        System.out.println("Enter the amount of money to add:");
        double money=sc.nextDouble();
        obj2.addmoney(money);
        System.out.println("Enter the amount of money to delete:");
        double money1=sc.nextDouble();
        obj2.deletemoney(money1);
    }
}

```

Output:

0.0
0.0
4.5
4500.0
0.0
0.0
7.5
4500.0

Your balance in paisa is:750.0
Enter the amount of money to add:
3
Your balance is:10.5
Enter the amount of money to delete:
4
Your balance is:6.5