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ROLL NO:15L124

DEPT:ECE-'A'

*************************JAVA PROGRAMMING*******************************

TASK→7

PROGRAM:

//TO IMPLEMENT THE CONCEPT OF ENCAPSULATION

SOURCE CODE:

Employee.java:

```
public class Employee {
         String firstName,lastName;
         String gender,dateOfBirth;
         int basicPay=2000;
         double netPay;
         float houseRentalAllowance,dearlyAllowance;
         float travelAllowance,providentFund;
         float houseRentalAllowanceAmount,dearlyAllowanceAmount;
         float travelAllowanceAmount,providentFundAmount;
        public void setFirstName(String firstName){
            this.firstName=firstName;
        }
        public void setLastName(String lastName){
            this.lastName=lastName;
        }
        public void setGender(String gender){
            this.gender=gender;
        }
        public void setDateOfBirth(String dateOfBirth){
            this.dateOfBirth=dateOfBirth;
        }
        public void setBasicPay(int basicPay){
            this.basicPay=basicPay;
        }
        public void setHouseRentalAllowance(float houseRentalAllowance){
            this.houseRentalAllowance=houseRentalAllowance;
        }
        public void setDearlyAllowance(float dearlyAllowance){
            this.dearlyAllowance=dearlyAllowance;
```

```java
        }
        public void setTravelAllowance(float travelAllowance){
            this.travelAllowance=travelAllowance;
        }
        public void setProvidentFund(float providentFund){
            this.providentFund=providentFund;
        }
        public String getFirstName(){
            return firstName;
        }
        public String getLastName(){
            return lastName;
        }
        public String getGender(){
            return gender;
        }
        public String getDateOfBirth(){
            return dateOfBirth;
        }
        public int getBasicPay(){
            return basicPay;
        }
        public float getHouseRentalAllowance(){
            return houseRentalAllowance;
        }
        public float getDearlyAllowance(){
            return dearlyAllowance;
        }
        public float getTravelAllowance(){
            return travelAllowance;
        }
        public float getProvidentFund(){
            return providentFund;
        }
        public double netPay(){
            houseRentalAllowanceAmount=basicPay*(houseRentalAllowance/100);
            dearlyAllowanceAmount=basicPay*(dearlyAllowance/100);
            travelAllowanceAmount=basicPay*(travelAllowance/100);
            providentFundAmount=basicPay*(providentFund/100);
            netPay=(houseRentalAllowanceAmount+dearlyAllowanceAmount
                    +travelAllowanceAmount)-providentFundAmount;
            return netPay;
        }
}
```

Solution.java:

```
public class Solution{
public static void main(String[] args) {
    Employee employee=new Employee();
    employee.setFirstName("Karthika");
    employee.setLastName("Krishnasamy");
    employee.setGender("Female");
    employee.setDateOfBirth("20/10/1997");
    employee.setBasicPay(2000);
    employee.setHouseRentalAllowance(4);
    employee.setDearlyAllowance(2.1f);
    employee.setTravelAllowance(1.5f);
    employee.setProvidentFund(4);
    System.out.println("FIRST NAME           :"+employee.getFirstName());
    System.out.println("LAST NAME            :"+employee.getLastName());
    System.out.println("GENDER               :"+employee.getGender());
    System.out.println("DATE OF BIRTH        :"+employee.getDateOfBirth());
    System.out.println("BASIC PAY            :"+employee.getBasicPay());
    System.out.println("HOUSE RENT ALLOWANCE:"
                                  +employee.getHouseRentalAllowance()+"%");
    System.out.println("DEARLY ALLOWANCE     :"
                                       +employee.getDearlyAllowance()+"%");
    System.out.println("TRAVEL ALLOWANCE     :"
                                       +employee.getTravelAllowance()+"%");
    System.out.println("PROVIDENT FUND       :"+employee.getProvidentFund()+"%");
    System.out.println("NETPAY               :"+"Rs."+employee.netPay());
}
}
```

OUTPUT:

```
C:\Users\students\Documents\INHERITANCE>javac Employee.java

C:\Users\students\Documents\INHERITANCE>javac Solution.java

C:\Users\students\Documents\INHERITANCE>java Solution
FIRST NAME          :Karthika
LAST NAME           :Krishnasamy
GENDER              :Female
DATE OF BIRTH       :20/10/1997
BASIC PAY           :2000
HOUSE RENT ALLOWANCE:4.0%
DEARLY ALLOWANCE    :2.1%
TRAVEL ALLOWANCE    :1.5%
PROVIDENT FUND      :4.0%
NETPAY              :Rs.72.0

C:\Users\students\Documents\INHERITANCE>
```

SOURCE CODE:

Complex.java

```
class Complex{
    private double real = 0;
    private double imaginary = 0;
    public Complex() {
    real = 0.0;
    imaginary = 0.0;
    }
    public void setRealvalue(double real){
        this.real=real;
    }
    public void setImaginaryvalue(double imaginary){
        this.imaginary=imaginary;
    }
    public double getRealvalue(){
        return real;
    }
    public double getImaginaryvalue(){
        return imaginary;
    }
    public String add(double real,double imaginary) {
       return (this.real + real)+((this.imaginary + imaginary)>0 ? "+":"")
              +(this.imaginary + imaginary)+"j";
    }
    public String subtract(double real,double imaginary) {
        return (this.real - real)+((this.imaginary - imaginary)>0 ? "+":"")
              +(this.imaginary - imaginary)+"j";
    }
    public String multiplyWith(double real,double imaginary) {
        double realtemp=(( this.real * real ) - ( this.imaginary * imaginary ));
        double imaginarytemp=(( this.imaginary * real ) + ( this.real * imaginary
));
        return realtemp + (imaginarytemp > 0 ? "+":"") + imaginarytemp + "j";
    }
    public String divideBy(double real,double imaginary) {
        double riTemp=( real * real ) + ( imaginary * imaginary );
        double rReal1=(( this.real * real ) +
                      ( this.imaginary * imaginary ))/riTemp;
        double iImaginary1=(( - imaginary * this.real )
                       + (real * this.imaginary))/riTemp;
        return rReal1 + (iImaginary1 > 0 ? "+":"") + iImaginary1 + "j";
    }
```

```java
    public boolean isReal(){
        boolean val=( real != 0 && imaginary == 0) ? true : false;
        return val;
    }
    public boolean isImaginary(){
        boolean val=( real == 0 && imaginary != 0) ? true : false;
        return val;
    }
}
```

Solution.java:

```java
class Solution{
public static void main(String args[]){
Complex complex1;
complex1 = new Complex();
complex1.setRealvalue(4);
complex1.setImaginaryvalue(7);
System.out.println("REAL VALUE             :"+complex1.getRealvalue());
System.out.println("IMAGINARY VALUE        :"+complex1.getImaginaryvalue());
System.out.println("COMPLEX ADDITION       :"+complex1.add(4,2));
System.out.println("COMPLEX SUBTRACTION    :"+complex1.subtract(5,2));
System.out.println("COMPLEX MULTIPLICATION :"+complex1.multiplyWith(1,2));
System.out.println("COMPLEX DIVISION       :"+complex1.divideBy(1,1));
System.out.println("REAL ROOT              :"+complex1.isReal());
System.out.println("IMAGINARY ROOT         :"+complex1.isImaginary());

}
}
```

OUTPUT:

```
C:\Users\students\Documents\INHERITANCE>javac Complex.java

C:\Users\students\Documents\INHERITANCE>javac Solution.java

C:\Users\students\Documents\INHERITANCE>java Solution
REAL VALUE             :4.0
IMAGINARY VALUE        :7.0
COMPLEX ADDITION       :8.0+9.0j
COMPLEX SUBTRACTION    :-1.0+5.0j
COMPLEX MULTIPLICATION :-10.0+15.0j
COMPLEX DIVISION       :5.5+1.5j
REAL ROOT              :false
IMAGINARY ROOT         :false
```

SOURCE CODE:

Point.java:

```
class Point{
    private int xAxis;
    private int yAxis;
    public Point(){
        xAxis=0;
        yAxis=0;
    }
    public void setXaxis(int xAxis){
        this.xAxis=xAxis;
    }
    public void setYaxis(int yAxis){
        this.yAxis=yAxis;
    }
    public int getXaxis(){
        return xAxis;
    }
    public int getYaxis(){
        return yAxis;
    }
    public String distance(int xAxis,int yAxis){
        System.out.println("\nx2:"+xAxis+"   y2:"+yAxis);
        double dist=Math.sqrt( Math.pow((xAxis - this.xAxis) , 2)
                        + Math.pow((yAxis - this.yAxis) , 2) );
        return "\nDISTANCE : "+dist;
    }
}
```

Solution.java:

```
class Solution{
    public static void main(String args[]){
       Point point=new Point();
       point.setXaxis(6);
       point.setYaxis(4);
       System.out.println("\nThe points are");
       System.out.println("\nx1:"+point.getXaxis()+"   y1:"+point.getYaxis());
       System.out.println(point.distance(4,3));
    }
}
```

OUTPUT:

```
C:\Users\students\Documents\INHERITANCE>javac Point.java

C:\Users\students\Documents\INHERITANCE>javac Solution.java

C:\Users\students\Documents\INHERITANCE>java Solution

The points are

x1:6   y1:4

x2:4   y2:3

DISTANCE : 2.23606797749979
```