SHRI VILEPARLE KELAVANI MANDAL'S
DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING
(Autonomous College Affiliated to the University of Mumbai)
NAAC ACCREDITED with "A" GRADE (CGPA : 3.18)

Object Oriented Programming using Java Laboratory (DJS22FEL22)

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BATCH: 1

1. WAP to find value of y using recursive function, where y=x^n .

```
import java.util.*;

class RecursiveSquare
{
	int square(int x, int n)
	{
		if(n>0)
		{
			return x*square(x,n-1);
		}
		return 1;
	}
	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
		System.out.println("Enter the base and power:");
		int x=sc.nextInt();
		int n=sc.nextInt();
		RecursiveSquare rs = new RecursiveSquare();
		System.out.println("Value of x^n is " + rs.square(x, n));
	}
}
```

```
C:\Users\ayush\Desktop\JAVA_assignment>java RecursiveSquare.java
Enter the base and power:
5 3
Value of x^n is 125
```

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2. WAP to display area of square and rectangle using the concept of ***overloaded*** **functions.**

```
import java.util.*;

class MethodOverloading
{
	int area(int l)
	{
		return l*l;
	}
	int area(int l, int b)
	{
		return l*b;
	}
	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
		MethodOverloading obj = new MethodOverloading();
		System.out.println("Enter side of square: ");
		int side=sc.nextInt();
		System.out.println("Enter length and width of rectangle:");
		int length=sc.nextInt();
		int width=sc.nextInt();
		System.out.println("The area of square is "+obj.area(side));
		System.out.println("The area of rectngle is "+obj.area(length,width));
	}
}
```

```
C:\Users\ayush\Desktop\JAVA_assignment>java MethodOverloading
Enter side of square:
10
Enter length and width of rectangle:
10 5
The area of square is 100
The area of rectngle is 50
```

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3. WAP to perform mathematical operations on 2 complex numbers by passing and returning object as argument.

```
class Complex {
    private double real;
    private double imaginary;

    public Complex(double real, double imaginary) {
        this.real = real;
        this.imaginary = imaginary;
    }

    public Complex add(Complex other) {
        double newReal = this.real + other.real;
        double newImaginary = this.imaginary + other.imaginary;
        return new Complex(newReal, newImaginary);
    }

    public Complex subtract(Complex other) {
        double newReal = this.real - other.real;
        double newImaginary = this.imaginary - other.imaginary;
        return new Complex(newReal, newImaginary);
    }

    public Complex multiply(Complex other) {
        double newReal = (this.real * other.real) - (this.imaginary * other.imaginary);
        double newImaginary = (this.real * other.imaginary) + (this.imaginary * other.real);
        return new Complex(newReal, newImaginary);
    }

    public String toString() {
        return "(" + real + " + " + imaginary + "i)";
    }
}

public class ComplexOperations {
    public static void main(String[] args) {
        Complex c1 = new Complex(2, 3);
        Complex c2 = new Complex(4, 5);

        Complex sum = c1.add(c2);
        Complex difference = c1.subtract(c2);
        Complex product = c1.multiply(c2);

        System.out.println("Complex Number 1: " + c1);
        System.out.println("Complex Number 2: " + c2);
        System.out.println("Sum: " + sum);
        System.out.println("Difference: " + difference);
        System.out.println("Product: " + product);
    }
}
```

```
C:\Users\ayush\Desktop\JAVA_assignment>javac ComplexOperations.java

C:\Users\ayush\Desktop\JAVA_assignment>java ComplexOperations
Complex Number 1: (2.0 + 3.0i)
Complex Number 2: (4.0 + 5.0i)
Sum: (6.0 + 8.0i)
Difference: (-2.0 + -2.0i)
Product: (-7.0 + 22.0i)
```

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4. WAP to count the number of objects made of a particular class using static variable and static method to display the same.

```
class Objects {
    private static int count = 0; // Static variable to count the number of objects

    public Objects() {
        count++; // Increment count when a new object is created
    }

    public static void displayCount() {
        System.out.println("Number of objects created: " + count);
    }
}

public class Object{
    public static void main(String[] args) {
        Objects obj1 = new Objects();
        Objects obj2 = new Objects();
        Objects obj3 = new Objects();

        Objects.displayCount(); // Display the count using the static method
    }
}
```

```
C:\Users\ayush\Desktop\JAVA_assignment>javac Object.java

C:\Users\ayush\Desktop\JAVA_assignment>java Object
Number of objects created: 3
```

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5. WOOP to arrange the names of students in descending order of their total marks, input data consists of students details such as names, ID.no, marks of maths, physics, chemistry. (Use array of objects)

```
import java.util.*;
class TotalMarks{
        String n;
        int p,c,m,t;
        static int no;
        static Scanner sc=new Scanner(System.in);
        void read(){
                System.out.println("Enter your name");
                n=sc.next();
                System.out.println("enter marks for physics,chemistry,maths");
                p=sc.nextInt();
                c=sc.nextInt();
                m=sc.nextInt();
                t=p+c+m;
        }
        public static void main(String args[]){
                System.out.println("Enter number of students");
                no=sc.nextInt();
                TotalMarks temp=new TotalMarks();
                TotalMarks h[]=new TotalMarks[no];
                for(int i=0;i<no;i++){
                        h[i]=new TotalMarks();
                        h[i].read();
                }
                for(int i=0;i<no;i++){
                        for(int j=0;j<no;j++){
                                if(h[i].t<h[j].t){
                                        temp=h[j];
                                        h[j]=h[i];
                                        h[i]=temp;
                                }
                        }
                }
                 for(int i=0;i<no;i++){
                         System.out.println(h[i].n+" "+h[i].t);
                 }
         }
}
```

```
C:\Users\ayush\Desktop\JAVA_assignment>javac TotalMarks.java

C:\Users\ayush\Desktop\JAVA_assignment>java TotalMarks
Enter number of students
2
Enter your name
Ayush
enter marks for physics,chemistry,maths
99
99
100
Enter your name
Dhruv
enter marks for physics,chemistry,maths
98
98
100
Dhruv 296
Ayush 298
```