OOPS CONCEPT

WRITE A JAVA PROGRAM TO CALCULATE FACTORIAL

```
import java.util.*;

public class Factorial {
    int i, fact = 1;
    int num;

    void result() {
        Scanner s = new Scanner(System.in);
        System.out.println("Enter a number: ");
        num = s.nextInt();
    }

    void cal() {
        for (i = 1; i <= num; i++) {
            fact = fact * i;
        }
        System.out.println("Result is= " + fact);
    }

    public static void main(String[] arg) {
        Factorial obj = new Factorial();
        obj.result();
        obj.cal();
    }
}
```

OUTPUT:

```
Enter a number:5
Result is=120
```


WRITE A JAVA PROGRAM TO CALCULATE SUM OF SERIES

```
import java.util.*;
public class SumofSeries
{
    int n,sum=0;
    SumofSeries()
    {
        Scanner s=new Scanner(System.in);
        System.out.println("Enter a number:");
        n=s.nextInt();
```

```
    }
    void cal()
    {
        for(int i=0;i<=n;i++)
        {
            sum=sum+i;
        }
    }
    void output()
    {
        System.out.println("Sum = "+sum);
    }
    public static void main(String[] arg)
    {
        SumofSeries obj=new SumofSeries();
        obj.cal();
        obj.output();
    }
}
```

OUTPUT:

```
Enter a number:10
Sum =55
```

WRITE A JAVA PROGRAM TO CALCULATE SIMPLE INTEREST

```
import java.util.*;

public class SimpleInterest {
    double principal, year, rate;
    double result;

    void input(double p,double t,double r)
    {
        principal = p;
        year = t;
        rate = r;
    }

    void cal() {
        result = (principal * year * rate) / 100;
    }

    void output() {
        System.out.println("Interest = " + result);
```

```
    }

    public static void main(String[] arg) {
        SimpleInterest obj = new SimpleInterest();
        obj.input(2000, 2, 15);
        obj.cal();
        obj.output();
    }
}
```

OUTPUT:
Interest = 600.0

WRITE A JAVA PROGRAM TO CALCULATE AREA OF CIRCLE AND VOLUME OF CYLINDER USING INHERITANCE

WRITE A JAVA PROGRAM TO CALCULATE AREA OF CIRCLE

```
class Circle
{
    protected double area;
    private int r;

    void get() {
        r = 5;
    }

    void cal() {
        area = 3.14 * r * r;
    }
}
class Cylinder extends Circle {
    private double volume;
    private int h;

    void get1()
    {
        h = 10;
    }

    void cal1()
    {
        volume = area * h;
    }
```

```
    double getVolume() {
        return volume;
    }

    void display() {
        System.out.println("Area of circle is: " + area);
        System.out.println("Volume of cylinder is: " + volume);
    }
}
class Inher {
    public static void main(String args[]) {
        Cylinder obj = new Cylinder();
        obj.get();
        obj.get1();
        obj.cal();
        obj.cal1();
        obj.display();
    }
}
```

OUTPUT:

```
Area of circle is: 78.5
Volume of cylinder is: 785.0
```

Assignment3 (06-10-‘23)

1. Write a Java program to enter the marks of a student in four subjects. Then calculate the total and aggregate, and display the grade obtained by the student. If the student scores an aggregate greater than 75%, then the grade is Distinction. If the aggregate is 60>= and <75, then the grade is First Division. If the aggregate is 50 >= and <60, then the grade is Second Division. If the aggregate is 40>= and <50, then the grade is Third Division, else the grade is Fail. Using Multilevel inheritance concept.

Sample Input & Output:

Enter the marks in python: 90

Enter the marks in c programming: 91

Enter the marks in Mathematics: 92

Enter the marks in Physics: 93

Total= 366

Aggregate = 91.5

DISTINCTION

Test cases:

a) 18, 76,93,65

b) 73,78,79,75

c) 98,106,120,95

d) 96,73, -85,95

e) 78,59.8,76,79

```
import java.util.Scanner;

class student {
    int marksPython, marksC, marksMath, marksPhy;

    void input() {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the marks in Python, C, Math, Phy: ");
        marksPython = sc.nextInt();
        marksC = sc.nextInt();
        marksMath = sc.nextInt();
        marksPhy = sc.nextInt();
    }
}

class average extends student {
    protected int total;
    protected double average;

    void cal() {
        total = marksPython + marksC + marksMath + marksPhy;
        average = total / 4;
    }
}

class result extends average {
    void displayGrade() {
        System.out.println("Total = " + total);
```

```
        System.out.println("Aggregate = " + average);

        if (average > 75) {
            System.out.println("DISTINCTION");
        } else if (average >= 60 && average < 75) {
            System.out.println("FIRST DIVISION");
        } else if (average >= 50 && average < 60) {
            System.out.println("SECOND DIVISION");
        } else if (average >= 40 && average < 50) {
            System.out.println("THIRD DIVISION");
        } else {
            System.out.println("FAIL");
        }
    }
}

class inh {
    public static void main(String[] args) {
        result s = new result();
        s.input();
        s.cal();
        s.displayGrade();
    }
}
```

```
Enter the marks in Python, C, Math, Phy: 90
91
92
93
Total = 366
Aggregate = 91.5
DISTINCTION
```


2. Write a Java program for the area of the circle, the volume of the cylinder, and the volume of the cone. Using Multilevel inheritance concept.

```
class Circle
{
    protected double area;
    private int r;
```

```
    void get() {
        r = 5;
    }

    void cal() {
        area = 3.14 * r * r;
    }
}
class Cylinder extends Circle {
    protected double volume;
    private int h;

    void get1()
    {
        h = 10;
    }

    void cal1()
    {
        volume = area * h;
    }



}


class Cone extends Cylinder {
    private double volume2;

    void cal2() {

        volume2 = (volume / 3);
    }

    void display() {
        System.out.println("Area of circle is: " + area);
        System.out.println("Volume of cylinder is: " + volume);
        System.out.println("Volume of cone is: " + volume2);
    }
}

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

```
        Cone obj = new Cone();
        obj.get();
        obj.get1();
        obj.cal();
        obj.cal1();
        obj.cal2();
        obj.display();
    }
```

Area of Circle: pi × radius2

Volume of cylinder: pi × radius2 × height

Volume of cone: (1/3) × pi × radius2 × height

```
class Circle
{
    protected double area;
    private int r;

    void Radius(int radius)
    {
        r = radius;
    }

    void cal() {
        area = 3.14 * r * r;
    }
}

class Cylinder extends Circle
{
    protected double volume;
    private int h;

    void Height(int height)
    {
        h = height;
    }

    void cal1()
    {
```

```
        cal();
        volume = area * h;
    }
}


}

class Cone extends Cylinder {
    private double volume2;

    void cal2() {
        cal1();
        volume2 = (volume / 3);
    }

    void display() {
        System.out.println("Area of circle is: " + area);
        System.out.println("Volume of cylinder is: " + volume);
        System.out.println("Volume of cone is: " + volume2);
    }
}

class Inher {
    public static void main(String args[]) {
        Cone obj = new Cone();
        obj.Radius(5);
        obj.Height(10);
        obj.cal2();
        obj.display();
    }
}
```

OUTPUT:
Area of circle is: 78.5
Volume of cylinder is: 785.0
Volume of cone is: 261.6666666666667