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**OOPs Practical 1**

**Aim:**

1. Create a class Stack and implement the functionalities of the Stack Class
2. Write a program to demonstrate method overloading. Create a class 3DShape and overload a method named volume() to calculate volume of different geometric shapes like sphere, cube, cuboid and cylinder. Create a main() to implement all the methods.

**Code & Output:**

**Code A:**

**stack.java**

public class stack {

    int top;

    int MAXSIZE = 20;

    int a[] = new int[MAXSIZE];

    stack(){

        top = -1;

    }

    int pop(){

        if(isEmpty()==0){

            System.out.println("Popped Element: "+ a[top]);

            int data = a[top];

            top--;

            return data;

        }

        System.out.println("STACK UNDERFLOW");

        return -1;

    }

    void push(int num){

        if(isFull()==0){

            top++;

            a[top] = num;

        }

    }

    int isEmpty(){

        if(top == -1){

            System.out.println("Stack Empty!");

            return 1;

        }

        return 0;

    }

    int isFull(){

        if(top == MAXSIZE-1){

            System.out.println("Stack Full!");

            return 1;

        }

        return 0;

    }

    int peek(){

        if(isEmpty()==0){

            System.out.println("Peek --> "+ a[top]);

            return a[top];

        }

        System.out.println("STACK UNDERFLOW");

        return -1;

    }

}

**main.java**

public class main {

    public static void main(String[] args) {

        stack S = new stack();

        S.push(49);

        S.peek();

        S.push(56);

        S.push(10);

        S.peek();

        S.pop();

        S.peek();

        S.pop();

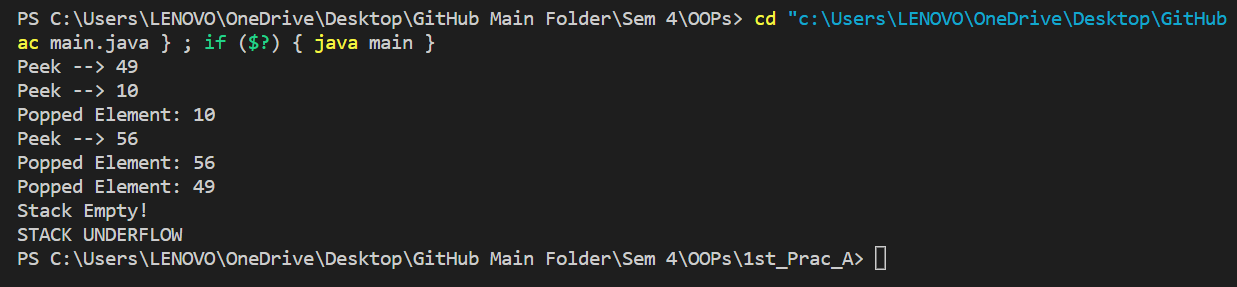
        S.pop();

        S.pop();

    }

}

**Output A:**

****

**Code B:**

**three\_d\_shape.java**

public class three\_d\_shape {

    double volume(double radius){

        return 4\*Math.PI\*radius\*radius\*radius/3;

    }

    double volume(int l, int b, int h){

        return l\*b\*h;

    }

    double volume(int r, int h){

        return Math.PI\*r\*r\*h;

    }

    double volume(int side){

        return side\*side\*side;

    }

}

**main.java**

public class main {

    public static void main(String[] args) {

        three\_d\_shape v = new three\_d\_shape();

        double sphere\_v = v.volume(5.0);

        System.out.println("Volume of Sphere : "+sphere\_v);

        double cube\_c= v.volume(2);

        System.out.println("Volume of Cube : "+cube\_c);

        double cuboid\_v = v.volume(2,3,4);

        System.out.println("Volume of Cuboid : "+cuboid\_v);

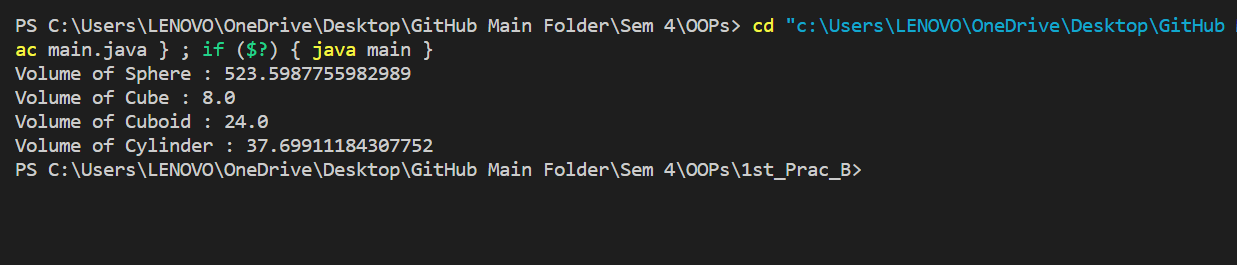
        double cylinder\_v = v.volume(2,3);

        System.out.println("Volume of Cylinder : "+cylinder\_v);

    }

}

**Output B:**

****