PRACTICAL 1

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Sec: A

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Aim:

A. Create a class Stack and implement the functionalities of the Stack Class
B. 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

```java
public class stack {

  int l;
  int a[];
  int top=-1;

  stack(int l){
    this.l = l;
    this.a = new int[l];
  }

  int isEmpty(){
    if(top==-1){
      return 1;
    }
    return 0;
  }
  int isFull(){
    if(top >= (this.l-1)){
      return 1;
    }
    return 0;
  }
```

```java
  void push(int x){
    if(isFull() == 0){
      this.a[top+1] = x;
      top++;
    }
    else
      System.out.println("STACK OVERFLOW ");
  }

  void peek(){
    if(isEmpty() == 0){
      System.out.println("AT TOP : "+ this.a[top]);
    }
    else
      System.out.println("STACK UNDERFLOW ");
  }

  int pop(){
    if(isEmpty() == 0){
    System.out.println("POPPED : "+ this.a[top]);
    int del = this.a[top];
    top--;
    return del;
  }
  else
    System.out.println("STACK UNDERFLOW");
    return 0;
}

}
```

Main.java

```java
public class main {

  public static void main(String[] args) {

    stack s1 = new stack(10);

    s1.push(4);
    s1.peek();
    s1.push(5);
    s1.push(2);
    s1.peek();
    s1.pop();
```

```
        s1.peek();
        s1.pop();
        s1.pop();
        s1.pop();


    }

}
```

OutputA:

CODE B:

Shape3D.java

```java
public class shape3D {

  //Sphere
  double volume(double rad){
    double vol;
    vol = Math.PI * (4/3) * rad * rad * rad;
    System.out.println("VOL OF SPHERE : "+vol);
    return vol;
  }

  // Cube
  int volume(int side){
    int vol = side * side * side;
    System.out.println("VOL OF CUBE : "+ vol);
    return vol;
  }

  double volume(double l,double b,double h){
    double vol = l*b*h;
    System.out.println("VOL OF CUBOID : "+ vol);
    return vol;
  }
  double volume(double h, double r){
```

```java
        double vol = Math.PI * r * r * h;
        System.out.println("VOL OF CYLINDER : "+ vol);
        return vol;
    }

}
```

Main.java

```java
// package prac1b;
public class main {

    public static void main(String[] args) {

        shape3D s1 = new shape3D();

        s1.volume(4.3, 1);
        s1.volume(1.0, 0.1, 10);
        s1.volume(2.4);
        s1.volume(10);

    }

}
```

OUTPUT B:

```
PS C:\Users\smitk> cd "c:\Users\smitk\Desktop\JAVA prac\prac1b\" ; if ($?) { javac main.java } ; if ($?)
{ java main }
VOL OF CYLINDER : 13.50884841043611
VOL OF CUBOID : 1.0
VOL OF SPHERE : 43.4293768432253
VOL OF CUBE : 1000
PS C:\Users\smitk\Desktop\JAVA prac\prac1b>
```