BITS PILANI, DUBAI CAMPUS
DUBAI INTERNATIONAL ACADEMIC CITY, DUBAI

FIRST SEMESTER 2021 – 2022
COURSE: F213 (Object Oriented Programming)
COMPONENT: Practical Sheet 3 **DATE:**21st -28thSeptember 2021

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Q.1 Design a class Prism to represent a prism.

Data Members: private double length(l), width(w), height(h)
public void setPrism(): to assign values to l,w,h
public void double topArea(): returns top area of prism as l*w
public void double bottomArea(): returns bottom area of prism as l*w
public void double leftArea(): returns left area of prism as h*w
public void double rightArea(): returns right area of prism as h*w
public void double frontArea(): returns front area of prism as h*l
public void double backArea(): returns back area of prism as h*l
public void double bottomArea(): returns bottom area of prism as l*w
public public double area(): returns a sum of the areas of all six sides as 2(l*w+h*w+h*l)
Develop a public class TestPrism that tests all these methods.

Solution:

```
import java.util.Scanner;
class Prism {
    private double l, w,h;
    public void setPrism(double l, double w, double h){
        this.l = l;
        this.w = w;
        this.h = h;
    }
    public double topArea(){
        return l*w;
    }
    public double bottomArea(){
        return l*w;
    }
    public double leftArea(){
        return h*w;
    }
    public double rightArea(){
```

```
        return h*w;
    }
    public double frontArea(){
        return h*l;
    }
    public double backArea(){
        return h*l;
    }
    public double area(){
        return 2*((l*w)+(h*w)+(h*l));
    }
}

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

    double l,w,h;
    Scanner s = new Scanner(System.in);
    System.out.print("Please Enter the Length: ");
    l = s.nextDouble();
    System.out.print("Please Enter the Width: ");
    w = s.nextDouble();
    System.out.print("Please Enter the Height: ");
    h = s.nextDouble();
    Prism obj = new Prism();
    obj.setPrism(l,w,h);
    System.out.print("Top area is: ");
    System.out.print(obj.topArea()); System.out.println();
    System.out.print("Bottom area is: ");
    System.out.print(obj.bottomArea()); System.out.println();
    System.out.print("Left area is: ");
    System.out.print(obj.leftArea()); System.out.println();
    System.out.print("Right area is: ");
    System.out.print(obj.rightArea()); System.out.println();
    System.out.print("Front area is: ");
    System.out.print(obj.frontArea()); System.out.println();
    System.out.print("Back area is: ");
    System.out.print(obj.backArea()); System.out.println();
    System.out.print("Total area is: ");
    System.out.print(obj.area()); System.out.println();
  }
}
```

Output:

```
anura@LAPTOP-JH3Q5OBP MINGW64 /e/College/Second_Year/OOPS/Practical/Practical_3
$ java TestPrism
Please Enter the Length: 1
Please Enter the Width: 2
Please Enter the Height: 3
Top area is: 2.0
Bottom area is: 2.0
Left area is: 6.0
Right area is: 6.0
Front area is: 3.0
Back area is: 3.0
Total area is: 22.0
```

Q.2. Design a class Fan to represent a fan.

Private data members: String fanType, String manufacturer, String model, Boolean isOn
Public data members: enum Speed with 5 levels from 1 to 5
Public void setFan() and getFan() methods
Public void on(): switch on the fan
Public void off(): switch off the fan
Public void speedUp(): to increase current speed, if not minimum 1
Public void speedDown(): to reduce current speed, if not maximum 5

Solution:

```
import java.util.Scanner;

enum Speed{
    s1,s2,s3,s4,s5;
}
class Fan{
    private String fanType, manufacturer, model;
    private Boolean isOn;
    public Speed spd;

    public void setFan(String fanType, String manufacturer, String model, Boolean
 isOn, Speed spd){
        this.fanType = fanType;
        this.manufacturer = manufacturer;
        this.model = model;
        this.isOn = isOn;
        this.spd = spd;
    }
    int s = 1;
    public void getFan(){
        if(spd == Speed.s1){s = 1;}
```

```
        if(spd == Speed.s2){s = 2;}
        if(spd == Speed.s3){s = 3;}
        if(spd == Speed.s4){s = 4;}
        if(spd == Speed.s5){s = 5;}
        if(isOn == true){
            System.out.println("The fan is ON. It of the type " + fanType + " and
 has the manufacturer " + manufacturer + ". The mode is " + model + ". Speed is "
 + s + ".");
        }
        else{
            System.out.println("The fan is OFF. It of the type " + fanType + " an
d has the manufacturer " + manufacturer + ". The mode is " + model + ".");
        }
    }

    public void on(){
        isOn = true;
    }

    public void off(){
        isOn = false;
    }
    public void speedUp(){
        if(spd == Speed.s1){ spd = Speed.s2;}
        else if(spd == Speed.s2){ spd = Speed.s3;}
        else if(spd == Speed.s3){ spd = Speed.s4;}
        else if(spd == Speed.s4){ spd = Speed.s5;}
    }
    public void speedDown(){
        if(spd == Speed.s5){ spd = Speed.s4;}
        else if(spd == Speed.s4){ spd = Speed.s3;}
        else if(spd == Speed.s3){ spd = Speed.s2;}
        else if(spd == Speed.s2){ spd = Speed.s1;}
    }

    public static void main(String[] args){
        Fan obj = new Fan();
        Speed spd = Speed.s1;
        obj.setFan("Ceiling", "Bajaj", "I305", true , spd);
        obj.getFan();
        obj.speedUp();
        obj.getFan();
        obj.speedDown();
```

```
        obj.getFan();
        obj.off();
        obj.getFan();
        obj.on();
        obj.getFan();
    }
}
```

Output:

```
anura@LAPTOP-JH3Q5OBP MINGW64 /e/College/Second_Year/OOPS/Practical/Practical_3
$ java Fan
The fan is ON. It of the type Ceiling and has the manufacturer Bajaj. The mode is I3O5. Speed is 1.
The fan is ON. It of the type Ceiling and has the manufacturer Bajaj. The mode is I3O5. Speed is 2.
The fan is ON. It of the type Ceiling and has the manufacturer Bajaj. The mode is I3O5. Speed is 1.
The fan is OFF. It of the type Ceiling and has the manufacturer Bajaj. The mode is I3O5.
The fan is ON. It of the type Ceiling and has the manufacturer Bajaj. The mode is I3O5. Speed is 1.
```