**BITS PILANI, DUBAI CAMPUS**

**DUBAI INTERNATIONAL ACADEMIC CITY, DUBAI**

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**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:**

**Text

Description automatically generated**

## 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 + " and 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:**

Text

Description automatically generated