**import java.util.Scanner;**

**class circle{**

**double radius;**

**String color;**

**circle() {**

**radius=1.0;**

**color="blue"; }**

**circle(double radius) {**

**this.radius=radius;**

**color="blue"; }**

**circle(double radius,String color) {**

**this.radius=radius;**

**this.color=color; }**

**double getarea() {**

**return Math.PI\*radius\*radius;}**

**double getradius(){**

**return radius;}**

**String getcolor(){**

**return color;}}**

**class cylinder extends circle{**

**double height;**

**double getheight(){**

**return height;}**

**cylinder() {**

**super();**

**height=2.0; }**

**cylinder(double height) {**

**super();**

**this.height=height;}**

**cylinder(double height, double radius) {**

**super(radius);**

**this.height=height;}**

**cylinder(double height,double radius, String color){**

**super(radius,color);**

**this.height=height;}**

**double getarea() {**

**return ((2\* Math.PI\*radius\*height)+(2\* Math.PI\*radius\*radius));}**

**double getvolume(){**

**return (super.getarea()\*height);}**

**void display(){**

**System.out.println("\nRadius is "+super.radius+",Height is "+height+", Color is "+super.color+",Area is "+getarea()+",Volume is "+getvolume());}**

**void check (cylinder c1,cylinder c2,int i,int j){**

**if((c1.radius==c2.radius)&& (c1.height==c2.height)&&(c1.color.equalsIgnoreCase(c2.color)))**

**System.out.println("The cylinders "+(i+1)+" and "+(j+1)+"are similar");}}**

**public class Main {**

**public static void main(String[] args) {**

**Scanner s = new Scanner(System.in);**

**cylinder[] c = new cylinder[4];**

**int i;**

**c[0] = new cylinder();**

**c[1] = new cylinder(3.0);**

**c[2] = new cylinder(3.0, 4.0, "Green");**

**System.out.println("Enter the details of cylinder 4 (height , radius and color)");**

**double h = s.nextDouble();**

**double r = s.nextDouble();**

**s.nextLine();**

**String st = s.nextLine();**

**c[3] = new cylinder(h, r, st);**

**for (i = 0; i < 4; i++) {**

**System.out.println("The dimensions of cylinder " + (i + 1) + " is ");**

**c[i].display(); }**

**for (i = 0; i < 4; i++) {**

**int j;**

**for (j = i + 1; j < 4; j++) {**

**c[i].check(c[i], c[j], i, j); } }}}**