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// -----"AreaPerimeter.java"-----
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import java.lang.*;
abstract class Shape
{
    protected String color;
    protected boolean filled;
    Shape()
    {
        System.out.println("Default Constructor");
        color="white";filled=false;
    }
    Shape( String color, boolean filled)
    {
        this.color=color; this.filled=filled;
    }
    public String getColor(){ return color;}
    public void setColor(String color)
    { this.color=color;}
    public boolean isFilled(){ return filled;}
    public void setFilled(boolean filled){ this.filled=filled;}

    abstract public double getArea();
    abstract public double getPerimeter();

    public String toString()
    { return "COLOR:"+color+" FILLED :"+filled; }
}

class Circle extends Shape
{
    protected double radius;
    Circle() { radius=0; }
    Circle(double radius){ this.radius=radius;}
    Circle(double radius,String color, boolean filled)
    {
        super(color,filled); this.radius=radius;
    }
    public double getRadius(){ return radius;}
    public void setRadius(double radius){ this.radius=radius;}
    public double getArea()
    { return 3.14*radius*radius;}
    public double getPerimeter(){return 2*3.14*radius;}
    public String toString()
    { return " CIRCLE :: RADIUS : "+radius+" COLOR:"+color+" FILLED :"+filled; }
}

class Rectangle extends Shape
{
    protected double width, length;
    Rectangle(){width=length=0;}
    Rectangle(double width,double length){
        this.width=width; this.length=length;}
    Rectangle(double width,double length,String color, boolean filled)
    { super(color,filled); this.width=width; this.length=length;}
    public double getWidth(){ return width;}
    public void setWidth(double width){ this.width=width;}
}
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    public double getLength(){ return length;}
    public void setLength(double length ) { this.length=length;}

    public double getArea() { return width*length;}
    public double getPerimeter(){return 2*(width+length);}
    public String toString()
    { return " RECTANGLE :: WIDTH : "+width+" LENGTH :"+length+" COLOR:"+color+" FILLED
:"+filled;      }
}
class Square extends Rectangle
{
    Square(){}
    Square(double side){width=length=side;}
    Square(double side,String color, boolean filled)
    { super(side,side,color,filled); }
    public double getSide(){ return width;}
    public void setSide(double side){ width=side;length=side;}
    public void setWidth(double side){ width=side;}
    public void setLength(double side ){length=side;}

    public String toString()
    { return " SQUARE :: side : "+width+" COLOR:"+color+" FILLED :"+filled;  }
}
public class AreaPerimeter
{
    public static void main(String a[])
    {
        System.out.println(" CIRCLE dimensions using constructor ---");

        Circle c=new Circle(10,"RED",true);
        System.out.println(""+c);
        System.out.println("\nCIRCLE : Area:: "+c.getArea()+" Perimeter :: "+c.getPerimeter());

        System.out.println(" \nCIRCLE dimensions using get and set methods ---");

        c.setColor("YELLOW");c.setRadius(5);c.setFilled(false);
        System.out.println(" CIRCLE:: Radius :"+c.getRadius()+" COLOR:"+c.getColor()+" FILLED
:"+c.isFilled());
        System.out.println("CIRCLE : Area:: "+c.getArea()+" Perimeter :: "+c.getPerimeter());

        System.out.println(" \nRECTANGLE dimensions using constructor ---");
        Rectangle r=new Rectangle(20,5,"GREEN",true);
        System.out.println(""+r);
        System.out.println("RECTANGLE : Area:: "+r.getArea()+" Perimeter :: "+r.getPerimeter());

        System.out.println(" \nRECTANGLE dimensions using get and set methods ---");

        r.setColor("PINK");r.setWidth(10);r.setLength(15);r.setFilled(true);

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        System.out.println(" RECTANGLE:: LENGTH :"+r.getLength()+"WIDTH : "+r.getWidth()+"
COLOR:"+r.getColor()+" FILLED :"+r.isFilled());

        System.out.println(" \nSQUARE dimensions using constructor ---");
        Square s=new Square(6,"BLUE",true);
        System.out.println(""+s);

        System.out.println("SQUARE : Area:: "+s.getArea()+" Perimeter :: "+s.getPerimeter());

        System.out.println(" \nSQUARE dimensions using get and set methods ---");

        s.setColor("PINK");s.setSide(5);r.setFilled(true);
        System.out.println(" SQUARE:: SIDE :"+s.getSide()+" COLOR:"+s.getColor()+" FILLED :"+s.isFilled());
        System.out.println("SQUARE : Area:: "+s.getArea()+" Perimeter :: "+s.getPerimeter());

    }
}

```

/\* EXECUTION AND OUTPUT

E:\ANDROID\ASSIGNMENT-1>javac AreaPerimeter.java

E:\ANDROID\ASSIGNMENT-1>java AreaPerimeter

CIRCLE dimensions using constructor ---

CIRCLE :: RADIUS : 10.0 COLOR:RED FILLED :true

CIRCLE : Area:: 314.0 Perimeter :: 62.800000000000004

CIRCLE dimensions using get and set methods ---

CIRCLE:: Radius :5.0 COLOR:YELLOW FILLED :false

CIRCLE : Area:: 78.5 Perimeter :: 31.400000000000002

RECTANGLE dimensions using constructor ---

RECTANGLE :: WIDTH : 20.0 LENGTH :5.0 COLOR:GREEN FILLED :true

RECTANGLE : Area:: 100.0 Perimeter :: 50.0

RECTANGLE dimensions using get and set methods ---

RECTANGLE:: LENGTH :15.0WIDTH : 10.0 COLOR:PINK FILLED :true

SQUARE dimensions using constructor ---

SQUARE :: side : 6.0 COLOR:BLUE FILLED :true

SQUARE : Area:: 36.0 Perimeter :: 24.0

SQUARE dimensions using get and set methods ---

SQUARE:: SIDE :5.0COLOR:PINK FILLED :true

SQUARE : Area:: 25.0 Perimeter :: 20.0

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