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package myPack;
import java.util.Scanner;
/**
 *
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 */

interface Shape{
    String getColor();
    void setColor(String color);
    float getArea();
    float getPerimeter();
}

class Circle implements Shape{
    String color="Red";
    protected float radius;
    public Circle(){
        radius=1;
    }

    public Circle(float radius){
        this.radius=radius;
    }

    public Circle(float radius, String color){
        this.color=color;
        this.radius=radius;
    }

    public float getRadius(){
        return radius;
    }

    public void setRadius(float radius){
        this.radius=radius;
    }

    public float getArea(){
        return (float) (Math.PI*radius*radius);
    }

    public float getPerimeter(){
        return (float) (2*Math.PI*radius);
    }

    public String getColor(){
        return color;
    }

    public void setColor(String color){
        this.color=color;
    }
}

class Rectangle implements Shape{

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protected float width, length;
String color="Red";

public Rectangle(){
    width=length=1;
}

public Rectangle(float width, float length){
    this.width=width;
    this.length=length;
}

public Rectangle(float width, float length, String color){
    this.color=color;
    this.width=width;
    this.length=length;
}

public float getWidth(){
    return width;
}

public void setWidth(float width){
    this.width=width;
}

public float getLength(){
    return length;
}

public void setLength(float length){
    this.length=length;
}

public float getArea(){
    return length*width;
}

public float getPerimeter(){
    return 2*(length+width);
}

public String getColor(){
    return color;
}

public void setColor(String color){
    this.color=color;
}

}

class Square extends Rectangle{
    protected float side;

    public Square(){

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        super();
        side=1;
    }

    public Square(float side){
        super(side, side);
        this.side=side;
    }

    public Square(float side, String color){
        super(side, side, color);
        this.side=side;
    }

    public float getSide(){
        return side;
    }

    public void setSide(float side){
        setWidth(side);
        setLength(side);
        this.side=side;
    }
}

public class TestShapeInterface {
    public static void main(String[] args) {
        int choice;
        String color, shapeType;
        float radius, length, width;

        Scanner in=new Scanner(System.in);

        Circle cir=null;
        Rectangle rect=null;
        Square sq=null;

        System.out.println("\t\tSHAPE: CIRCLE");
        System.out.println("Choice:\n\t1. Create object\n\t2. Create
object with radius\n\t3. Create object with radius and color\n\t0.
Exit\nEnter choice: ");
        choice=in.nextInt();

        switch(choice)
        {
            case 1: cir=new Circle();
                    System.out.println("Object created
successfully!");
                    break;
            case 2: System.out.println("Enter radius: ");
                    radius=in.nextFloat();
                    cir=new Circle(radius);
                    break;
            case 3: System.out.println("Enter radius: ");
                    radius=in.nextFloat();

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        System.out.println("Enter color : ");
        in.nextLine();
        color=in.nextLine();
        cir=new Circle(radius, color);
        break;
    }
    System.out.println("Choice:\n\t1. Set Detail\n\t0.
Exit\nEnter choice: ");
    choice=in.nextInt();
    while(choice!=0){
        switch(choice){
            case 1: System.out.println("Enter radius: ");
                    radius=in.nextFloat();
                    cir.setRadius(radius);
                    System.out.println("Enter color : ");
                    in.nextLine();
                    color=in.nextLine();
                    cir.setColor(color);
                    break;
        }
        System.out.println("Choice:\n\t1. Set Detail\n\t0.
Exit\nEnter choice: ");
        choice=in.nextInt();
    }

    System.out.println("\t\tSHAPE: RECTANGLE");
    System.out.println("Choice:\n\t1. Create object\n\t2. Create
object with size\n\t3. Create object with size and color\n\t0.
Exit\nEnter choice: ");
    choice=in.nextInt();

    switch(choice)
    {
        case 1: rect=new Rectangle();
                System.out.println("Object created
successfully!");
                break;
        case 2: System.out.println("Enter length: ");
                length=in.nextFloat();
                System.out.println("Enter width: ");
                width=in.nextFloat();
                rect=new Rectangle(length, width);
                break;
        case 3: System.out.println("Enter length: ");
                length=in.nextFloat();
                System.out.println("Enter width: ");
                width=in.nextFloat();
                System.out.println("Enter color : ");
                in.nextLine();
                color=in.nextLine();
                rect=new Rectangle(length, width, color);
                break;
    }
    System.out.println("Choice:\n\t1. Set Detail\n\t0.
Exit\nEnter choice: ");

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choice=in.nextInt();
while(choice!=0){
    switch(choice){
        case 1: System.out.println("Enter length: ");
                length=in.nextFloat();
                rect.setLength(length);
                System.out.println("Enter width : ");
                width=in.nextFloat();
                rect.setWidth(width);
                System.out.println("Enter color : ");
                in.nextLine();
                color=in.nextLine();
                rect.setColor(color);
                break;
    }
    System.out.println("Choice:\n\t1. Set Detail\n\t0.
Exit\nEnter choice: ");
    choice=in.nextInt();
}

System.out.println("\t\tSHAPE: SQUARE");
System.out.println("Choice:\n\t1. Create object\n\t2. Create
object with side\n\t3. Create object with side and color\n\t0.
Exit\nEnter choice: ");
choice=in.nextInt();

switch(choice)
{
    case 1: sq=new Square();
            System.out.println("Object created
successfully!");
            break;
    case 2: System.out.println("Enter side : ");
            length=in.nextFloat();
            sq=new Square(length);
            break;
    case 3: System.out.println("Enter side : ");
            length=in.nextFloat();
            System.out.println("Enter color : ");
            in.nextLine();
            color=in.nextLine();
            sq=new Square(length, color);
            break;
}
System.out.println("Choice:\n\t1. Set Detail\n\t0.
Exit\nEnter choice: ");
choice=in.nextInt();
while(choice!=0){
    switch(choice){
        case 1: System.out.println("Enter side: ");
                length=in.nextFloat();
                sq.setSide(length);
                System.out.println("Enter color : ");

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        in.nextLine();
        color=in.nextLine();
        sq.setColor(color);
        break;
    }
    System.out.println("Choice:\n\t1. Set Detail\n\t0.
Exit\nEnter choice: ");
    choice=in.nextInt();
}

Shape s[]={cir, rect, sq};

for(Shape obj:s){
    shapeType=obj.getClass().getName();
    switch(shapeType){
        case "Circle": System.out.println("\t\tSHAPE :
CIRCLE");
                        System.out.println("\tCIRCLE
PARAMETERS");
                        Circle c=(Circle) obj;
                        System.out.println("Radius      :
"+c.getRadius());
                        break;
        case "Rectangle": System.out.println("\t\tSHAPE :
RECTANGLE");
                        System.out.println("\tRECTANGLE
PARAMETERS");
                        Rectangle r=(Rectangle) obj;
                        System.out.println("Length      :
"+r.getLength());
                        System.out.println("Width      :
"+r.getWidth());
                        break;
        case "Square": System.out.println("\t\tSHAPE :
SQUARE");
                        System.out.println("\tSQUARE
PARAMETERS");
                        Square sqr=(Square) obj;
                        System.out.println("Side      :
"+sqr.getSide());

                    }
    System.out.println("Area      : "+obj.getArea());
    System.out.println("Perimeter: "+obj.getPerimeter());
    System.out.println("Color      : "+obj.getColor());
}

}

}

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