E . B. SUWATHI [15L247]

ECE - B

JAVA ASSIGNMENT DAY 9

//implementation of abstract class using array of objects for shapes

Shape.java:

```
package org.object;

public abstract class Shape {

	protected String name = "shape";
	protected String color = "yellow";
	protected boolean filled = false;

	public Shape() {
	}

	public Shape(String name, String color, boolean filled) {
		this.color = color;
		this.name = name;
		this.filled = filled;
	}

	public void setName(String name) {
		this.name = name;
	}

	public String getName() {
		return name;
	}

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

	public String getColor() {
		return color;
	}

	public void setFilled(boolean filled) {
		this.filled = filled;
	}

	public boolean isfilled() {
		return filled;
	}
	public abstract double area();
}
```

Circle.java

```java
package org.object.round;

import org.object.Shape;

public class Circle extends Shape {
	protected double radius = 1.0;
	private final static double PI = 3.14;

	public Circle() {
		super();
	}

	public Circle(String name, String color, boolean filled, double radius) {
		super(name, color, filled);
		this.radius = radius;
	}

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

	public double getRadius() {
		return radius;
	}

	public double getPI() {
		return PI;
	}

	public double area() {
		return this.radius * this.PI * this.radius;
	}

	@Override
	public String toString() {
		return "Circle      [area = " + area() + "]";
	}

}
```

Cylinder.java

```
package org.object.round;

public class Cylinder extends Circle {

	protected double height;

	public Cylinder() {
		super();
	}

	public Cylinder(String name, String color, boolean filled, double radius,
double height) {
		super(name, color, filled, radius);
		this.height = height;
	}

	public void setHeight(double height) {
		this.height = height;
	}

	public double getHeight() {
		return height;
	}

	public double area() {
		double res = super.area() * this.height;
		return res;
	}

	@Override
	public String toString() {
		return "Cylinder    [area = " + height + "]";
	}

}
```

Triangle.java

```java
package org.object.tri;

import org.object.Shape;

public class Triangle extends Shape {
	protected double base = 1.0;
	protected double height = 1.0;

	public Triangle() {
		super();
	}

	public Triangle(String name, String color, boolean filled, double base, double
height) {
		super(name, color, filled);
		this.base = base;
		this.height = height;
	}

	public void setBase(double base) {
		this.base = base;
	}

	public double getBase() {
		return base;
	}

	public void setHeight(double height) {
		this.height = height;
	}

	public double getHeight() {
		return height;
	}

	public double area() {
		return 0.5 * this.base * this.height;
	}

	@Override
	public String toString() {
		return "Triangle    [area = " + area() + "]";
	}

}
```

Square.java

```java
package org.object.square;

import org.object.Shape;

public class Square extends Shape {
	protected double side = 1.0;

	public Square() {
		super();
	}

	public Square(String name, String color, boolean filled, double side) {
		super(name, color, filled);
		this.side = side;
	}

	public void setSide(double side) {
		this.side = side;
	}

	public double getSide() {
		return side;
	}

	public double area() {
		return this.side * this.side;
	}

	@Override
	public String toString() {
		return "Square	[area = " + area() + "]";
	}

}
```

Rectangle.java

```
package org.object.square;

import org.object.Shape;

public class Rectangle extends Shape {
	protected double length = 1.0;
	protected double height = 1.0;

	public Rectangle() {
		super();
	}

	public Rectangle(String name, String color, boolean filled, double length,
double height) {
		super(name, color, filled);
		this.length = length;
		this.height = height;
	}

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

	public double getLength() {
		return length;
	}

	public void setHeight(double height) {
		this.height = height;
	}

	public double getHeight() {
		return height;
	}

	public double area() {
		return this.length * this.height;
	}

	@Override
	public String toString() {
		return "Rectangle   [area = " + area() + "]";
	}

}
```

Solution.java

```
package org.main;

import org.object.Shape;
import org.object.round.Circle;
import org.object.round.Cylinder;
import org.object.square.Rectangle;
import org.object.square.Square;
import org.object.tri.Triangle;

public class Solution {

	public static void main(String[] args) {
		Shape shape[] = new Shape[5];
		shape[0]  = new Circle("circle", "blue", true, 2.0);
		System.out.println(shape[0]);
		shape[1]  = new Cylinder("cylinder", "orange", true, 2.0, 2.0);
		System.out.println(shape[1]);
		shape[2] = new Triangle("triangle", "green", true, 6.0, 7.0);
		System.out.println(shape[2]);
		shape[3]  = new Rectangle("rectangle", "grey", true, 2.0, 4.0);
		System.out.println(shape[3]);
		shape[4]  = new Square("square", "black", true, 2.0);
		System.out.println(shape[4]);

	}

}
```

OUTPUT: