

**E.B.SUWATHI [15L247]**

**ECE – B**

## **JAVA ASSIGNMENT DAY - 8**

//inheritance using shapes

### **SINGLE INHERITANCE:**

**Shape.java**

```
package org.object ;
public 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 setFilledr(String filled ) {
        this.color = color ;
    }
    public boolean isfilled() {
        return filled;
    }
}
```

## Circle.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 ;
    }
}
```

## Source.java

```
package org.main ;
import org.object.Shape;
import org.object.round.Circle;
public class Solution {
    public static void main(String[] args) {
        Circle circle = new Circle("circle","blue",true,2.0) ;
        System.out.println("CIRCLE AREA"+" " +circle.area() );
    }
}
```

## OUTPUT:

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\object\Shape.java

C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\object\round\Circle.java

C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\main\Solution.java

C:\Users\students\Documents\Inheritance>java -cp bin; org.main.Solution
CIRCLE AREA      : 12.56

C:\Users\students\Documents\Inheritance>
```

## MULTILEVEL INHERITANCE :

### Shape.java

```
package org.object ;
public 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 setFilledr(String filled ) {
        this.color = color ;
    }
    public boolean isfilled() {
        return filled;
    }
}

```

## Circle.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 ;
    }
}

```

## Cylinder.java

```
package org.object.round ;
import org.object.Shape ;
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() {
        return super.area() * this.height ;
    }
}
```

## Solution.java

```
package org.main ;
import org.object.Shape;
import org.object.round.Circle;
import org.object.round.Cylinder;
public class Solution {
    public static void main(String[] args) {
        Circle circle = new Circle("circle","blue",true,2.0) ;
        System.out.println("CIRCLE AREA      :"+" " +circle.area() );
        Cylinder cylinder = new Cylinder("cylinder","red",true,2.0,4.0) ;
        System.out.println("CIRCLE AREA      :"+" " +cylinder.area() );
    }
}
```

## OUTPUT:

```
C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\object\Shape.java
C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\object\round\Circle.java
C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\object\round\Cylinder.java
C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\main\Solution.java
C:\Users\students\Documents\Inheritance>java -cp bin; org.main.Solution
CIRCLE AREA      : 12.56
CIRCLE AREA      : 50.24
C:\Users\students\Documents\Inheritance>
```

## HIERARICAL INHERITANCE:

### Shape.java

```
package org.object ;
public 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 setFilledr(String filled ) {
        this.color = color ;
    }
}
```

```
}  
    public boolean isfilled() {  
        return filled;  
    }  
}
```

## Circle.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 ;  
    }  
}
```

## Triangle.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 ;
    }
}

```

## 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 ;
    }
}

```

## Solution.java

```

package org.main ;
import org.object.Shape;
import org.object.round.Circle;
import org.object.square.Rectangle;
import org.object.tri.Triangle;
public class Solution {
    public static void main(String[] args) {
        Circle circle = new Circle("circle","blue",true,2.0) ;
        System.out.println("CIRCLE AREA          :"+" " +circle.area() );
        Rectangle rectangle = new Rectangle("rectangle","red",false,2.0,4.0) ;
        System.out.println("RECTANGLE AREA          :"+" " +rectangle.area() );
        Triangle triangle = new Triangle("triangle","green",true,6.0,7.0) ;
        System.out.println("TRIANGLE AREA          :"+" " +triangle.area() );
    }
}

```

## OUTPUT:

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\object\Shape.java
C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\object\round\Circle.java
C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\object\square\Rectangle.java
C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\object\tri\Triangle.java
C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\main\Solution.java
C:\Users\students\Documents\Inheritance>java -cp bin org.main.Solution
CIRCLE AREA      : 12.56
RECTANGLE AREA   : 8.0
TRIANGLE AREA    : 21.0
C:\Users\students\Documents\Inheritance>
```

## HYBRID INHERITANCE:

### Shape.java

```
package org.object ;
public 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 setFilledr(String filled ) {
        this.color = color ;
    }
    public boolean isfilled() {
        return filled;
    }
}

```

### 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 ;
    }
}

```

```
}
```

## Triangle.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 ;
    }
}
```

## Circle.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 ;
    }
}
```

## Square.java:

```
package org.object.square;
import org.object.Shape ;
public class Square extends Rectangle {
    protected double side = 1.0;
    public Square() {
        super();
    }
    public Square(String name ,String color , boolean filled , double length ,
double height, double side) {
        super(name , color , filled , length , height);
        this.length = length ;
        this.height = height ;
    }
}
```

```

        this.side = side ;
    }
    public void setSide(double side ) {
        this.side = side ;
    }
    public double getSide() {
        return side ;
    }
    public double area() {
        return this.side * this.side ;
    }
}

```

### Cylinder.java :

```

package org.object.round ;
import org.object.Shape ;
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() {
        return super.area() * this.height ;
    }
}

```

### 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) {
        Circle circle = new Circle("circle","blue",true,2.0) ;
        System.out.println("CIRCLE AREA      :"+ " " +circle.area() );
        Rectangle rectangle = new Rectangle("rectangle","red",false,2.0,4.0) ;
        System.out.println("RECTANGLE AREA      :"+ " " +rectangle.area() );
        Triangle triangle = new Triangle("triangle","green",true,6.0,7.0) ;
        System.out.println("TRIANGLE AREA      :"+ " " +triangle.area() );
        Cylinder cylinder = new Cylinder("cylinder","orange",true,2.0,2.0) ;
        System.out.println("CYLINDER AREA      :"+ " " +cylinder.area() );
        Square square = new Square("square","black",true,2.0,2.0,3.0) ;
        System.out.println("SQUARE AREA      :"+ " " +square.area() );
    }
}

```

## OUTPUT:

```

C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\object\Shape.java
C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\object\round\Circle.java
C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\object\square\Rectangle.java
C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\object\tri\Triangle.java
C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\object\round\Cylinder.java
C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\object\square\Square.java
C:\Users\students\Documents\Inheritance>javac -d bin -cp bin; src\org\main\Solution.java

C:\Users\students\Documents\Inheritance>java -cp bin org.main.Solution
CIRCLE AREA      : 12.56
RECTANGLE AREA   : 8.0
TRIANGLE AREA    : 21.0
CYLINDER AREA    : 25.12
SQUARE AREA      : 9.0

C:\Users\students\Documents\Inheritance>

```