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JAVA PROGRAMMING

Task-8

Single inheritance

Shape:

```
package org.object;
public class Shape{
    protected String name="shape";
    protected String colour="yellow";
    protected boolean filled=false;
    public Shape(){

    }
    public Shape(String name,String colour,boolean filled){
        this.name = name;
        this.colour = colour;
        this.filled = filled;
    }
    public void setName(String name){
        this.name = name;
    }
    public void setColour(String colour){
        this.colour = colour;
    }
     public void setFilled(Boolean filled){
        this.filled = filled;
    }
    public String getName(){
        return this.name;
    }
     public String getColour(String colour){
        return this.colour;
    }
    public boolean getFilled(){
        return this.filled;
```

```
    }
}
```

Circle:

```
package org.object.round;
import  org.object.Shape;
public class Circle extends Shape{
    protected double radius=1.0;
    final private static double PI=3.14;
    public Circle(){
    }
    public Circle(String name,String colour,boolean filled,double radius){
        super(name,colour,filled);
        this.radius = radius;

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

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

Solution:

```
package org.main;
import org.object.Shape;
import org.object.round.Circle;



public class Solution{
    public static void main(String arg[]){
         Circle circle=new Circle("circle","pinK",true,2.0);
```

```
        System.out.println("AREA OF CIRCLE:"+circle.Area());

    }
}
```

Output:

```
C:\Users\students\Documents\inheritance>javac -d 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
AREA OF CIRCLE:12.56
```

Multilevel inheritance:

Shape

```
package org.object;
public class Shape{
    protected String name="shape";
    protected String colour="yellow";
    protected boolean filled=false;
    public Shape(){

    }
    public Shape(String name,String colour,boolean filled){
        this.name = name;
        this.colour = colour;
        this.filled = filled;
    }
    public void setName(String name){
        this.name = name;
    }
    public void setColour(String colour){
        this.colour = colour;
    }
     public void setFilled(Boolean filled){
```

```
        this.filled = filled;
    }
    public String getName(){
        return this.name;
    }
     public String getColour(String colour){
        return this.colour;
    }
    public boolean getFilled(){
        return this.filled;
    }
}
```

Circle

```
package org.object.round;
import  org.object.Shape;
public class Circle extends Shape{
    protected double radius=1.0;
    final private static double PI=3.14;
    public Circle(){
    }
    public Circle(String name,String colour,boolean filled,double radius){
        super(name,colour,filled);
        this.radius = radius;

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

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

Cylinder

```
package org.object.round;
import org.object.round.Circle;
public class Cylinder extends Circle{
    protected double height=1.0;
    public Cylinder(){

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

    }
    public void setHeight(double height){
        this.height = height;
    }
    public double getHeight(){
        return this.height;
    }
    public double Area(){
        double area=super.Area()*height;
        return area;
    }


}
```

Solution

```
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 arg[]){
         Circle circle=new Circle("circle","pinK",true,2.0);
         Cylinder cylinder=new Cylinder("cylinder","pinK",true,4.0,2.0);
        System.out.println("AREA OF CIRCLE:"+circle.Area());
        System.out.println("AREA OF CYLINDER:"+cylinder.Area());
```

```
    }
}
```

Output

```
C:\Users\students\Documents\inheritance>javac -d 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
AREA OF CIRCLE:12.56
AREA OF CYLINDER:56.519999999999996
```

Hierarchical inheritance:

Shape

```
package org.object;
public class Shape{
    protected String name="shape";
    protected String colour="yellow";
    protected boolean filled=false;
    public Shape(){

    }
    public Shape(String name,String colour,boolean filled){
        this.name = name;
        this.colour = colour;
        this.filled = filled;
    }
    public void setName(String name){
        this.name = name;
    }
    public void setColour(String colour){
        this.colour = colour;
    }
     public void setFilled(Boolean filled){
        this.filled = filled;
    }
```

```
    public String getName(){
        return this.name;
    }
     public String getColour(String colour){
        return this.colour;
    }
    public boolean getFilled(){
        return this.filled;
    }
}
```

Rectangle

```
package org.object.square;
import org.object.Shape;
public class Rectangle extends Shape{
        private double length=1.0;
        private double breath=1.0;
    public Rectangle(String name,String colour,boolean filled,double
length,double breath){
        super(name,colour,filled);
        this.length = length;
        this.breath = breath;

    }
    public void setbreath(double breath){
        this.breath = breath;
    }
    public double getbreath(){
        return this.breath;
    }
     public void setlength(double length){
        this.breath = breath;
    }
    public double getlength(){
        return this.length;
    }
    public double Area(){
        double area = length*breath;
        return area;
    }

}
```

Triangle

```
package org.object.tri;
import org.object.Shape;
public class Triangle extends Shape{
        private double breath=1.0;
        private double height=1.0;
    public Triangle(String name,String colour,boolean filled,double height,double
breath){
        super(name,colour,filled);
        this.breat = breath;
         this.height = height;


    }
    public void setbreath(double breath){
        this.breath = breath;
    }
    public double getbreath(){
        return this.breath;
    }
    public void setHeight(double height){
        this.heigh t= height;
    }
    public double getHeight(){
        return this.height;
    }
    public double Area(){
        double area = (0.5)*(height*breath);
        return area;
    }

}
```

Circle

```
package org.object.round;
import  org.object.Shape;
public class Circle extends Shape{
    protected double radius=1.0;
    final private static double PI=3.14;
    public Circle(){
    }
```

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

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

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

Solution

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


public class Solution{
    public static void main(String arg[]){
         Circle circle = new Circle("circle","pinK",true,2.0);
         Rectangle rectangle = new Rectangle("rectangle","yellow",true,3,4);
         Triangle triangle = new Triangle("triangle","white",true,3,4);
         //Cylinder cylinder=new Cylinder("cylinder","pinK",true,4.0,2.0);
          System.out.println("AREA OF CIRCLE   :"+circle.Area());
          System.out.println("AREA OF RECTANGLE:"+rectangle.Area());
           System.out.println("AREA OF TRIANGLE:"+triangle.Area());

        //System.out.println("AREA OF CYLINDER:"+cylinder.Area());
    }
}
```

Output

```
C:\Users\students\Documents\inheritance>javac -d bin src\org\object\Shape.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\square\Rectangle.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
AREA OF CIRCLE   :12.56
AREA OF RECTANGLE:12.0
AREA OF TRIANGLE:6.0
```

Hybrid inheritance:

Shape

```java
package org.object;
public class Shape{
    protected String name="shape";
    protected String colour="yellow";
    protected boolean filled=false;
    public Shape(){

    }
    public Shape(String name,String colour,boolean filled){
        this.name = name;
        this.colour = colour;
        this.filled = filled;
    }
    public void setName(String name){
        this.name = name;
    }
    public void setColour(String colour){
        this.colour = colour;
    }
     public void setFilled(Boolean filled){
        this.filled = filled;
    }
    public String getName(){
        return this.name;
    }
     public String getColour(String colour){
        return this.colour;
```

```
    }
    public boolean getFilled(){
        return this.filled;
    }
}
```

Rectangle

```
package org.object.square;
import org.object.Shape;
public class Rectangle extends Shape{
        private double length=1.0;
        private double breath=1.0;
    public Rectangle(String name,String colour,boolean filled,double
length,double breath){
        super(name,colour,filled);
        this.length = length;
        this.breath = breath;

    }
    public void setbreath(double breath){
        this.breath = breath;
    }
    public double getbreath(){
        return this.breath;
    }
     public void setlength(double length){
        this.breath = breath;
    }
    public double getlength(){
        return this.length;
    }
    public double Area(){
        double area = length*breath;
        return area;
    }

}
```

Triangle

```
package org.object.tri;
import org.object.Shape;
public class Triangle extends Shape{
```

```
        private double breath=1.0;
        private double height=1.0;
    public Triangle(String name,String colour,boolean filled,double height,double
breath){
        super(name,colour,filled);
        this.breat = breath;
         this.height = height;


    }
    public void setbreath(double breath){
        this.breath = breath;
    }
    public double getbreath(){
        return this.breath;
    }
    public void setHeight(double height){
        this.heigh t= height;
    }
    public double getHeight(){
        return this.height;
    }
    public double Area(){
        double area = (0.5)*(height*breath);
        return area;
    }

}
```

Circle

```
package org.object.round;
import  org.object.Shape;
public class Circle extends Shape{
    protected double radius=1.0;
    final private static double PI=3.14;
    public Circle(){
    }
    public Circle(String name,String colour,boolean filled,double radius){
        super(name,colour,filled);
        this.radius = radius;

    }
```

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

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

Square:

```
package org.object.square;
import org.object.square.Rectangle;
public class Square extends Rectangle {
        private double side=1.0;
    public Square(String name,String colour,boolean filled,double length,double
breath,double side){
        super(name,colour,filled,length,breath);
        this.side = side;

    }
    public void setside(double breath){
        this.side = side;
    }
    public double getside(){
        return this.side;
    }
    public double Area(){
        double area = side*side;
        return 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.tri.Triangle;
import org.object.square.Square;


public class Solution{
    public static void main(String arg[]){
         Circle circle = new Circle("circle","pinK",true,2.0);
         Rectangle rectangle = new Rectangle("rectangle","yellow",true,3,4);
         Triangle triangle = new Triangle("triangle","white",true,3,4);
         Cylinder cylinder=new Cylinder("cylinder","pinK",true,4.0,2.0);
         Square square=new Square("square","pinK",true,2,3,4);
         System.out.println("AREA OF CIRCLE   :"+circle.Area());
         System.out.println("AREA OF RECTANGLE:"+rectangle.Area());
         System.out.println("AREA OF TRIANGLE :"+triangle.Area());
         System.out.println("AREA OF CYLINDER :"+cylinder.Area());
         System.out.println("AREA OF SQUARE   :"+square.Area());
    }
}
```

Output:

```
C:\Users\students\Documents\inheritance>javac -d bin src\org\object\Shape.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\square\Rectangle.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\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
AREA OF CIRCLE   :12.56
AREA OF RECTANGLE:12.0
AREA OF TRIANGLE :6.0
AREA OF CYLINDER :100.48
AREA OF SQUARE   :16.0
```