Program 05 : Inheritance & Polymorphism – Shape Class

Develop a JAVA program to create a class named shape. Create three sub classes namely: circle, triangle and square, each class has two member functions named draw () and erase (). Demonstrate polymorphism concepts by developing suitable methods, defining member data and main program.

**Java Code**

class Shape {

protected String name;

public Shape(String name) {

this.name = name;

}

public void draw() {

System.out.println("Drawing a " + name);

}

public void erase() {

System.out.println("Erasing a " + name);

}

}

class Circle extends Shape {

private double radius;

public Circle(String name, double radius) {

super(name);

this.radius = radius;

}

@Override

public void draw() {

System.out.println("Drawing a circle with radius " + radius);

}

@Override

public void erase() {

System.out.println("Erasing a circle with radius " + radius);

}

}

class Triangle extends Shape {

private double base;

private double height;

public Triangle(String name, double base, double height) {

super(name);

this.base = base;

this.height = height;

}

@Override

public void draw() {

System.out.println("Drawing a triangle with base " + base + " and height " + height);

}

@Override

public void erase() {

System.out.println("Erasing a triangle with base " + base + " and height " + height);

}

}

class Square extends Shape {

private double side;

public Square(String name, double side) {

super(name);

this.side = side;

}

@Override

public void draw() {

System.out.println("Drawing a square with side length " + side);

}

@Override

public void erase() {

System.out.println("Erasing a square with side length " + side);

}

}

public class ShapeDemo {

public static void main(String[] args) {

Shape[] shapes = new Shape[3];

shapes[0] = new Circle("Circle", 5.0);

shapes[1] = new Triangle("Triangle", 4.0, 6.0);

shapes[2] = new Square("Square", 3.0);

for (Shape shape : shapes) {

shape.draw();

shape.erase();

System.out.println();

}

}

}

### Output

$ java ShapeDemo

Drawing a circle with radius 5.0

Erasing a circle with radius 5.0

Drawing a triangle with base 4.0 and height 6.0

Erasing a triangle with base 4.0 and height 6.0

Drawing a square with side length 3.0

Erasing a square with side length 3.0