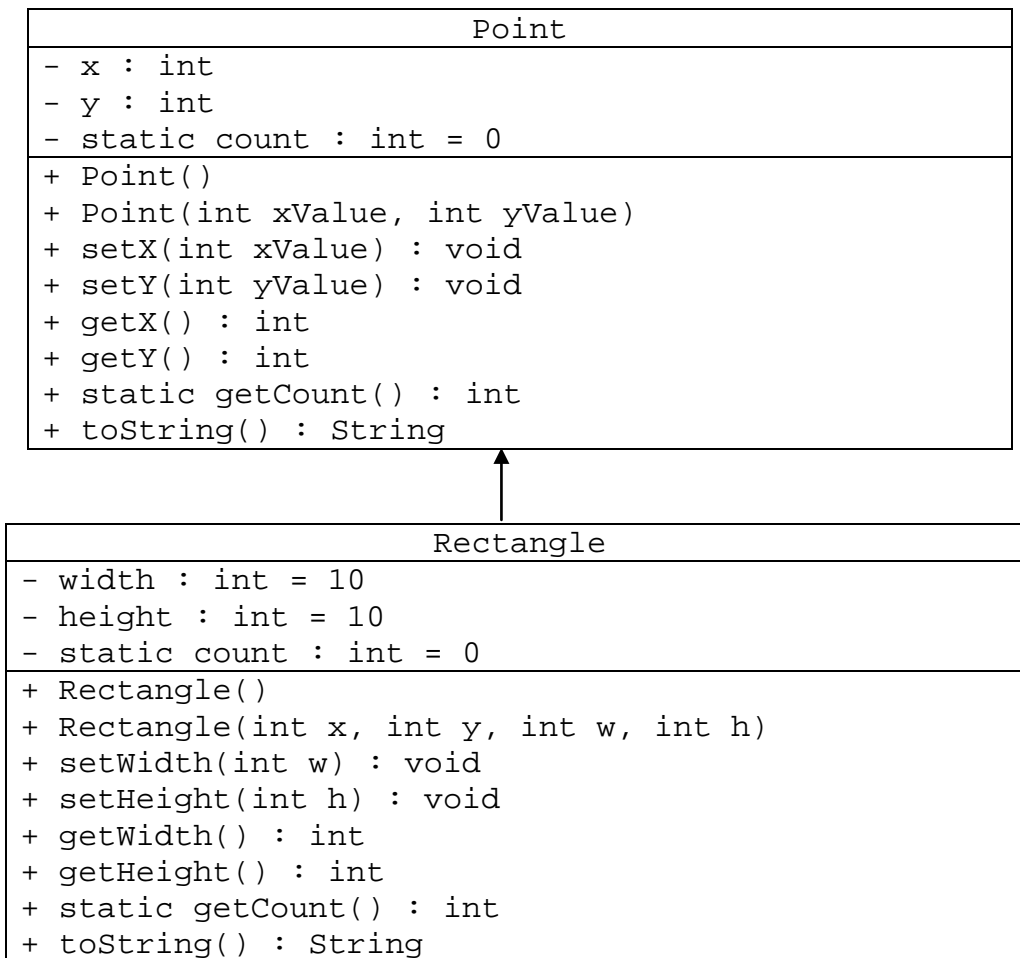


บทที่ 10 การออกแบบ Class แบบ Inheritance และใช้งาน Garbage Collection

การออกแบบและสร้าง Class แบบ Inheritance โดยมีการออกแบบ Class ตาม Class Diagram ดังนี้



การทดลองที่ 10-1

```
// File Name : Point.java

public class Point {
    private int x = 10; // x part of coordinate pair
    private int y = 10; // y part of coordinate pair
    private static int count = 0;

    // no-argument constructor
    public Point() {
        setX(0);
        setY(0);
        count++;
    }
}
```

```

// constructor
public Point( int xValue, int yValue ) {
    setX(xValue);
    setY(yValue);
    count++;
}

// finalizer
protected void finalize() {
    count--;
}

// set x in coordinate pair
public void setX( int xValue ) {
    x = xValue; // no need for validation
}

// return x from coordinate pair
public int getX() {
    return x;
}

// set y in coordinate pair
public void setY( int yValue ) {
    y = yValue; // no need for validation
}

// return y from coordinate pair
public int getY() {
    return y;
}

public static int getCount() {
    return count;
}

// return String representation of Point object
public String toString() {
    return "[" + getX() + ", " + getY() + "]";
}
} // end class Point

```

```

// File Name : PointApplet.java

import javax.swing.*;
import java.awt.*;

public class PointApplet extends javax.swing.JApplet {
    int size;
    Point p[] ;
}

```

```

public void init()
{
    String input; // user's input

    // obtain user's choice
    input = JOptionPane.showInputDialog(
        "Enter number of point : " );

    size = Integer.parseInt( input ); // convert input to int
    p = new Point[size];

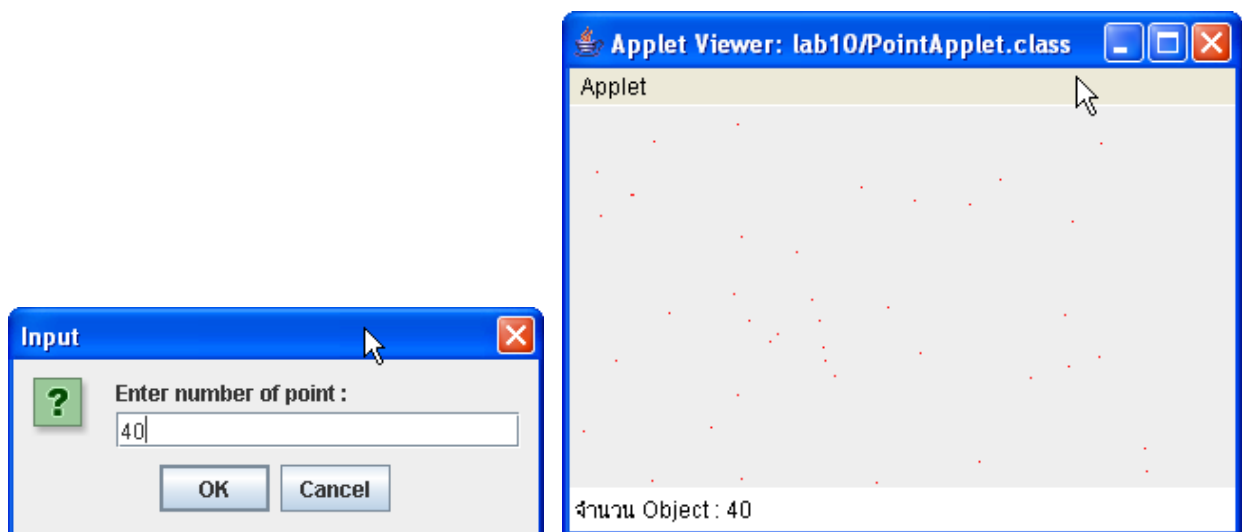
    for(int n = 0 ; n < p.length ; n++) {
        int x = 5 + (int) (Math.random() * 300);
        int y = 5 + (int) (Math.random() * 200);
        p[n] = new Point(x, y);
    }
} // end method init

// draw shapes on applet's background
public void paint( Graphics g )
{
    super.paint( g ); //call paint method inherited from JApplet

    for ( int n = 0; n < p.length; n++ ) {
        // set color
        g.setColor( new Color(255,0,0) );
        // plot point
        g.drawLine( p[n].getX(), p[n].getY(), p[n].getX(),
            p[n].getY() );
    } // end for
    showStatus("จำนวน Object : "+ Point.getCount());
} // end method paint
}

```

ผลลัพธ์



การทดลองที่ 10-2

```
// File Name : Rectangle.java

public class Rectangle extends Point {
    private int width = 10;
    private int height = 10;
    private static int count = 0;

    /** Creates a new instance of Rectangle */
    public Rectangle() {
    }

    public Rectangle(int x, int y, int w, int h ) {
        super(x,y);
        setWidth(w);
        setHeight(h);
    }

    public void setWidth(int w) {
        width = w;
    }

    public void setHeight(int h) {
        height = h;
    }

    public int getWidth() {
        return width;
    }

    public int getHeight() {
        return height;
    }

    public int getArea() {
        return width*height;
    }
}
```

```

public static int getCount() {
    return count;
}

protected void finalize() {
    count--;
}

public String toString() {
    return "Conner Left = " + super.toString() + "; Width = " +
        getWidth() + "; Height = " + getHeight();
}
}

```

```

// File Name : RectangleApplet.java

import javax.swing.*;
import java.awt.*;

public class RectangleApplet extends javax.swing.JApplet {
    int x, y;
    Rectangle r ;

    public void init()
    {
        String input; // user's input

        // obtain user's choice
        input = JOptionPane.showInputDialog(
            "Enter value x of left point : " );
        x = Integer.parseInt( input ); // convert input to int
        input = JOptionPane.showInputDialog(
            "Enter value y of left point : " );
        y = Integer.parseInt( input ); // convert input to int

        int w = 10 + (int) (Math.random() * 280);
        int h = 10 + (int) (Math.random() * 180);
        r = new Rectangle(x, y, w, h);
    } // end method init

    // draw shapes on applet's background
    public void paint( Graphics g )
    {
        super.paint( g ); //call paint method inherited from JApplet
        // set color
        g.setColor( Color.ORANGE );
        g.drawRect(r.getX(), r.getY(), r.getWidth(),r.getHeight() );
        g.setColor( Color.BLUE );
        g.drawString( "Point Left : " + r.getX() + ", " + r.getY(),
            r.getX(), r.getY());
    }
}

```

```
g.drawString( "Width : " + r.getWidth() , r.getX(),  
              r.getY() + 15);  
g.drawString( "Height : " + r.getHeight() , r.getX(),  
              r.getY() + 30);  
g.drawString( "Area : " + r.getArea() , r.getX(),  
              r.getY() + 45);  
  
} // end method paint  
}
```

ผลลัพธ์

