

## Exercise: Persevering Scribble Applet

This exercise will give you a chance to use the `java.util.Vector` (or `java.util.ArrayList`) class and should help you become familiar with the JDK 1.1 event-handling model and introduce you to the use of anonymous inner classes.

### 1. The Exercise

The simple Scribble applet given below has a fundamental problem: while it embodies both a view and a controller (a *delegate*), it has no underlying model (data storage). This manifests itself such that if the applet's frame is obscured and then uncovered, the currently displayed drawing will be lost.

You should add a model to the applet so that this problem is avoided.

### 2. Hints

- your model should utilise `java.util.Vector` (if you have JDK 1.2 or greater installed, you should use `java.util.ArrayList` instead). You will also need to create a `LineSegment` class to contain each line segment of the drawing.
- you should provide a `paint ()` method to override the default version provided by the `java.applet.Applet` superclass

### 3. The Original Applet

```
import java.awt.*;
import java.awt.event.*;

public class Scribble extends java.applet.Applet
{
    int last_x = 0, last_y = 0;

    public void init ()
    {
        addMouseListener
        (
            new MouseAdapter ()
            {
                public void mousePressed (MouseEvent e)
                { last_x = e.getX (); last_y = e.getY (); }
            }
        );

        addMouseMotionListener
        (
            new MouseMotionAdapter ()
            {
                public void mouseDragged (MouseEvent e)
                {
                    Graphics g = getGraphics ();
                    int x = e.getX (), y = e.getY ();
                    g.setColor (Color.black);
                    g.drawLine (last_x, last_y, x, y);
                    last_x = x; last_y = y;
                }
            }
        );
    }
}
```

### 4. The HTML

Here is the `Scribble.html` file:

```
<html>
<head>
<title>Scribble</title>
</head>
<body>
<applet code=Scribble width=320 height=240 >
</applet>
</body>
</html>
```