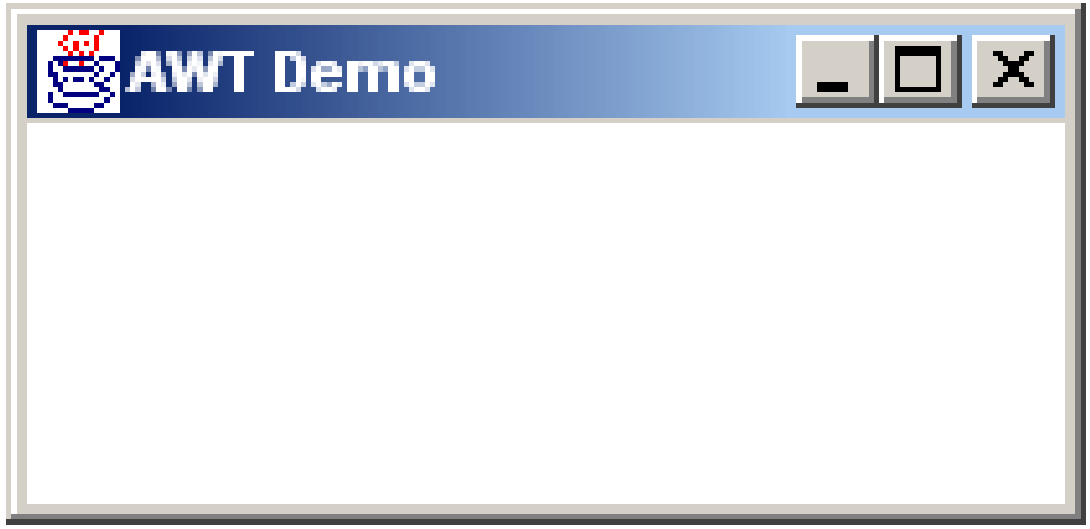
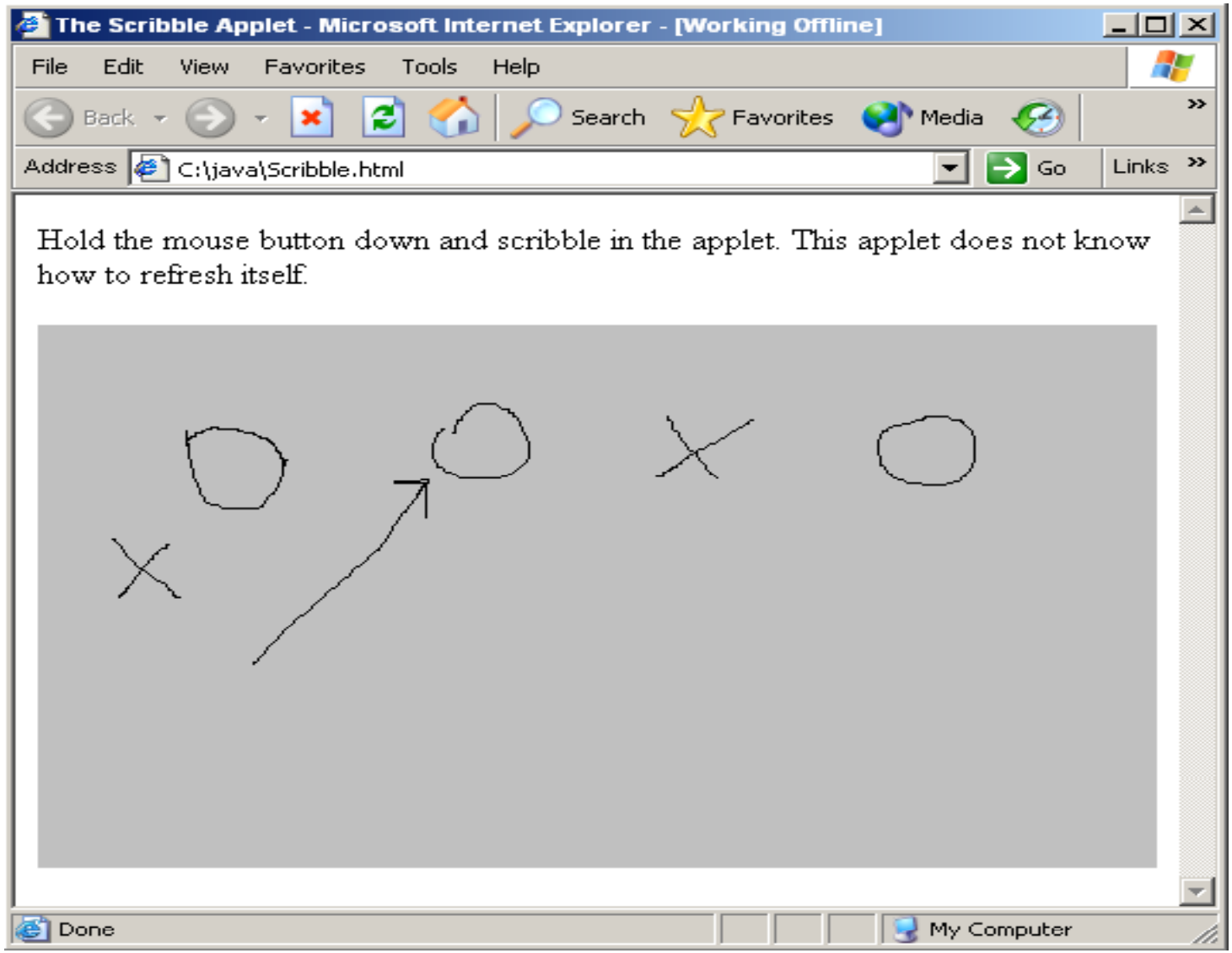
# Windows program example

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

public class wpexample extends Frame {

  public wpexample(String title) {

    super(title);  // set frame title.
    this.addWindowListener(new WindowAdapter() {
      public void windowClosing(WindowEvent e) { System.exit(0); }
    });
    this.setFont(new Font("SansSerif", Font.PLAIN, 12));
}
  public static void main(String[] args) {
    Frame f = new wpexample("AWT Demo");
    f.pack();
    f.show();
  }
}
```


AWT Demo

# Applet example

```
import java.applet.*;
import java.awt.*;
/**
 * This applet lets the user scribble with the mouse.  It demonstrates
 * the Java 1.0 event model.
 **/
public class Scribble extends Applet {
  private int last_x = 0, last_y = 0;  // Fields to store a point in.
  // Called when the user clicks.
  public boolean mouseDown(Event e, int x, int y) {
    last_x = x; last_y = y;           // Remember the location of the click.
    return true;
  }
  // Called when the mouse moves with the button down
  public boolean mouseDrag(Event e, int x, int y)  {
    Graphics g = getGraphics();       // Get a Graphics to draw with.
    g.drawLine(last_x, last_y, x, y);  // Draw a line from last point to this.
    last_x = x; last_y = y;           // And update the saved location.
    return true;
  }
}
```


The Scribble Applet - Microsoft Internet Explorer - [Working Offline]
File Edit View Favorites Tools Help
Back Search Favorites Media
Address C:\java\Scribble.html
Go Links
Hold the mouse button down and scribble in the applet. This applet does not know how to refresh itself.
Done
My Computer

# Graphics

```
import java.applet.*;
import java.awt.*;

/**
 * An applet that demonstrates most of the graphics primitives in java.awt.Graphics.
 **/
public class GraphicsSampler extends Applet
{
  Image image;
  Image background;

  // Initialize the applet
  public void init()
  {
    this.setBackground(Color.lightGray);
    image = this.getImage(this.getDocumentBase(), "tiger.gif");
    background = this.getImage(this.getDocumentBase(), "background.gif");
  }
```

# Graphics

```
// Draw the applet whenever necessary
 public void paint(Graphics g)
 {
   Color fill = new Color(200, 200, 200);
   Color outline = Color.blue;
   Color textcolor = Color.red;
   Font font = new Font("sansserif", Font.BOLD, 14);
   g.setFont(font);
   // get a background image and tile it
   tile(g, this, background);
   // Draw a line
   g.setColor(outline);
   g.drawLine(25, 10, 150, 80);
   centerText("drawLine()", null, g, textcolor, 25, 10, 150, 80);
   // Draw an arc
   g.setColor(fill);
   g.fillArc(225, 10, 150, 80, 90, 135);
   g.setColor(outline);
   g.drawArc(225, 10, 150, 80, 90, 135);
   centerText("fillArc()", "drawArc()", g, textcolor, 225, 10, 150, 80);
```

# Graphics

```
// Draw a rectangle
  g.setColor(fill);
  g.fillRect(25, 110, 150, 80);
  g.setColor(outline);
  g.drawRect(25, 110, 150, 80);
  centerText("fillRect()", "drawRect()", g, textcolor, 25, 110, 150, 80);

  // Draw a rounded rectangle
  g.setColor(fill);
  g.fillRoundRect(225, 110, 150, 80, 20, 20);
  g.setColor(outline);
  g.drawRoundRect(225, 110, 150, 80, 20, 20);
  centerText("fillRoundRect()", "drawRoundRect()", g, textcolor,
          225, 110, 150, 80);

  // Draw a 3D rectangle (clear an area for it first)
  g.setColor(fill);
  g.clearRect(20, 205, 160, 90);
  g.draw3DRect(25, 210, 150, 80, true);
  g.draw3DRect(26, 211, 148, 78, true);
  g.draw3DRect(27, 212, 146, 76, true);
  centerText("draw3DRect()", "x 3", g, textcolor, 25, 210, 150, 80);
```

# Graphics

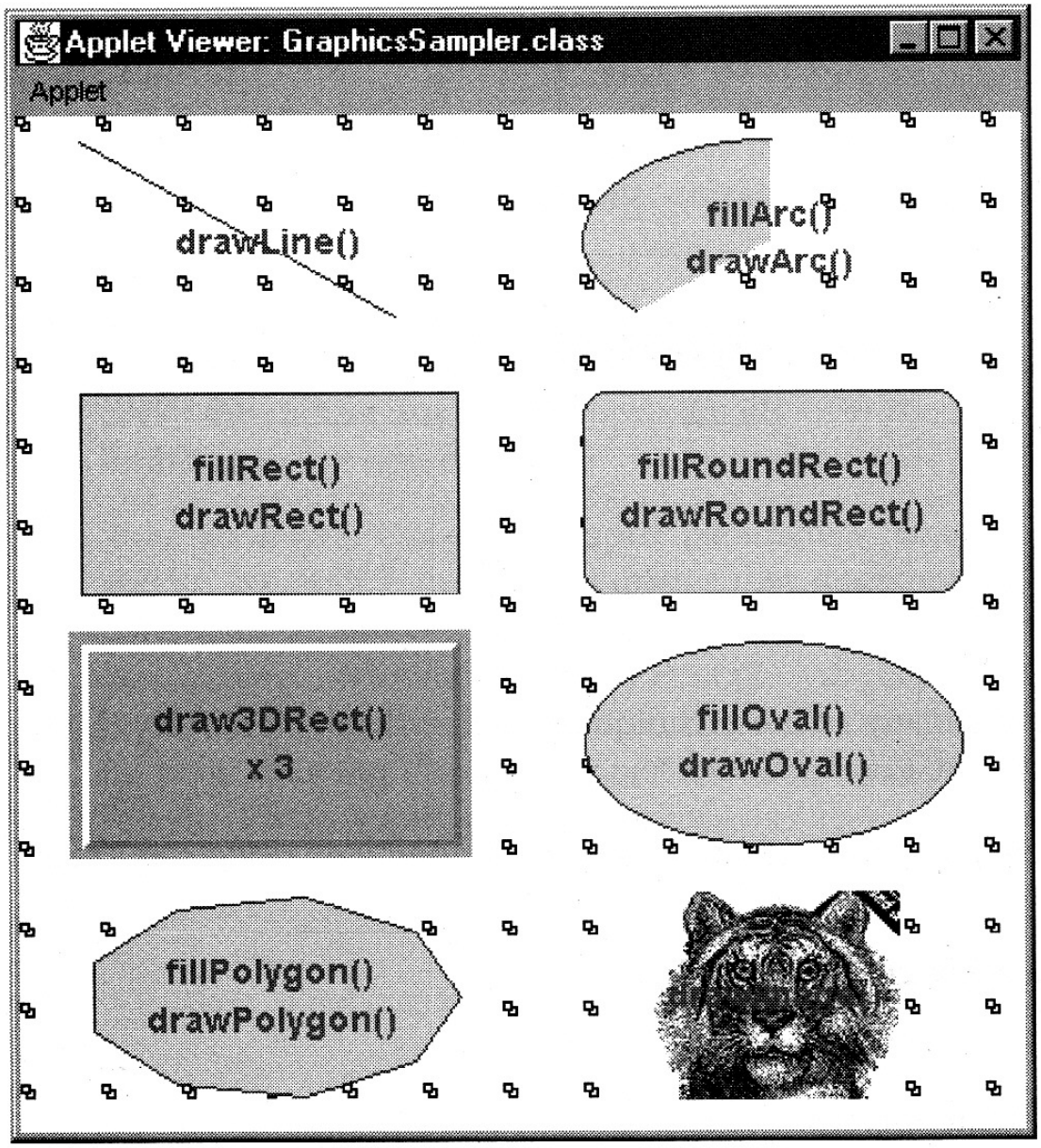
```
// Draw an oval
  g.setColor(fill);
  g.fillOval(225, 210, 150, 80);
  g.setColor(outline);
  g.drawOval(225, 210, 150, 80);
  centerText("fillOval()", "drawOval()", g, textcolor, 225, 210, 150, 80);

  // Draw a polygon
  int numpoints = 9;
  int[] xpoints = new int[numpoints+1];
  int[] ypoints = new int[numpoints+1];
  for(int i=0; i < numpoints; i++) {
    double angle = 2*Math.PI * i / numpoints;
    xpoints[i] = (int)(100 + 75*Math.cos(angle));
    ypoints[i] = (int)(350 - 40*Math.sin(angle));
  }
  g.setColor(fill);
  g.fillPolygon(xpoints, ypoints, numpoints);
  g.setColor(outline);
  xpoints[numpoints] = xpoints[0];  ypoints[numpoints] = ypoints[0];
  g.drawPolygon(xpoints, ypoints, numpoints+1);
  centerText("fillPolygon()", "drawPolygon()", g, textcolor,
          25, 310, 150, 80);
```

# Graphics

```
// Center and draw an image
  int w = image.getWidth(this);
  int h = image.getHeight(this);
  g.drawImage(image, 225 + (150-w)/2, 310 + (80-h)/2, this);
  centerText("drawImage()", null, g, textcolor,  225, 310, 150, 80);
 }

 // Utility method to tile an image on the background
 protected void tile(Graphics g, Component c, Image i)
 {
  Rectangle r = c.getBounds();  // use c.bounds() in Java 1.0.x
  int iw = i.getWidth(c);
  int ih = i.getHeight(c);
  if ((iw <= 0) || (ih <= 0)) return;
  for(int x=0; x < r.width; x += iw)
    for(int y=0; y < r.height; y += ih)
      g.drawImage(i, x, y, c);
 }
```

# Graphics

```
// Utility method to center text in a rectangle
 protected void centerText(String s1, String s2, Graphics g, Color c,
                           int x, int y, int w, int h)
 {
   Font f = g.getFont();
   FontMetrics fm = Toolkit.getDefaultToolkit().getFontMetrics(f);
   int ascent = fm.getAscent();
   int height = fm.getHeight();
   int width1=0, width2 = 0, x0=0, x1=0, y0=0, y1=0;
   width1 = fm.stringWidth(s1);
   if (s2 != null) width2 = fm.stringWidth(s2);
   x0 = x + (w - width1)/2;
   x1 = x + (w - width2)/2;
   if (s2 == null)
     y0 = y + (h - height)/2 + ascent;
   else {
     y0 = y + (h - (int)(height * 2.2))/2 + ascent;
     y1 = y0 + (int)(height * 1.2);
   }
   g.setColor(c);
   g.drawString(s1, x0, y0);
   if (s2 != null) g.drawString(s2, x1, y1);
 }
}
```


Applet Viewer: GraphicsSampler.class
Applet
drawLine()
fillArc()
drawArc()
fillRect()
drawRect()
fillRoundRect()
drawRoundRect()
draw3DRect()
x 3
fillOval()
drawOval()
fillPolygon()
drawPolygon()