The paint() Method

◆ How does Java draw the GUI components?
◆ public void paint(Graphics g)
  ◆ A method of java.awt.Component
  ◆ Inherits by all AWT and Swing components
  ◆ Responsible for "drawing" the component

Customize paint()

public class PaintBoard extends JFrame {
  ...
  ...
  public void paint( Graphics g )
  {
    super.paint(g);
    // paint some more
  }
  ...
}

paint() Again

public class PaintBoard2D extends JFrame {
  ...
  ...
  public void paint( Graphics g )
  {
    super.paint(g);
    Graphics2D g2 = (Graphics2D) g;
    // paint some more
  }
  ...
}

Old Friends

◆ Graphics2D is a subclass of Graphics
  ◆ drawLine, drawString
  ◆ draw/fillRect, draw/fillOval, draw/fillArc
  ◆ ...

New Friends in java.awt.geom

◆ Shape
  ◆ Line2D, Arc2D, Ellipse2D, Rectangle2D,
    RoundedRectangle
  ◆ Curves
  ◆ GeneralPath (generalized polygon)
  ◆ Area (boolean of shapes)
◆ g2.draw( Shape ), g2.fill( Shape )
◆ http://java.sun.com/docs/books/tutorial/2d/display/programme.html
Coordinates

- Float and double coordinates
  - Line2D.Float, Line2D.Double
  - Rectangle2D.Float, Rectangle2D.Double
  - Ellipse2D.Float, Ellipse2D.Double

- Why?

Stroke – Line Width and More

- g2.setStroke( Stroke )
- BasicStroke
  - width
  - end caps
  - line joins
  - miter limit
  - dash pattern

Paint – Fancy Colors

- g2.setPaint( Paint )
- Paint
  - Color
  - GradientPaint
    - (x1, y1, color1, x2, y2, color2)
  - TexturePaint

Transformations

- It’s the coordinate system that moves.
- Transformations
  - g2.translate(double x, double y)
  - g2.rotate(double theta, double x, double y)
  - g2.scale(double sx, double sy)

Simple Animation

```java
public void paint(Graphics g)
{
    ... ...
    try
    {
        Thread.sleep(100);
    }
    catch( Exception e )
    {
    }
    repaint();
}
```