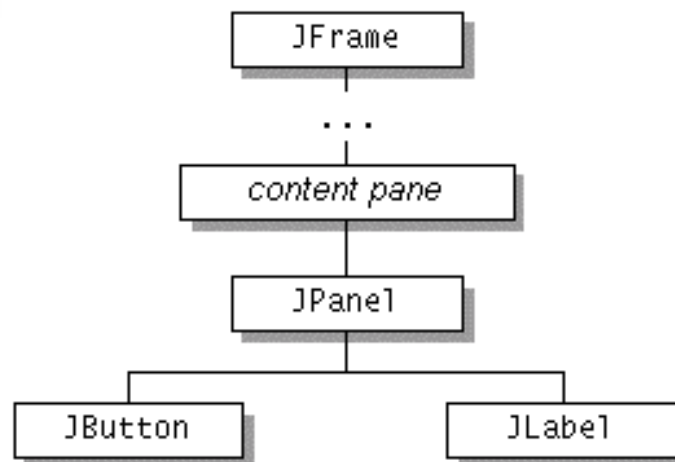


Java (pre-Java2D) Graphics

Painting: Down the Containment Hierarchy



Custom Component

- The `paint` method delegates work to:
 - `paintComponent`
 - `paintBorder`
 - `paintChildren`
- Override `paintComponent` for specialized UI/look-and-feel
- Invoke `repaint` to schedule for painting

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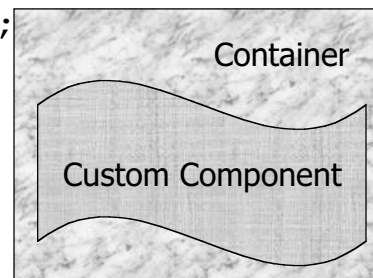
Simple Example

```
class ImagePanel extends JPanel {
    . . .
    public void paintComponent(Graphics g) {
        // paint background
        super.paintComponent(g);
        // 85x62 image
        g.drawImage(image, 0, 0, this);
        // same image, scaled and moved right
        g.drawImage(image, 90, 0, 300, 62, this);
    }
}
```



Non-opaque Component

- In `paintComponent`:
don't invoke `super.paintComponent`
- In constructor:
`setOpaque(false);`

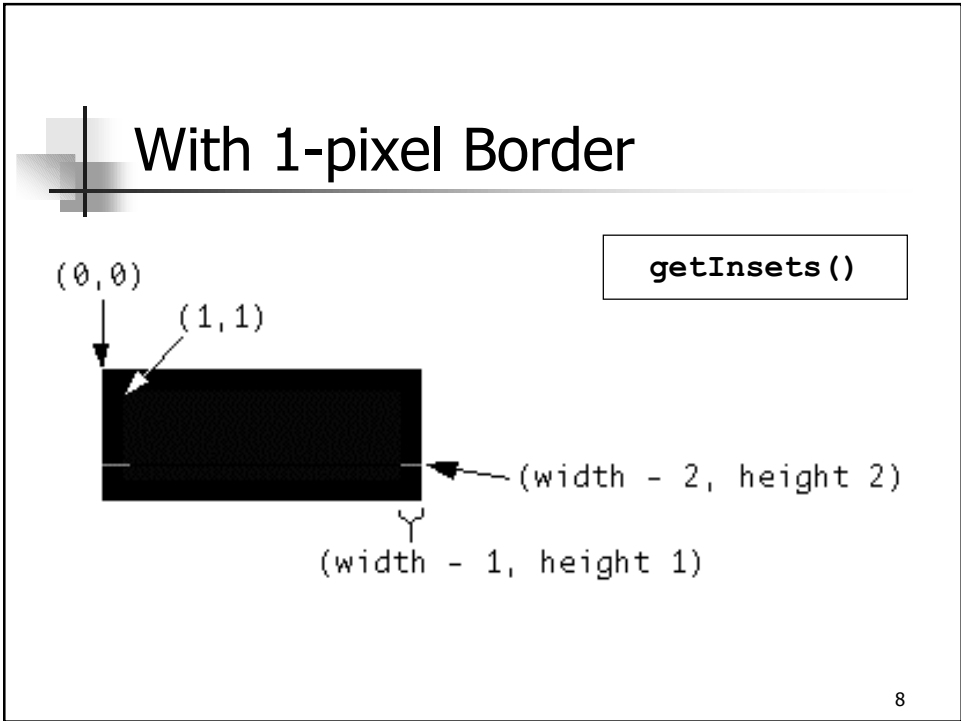
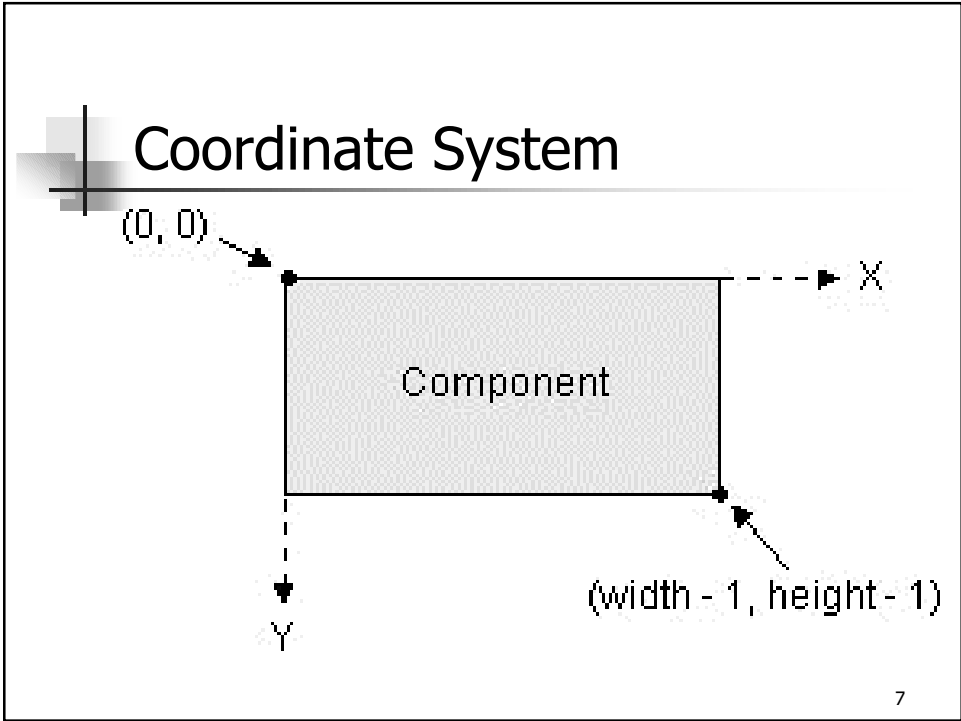


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Graphics Object

- Context for
 - color, font, clipping, etc.
- Drawing methods
 - simple shapes
 - text
 - image
 - copying a region

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Simple Shapes

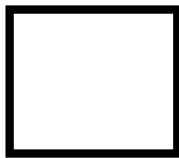
- Line

```
g.drawLine(x1, y1, x2, y2);
```

- Rectangle

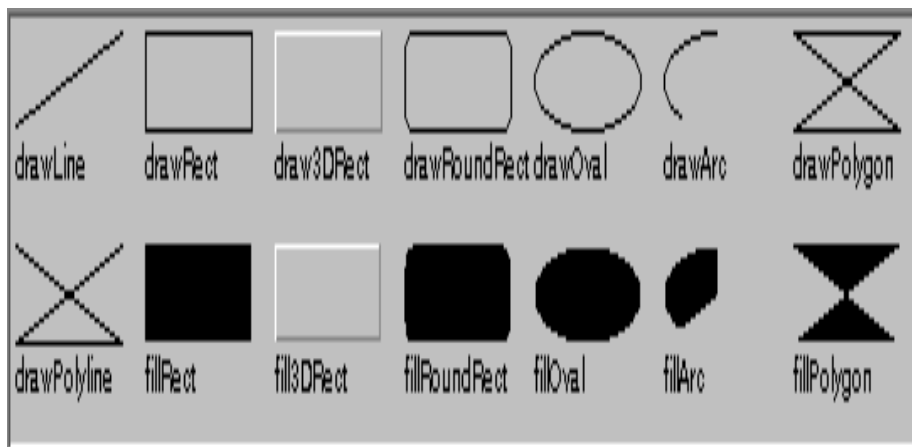
```
g.drawRect(x, y, w - 1, h - 1);
```

```
g.fillRect(x, y, w, h);
```



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Simple Shapes (cont'd)



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Working with Text

- Loading a font

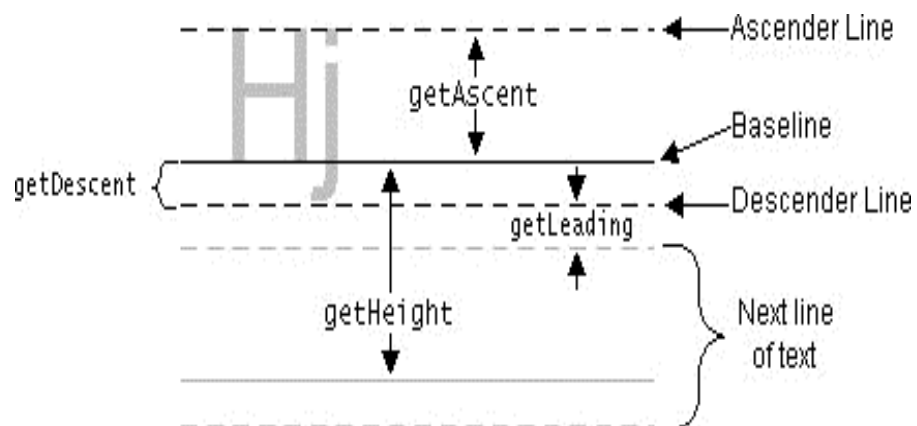
```
g.setFont(new Font(
    "SansSerif", Font.PLAIN, 12
));
```

- Drawing

```
g.drawString("Hj", x, y);
```

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Font Metrics



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Image

- Loading

```
myImage = getImage(URL);
myImage = Toolkit.
    getDefaultToolkit().
    getImage(filenameOrURL);
```

- Drawing

```
g.drawImage(myImage,
    0, 0, this);
```

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Tracking image loading

```
MediaTracker tracker = new MediaTracker(this);
tracker.addImage(myImage);

try {
    tracker.waitForAll(); // wait till image loading finishes
} catch (InterruptedException e) {};

if (tracker.checkAll()) { // loading completed
    // draw the image
} else { // loading interrupted
    // do something else
}
```

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ImageIcon

- Sequential image loading
- Loading

```
ImageIcon icon = new
    ImageIcon(filenameOrURL);
```
- Drawing

```
icon.paintIcon(this, g, x, y);
```

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Clipping

```
Rectangle oldClipBounds =
    g.getClipBounds();

g.setClip(new Rectangle(...));

// Perform custom painting...

g.setClip(oldClipBounds);
```

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Color

- Pre-defined colors
`Color.black, Color.cyan, . . .`
- Custom colors
`new Color(r, g, b)`
- Setting color
`g.setColor(myColor);`

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Forthcoming: Java2D !

- Complex shapes and attributes
- Fill gradients and textures
- Transformations
- Image processing
- Hit detection
- Composition of overlapping drawings
- Printing

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