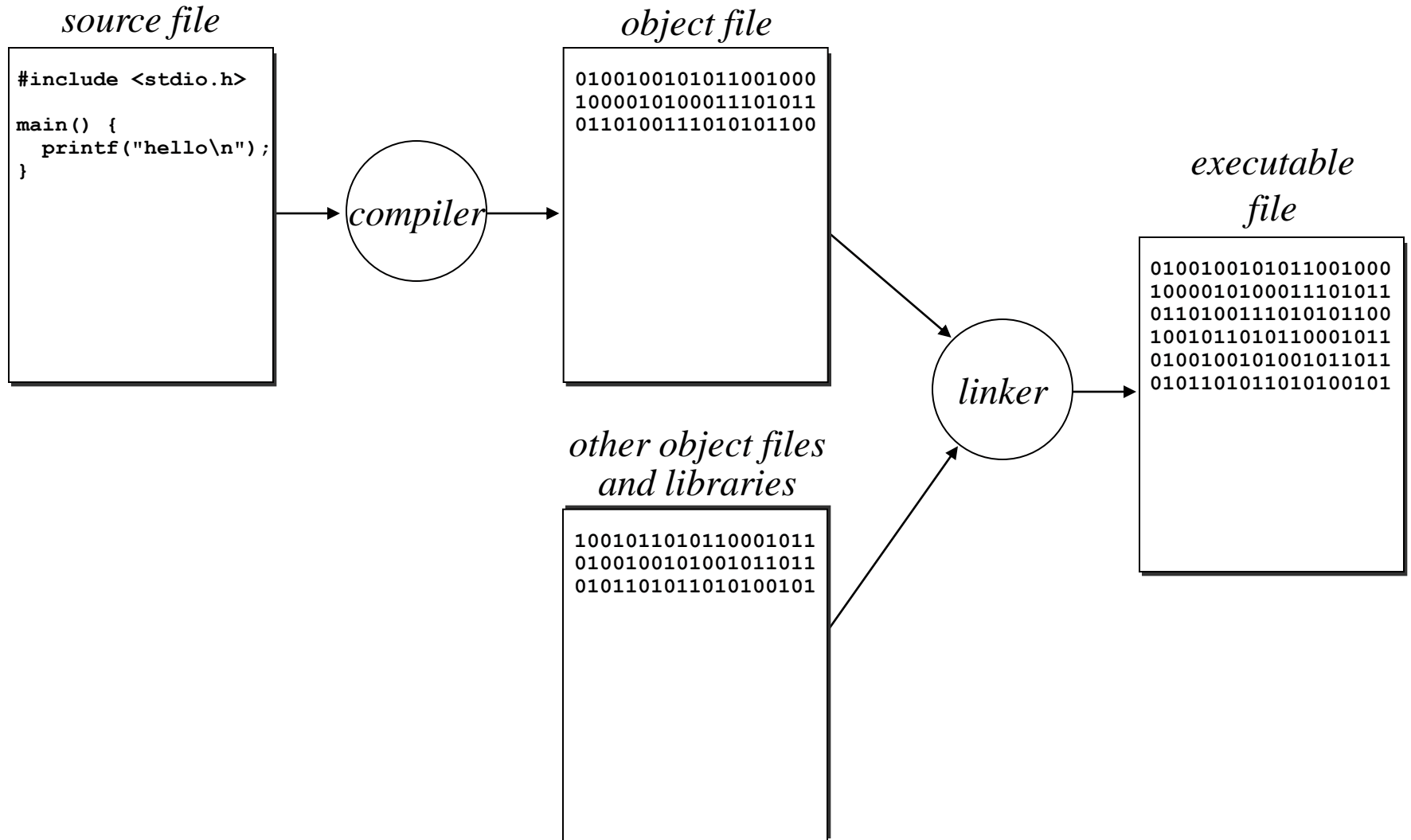
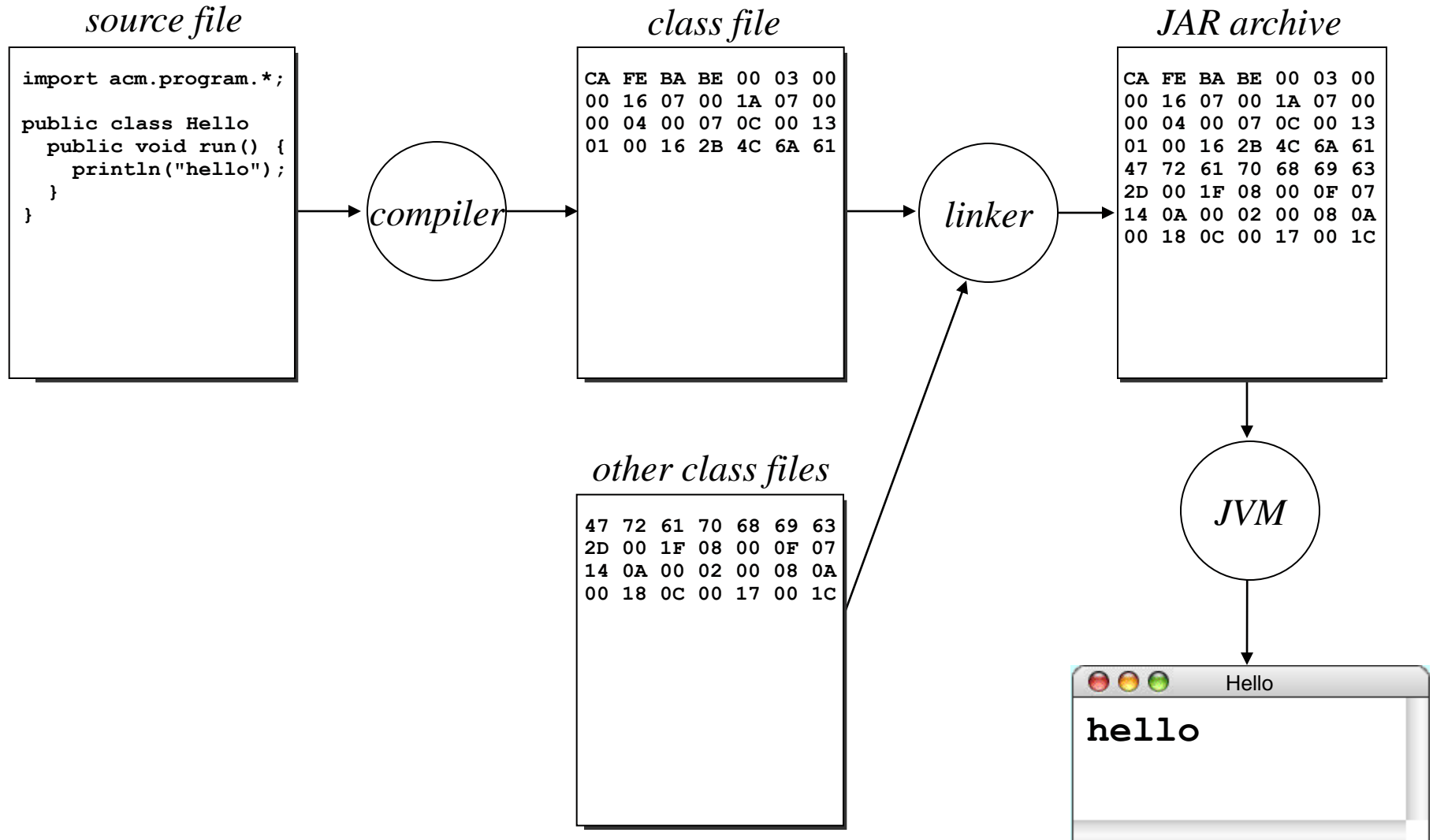




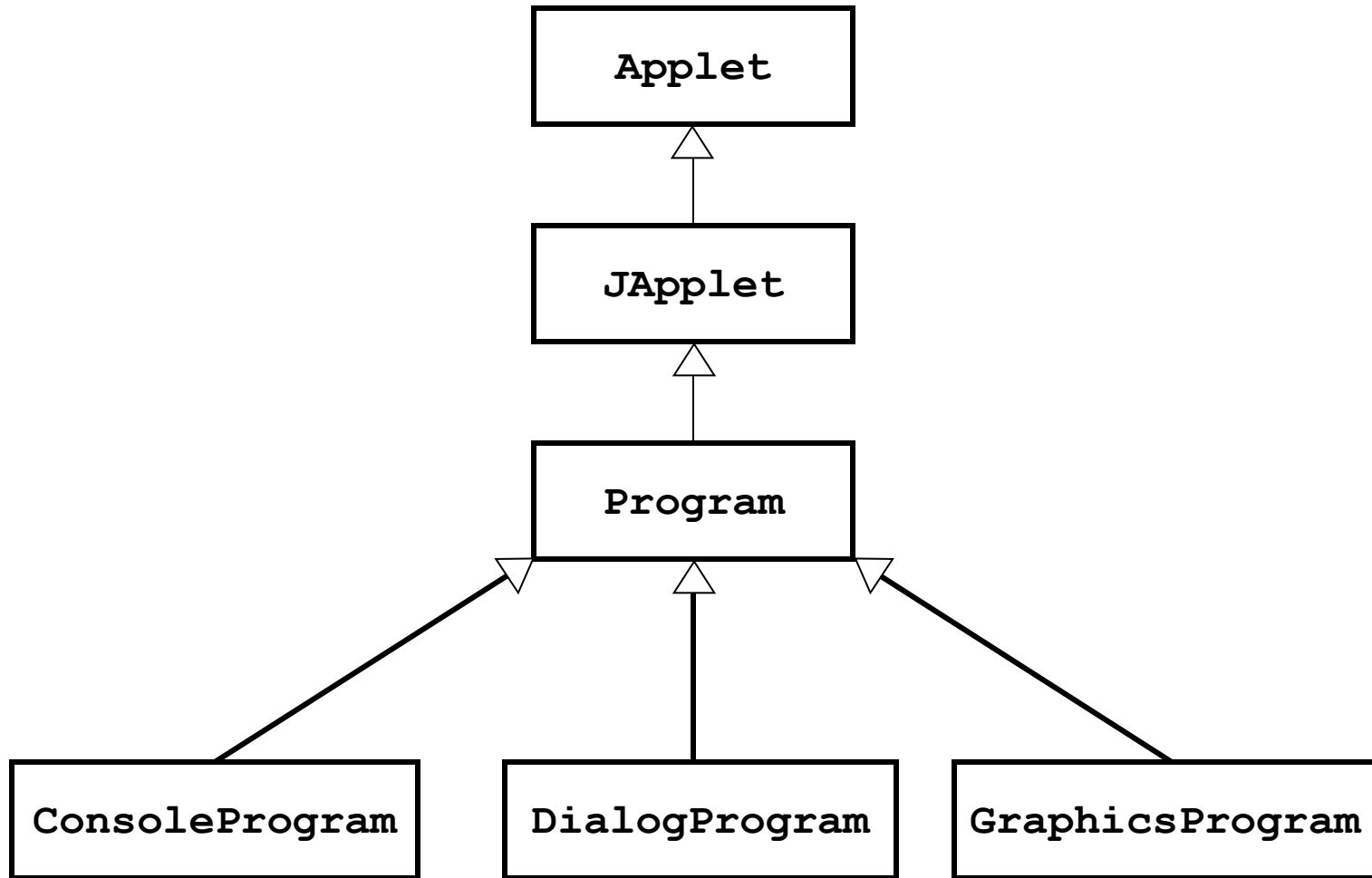
# The Compilation Process



# The Java Interpreter



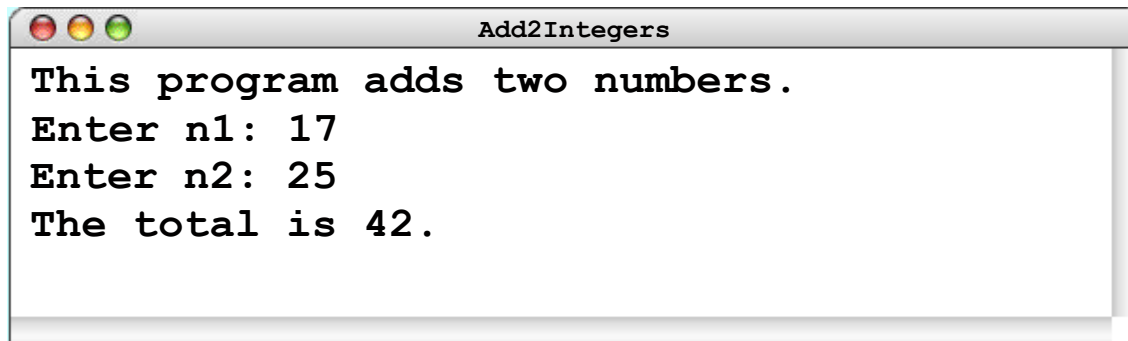
# acm.program Hierarchy



# The Add2Integers Program

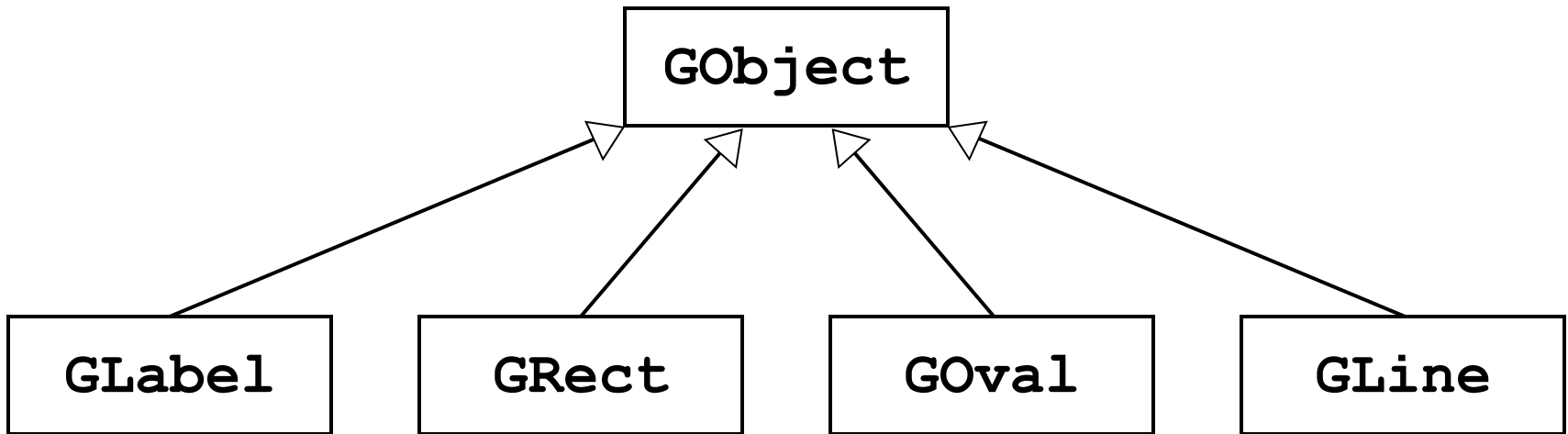
```
class Add2Integers extends ConsoleProgram {  
    public void run() {  
        println("This program adds two numbers.");  
        int n1 = readInt("Enter n1: ");  
        int n2 = readInt("Enter n2: ");  
        int total = n1 + n2;  
        println("The total is " + total + ".");  
    }  
}
```

n1	n2	total
17	25	42



# The GObject Hierarchy

The classes that represent graphical objects form a hierarchy, part of which looks like this:



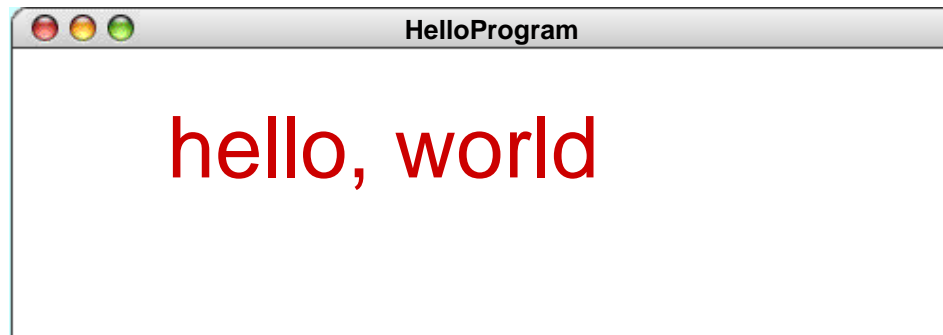
# Sending Messages to a GLabel

The following program illustrates sending a message to an object. Note that the label doesn't appear until it is added to the canvas.

```
public class HelloProgram extends GraphicsProgram {  
    public void run() {  
        GLabel label = new GLabel("hello, world", 100, 75);  
        label.setFont("SansSerif-36");  
        label.setColor(Color.RED);  
        add(label);  
    }  
}
```

label

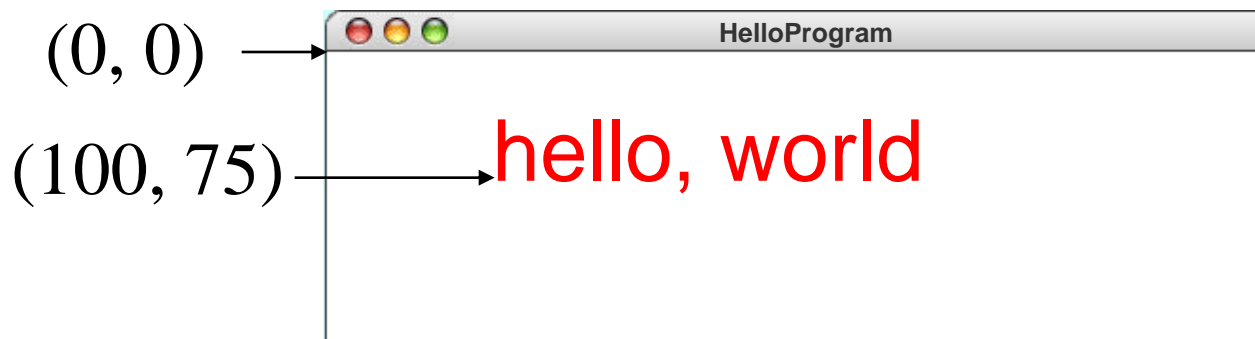
hello, world



*skip simulation*

# Graphics Coordinates

- Origin is upper left
- Everything measured in pixels (dots on the screen)
- x coordinates increase to the right
- y coordinates increase going down
- **GLabel** coordinates are baseline of first character



# Operations on the GObject Class

The following operations apply to all **GObjects**:

*object*.**setColor** (*color*)

Sets the color of the object to the specified color constant.

*object*.**setLocation** (*x*, *y*)

Changes the location of the object to the point (*x*, *y*).

*object*.**move** (*dx*, *dy*)

Moves the object on the screen by adding *dx* and *dy* to its current coordinates.

The standard color names are defined in the **java.awt** package:

**Color.BLACK**

**Color.RED**

**Color.BLUE**

**Color.DARK\_GRAY**

**Color.YELLOW**

**Color.MAGENTA**

**Color.GRAY**

**Color.GREEN**

**Color.ORANGE**

**Color.LIGHT\_GRAY**

**Color.CYAN**

**Color.PINK**

**Color.WHITE**

# Operations on the GLabel Class

## Constructor

```
new GLabel(text, x, y)
```

Creates a label containing the specified text that begins at the point (*x*, *y*).

## Methods specific to the GLabel class

```
label.setFont(font)
```

Sets the font used to display the label as specified by the font string.

The font is typically specified as a string in the form

```
"family-style-size"
```

*family* is the name of a font family

*style* is either **PLAIN**, **BOLD**, **ITALIC**, or **BOLDITALIC**

*size* is an integer indicating the point size

# Drawing Geometrical Objects

## Constructors

**new GRect** (*x*, *y*, *width*, *height*)

Creates a rectangle whose upper left corner is at (*x*, *y*) of the specified size.

**new GOval** (*x*, *y*, *width*, *height*)

Creates an oval that fits inside the rectangle with the same dimensions.

**new GLine** (*x*<sub>0</sub>, *y*<sub>0</sub>, *x*<sub>1</sub>, *y*<sub>1</sub>)

Creates a line extending from (*x*<sub>0</sub>, *y*<sub>0</sub>) to (*x*<sub>1</sub>, *y*<sub>1</sub>).

## Methods shared by the **GRect** and **GOval** classes

*object*.**setFilled**(*fill*)

If *fill* is **true**, fills in the interior of the object; if **false**, shows only the outline.

*object*.**setFillColor**(*color*)

Sets the color used to fill the interior, which can be different from the border.