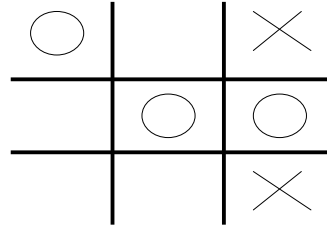


CS202 Java Object Oriented Programming GUI Programming – Color and Drawing Methods

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The Need to Draw



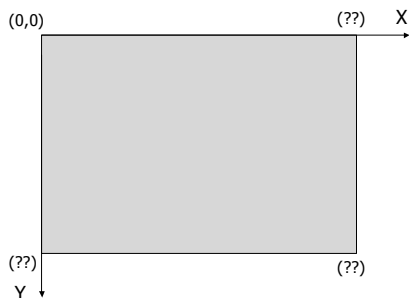
The paint() Method

- ◆ 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  
        ...  
    }  
}
```

Drawing Area

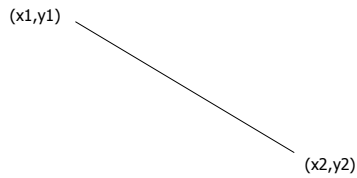


Graphics Class

- ◆ In `java.awt` package
- ◆ Draw lines
- ◆ Draw strings
- ◆ Draw un/filled rectangles, ovals, arcs, and polygons
- ◆ Set and get drawing color
- ◆ Set and get drawing fonts
- ◆ Clear a rectangular region
- ◆ ... more

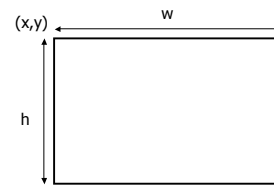
Line

◆ `void drawLine(int x1, int y1, int x2, int y2)`



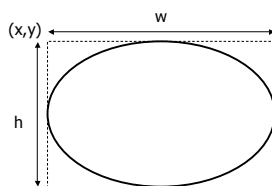
Rectangle

◆ `void drawRect(int x, int y, int w, int h)`
◆ `void fillRect(int x, int y, int w, int h)`
◆ `void clearRect(int x, int y, int w, int h)`



Oval

◆ `void drawOval(int x, int y, int w, int h)`
◆ `void fillOval(int x, int y, int w, int h)`



Arc

◆ `void drawArc(int x, int y, int w, int h, int startAngle, int arcAngle)`
◆ `void fillArc(int x, int y, int w, int h, int startAngle, int arcAngle)`
◆ **Arc**

- Begins at `startAngle`
- Extends `arcAngle`

◆ 0 degree is at the 3 o'clock position
◆ `startAngle` must be 0 or positive
◆ `arcAngle`

- Positive – counter clock-wise rotation
- Negative – clock-wise rotation

String

◆ `void drawString(String s, int x, int y)`

Welcome to Java
(x,y)

Color Class

◆ In `java.awt` package
◆ **Predefined colors**

- `Color.red`, `Color.black`, `Color.blue` ...
- Exercise: read Java API doc for `Color`

◆ **Constructor**

- `Color(int r, int g, int b)`
- `getGreen()`, `getRed()`, `getBlue()`
- ... more

Program with Color

- ◆ Drawing color
 - `g.getColor()`
 - `g.setColor()`
 - ◆ Background color
 - `getBackground()`
 - `setBackground(Color c)`
- ```
// get current drawing color
Color c = g.getColor();

// draw some red stuff
g.setColor(Color.red);
...

// draw some yellow stuff
g.setColor(Color.yellow);
...

// restore the original drawing color
g.setColor(c);
```

## Color Chooser

- ◆ `JColorChooser`
  - `Color showDialog( Component parent, String title, Color initialColor )`
    - ◆ A static method
    - ◆ Could return `null`

## Happy Face Example

