Lecture 14

- Topics Covered
  - Swing
    - JFrame
    - Point
    - Container
    - Toolkit
    - Dimension
Java’s GUI Hierarchy

- As you can imagine, there is a hierarchy in Java that will help us in our GUI programming
Component Hierarchy

- Component (abstract)
  - Container
    - JComponent
      - Many Swing Components
    - Window
    - Panel
      - Frame
      - Dialog
        - JFrame
        - JDialog
AWT vs. Swing

- AWT (Abstract Windows Toolkit)
  - Older set of classes for GUI’s
  - java.awt

- Swing
  - Newer hierarchy of classes for GUI’s
  - Offers greater compatibility across various operating systems
  - javax.swing

- Should use Swing when a class is available.
- Should use AWT when there is no Swing class available for component
Creating a Window

- JFrame is the type we will use to create a window
  - Constructors
    - JFrame()
    - JFrame(String title)
  - Other useful methods
    - void setTitle(String title)
    - void setResizable(boolean x)
    - void setDefaultCloseOperation(int op)
      - EXIT_ON_CLOSE allows the application to end when the X is chosen on the window
Let’s look at a quick example

```java
public class MyFrame extends JFrame{
    public MyFrame(){
        super("This is fun");
        setBounds(0,0,300,200);
    }
    public MyFrame(String title){
        super(title);
        setBounds(0,0,300,200);
    }
    public static void main(String[] args){
        JFrame frame = new MyFrame("Testing");
        frame.setVisible(true);
        frame.setResizable(false);
        frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    }
}
```
Coordinates

- Consider the statement
  - `setBounds(0,0,300,200);`
  - `setBounds(x1, y1, x2, y2);`
    - `x1, y1` tells us where the upper left corner of the window will be placed
    - `x2, y2` tells us the dimensions of the window from the point `(x1, y1)`
- Let’s say our screen size (resolution) was 800x600 and we wanted to center the window in the screen
  - `x1 = (800-x2) / 2`
  - `y1 = (600-y2) / 2`
- What if we don’t know what the resolution will be on the machine our program runs on?
  - There are some AWT classes that will help us
    - `Toolkit toolkit = Toolkit.getDefaultToolkit();`
    - `Dimension dim = toolkit.getScreenSize();`
- Let’s look at a way to use this
Exercise

• Create a window class that extends JFrame
  – The window should be sized at 400x300
  – The window should be placed in the lower right hand corner
  – The window should be resizeable
  – The window should close upon the pressing of the X button
  – Add a method to the derived class that will change the background color... call this method from the derived frame constructor

    Container contentPane = getContentPane();
    // calling object if outside of a JFrame instance method
    contentPane.setBackground(Color.PICKONE);