Toward a GUI-programming model

- **We want to adhere to language-independent ideals**
  - Concepts move from GUIs in Java to ...
  - `javax.swing` and `java.awt` offer thousands of choices
    - Too many to have to understand/find comfort in, but ...

- **We want to write reasonable, robust, GUI applications**
  - Actually write code, not simply adhere to lofty ideals
  - Show me the code!

- **Simple, extensible, re-usable conceptual framework**
  - How to develop GUIs, how to extend
  - Ask Questions
One GUI Conceptual Framework

- **Create a JPanel for the GUI contentPane**
  - Provide a BorderLayout, organize hierarchically
  - Ok to use GridLayout, FlowLayout, ... nested

- **Create Buttons, Menu-items, and other widgets**
  - Bind each event-generator to a listener
  - Do not dispatch within a listener on event source
    - No "if event-generator is button A do this"

- **Use anonymous inner classes, or named inner classes**
  - Process events, created and attached close-to-source
  - Make a button, make a button-listener
Click on a button, display the click

```java
ActionListener textDisplayer = new ActionListener(){
    public void actionPerformed(ActionEvent e) {
        showText(e.getActionCommand());
    }
};
```

- **What does an ActionListener do?**
  - Listens for an event, e.g., from Button, Menu, ...
  - Processes the command/event

- **How do anonymous classes work?**
  - Note: ActionListener is an *interface*, but object created!
  - See what Eclipse refactoring will do with this
Making a Move: View and Controller

```java
ActionListener moveMaker = new ActionListener(){
    public void actionPerformed(ActionEvent e) {
        int val = Integer.parseInt(e.getActionCommand());
        myControl.makeMove(new PuzzleMove(val));
    }
};
```

- We know this will be bound to a specific type of button
  - Not generic, completely application specific
  - Turns swing/GUI event into application event: Move
- Controllers should be programmed abstractly
  - Don't base code on a GUI toolkit, separate concerns