COP 3330, Spring 2013

GUIs - I

Instructor : Arup Ghosh

03-20-13

School of Electrical Engineering and Computer Science
University of Central Florida

GUIs

- Recall Command-line applications
- Graphical User Interfaces – the kind of interface you use on pretty much every modern OS.
- Event-driven programming
- Windows, text areas, buttons, mouse-driven action, etc.
- With a GUI, user is not limited to responding to prompts in a particular order and receiving feedback in one place. Instead user can interact as needed with various components such as buttons, text fields.

Overview

- For creating GUI-based program in Java, you need at least three kinds of objects.
  - components
    - A component is an object that defines a screen element used to display information or allow the user to interact with a program in a certain way.
      - push buttons, text fields, labels, scroll bars, menus.
  - events
    - An event is an object that represents some occurrence in which we may be interested. Often, events correspond to user actions (pressing mouse buttons, typing a key on the keyboard, etc). - Most GUI components generate events to indicate user action related to that component (e.g., some event to indicate that the button has been pushed).
  - Listeners - A listener is an object that waits for an event to occur and responds in some way when it does.

- A big part of designing a GUI-based program is establishing the relationships among the listener, the event it listens for, and the component that will generate the event.
- For the most part, we will use components and events that are predefined by classes in the Java class library.
- We will tailor the behavior of the components, but their basic roles have been established already.
- We will write our own listener classes to perform whatever actions we desire when events occur.

- For creating a java program that uses a GUI, we must:
  - Instantiate and set up the necessary components.
  - Implement listener classes that define what happens when particular events occur.
  - Establish the relationship between the listeners, and the components that generate the events of interests.

- Java components and other GUI related classes are defined in two packages: java.awt and javax.swing.
- The Abstract Windowing Toolkit was the original Java GUI package.
- The swing package was added later.

Swing

- We'll use the Swing libraries (part of the standard Java library) in javax.swing.*.
- Swing is built on AWT – the Abstract Windowing Toolkit, located in java.awt.*
- This is a somewhat more complex set of GUI libraries that date back to the early days of Java.
- Usually more convenient to use Swing, but elements of AWT are still used – for example, event handling still uses AWT classes.

Example: Adding Numbers

- We'll use the JOptionPane class.

- Don't forget to look it up in the docs and the guide here: http://docs.oracle.com/javase/tutorial/uiswing/components/dialog.html