Designing & Building User Interfaces

- MVC - Model/View/Controller Architecture
- View components provided by Java (awt and swing)
- Nesting components to create a composite user interface (UI)
- Design Principles for Graphical User Interfaces (GUIs)
- GUI design exercise
- Critique
MVC - Model/View/Controller Architecture

- Network
- IPC
- Lab 5

- Model
  - Application Data
  - Lab 1

- Persistence
  - Lab 2

- View
  - Lab 3

- Controllers
  - Lab 4

- State change notification
- Update
- State mutation
- Events
- User feedback
Java’s view components (swing/awt)

"pluggable look & feel"

package javax.swing

Object

Component

Container

Window

Frame

JComponent

JPanel

JSplitPane

JScrollPane

JTabbedPane

JOptionPane

JLayeredPane

JToolBar

JFileChooser

JColorChooser

JPopupMenu

JToolTip

JProgressBar

JFileChooser...
See examples at
http://java.sun.com/docs/books/tutorial/uiswing/components/components_pics.html

But...

having pretty components does not imply that a UI is
  • easy & intuitive to learn
  • easy & comfortable to use
  • aesthetically pleasing
  • efficient for beginners
  • efficient for advanced users
  • natural for the application domain
  • responsive
  • scalable to demanding users
Some UI design principles:

* Provide interaction using vocabulary of the application domain

* Direct manipulation
  - WYSIWYG
  - Physically obvious + intuitive pointer motion
  - Labeled buttons for actions
  - Immediate display of results w/ intermediate feedback
  - Easily reversible commands (UNDO)

* Modeless design (few dialog boxes, few tool modes)

* Avoid clutter

* Consistency across multiple applications (familiarity)
UI Design Exercise:
- CSE department needs to manage the assignment of people to offices
- Office assignments change only occasionally
- Visitors want to find where people are located and see office hours and contact info
- Faculty would like their graduate students nearby
- Each person has 1 office
- Graduate student offices may hold multiple people
- The floorplan is available as an image file
- You have a still camera, a video camera, and a microphone

Countdown: 2 min.
By Name:
- John Doe
By Office:
- #
Search
Clear

John Doe
Phone: 555-5555
Office: 555
Hours: 1-2 p.m.
Edit Info
name

hours

office

SAVE CLEAR
Add GPS

Error checking
- unobtrusive
- dynamic - as you go

Debug mode?

* Prevent errors in GUI

Office Hours:
Phone: