

# Course Summary

Note Title

4/24/2007

Presentations Thursday

8 min — on laptop

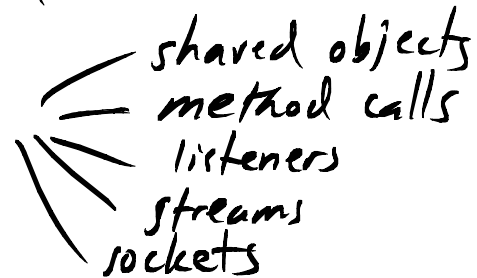
Important features

Practice / Plan

One partner "drive" while the other person talks

# Theme: Design & Communication

⇒ Design For Communication  
modules communicate



- abstraction & specification
- orthogonality
- extensibility
- modularity
- clarity / readability
- technical topics:

class hierarchies & UML,  
streams  
MVC  
concurrency  
interprocess comm

⇒ Communication about Design

Well-defined interfaces, responsibilities, integration, planning

## Labs:

① Model — what is represented, how, how does it fit together?

② <sup>UML</sup> Persistence

③ View — user's visualization of the model

④ Controllers — user experience (scenarios for design)  
DIRECT MANIPULATION

⑤ Interprocess Communication — sockets  
talked about RMI

Review sheet linked from CSE132 home page  
Part I follows labs, Part II — reflects on your experience

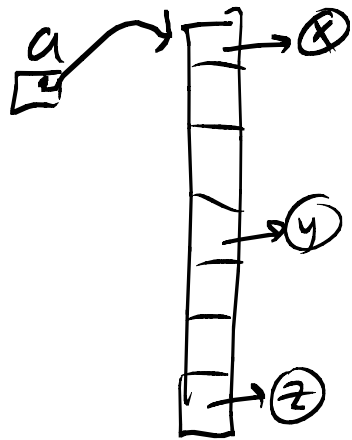
Abstraction / Specification

Abstraction Functions

— ADTs , later: GUIs

HashTable  $t$

$$AF(t) = \{e \mid \exists i, t.a[i] = e\}$$



rep.invariants / encapsulation  
repOK, testing

## Class Hierarchies / Polymorphism / UML

Orthogonality — Comparator (plug-in)

Design Patterns

- Bridge
  - Composite
  - Factory
  - Flyweight
  - Publish/Subscribe
  - Adaptor / Proxy / Wrapper
- Indirection

Streams / Java io / File systems

- Orthogonality  
stream types that wrap other streams
- Human vs. machine readable formats / custom vs. standard

Iterator & Visitor Pattern

Composite

User Interface Design & Implementation

Direct manipulation

Technical issues

View components

layout managers — orthogonality

Property Change Support

Swing components have models

Controllers

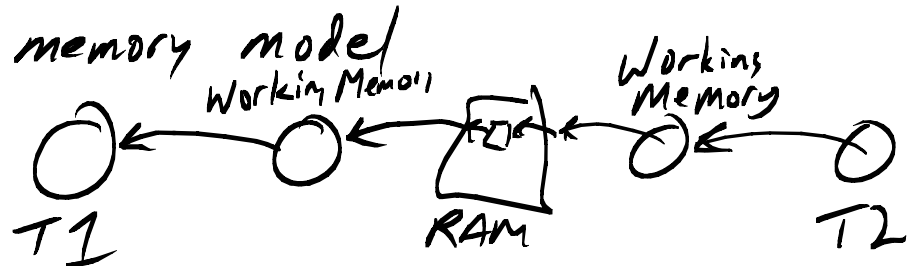
Listener Interfaces

Inner classes — final variables for local & anonymous

EventQueue — handled in a separate thread

## Threads & Concurrency control

- creating threads
- control inter-leaving of steps of threads
  - locks ← careful!!!!
  - synchronized methods & blocks ← careful!
  - deadlock
  - low-level thread memory model  
volatile



- abstractions for concurrency
  - Bounded Buffer
  - wait-free queue (didn't cover)

## Inprocess Communication

IP / TCP, sockets as support for TCP streams, RMI