COCOA WORKSHOP PART 3

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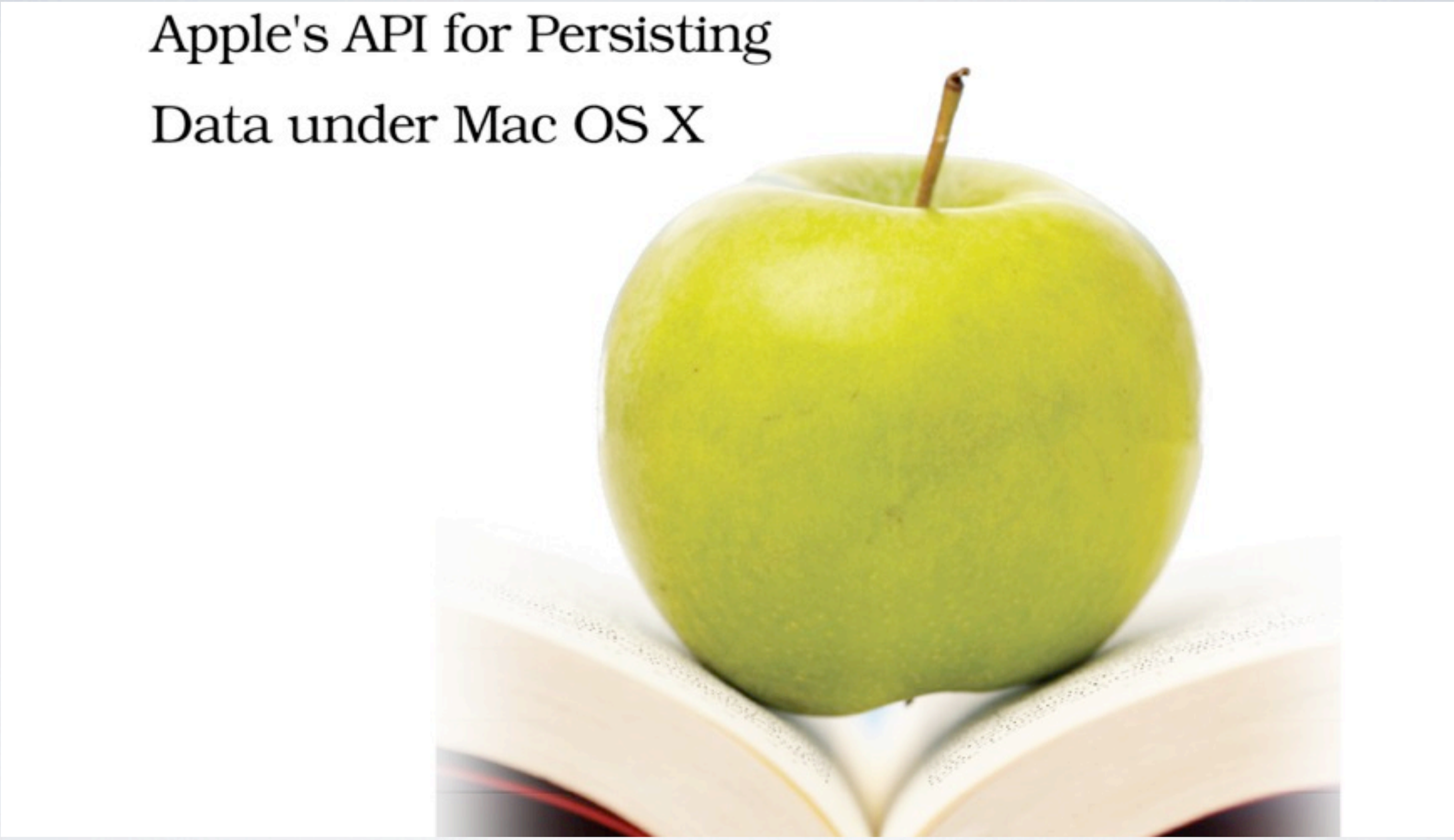
Workshop Schedule

1. Introduction, Foundation	2009-02-17
2. GUI Programming	2009-02-19
3. Hands-On	**2009-02-24**
4. Advanced	2009-02-26

Structure

- Homework
- CoreData
- Practical Experience
- Performance
- Tools
- Big Example 3

HOMEWORK



COREDATA

Concepts

- Use KVO/KVC/Bindings, but use a database instead of an NSArray
- Object-Oriented Database
- Supports metadata

Important Classes

- NSPersistentStore
- NSPersistentStoreCoordinator
- NSManagedObjectModel
- NSManagedObject

NSPersistentStore

- Represents the database file on disk
- Currently four backends: XML, binary, SQLite and in-memory

NSManagedObjectModel

- Database-lingo: "Schema"
- Created visually in XCode

NSPersistentStoreCoordinator

- Connects a persistent store to a model
- Initialized with a model, creates the persistent store instance
- Metadata handling

NSManagedObject

- A single object in the database
- Access data using KVC
- Can be subclassed for domain-specific behavior

PRACTICAL EXPERIENCE

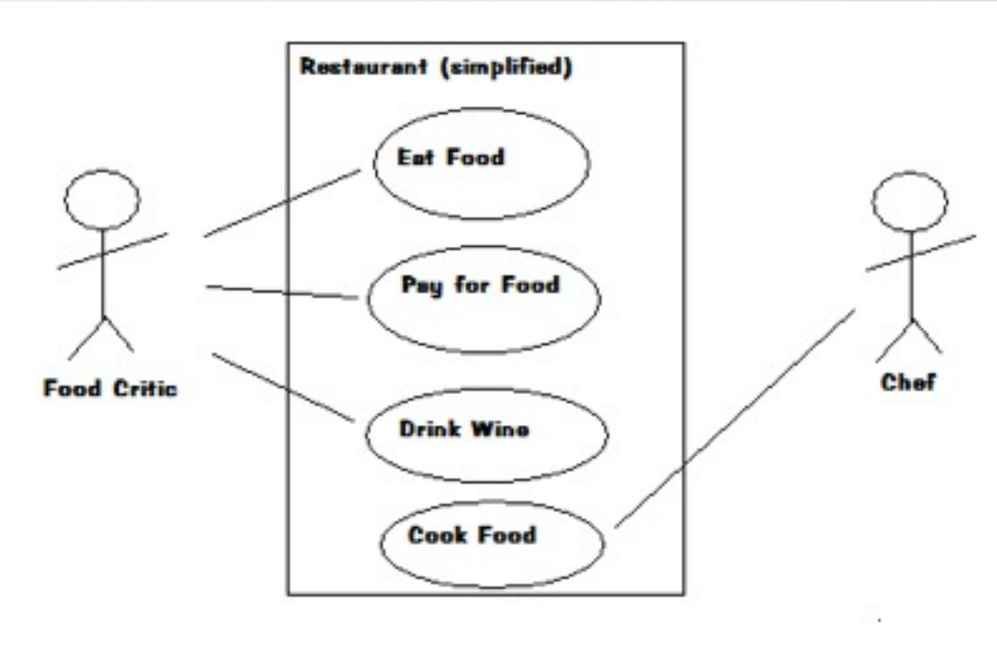
Workflows

- Workflows are the most important part of an application

- Think in terms of use cases: A user wants to achieve a task

  - How can the user do that?
    → **make obvious**

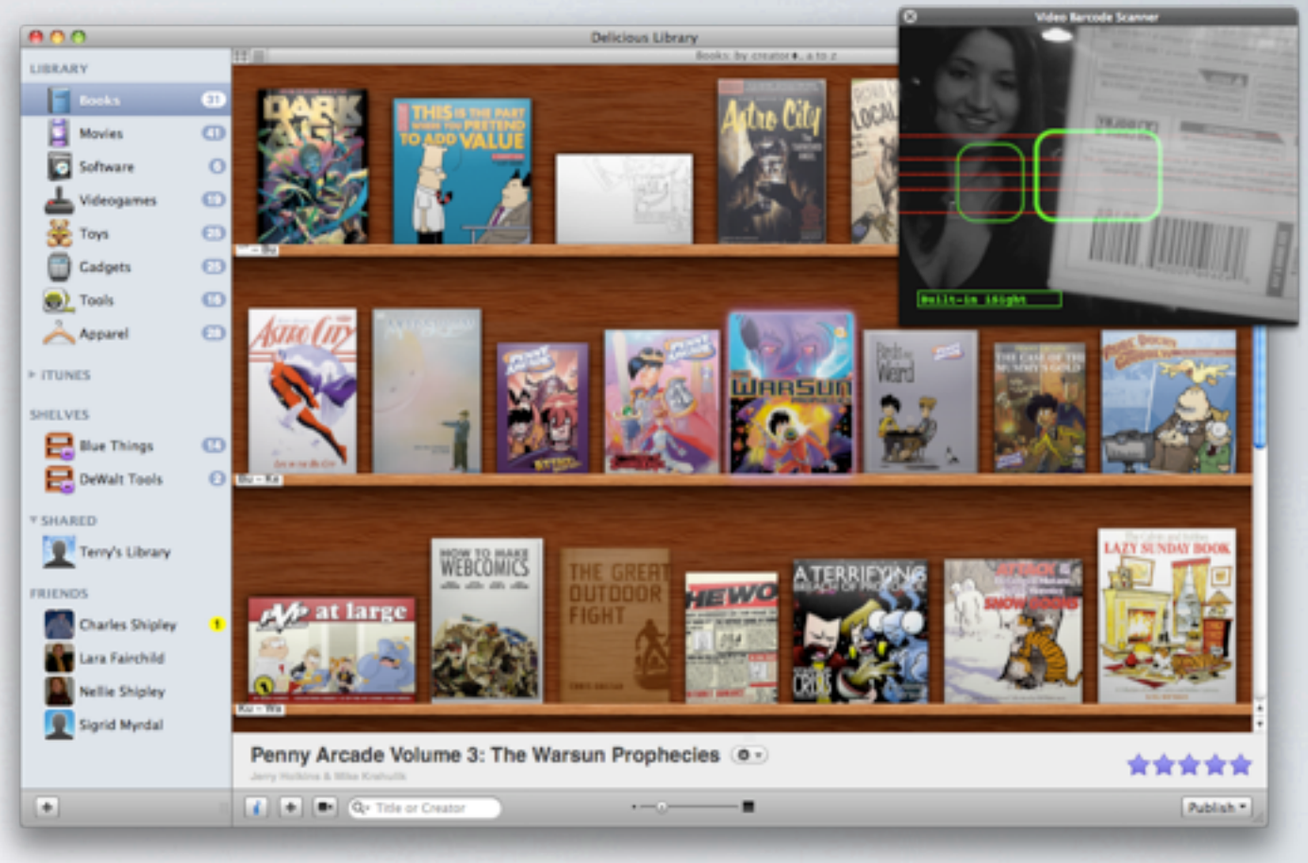
  - How many mouse clicks/key presses are required?
    → **minimize**



Simplify

- The best applications are the ones that don't need a book to explain
  - Users do not read the documentation!
- Use Apple's applications as a blueprint

Forget Default Controls



- PulpFiction: **Every** control was a subclass!
- ADA-level applications require a lot of customization to get the feeling right
- Get a user interface designer!
  - Or become one yourself
  - Apple Human Interface Guidelines
    - They're not the end of all wisdom, but a start

Custom View Drawing

- Subclass NSView
- override `- (void)drawRect:(NSRect)dirtyRect`
- Coloring: `[[NSColor ...] set];`

Drawing Functions

- `NSEraseRect(NSRect aRect)`
- `NSRectFill(NSRect aRect)`
- `NSFrameRect(NSRect aRect)`
- `-[NSView drawInRect:(NSRect)dstRect fromRect:(NSRect)srcRect operation:(NSCompositingOperation)op fraction:(CGFloat)delta]`
- `NSDrawThreePartImage`
- `NSDrawNinePartImage`

Text Drawing

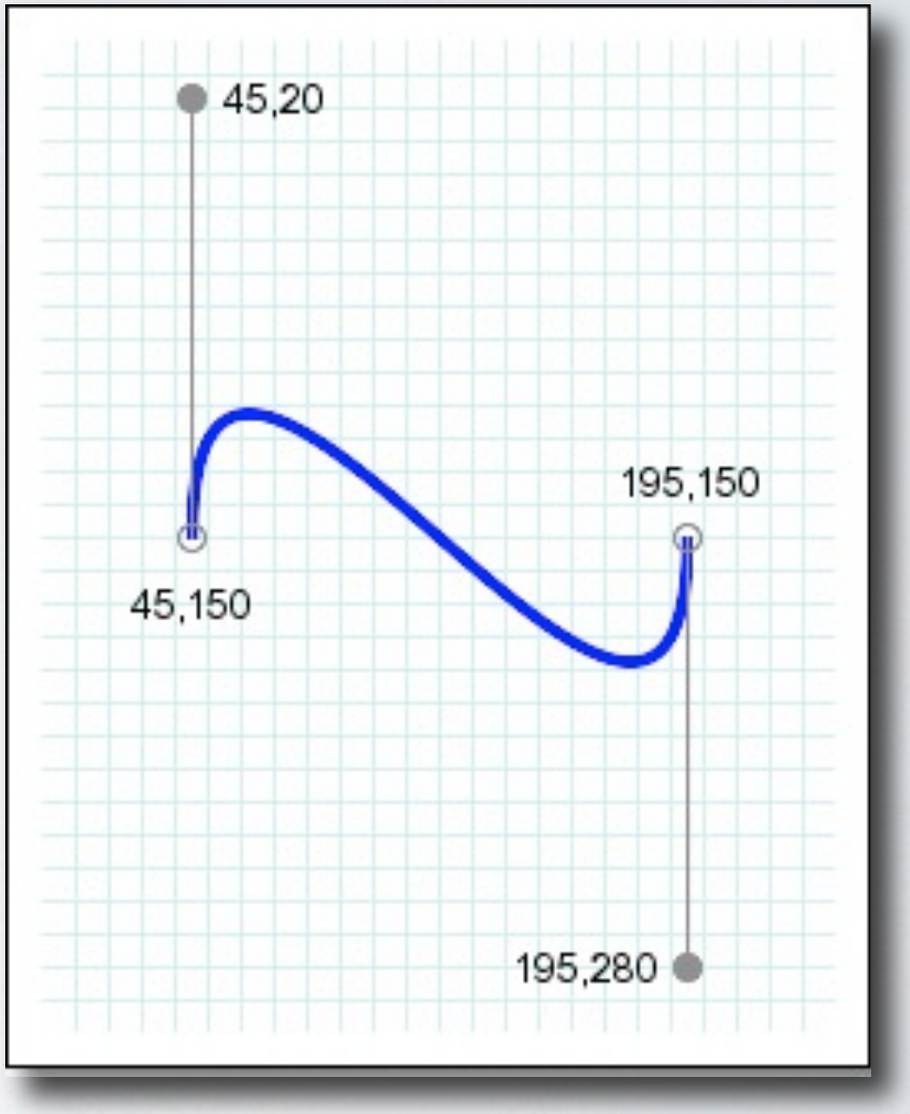
- NSString category in AppKit

```
- (void)drawAtPoint:(NSPoint)aPoint
    withAttributes:(NSDictionary *)attributes
```

- And a few more
- See also NSAttributedString

NSBezierPath

- "An NSBezierPath object allows you to create paths using PostScript-style commands. Paths consist of straight and curved line segments joined together."
- See documentation



Field Editor

- NSTextField does not do its own text editing
- One NSTextView for the whole window
- Important when doing custom drawing!
- Window delegate:

```
- (id)windowWillReturnFieldEditor:(NSWindow *)window
                          toObject:(id)anObject
```

Performance

- "Felt experience" is important
- Do **not** block the main thread!
- Use NSThread or NSOperationQueue
- Instruments & Shark

NSThread

```
+ [NSThread detachNewThreadSelector:(SEL)aSelector
                          toTarget:(id)aTarget
                        withObject:(id)anArgument]
```

- Don't forget the autorelease pool!
- Result:

```
- [NSObject performSelectorOnMainThread:(SEL)sel
                              withObject:(id)obj
                           waitUntilDone:(BOOL)wait]
```

- AppKit is not threadsafe! Only use from main thread

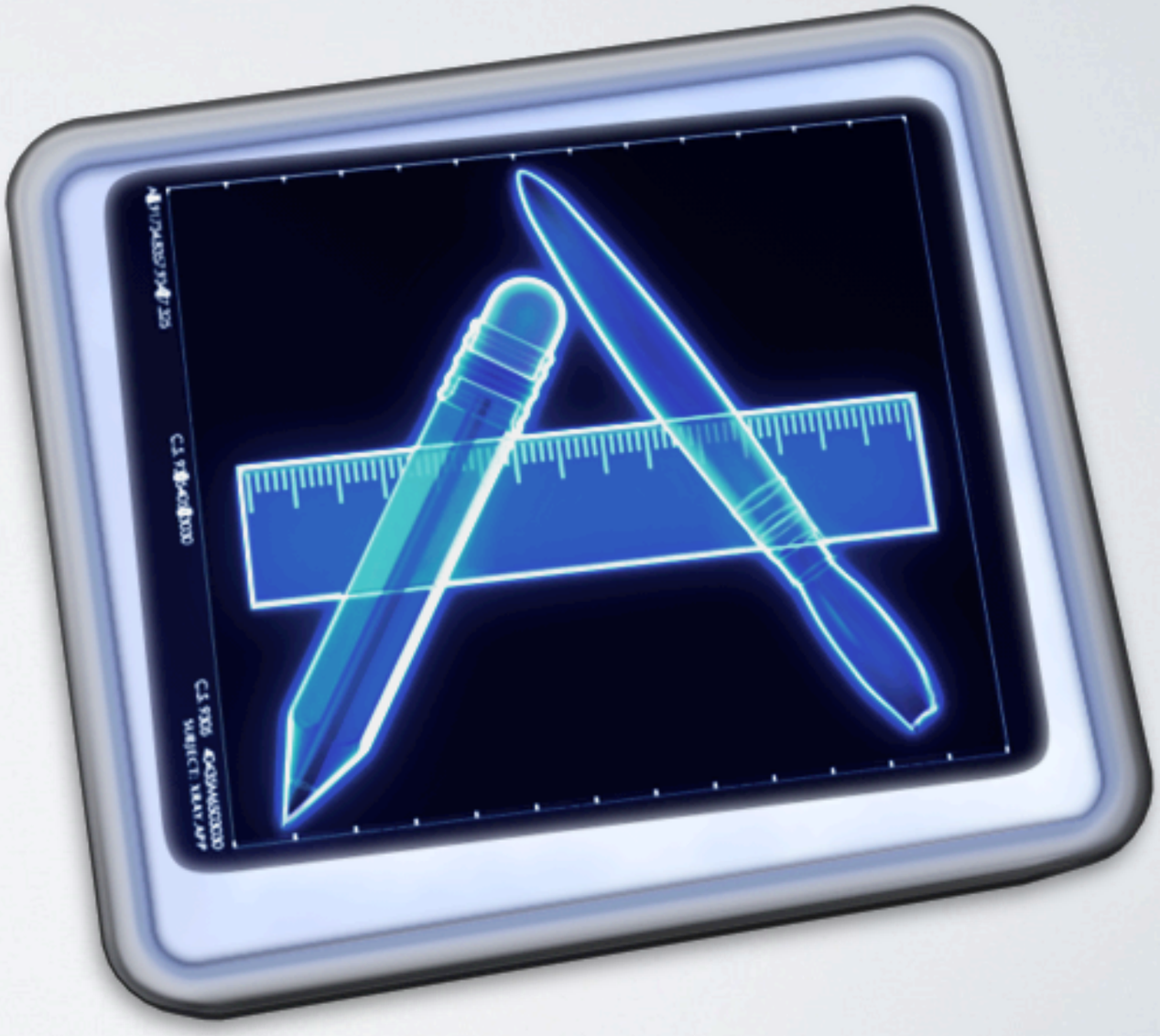
NSOperationQueue

- Small operations in parallel, required for effectively using multiprocessing
- Subclass NSOperation, override `- (void)main`
- `- [NSOperationQueue addOperation:]`
- Many configuration options, see documentation

TOOLS

Instruments

- Measuring runtime application performance
- Leak checks, stack depth, etc



SHARK

- Perform example session, measure performance on a source level

Quartz Debug

- Testing drawing performance
- Misc. debugging facilities
- Resolution independence

Overall Progress So Far

- Foundation
  - Collection classes, runloop, notifications
- AppKit
  - Views, controls, NSApplication, nibs
  - Custom view drawing
- CoreData
  - Object-oriented database

What's Left?

- Non-conventional user interfaces (Frontrow, Coverflow, …)
- Embedding a web browser (iTunes Store)
- Embedding video
- iPhone / Cocoa Touch

BIG EXAMPLE 3

Homework

- Add CoreData to your address book from last week
- Hint: Use the CoreData template to get started