



SMACK 2011

Exploring the use of Android OS in CS2

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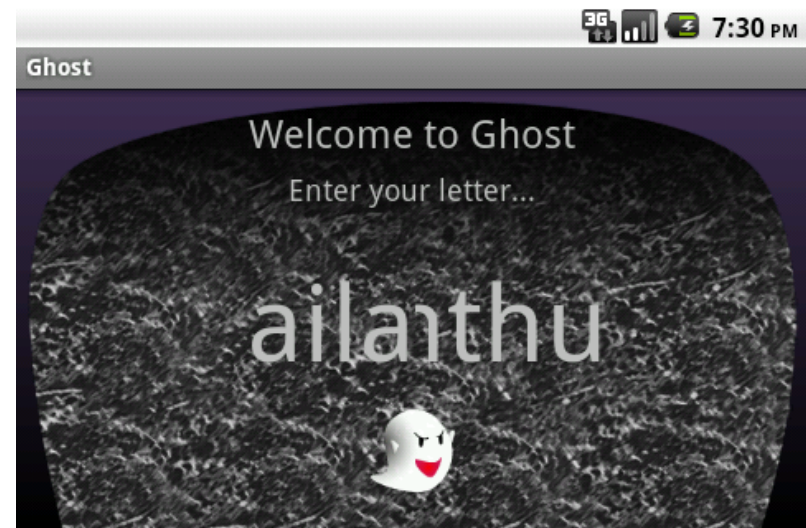
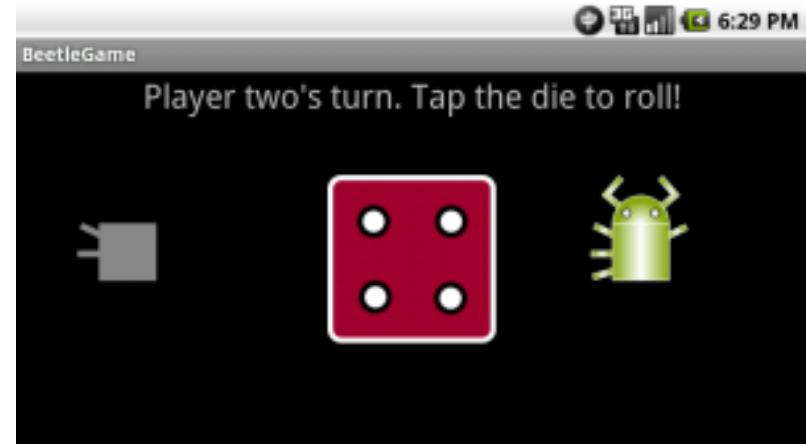


May 22, 2011



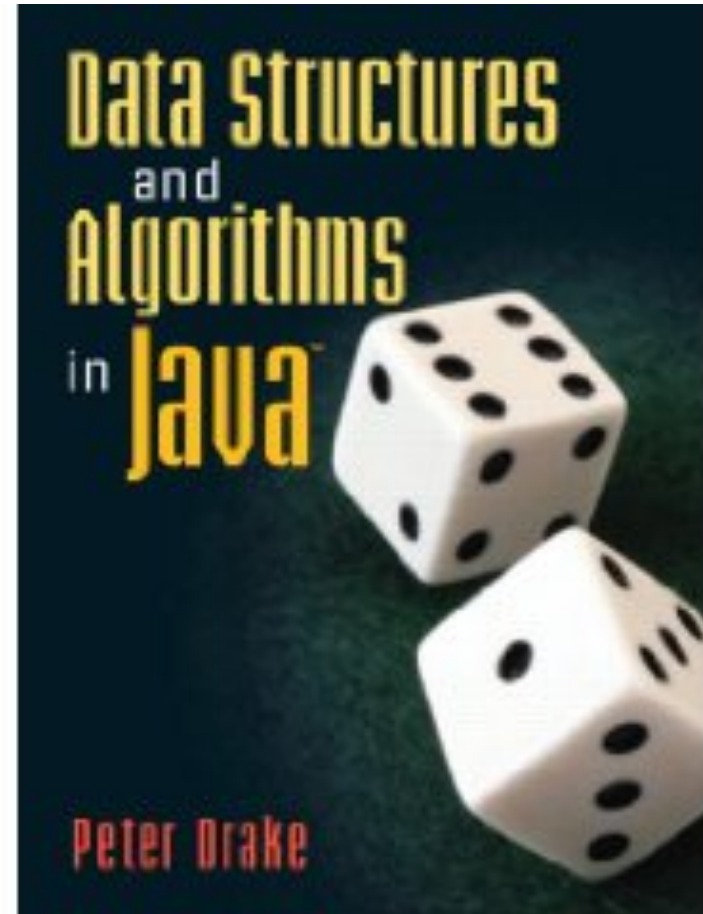
Android4CS2

- Project Goals
- Philosophy
- Sample Projects
- Evaluation
- Future Work

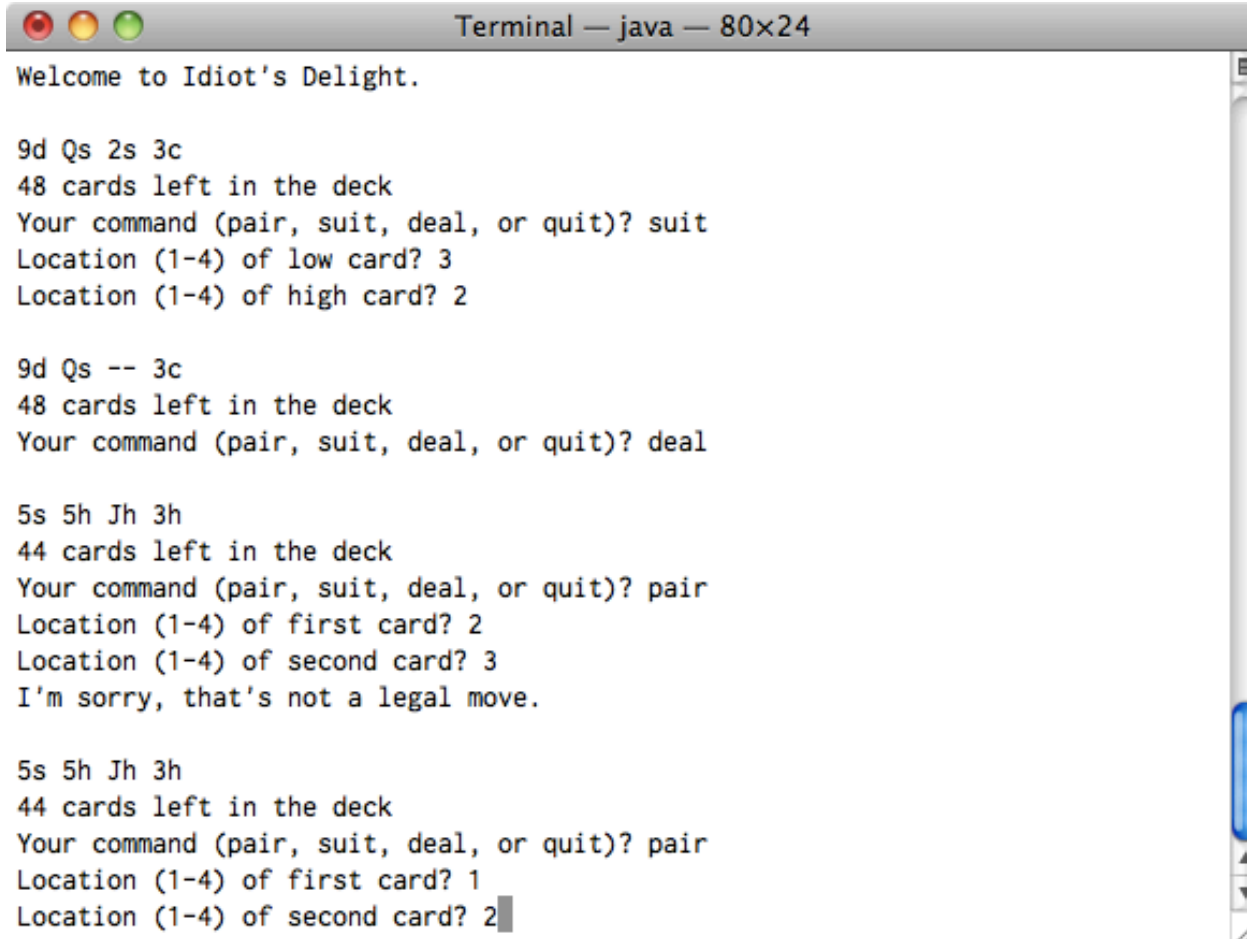


Data Structures and Algorithms

- 2005 Text by Peter Drake
- Focus on games
 - Board
 - Card
 - Dice
- Students know the rules
- Projects focused on understanding **concepts** instead of **specifications**



Idiot's Delight Text

A screenshot of a terminal window titled "Terminal — java — 80x24". The window contains the text of a card game called "Idiot's Delight". The text is as follows:

```
Welcome to Idiot's Delight.

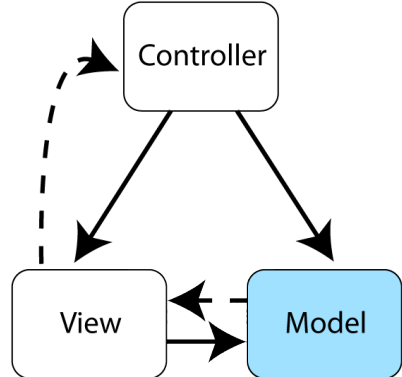
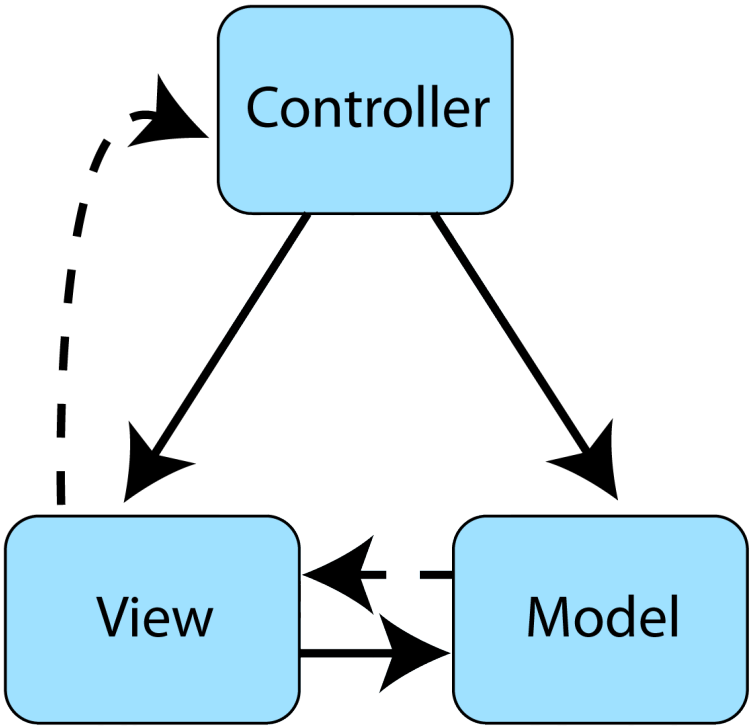
9d Qs 2s 3c
48 cards left in the deck
Your command (pair, suit, deal, or quit)? suit
Location (1-4) of low card? 3
Location (1-4) of high card? 2

9d Qs -- 3c
48 cards left in the deck
Your command (pair, suit, deal, or quit)? deal

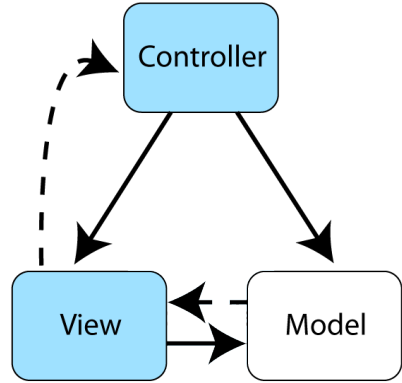
5s 5h Jh 3h
44 cards left in the deck
Your command (pair, suit, deal, or quit)? pair
Location (1-4) of first card? 2
Location (1-4) of second card? 3
I'm sorry, that's not a legal move.

5s 5h Jh 3h
44 cards left in the deck
Your command (pair, suit, deal, or quit)? pair
Location (1-4) of first card? 1
Location (1-4) of second card? 2
```

Model-View-Controller



Data Structures
Core Content



Android
Wrapper

Android Mobile Phones

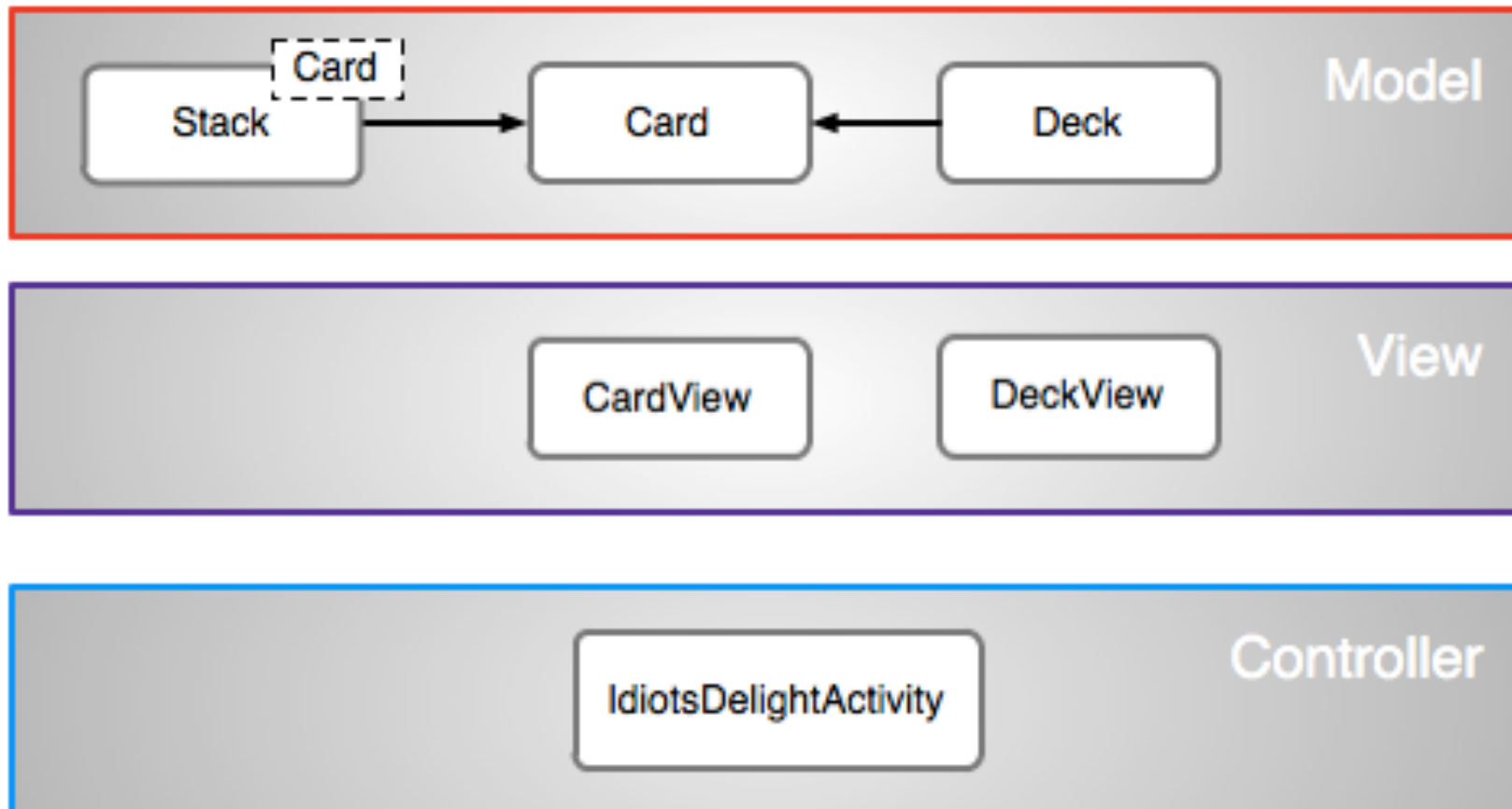
- Google Android Education Grant
 - 12 Motorola Droids
- Android \approx Java
- High motivation
- Code can be cleanly separated



Idiot's Delight Android



Idiot's Delight MVC



13 Skeleton Projects


 Die Roller

 Beetle

 Domino Flip

 Light String

 Domineering

 Idiot's Delight

 War

 Go Fish

 Questions

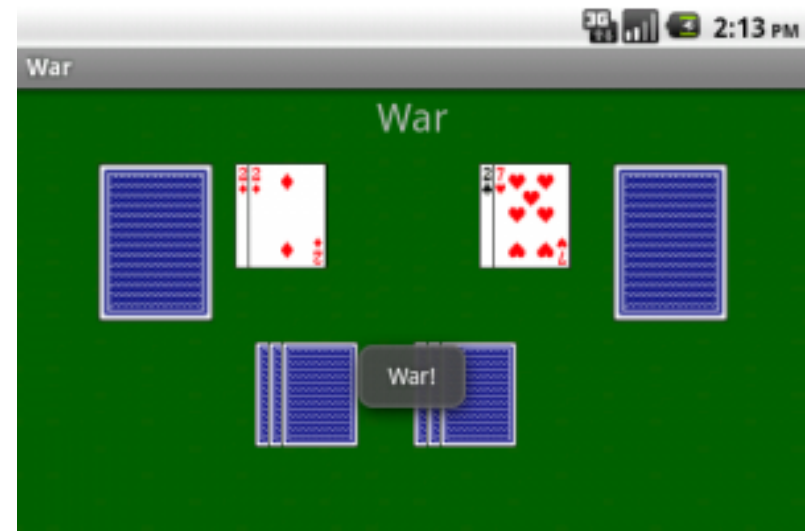
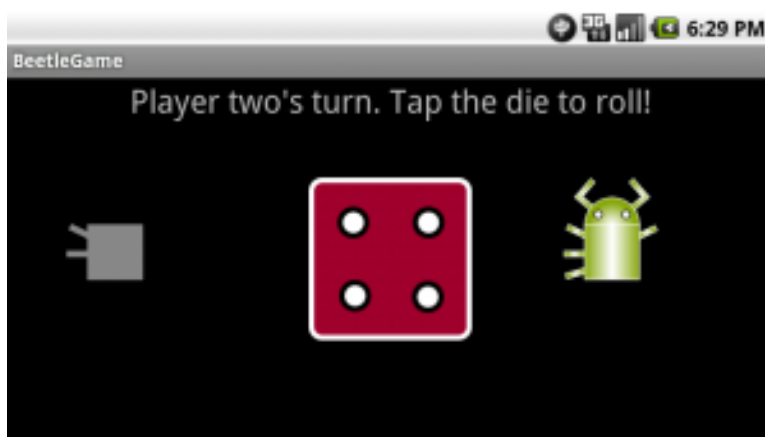
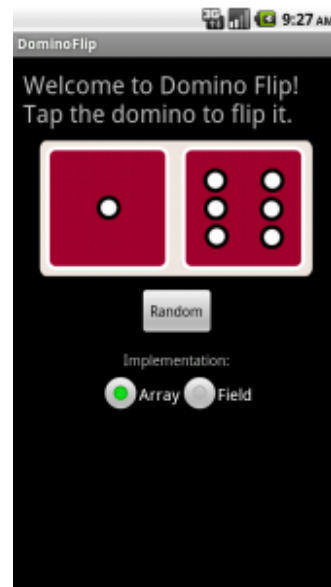
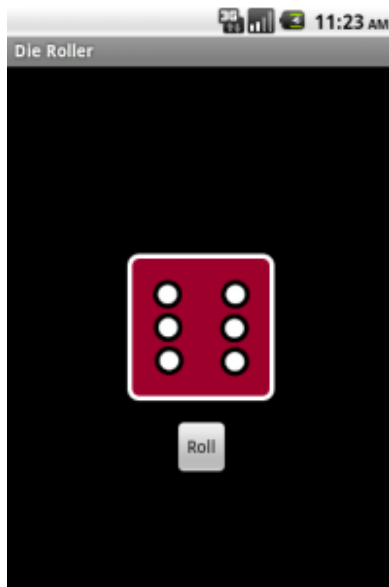
 Ghost

 Where is Wall Drug

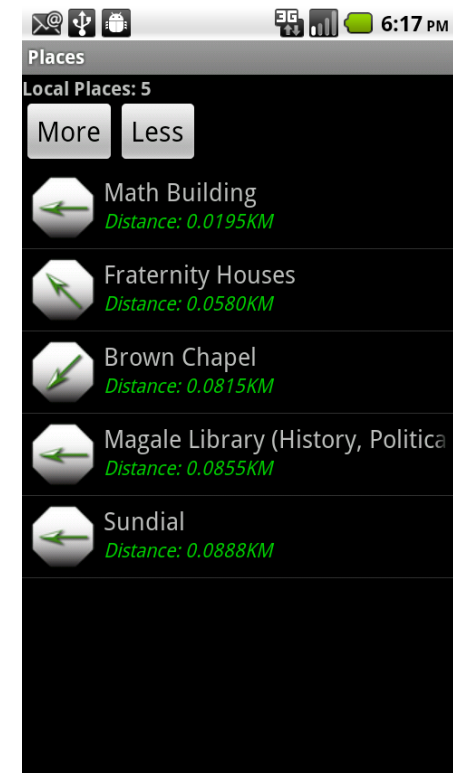
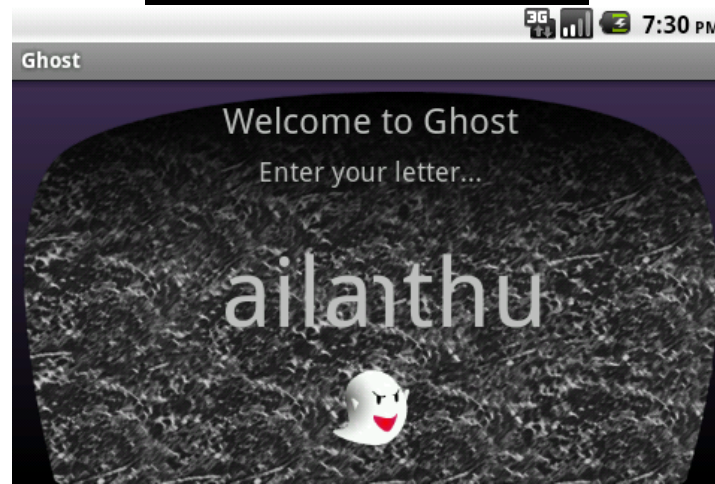
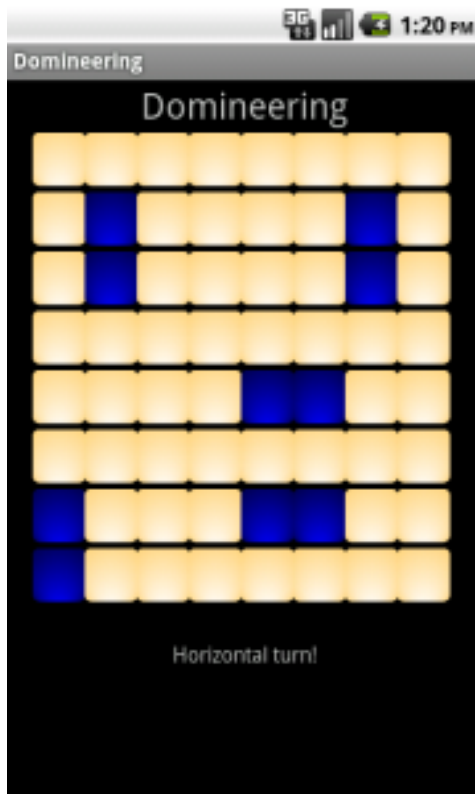
 Top Spin

 Places

Project Screenshots



Project Screenshots



13 Skeleton Projects


 Die Roller

 Beetle

 Domino Flip

 Light String

 Domineering

 Idiot's Delight

 War

 Go Fish

 Questions

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 Where is Wall Drug

 Top Spin

 Places

Data Structures Concepts

 OO Code

 OO Code

 Interface

 Inheritance

 2D Array

 Stack

 Queue

 List

 Binary Tree

 Digital Search Tree

 OO Code

 Array vs. Linked

 Quad Tree

Android Concepts

 Hello World

 Bitmap Layers

 XML Layout

 Custom View / Timer

 GridView

 Listeners / Toast

 XML Animation

 GalleryView

 Object Serialization

 File I/O

 GPS/Compass

 Intents / Bundles

 ListView

Spring 2011 Pilot

- Pilot at two institutions
 - Centenary College of Louisiana (4)
 - Allegheny College (18)
- Benefits
 - High student engagement
 - Real-world context for learning interfaces/inheritance
 - Allowed for final project in Android
 - Connect Four, Game of Life, Word Scramble, Swim Timer
- Weaknesses
 - Requires high student commitment
 - Eclipse + Android + SVN + Linux can be buggy
 - Slightly less material covered

Future Work

- Rigorous pre/post evaluation
- Expand Pilot to more schools
- Write tutorial documentation
- Test in Mobile Development course
- Code additional projects
 - Other textbooks
 - SIGCSE Nifty Assignments

Acknowledgements

- <http://www.rockalypse.org/blogs/android4cs2/>
- <http://code.google.com/p/android4cs2/>

