

WELCOME TO ADVANCED IOS DEVELOPMENT

HOW IS THIS GOING TO WORK?

COURSE LOGISTICS

- Flipped Classroom
 - Videos of lectures
 - Meet for discussions and office hours



COURSE LOGISTICS

- Regular Class Meeting
 - Tuesday 5:30-6:30pm
 - Lecture Video Recap/Demos
 - Friday 10:00-10:30am (See slack poll)
 - Office hours 10:30am-11:00am
- Office hours
 - Monday 10:00 - 11:00am
 - Set up a "time" via Slack

Introduce upcoming weeks material
Introduce/update assignment
Open Q and A

Student showcase and presentations
(App videos/Case Studies)



COURSE LOGISTICS

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Ask questions about the video (session/slide#)

Questions from Slack to be addressed

Code demos and walkthroughs

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 - Set up a "time" via Slack

Group vs. individual vs. working time in a "breakout" room

COURSE RESOURCES

COURSE RESOURCES

- Canvas "Lite"
- Links to materials
 - Github
 - Panopto

The sidebar menu includes:

- Account
- Dashboard
- Courses** (highlighted)
- Calendar
- Inbox
- Commons
- Help

Panopto Video (highlighted with a red box)

Links to:

- Purchase UChicago Bookstore Course Materials
- Purchase Seminary Co-op Course Materials
- Zoom - University of Chicago Main Account
- Collaborations
- Conferences

2020.02

Course Syllabus

[Jump to Today](#)

[Edit](#)

[Home](#)

[Announcements](#)

See full syllabus on Github

[Syllabus](#)

<https://github.com/uchicago-mobi/mpcs51032-2020-spring/wiki/Syllabus>

[Modules](#)

[Assignments](#)

[Discussions](#)

[Library Reserves](#)

[People](#)

[Grades](#)

[Panopto Video](#)

[Purchase UChicago Bookstore Course Materials](#)

[Purchase Seminary Co-op Course Materials](#)

[Zoom - University of Chicago Main Account](#)

[Collaborations](#)

[Conferences](#)

Course Summary:

Date	Details	
Tue Apr 21, 2020	Assignment 1	due by 5:29pm

University focus on
protecting student work
and information

COURSE RESOURCES

- Panopto video hosting
- Organized by "Sessions"
- Link directly from within canvas



THE UNIVERSITY OF CHICAGO

Powered by Panopto

Search in folder "session1"...

Create

Home My Folder Shared with Me Everything Browse

session1

↑ Refresh Filter by date Show scheduled recordings

Sort by: Name Duration Date ▾

Add folder

session-1a

Processing : 72%

session-1b

6 hours ago

ADVANCED iOS APPLICATION DEVELOPMENT

MPCS 51032 • SPRING 2020 • 25:42

COURSE RESOURCES

- Github
Repository for all course materials (no website 😢)
- <https://github.com/uchicago-mobi/mpcs51032-2020-spring>

The screenshot shows a GitHub repository page for the repository `uchicago-mobi / mpcs51032-2020-spring`. The repository has 2 commits, 1 branch, 0 packages, 0 releases, and 1 contributor. The latest commit was made 1 hour ago. A yellow callout box highlights the repository name and describes it as containing "Materials for each session (slides, videos, projects, etc.)".

No description, website, or topics provided.

Manage topics

2 commits 1 branch 0 packages 0 releases 1 contributor

Branch: master New pull request Create new file Upload files Find file Clone or download

tabinks Add session 1 materials Latest commit 32e2c12 1 hour ago

session1 Add session 1 materials 1 hour ago

README.md Initial commit 3 hours ago

MPCS51032-2020-spring

Materials for each session (slides, videos, projects, etc.)

Contact GitHub Pricing API Training Blog About

COURSE RESOURCES

A screenshot of the GitHub header bar. It includes a logo, a search bar with placeholder text "Search or jump to...", navigation links for "Pull requests", "Issues", "Marketplace", and "Explore", and a notification bell icon with a blue dot indicating four notifications.

A screenshot of a GitHub repository page. The repository name is "uchicago-mobi / mpcs51032-2020-spring". It shows 4 unwatched issues, 0 stars, and 0 forks. Navigation tabs include Code, Issues (0), Pull requests (0), Actions, Projects (0), Wiki (selected), Security, Insights, and Settings.

Assignment 1

tabinks edited this page 2 hours ago · 5 revisions

What do John Travolta, Barack Obama, Shaquille O'Neil, Whoopi Goldberg, Glenn Beck, Jay Leno, Cheech Marin, Jerry Seinfeld, Sting, Queen Latifah, Jimmy Buffett, Madonna, Spike Lee, Jerry Garcia, Paul McCartney, Jamie Lee Curtis, Bob Dylan, The Dutches of York and Steve Martin have in common?

They've all written a children's book...and so will you.

A screenshot of a wiki page titled "Assignment 1". The page content includes a large yellow arrow pointing towards the "Pages" section. The "Pages" section shows 4 results and includes a search bar labeled "Find a Page..", a "Home" link, and a "Assignment 1" link.

COURSE RESOURCES

Post all questions to the appropriate channel unless personal. **All HW questions need to be in #assignment channels.**

The screenshot shows a Slack workspace interface. On the left, there's a sidebar with various icons and a list of channels. The '# general' channel is currently selected and highlighted in blue. Other visible channels include '# assignment-1', '# office-hours', '# random', and Direct messages. A message from user 'abinkowski' in the '# general' channel is highlighted, reading: "Your first assignment Please respond to this thread with what you are most interested in learning about related to iOS, watchOS, tvOS, iPadOS, macOS development this quarter. I have a long list of topics (which we will discuss tomorrow), but I want to make sure that I cover what you are most interested you're not sure, just wait until tomorrow after class to answer." A yellow callout box with a black border and white text contains the instruction: "Post all questions to the appropriate channel unless personal. **All HW questions need to be in #assignment channels.**". The main workspace shows other messages and activity in the '# general' channel, such as a welcome message from 'abinkowski' and a message from 'Tulip Fan'.

ZOOM

- Please make sure you are muted if you are not talking
- Questions
 - "Raise Hand" if you have a question
 - Type it in the chat
 - Post in slack
- All sessions will be recorded
 - You can opt-out by turning camera and microphone off
 - Will not be distributed outside of class



CLASS

COURSE SESSIONS

- Small class so we have a lot of flexibility
- Please let me know how things are going
- Having any difficulties or concerns about anything, please let me know



ADVANCED IOS

ADVANCED IOS DEVELOPMENT

- Everyone here can build an app
 - Building an app is easy; building a successful one is difficult
- Purpose of class:
 - Develop real-world skills on more complex projects
 - Additional platforms (watchOS, tvOS)
 - Create a portfolio of apps
 - Develop a "polished" final project



ADVANCED IOS DEVELOPMENT

- Where can it take you
 - Professional iOS development
 - Indie developer
 - TA for this class :)



COURSE DESIGN

COURSE DESIGN

- Thorough instruction on the more “advanced” concepts for developing iOS apps
 - Some are just new frameworks we have not covered
 - CloudKit, TextKit, SpriteKit, CoreML, CoreImage
 - Some are “advanced”
 - Performance and optimization, CoreData, Custom Framework, Extensions

COURSE DESIGN

- New platforms
 - tvOS
 - watchOS
 - iPadOS
 - macOS Catalina



COURSE DESIGN



- We are going to learn Objective-C 😳

COURSE DESIGN

- Expectations
 - You are highly motivated
 - You will do a lot of self-learning to address questions that effect your app
 - You will not wait until the last minute on assignments and projects
 - You will show up for "class" and participate

ASSIGNMENTS

- Syllabus
- <https://github.com/uchicago-mobi/mpcs51032-2020-spring/wiki/Syllabus>

Syllabus

tabinks edited this page now · 3 revisions

Course syllabus is subject to change.

Session 1

- Page view controllers
- Speech synthesis
- External audio sources
- Attributed String
- Text Kit
- Nib view controllers

Session 2

- Objective-C
- Finger painting
- UIKit Dynamics
- App Store rules for Kids applications
- Advanced UIView animations
- Property animators

Session 3

- CloudKit
- Notifications

▼ Pages 4

Find a Page...

[Home](#)

[Assignment 1](#)

[Session 1](#)

[Syllabus](#)

+ Add a custom sidebar

Clone this wiki locally

<https://github.com/uchicago-mobi/mpcs51032-2020-spring/wiki/Syllabus>



COURSE DESIGN

- Polled former students and colleagues about the topics that are most beneficial
- Feel free to suggest topics (Slack, email, now)

The screenshot shows the 'Jobs at Apple' website interface. At the top, there are links for Mac, iPad, iPhone, Watch, TV, Music, and Support. Below that, there are tabs for Corporate, Retail, and Students. The main title is 'Jobs at Apple' and it says '591 job(s) found'. On the left, there's a 'Filter by' sidebar with options like Keywords (selected), Location, Language Skills, Business Line, Job Function, and My Filter Mixes. Below the sidebar are 'Clear all filters' and 'Hide filters' buttons. The search bar contains the word 'ios'. A note in a box says: 'Certain filters have already been applied. To change the results, change the filters. Corporate jobs require English-language skills.' The main content area shows a table of 10 job listings, each with columns for Job Title, Job Function, and Location. All listed jobs are in Santa Clara Valley and are Software Engineering roles related to iOS.

Job Title	Job Function	Location
iOS QA Engineer	Software Engineering	Santa Clara Valley
Siri iOS Engineer	Software Engineering	Santa Clara Valley
Siri iOS Engineer	Software Engineering	Santa Clara Valley
Siri iOS Engineer	Software Engineering	Santa Clara Valley
Siri iOS Engineer	Software Engineering	Santa Clara Valley
iOS App Reviewer	Marketing	Santa Clara Valley
iOS Power QA Engineer	Software Engineering	Santa Clara Valley
iOS Home App Engineer	Software Engineering	Santa Clara Valley

COURSE DESIGN

- 4 “App Store ready” apps as homework assignments
- Third-party Code Case Study
- Create your own app for final project

COURSE DESIGN

- Week 1 - Homework 1 Assigned
- Week 2 -
- Week 3 -Homework 1 Due, Homework 2 Assigned
- Week 4 -
- Week 5 -Homework 2 Due, Homework 3 Assigned
- Week 6 -
- Week 7 - Homework 3 Due, Homework 4 Assigned
- Week 8 -
- Week 9 - Homework 4 Due
- Final Exam Week - Final Projects Due



**USE OFF WEEKS TO WORK ON FINAL
PROJECT AND CASE STUDIES**

COURSE DESIGN

- Assignments (4 * 16.25%) 65%
- Case Study %5
- Final Project 30%

ASSIGNMENTS

- Honor Code
 - All the assignments should be your own work
 - Department policies are strictly enforced
- Online Resources
 - Most valuable resources you have for learning to develop iOS apps
 - Attribution is required in README.md file AND retain original headers

ASSIGNMENTS

ASSIGNMENTS

- Focus on application design (MVC)
- Best practices in coding style
- User Interface design and user experience
- Use as many frameworks as possible

ASSIGNMENTS

User interfaces
matters

- Homework grading
 - Specific requirements to be met
 - Must compile with no warning/errors
 - Commented using HeaderDoc formatting style
 - **Included requirements**
 - Style Points
 - Application design
 - Coding factoring/style
 - Readability
 - Best practices

ASSIGNMENTS

- Instructor Code Review
 - You have 2 weeks to do each assignment
 - Treat off week as 'code review'
 - Suggestions about coding style, refactoring
 - Help identify common issues to address in class
- Suggestion
 - Week 1: Application design, prototype basic functionality
 - Week 2: Add new functions, refinements, interface design



Feature rollout is
purposeful

ASSIGNMENTS

- Third Party Frameworks
 - You may **not** use 3rd party frameworks for homework unless noted or specific permission is granted
 - You may use them for your final project.
 - Please submit them with your proposal.
 - You should be able to comfortably explain what they do.
 - Some third-party frameworks are overly complex for what you are trying to do. Some (even popular ones) do not use best practices.

CASE STUDIES

CONTROL CASE STUDIES

- Profile an open source control or framework
 - Cocoa Controls
 - Github
 - Maniac Dev
- Aims
 - Identify best practices
 - Increase your exposure (both senses of the word)
 - See under-the-hood of design patterns
 - Code review

The screenshot shows the Cocoa Controls website interface. On the left, there's a sidebar with filter options: 'SORT' (Date selected), 'FILTER COCOAPODS' (Yes selected), and 'LICENSES' (All selected). The main content area displays two iPhone screenshots. The top screenshot shows a list of controls with a 'Date' filter applied. The bottom screenshot shows a different view with a 'Carrier' status bar.

SORT

Date

Rating

Apps

FILTER COCOAPODS

Yes

No

LICENSES

All

Apache 2.0

BSD

CC BY 3.0

CC BY-SA 3.0

Commercial

Custom

Eclipse Public License

GPL

ISC

MIT

In Xcode instead of running the project, choose from the menu Product/Test to run the unit tests included in the xcode project.

CONTROL STUDIES

- 5% of final grade
- Requirements
 - ~15 minutes technical presentation and questions
 - Code review of control
 - Implement the control in a demo app that you will walk-through
 - Source code will be put in class playground to share
 - Submit a pull-request to the author
 - Just had one closed by Apple from 2 years ago on ResearchKit

Good interview prep

The screenshot shows a GitHub repository page for 'MHTabBarController' by 'hollance'. The repository has 332 stars and 5 issues. It contains code for a custom tab bar controller for iOS 5. The README.md file describes it as a custom container view controller for iOS 5 that works like a regular UITabBarController but with tabs at the top. It includes a screenshot of an iPhone displaying three tabs ('Tab 1', 'Tab 2', 'Tab 3') at the top, each with a list of items ('Tab 1 - Row 0', 'Tab 1 - Row 1', 'Tab 1 - Row 2', 'Tab 1 - Row 3'). A note at the bottom states that customizing the tab bar's appearance requires modifying the code.

fantastical definition · [UIcollectionView Subclass](#) · [ViewController Catalog](#) · [adownload.apple.com](#) · [Twitter+client.png \(102\)](#) · [holla](#)

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hollance / MHTabBarController

PUBLIC [Code](#) [Network](#) [Pull Requests](#) [Issues](#) [Graphs](#)

A custom tab bar controller for iOS 5 — Read more <http://www.hollance.com/2011/11/mhtabbarcontroller-a-custom-tab-bar-for-ios-5-using-the-new-container-apis/>

[Clone in Mac](#) [ZIP](#) [HTTP](#) [SSH](#) [Git Read-Only](#) <https://github.com/hollance/MHTabBarController.git> [Read-Only](#)

[branch: master](#) [Files](#) [Commits](#) [Branches](#)

MHTabBarController

Uses UITabBarItem to set the tab's title and an optional image.

hollance authored 3 months ago latest commit 45a56d7

File	Time Ago	Description
Demo.xcodeproj	3 months ago	Uses UITabBarItem to set the tab's title and an optional image. [hollance]
Demo	3 months ago	Uses UITabBarItem to set the tab's title and an optional image. [hollance]
MHTabBarController	3 months ago	Uses UITabBarItem to set the tab's title and an optional image. [hollance]
.gitignore	a year ago	First commit. [hollance]
Design.psd	3 months ago	Uses UITabBarItem to set the tab's title and an optional image. [hollance]
README.md	3 months ago	Cleaned up and modernized the code a bit. Added @2x graphics. [hollance]
Screenshot.png	a year ago	First commit. [hollance]

README.md

MHTabBarController

This is a custom container view controller for iOS 5 that works just like a regular UITabBarController, except the tabs are at the top and look different.

To customize the tab bar's appearance you currently have to mess around in the code a bit.

The MHTabBarController source code is copyright 2011-2012 Matthijs Hollmans and is licensed under the terms of the MIT license.

CONTROL STUDIES

- Signups will be sent out later
- Find something to use in your final project

github Explore GitHub Search Features Blog

Sign up for free Sign in

PUBLIC hollance / MHTabBarController

Code Network Pull Requests 1 Issues 5 Graphs

A custom tab bar controller for iOS 5 — Read more
<http://www.hollance.com/2011/11/mhtabbarcontroller-a-custom-tab-bar-for-ios-5-using-the-new-container-apis/>

Clone in Mac ZIP HTTP SSH Git Read-Only https://github.com/hollance/MHTabBarController.git Read-Only access

branch: master Files Commits Branches 1 Tags 1

MHTabBarController + 4 commits

Uses UITabBarItem to set the tab's title and an optional image.

hollance authored 3 months ago latest commit 45a55d7db8

File	Time Ago	Description
Demo.xcodeproj	3 months ago	Uses UITabBarItem to set the tab's title and an optional image. [hollance]
Demo	3 months ago	Uses UITabBarItem to set the tab's title and an optional image. [hollance]
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README.md

MHTabBarController

This is a custom container view controller for iOS 5 that works just like a regular UITabBarController, except the tabs are at the top and look different.



To customize the tab bar's appearance you currently have to mess around in the code a bit.

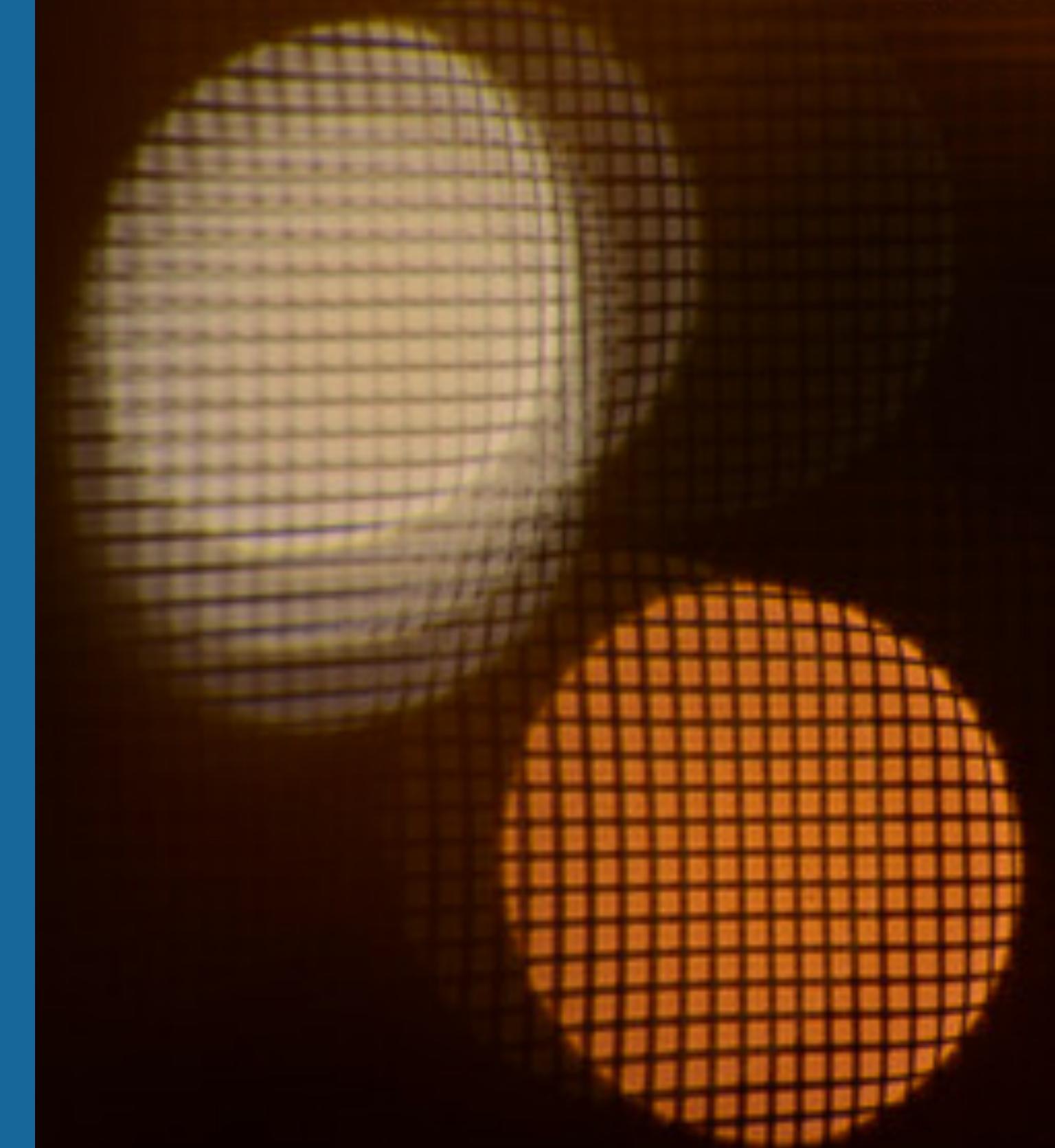
The MHTabBarController source code is copyright 2011-2012 Mathijs Hollmans and is licensed under the terms of the MIT license.

FINAL PROJECTS

FINAL PROJECTS

- Create new application
- Continue your app with major advancements
- Submit proposals anytime
- Start discussing it now

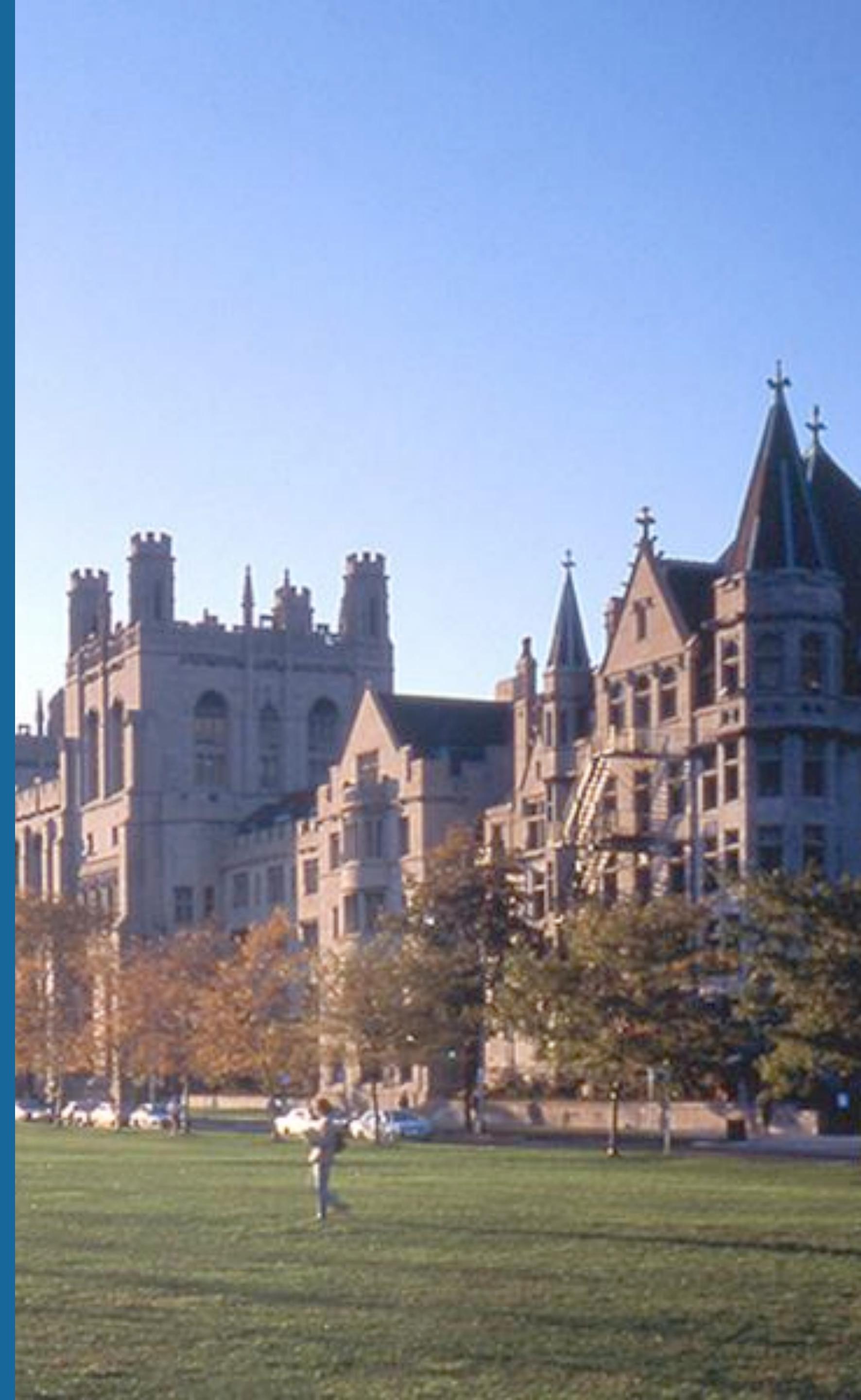
Sound On Sou
by Diomed



be creative, again.

ADVANCED IOS

- Questions??



ASSIGNMENT 1

POP QUIZ

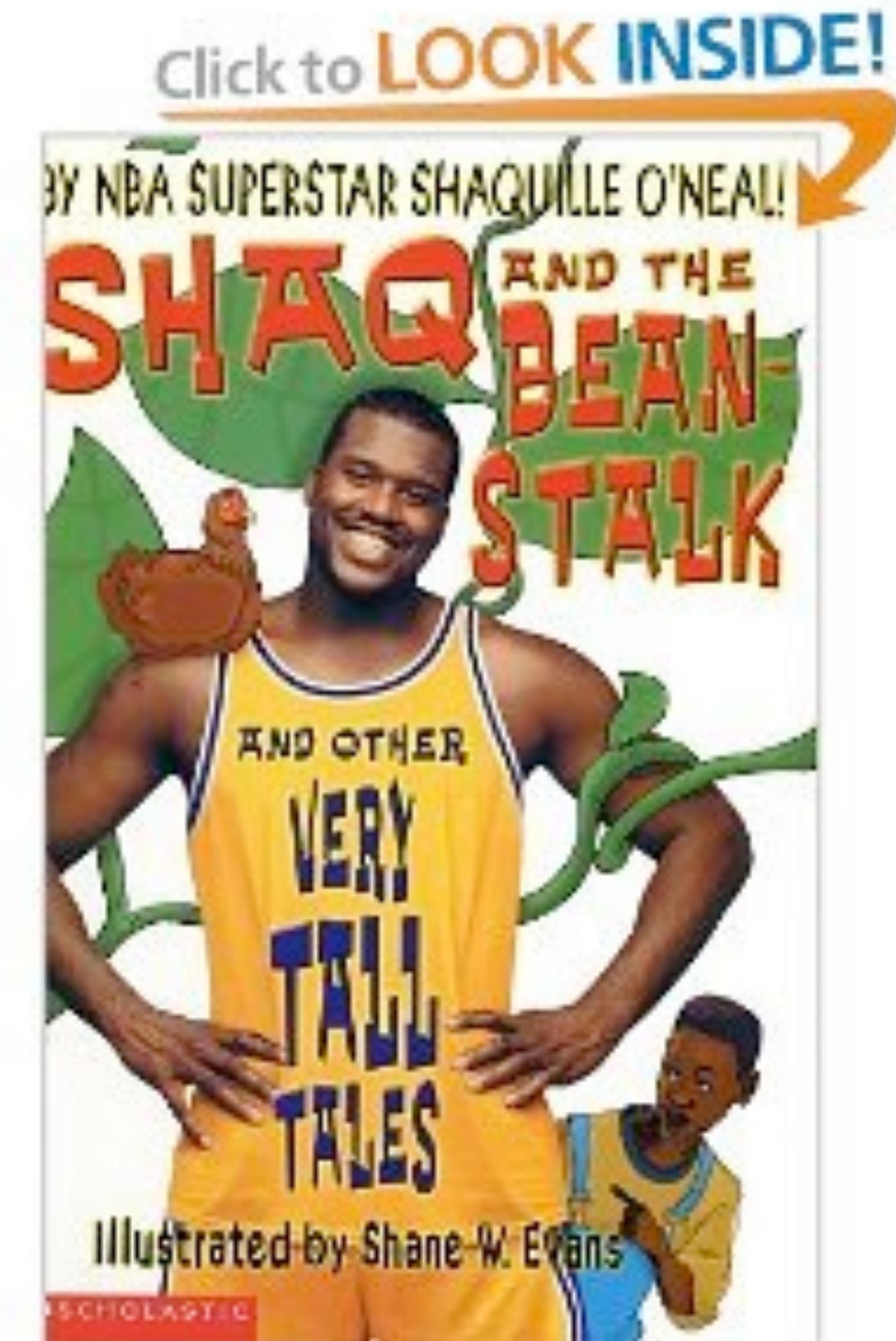
What do John Travolta, Barack Obama, Shaquille O'Neil,
Whoopi Goldberg, Glenn Beck, Jay Leno, Cheech Marin,
Jerry Seinfeld, Sting, Queen Latifah, Jimmy Buffett,
Madonna, Spike Lee, Jerry Garcia, Paul McCartney, Jamie
Lee Curtis, Bob Dylan, The Dutchess of York and Steve
Martin have in common?

ASSIGNMENT 1



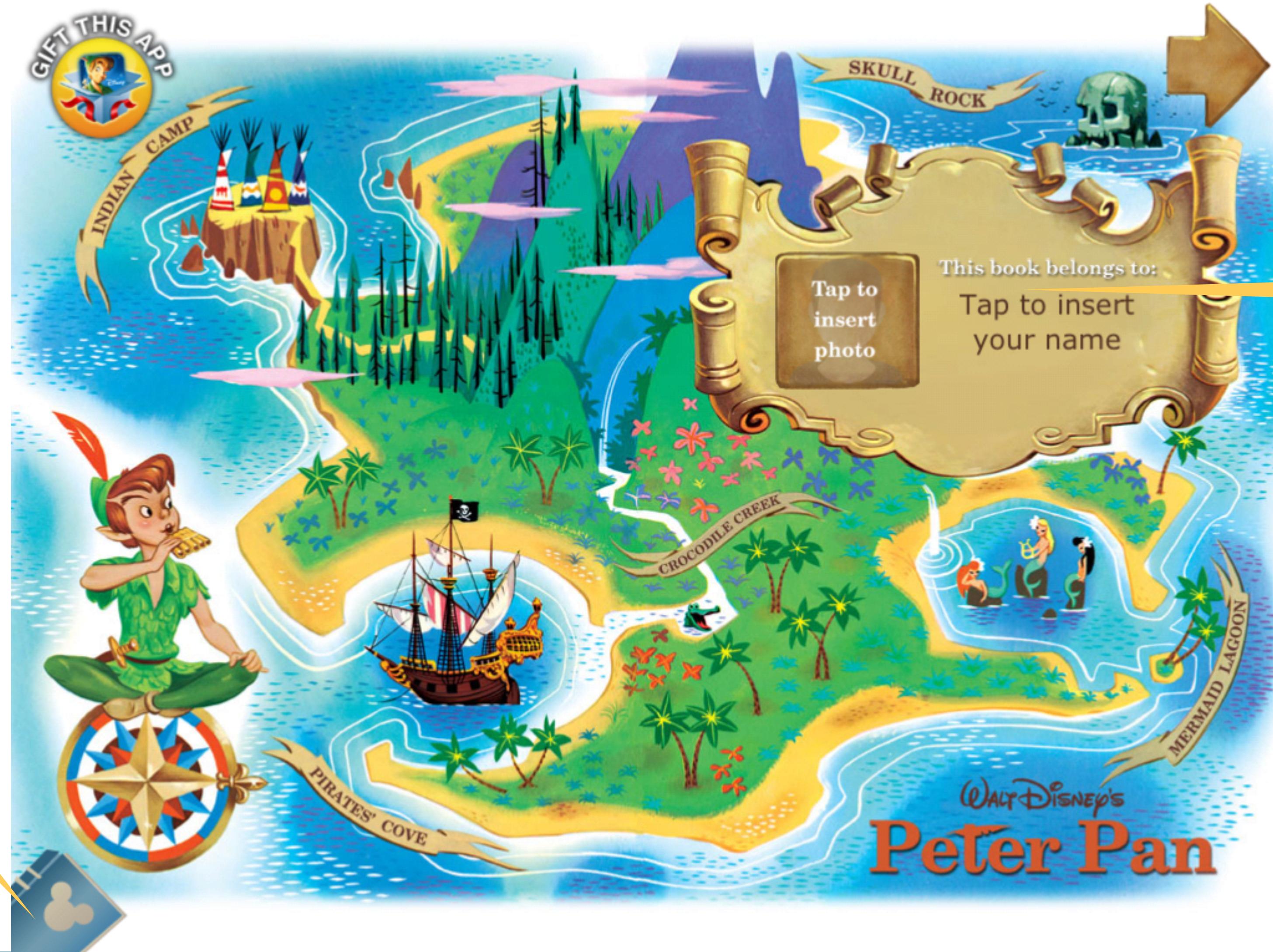
IF A CELEBRITY CAN DO IT, SO CAN YOU

- Create a children's book using `UIPageViewController
- A hilarious, heartwarming and/or educational tale
 - At least 6 pages of unique content
- Must be better than "Shaq and Beanstalk"



ASSIGNMENT 1

About the author

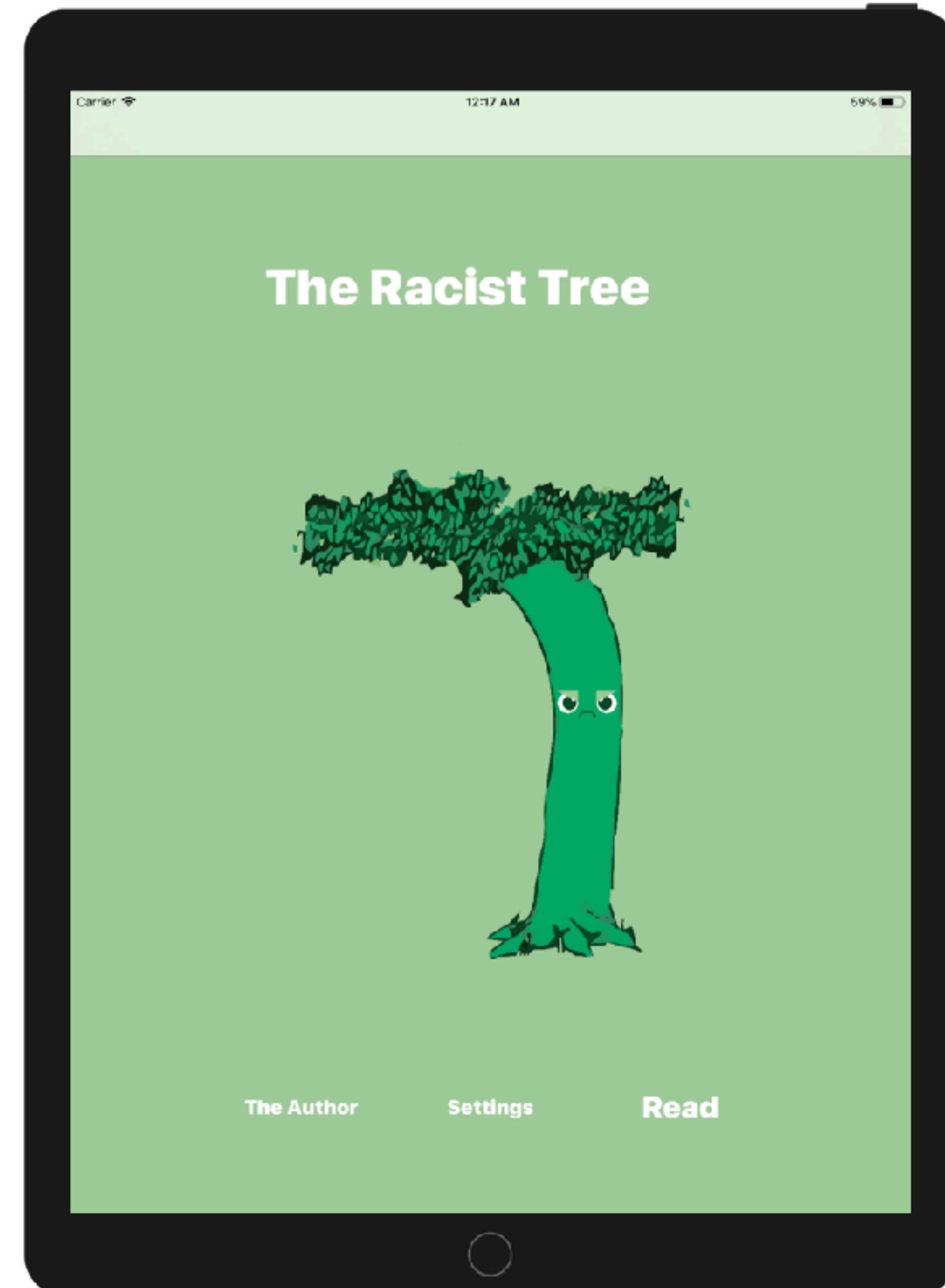


Settings

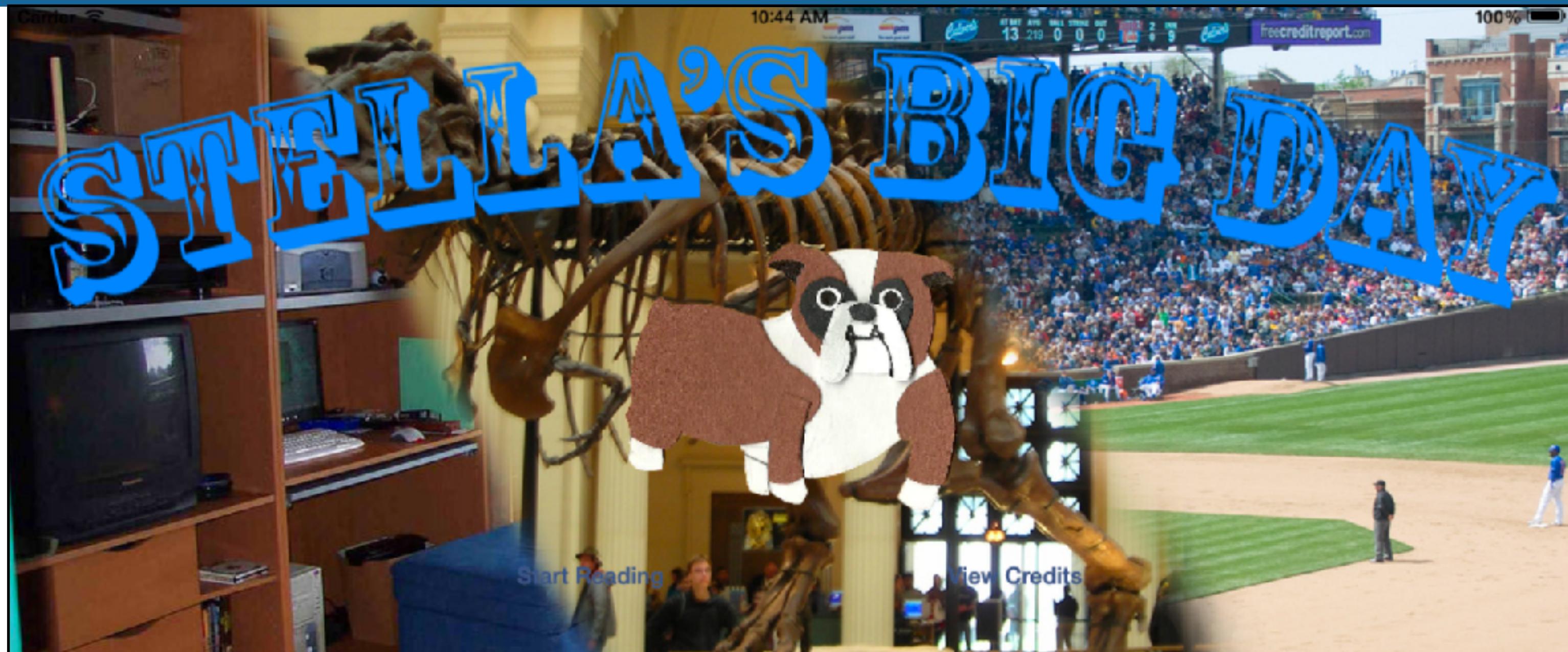
ASSIGNMENT 1



ASSIGNMENT 1



ASSIGNMENT 1



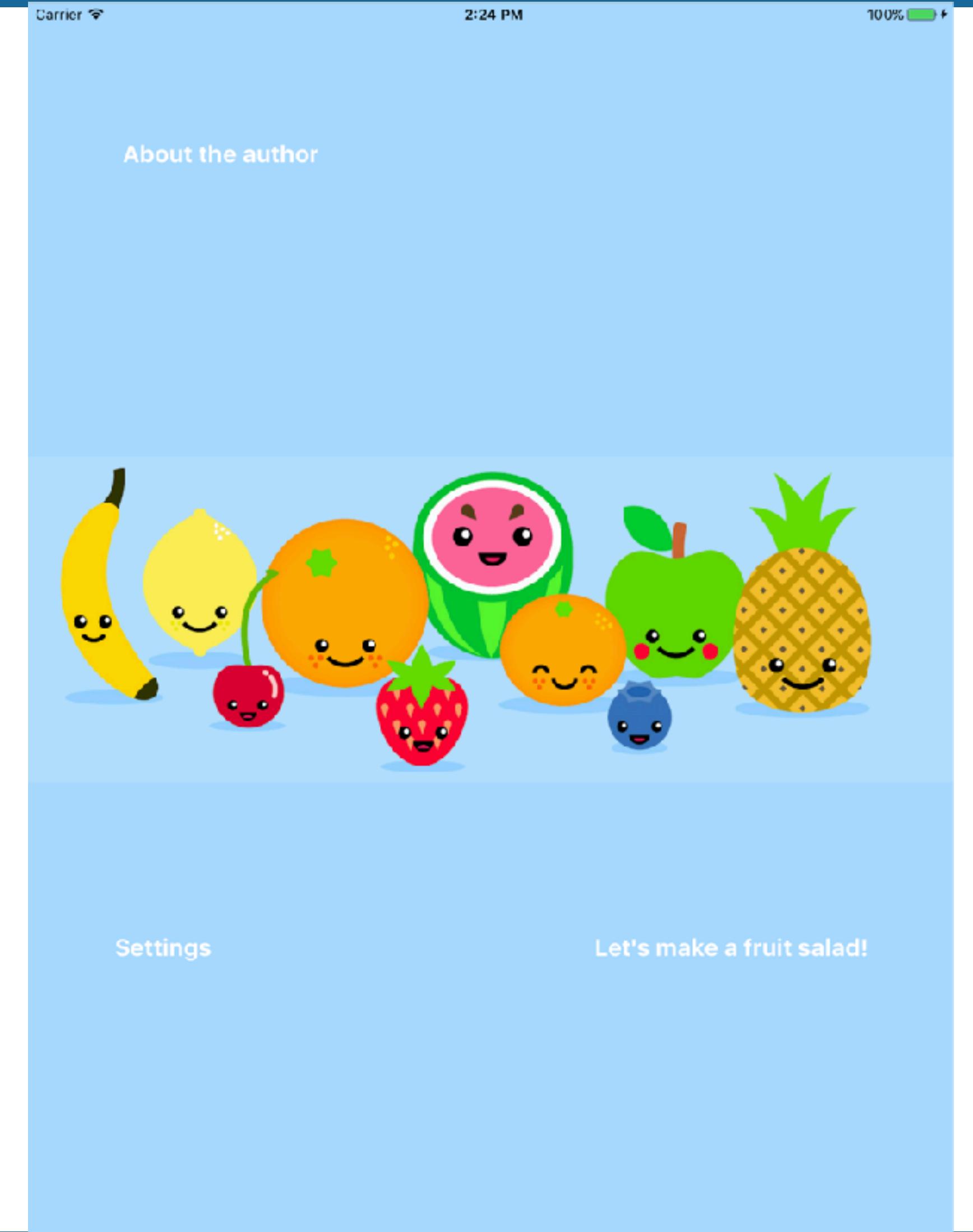
Tap this button to return to the home page



Tap this button to have the book read to you

Swipe or tap the edge of the screen to move between pages

Try tapping on different objects on screen to see what happens!



About the author

Settings

Let's make a fruit salad!

ASSIGNMENT 1



Carrier ⌘

5:23 PM

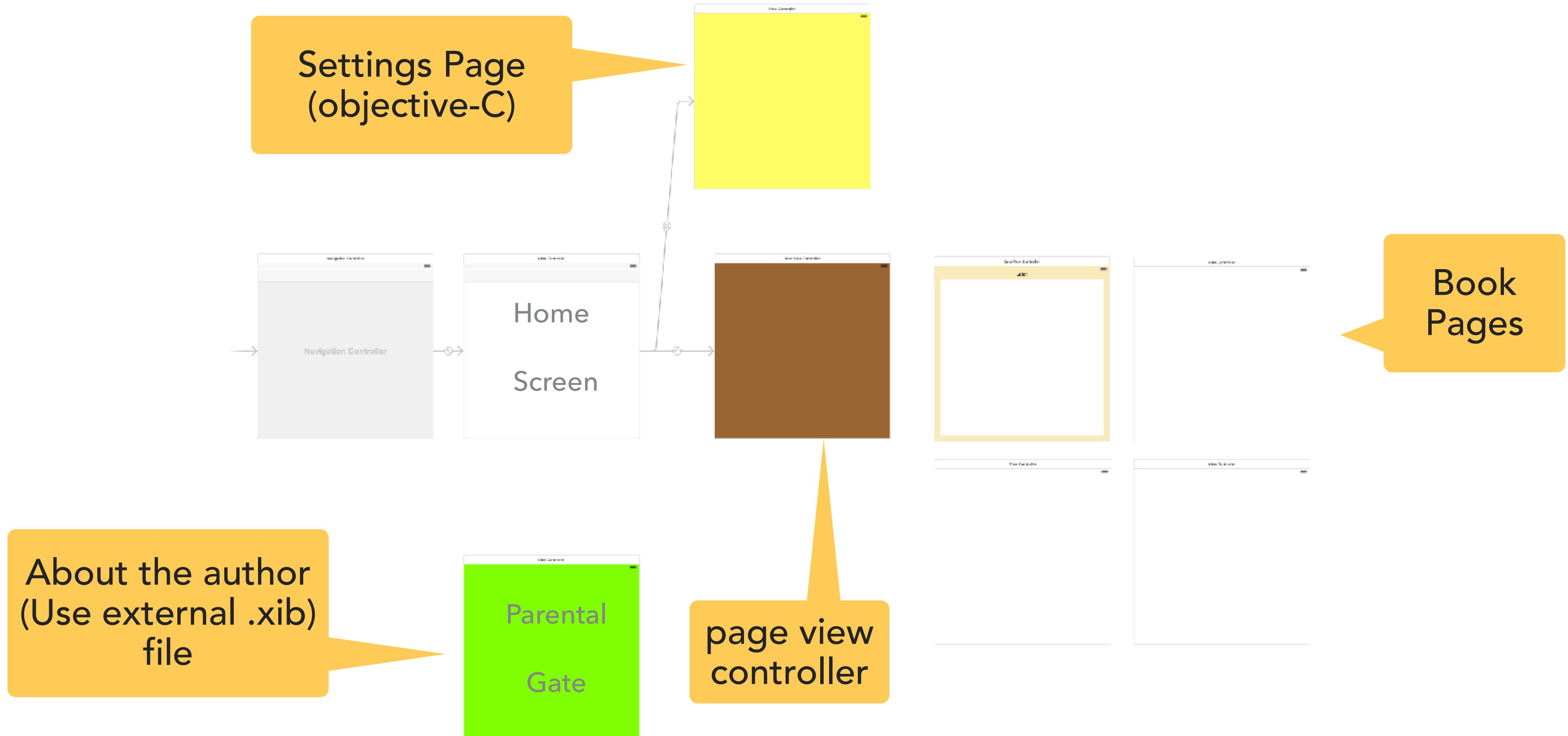
100% 



Children_Book



OVERALL REQUIREMENTS



OVERALL REQUIREMENTS

- “Home Page” that represents the beginning of the book
- “Settings page” for “Read to Me” options (objective-c)
 - Automatically play on each page
 - Tap-to-play
 - Store these preferences in `UserDefaults`
- “About the Author” page protected by Parental Gate (external .xib file)
- Store currently reading page so that book opens to last view paged
- Create an App video of your book

BOOK PAGES

- Every content page must implement:
 - “Read to me” functionality
 - Record sound using Audacity, Garage Band, iPhone and email to self (UITextKit, AVSpeechSynthesis, next week)
 - Words should highlight as they are read
 - Start automatically or by button tap (depending on user preference in settings)
 - Picture and text
 - You must use `UIDynamics` for on-screen element (next week)
 - `UIGestureRecognizer` of on-screen element
 - UIViewPropertyAnimator based animations
 - Tap to hear sound effects
 - Button to return to home page

How Jane Met John

Read the Story

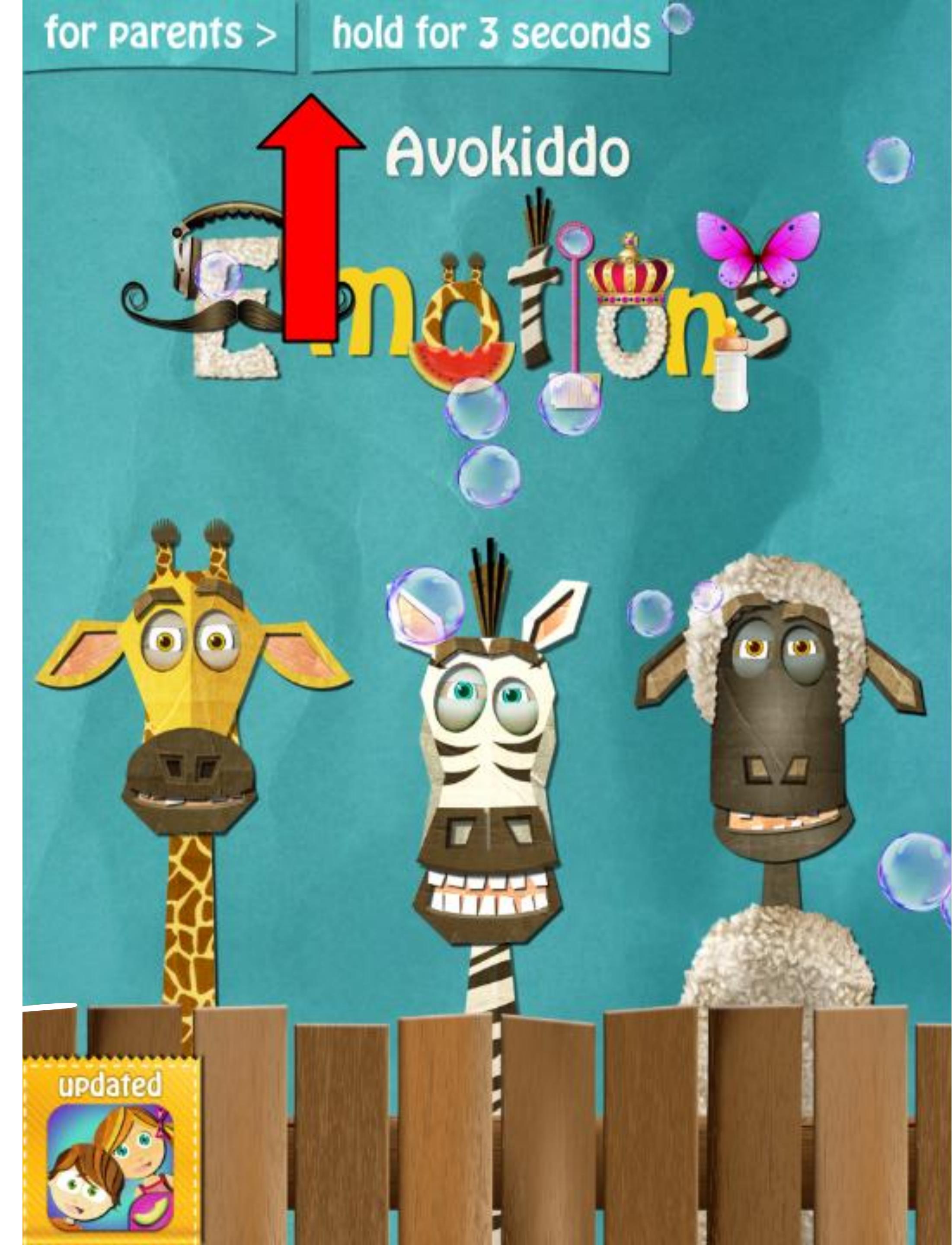
About the Author

Settings

PARENTAL GATE

SUBTITLE

- Features are intended for parents, not kids
 - In-app purchase
 - Signup for news
 - Social Media
- Prevent kids from accessing inappropriate content



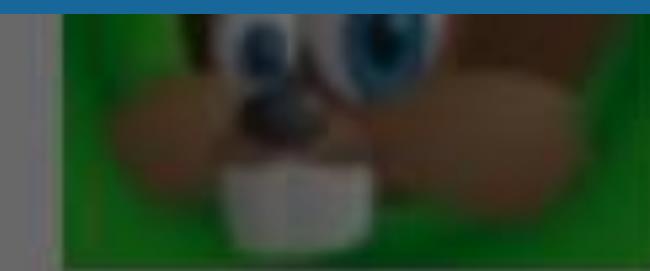


Start About Settings

PARENTAL GATE

- Implementation used to be a best practice, now it is required
 - 24. Kids Apps
 - 24.3- Apps primarily intended for use by kids under 13 must get parental permission or use a parental gate before allowing the user to link out of the app or engage in commerce
- This requires gating when linking out of the app or engaging in commerce such as selling in-app items.

PARENTAL GATE



More Fun!



ARE YOU AN ADULT?

What is **20 - 5 =**

A white rectangular input field for entering the answer to the subtraction problem.

Submit



PARENTAL GATE

Touch the **triangle** for 2
seconds



PARENTAL GATE

REQUIREMENTS

- Implement a Parental Gate for your book app
 - Triggered when the user tries to view the “About the Author” screen
 - In practice the credits screen would typically have a link to social media
- Custom finger drawing view for validator
- Needs to use custom error handling do-try-throw
 - Custom ErrorType

SETTINGS PAGE

REQUIREMENTS

- Settings page in objective-c 😳
- Allow user to select preference to automatically read the page
 - Default should be "on"



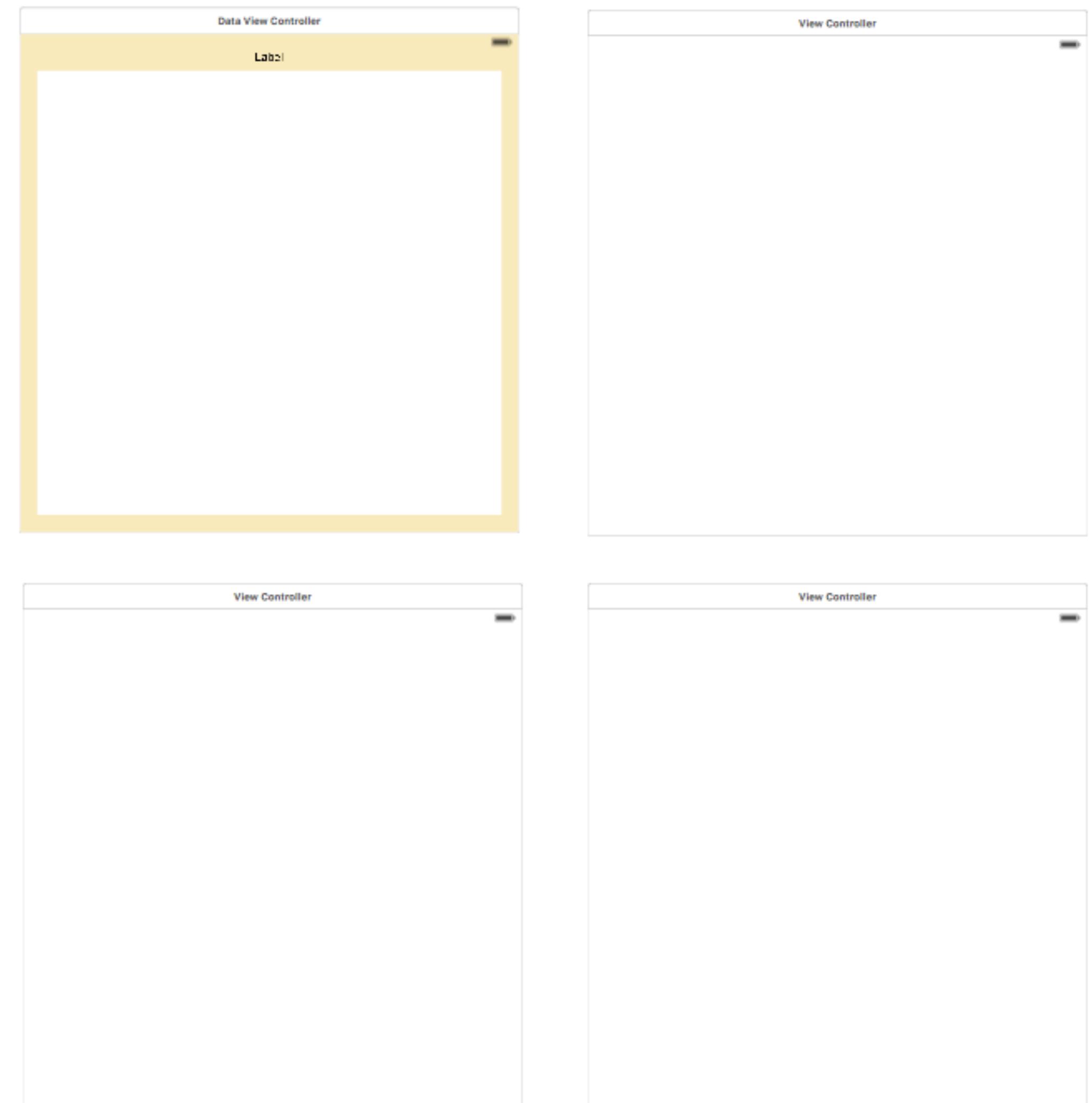
Read to me



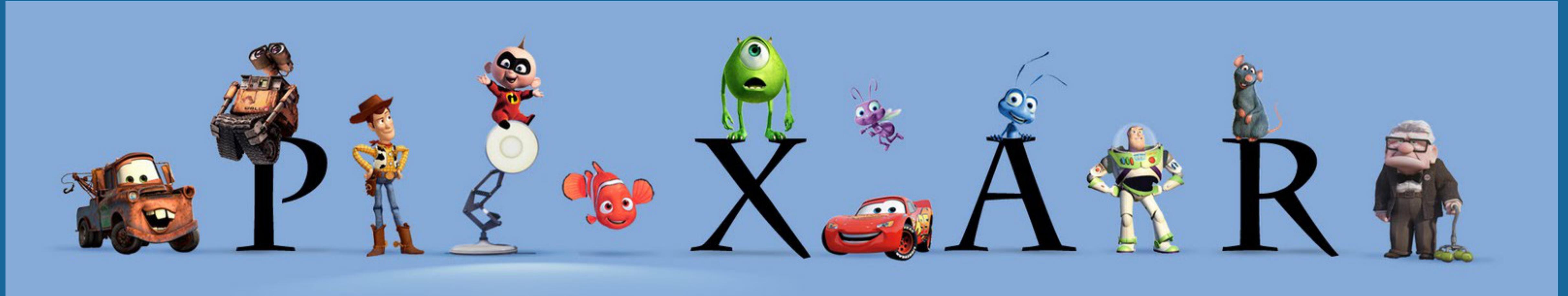
BOOK PAGE OPTIONS

SUBTITLE

- Implementations options
 - View controller per page
 - Create view controller templates
 - Design 3 different styles of pages
 - Each page is a dictionary that includes images paths, text, sound file paths, animation start/stop frames



DUE DATE



- Due 2 Weeks
 - No late homework accepted
- “It’s all about story...story, story, story.” ~John Lasseter

RECOMMENDED WORK FOR THIS WEEK

- Page View Controller
 - Get basic layout
 - Back to home button
 - Save current page
 - How to handle interrupted page turns
- Book pages
 - Draw them out
 - Sound effects
 - Interactive element
 - Text-to-speech

GOING OVER NEXT WEEK

- Settings screen
 - Obj-c first app from Apple
 - Obj-c bridging header
- Parental gate
- App Preview
- Picture and text
 - `UIDynamics` for on-screen element
 - UIViewPropertyAnimator