

Lecture 11

App Design &

Final Project Kickoff

Today

- Final Project Kickoff & Grading
- The Human Interface Guidelines
- Dark Mode and Color Accessibility
- Final Project Ideas Feedback



Final Project — Design

Choosing Your Topic

- No “approval” process
- Come up with an *original idea* & use what you’ve learned!
 - IMO, the best ideas stem from your personal experiences (*this is an app that only you can build*).

Choosing Your Topic

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- Come up with an *original idea* & use what you’ve learned!
 - IMO, the best ideas stem from your personal experiences (*this is an app that only you can build*).
 - ***Does not have to be useful or improve the world. Just has to be something you care about making.***
 - Life is finite! Make things you’re proud of.

So what have we learned?

Swift

Xcode

Interface Builder

Multithreading

Codable

Closures

Protocols

Networking

Optionals

Delegation

MVC

Optionals

Swift

Xcode

Interface Builder

Segues

UITableView

Autolayout

UIKit

UIButton

UILabel

MKMapView

Multithreading

Codable

Closures

Protocols

Networking

Optionals

Delegation

MVC

Optionals

Swift

Xcode

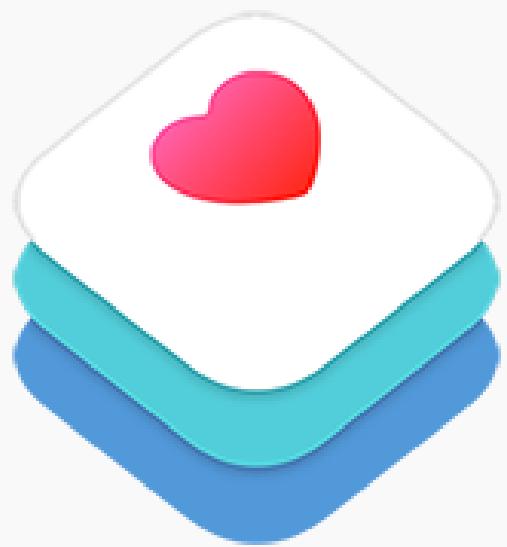
Interface Builder

There are so many more features!

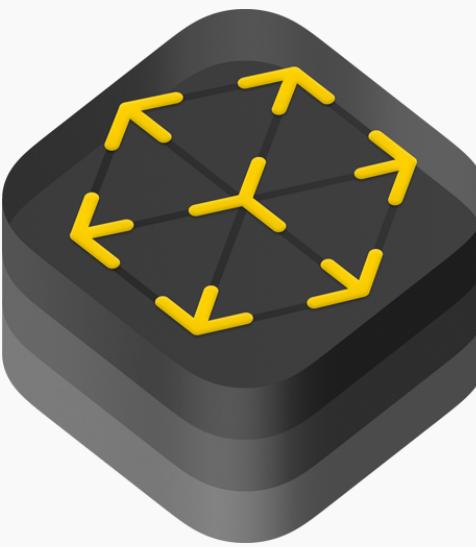
And you now have the experience to use them.



All of these frameworks use Swift, Protocols, Delegation, and the other paradigms you've used in this class.



HealthKit



ARKit



SiriKit



CoreML

App Design – First Steps

- Solidify your idea
 - Make a list of features you'd like to support
 - Be specific, and be realistic!
- Write a “user story” — go through (in detail) the experience of using your app.
 - “Dominic opens the app and sees a login screen, where he can choose to either create an account or continue as a guest. Tapping “Continue As Guest”, Dominic is taken to the main screen, where...”
 - You’ll submit this for Milestone 1 (more on that later).
- Figure out your Navigation hierarchy and do a rough UX sketch (wireframe)
- *(Optional) Use Figma or Adobe XD to create a novel interface design.*

App Design — First Steps

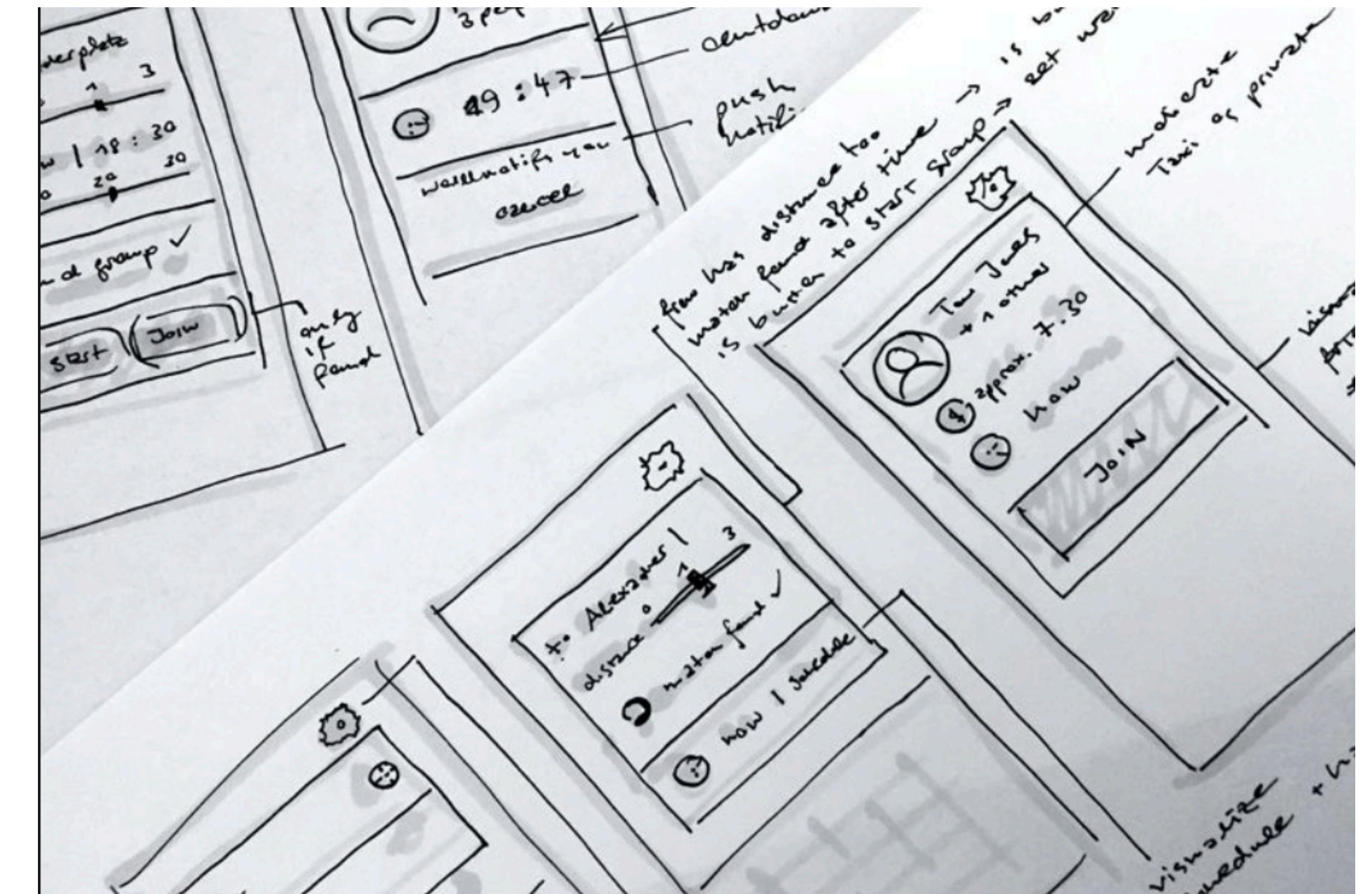
1. Feature list
2. User Story
3. UX Design
4. (Optional) UI Design



UX = User Experience — this is the *structure* of the UI. UI = User Interface — this describes the whole experience, including the visuals. Don't @ me.

UX Sketch

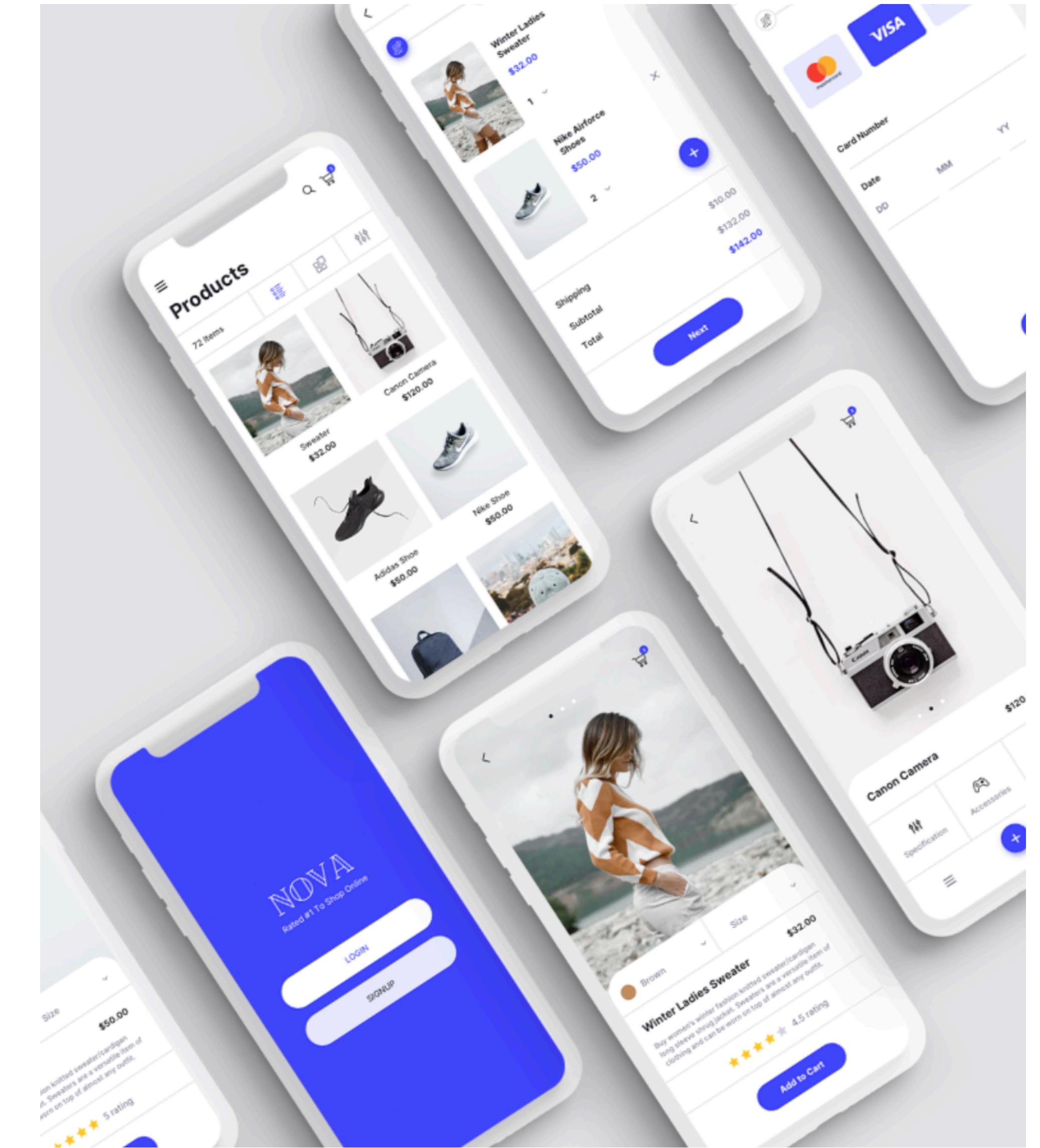
- Doesn't have to be pretty (but try to make it readable for me).
- At a bare minimum, define your UI's navigation hierarchy (examples later in the lecture).
- This is just a tool to help you plan — its a completion grade.
 - Submitted with Milestone 1.



This is a good level of detail to shoot for.

UI Design Advice

- Plenty of resources on the internet if this interests you.
- I recommend **Figma**.
- When starting out, find examples of great design and **copy them**.
 - Especially when it comes to “hard” topics like text hierarchy, interface flow, and writing voice.
- A few of my favorite designers: [Halide](#), [Teenage Engineering](#), [Panic](#), and (ofc) [Apple](#)



There are also lots of great “UIKits” that you use in Figma or Sketch – another great way to get started.



Final Project — Logistics

Final Project Schedule

- Monday April 13th — **Milestone 1 Due**
 - *Text Post: detail your idea, explain your challenges and upload a photo of your app's wireframe (hand drawn or digital)*
 - *Code Submission: submit at least a created Xcode project*
- Friday April 17th — **Milestone 2 Due**
 - *By this point you should have a clear runway ahead. Aim for being >= 30% done.*
 - *Text Post: explain your progress so far and detail any future challenges*
 - *Code Submission: submit a zipped Xcode project, hopefully with good progress.*
- Thursday April 23rd — **Demo Days, Project Due**

Final Project Grading

- Milestones 1 and 2 (text & code) are completion grades
 - Collectively worth **40% — 10% each**
 - Try your best, but don't worry if you're a day late on one of these. They are meant to keep you on track, not stress you out.
- Final Demo Video is worth **10%**
- Final Code Submission is worth **50%**
- ***In effect, the FP is 50% completion grades.***

Rubric

Code quality

10 points

Experience quality

10 points

Feature ambition

10 points

UI design

10 points

Bug free

10 points

Final Project Weight Change

- Currently the final project is worth **30%** of the course grade.
 - This is a little intense, seeing as we aren't on campus and the schedule is compressed.
- Therefore I will be making the FP worth **15%** and Apps worth **65%**, *only for those this helps*.
 - So for each student I will determine their grade *before* this change (FP worth 30%, Apps 50%), as well as *after* this change (FP worth 15%, Apps 65%). **I will use the higher of the two grades.**



The Human Interface Guidelines

- A set of App Design guides published by Apple.
- Any time you aren't sure of the "right way" to design or use an iOS component — the HIGs are perfect for that.
- The HIGs promote very "iOS-y" feeling apps. That's a good thing, and will make your users easily able to use your app.

⌄ iOS

Themes

Mac Catalyst

Interface Essentials

› App Architecture

› User Interaction

› System Capabilities

› Visual Design

› Icons and Images

› Bars

› Views

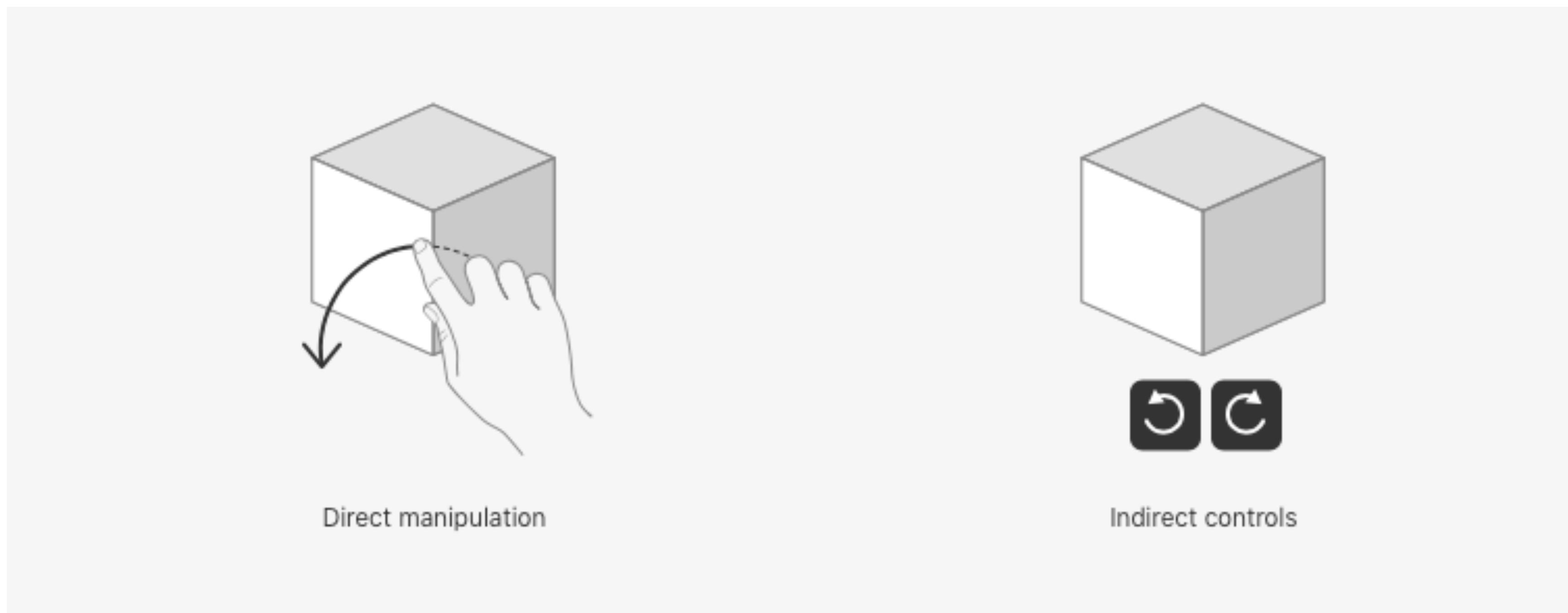
› Controls

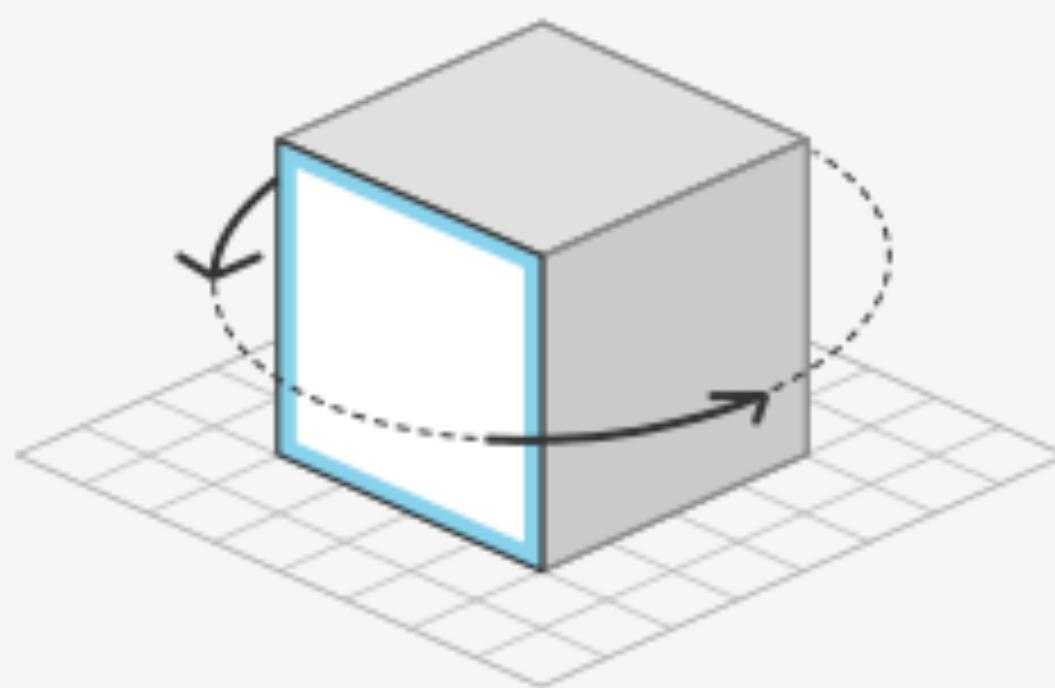
› Extensions

<https://developer.apple.com/design/human-interface-guidelines/ios/overview/themes/>

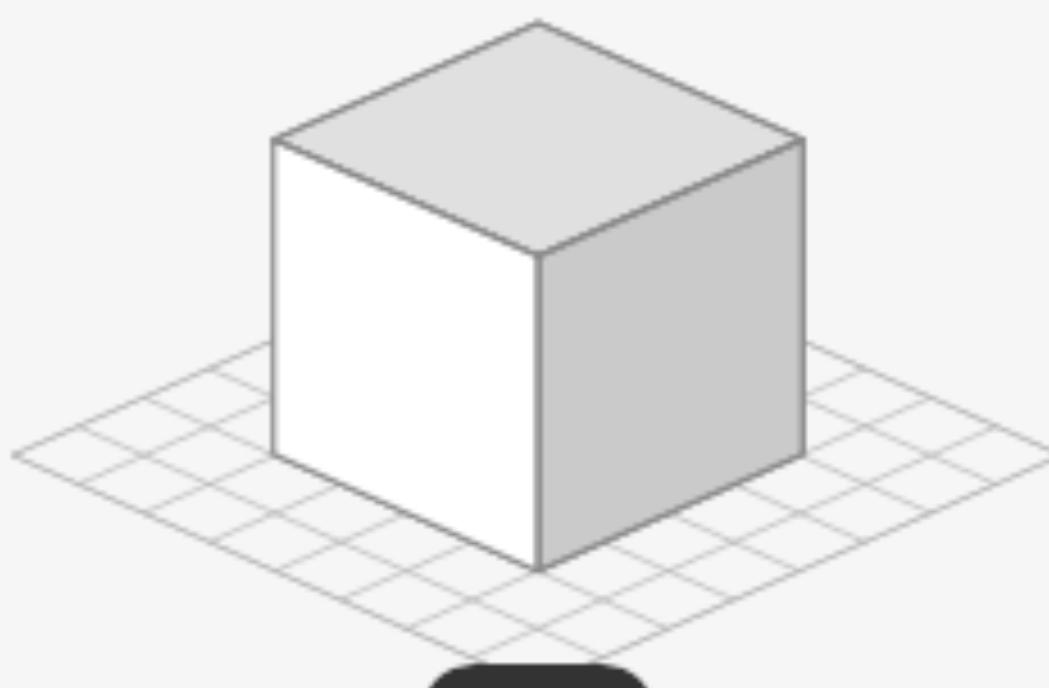
The best of HIGs

- Augmented Reality
 - <https://developer.apple.com/design/human-interface-guidelines/ios/system-capabilities/augmented-reality/>

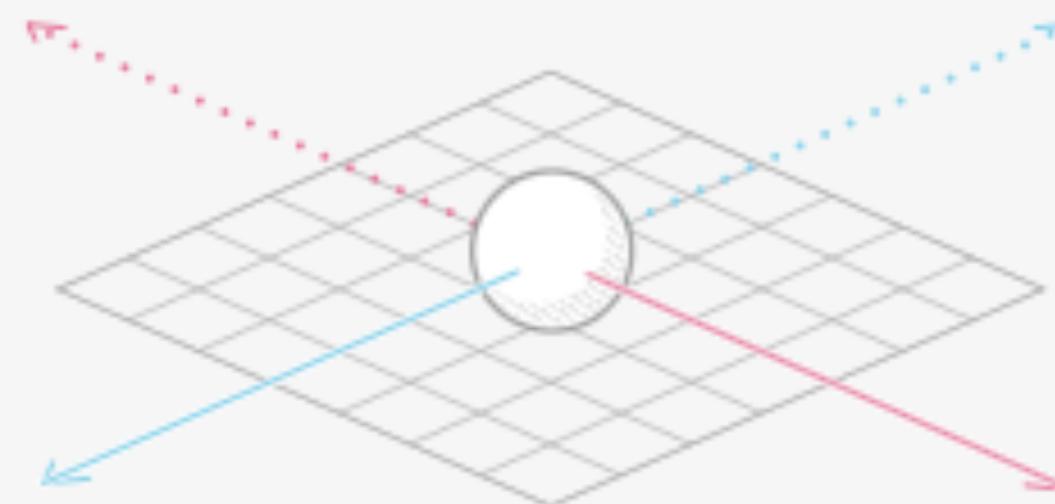




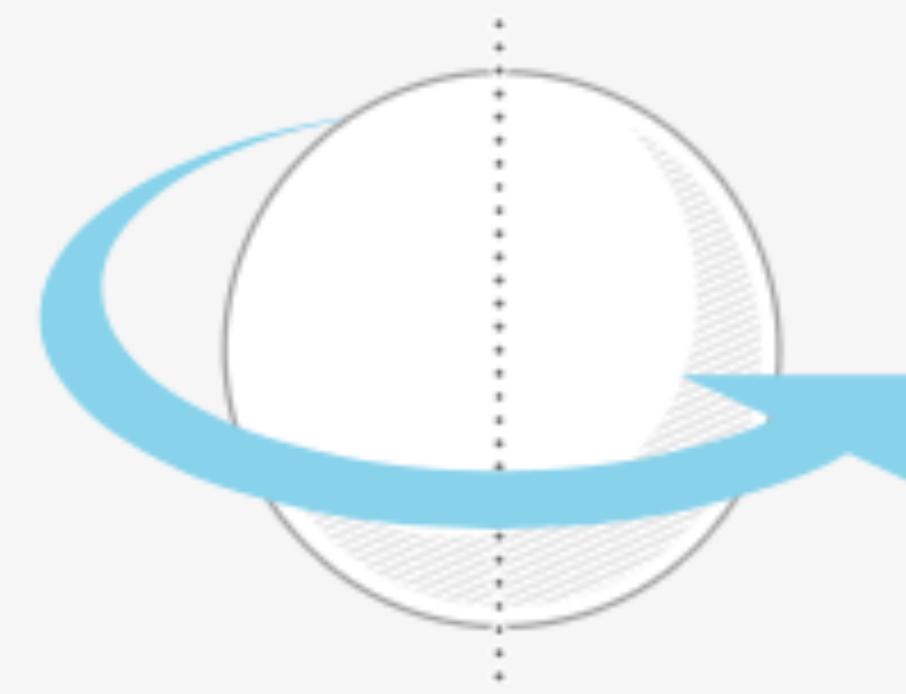
Prefer a 3D hint in a 3D context.



If necessary, use a 2D hint in a 3D context.



Limit movement to the two-dimensional surface on which the object rests.



Limit object rotation to a single axis.

Other interesting pages

- Haptics
- Ratings and Reviews
- Navigation
 - **If you only read one — make it this one.**
- Color

“People tend to be unaware of an app’s navigation until it doesn’t meet their expectations. Your job is to implement navigation in a way that supports the structure and purpose of your app without calling attention to itself.”

Other interesting pages

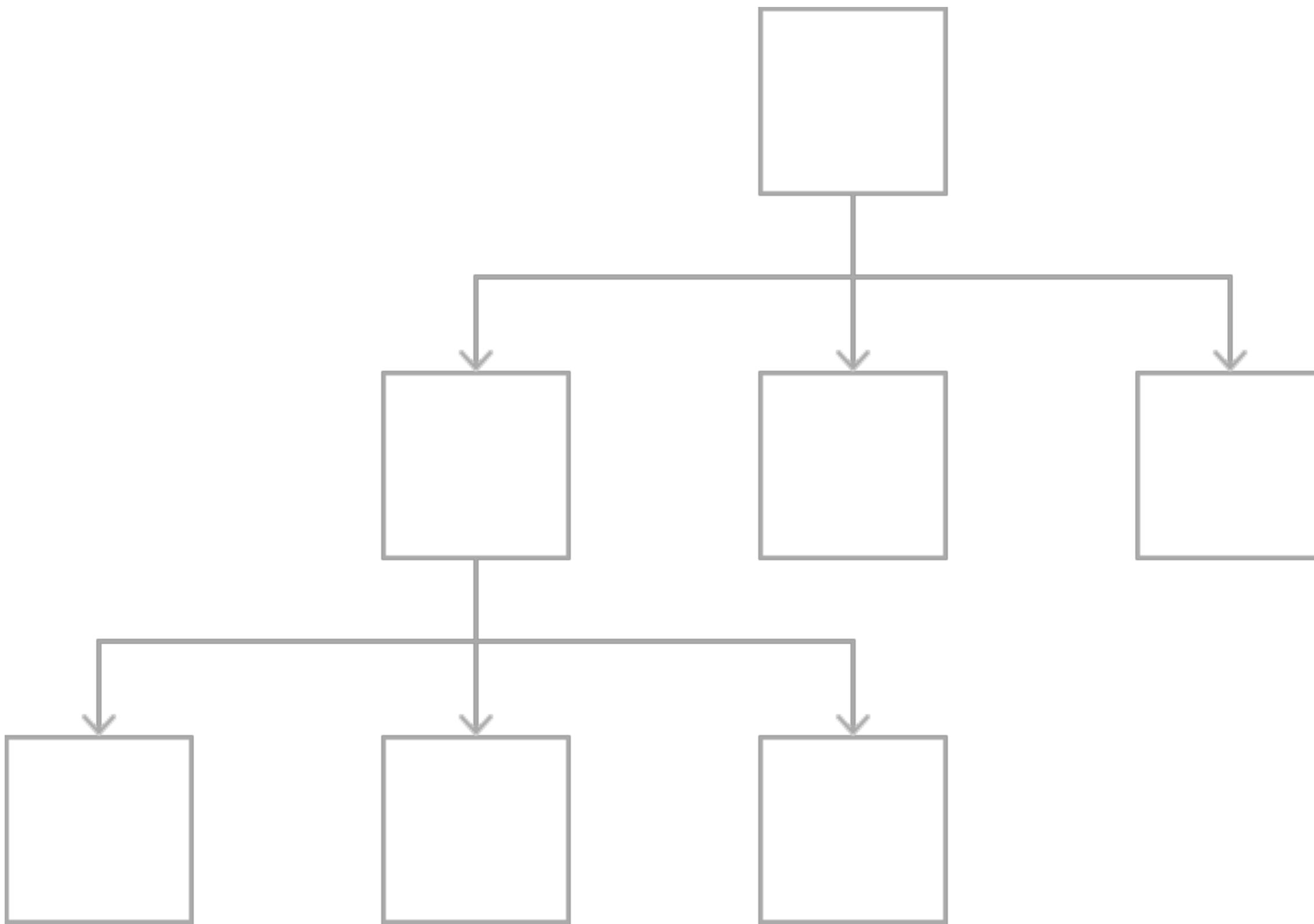
- Haptics
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“People tend to be unaware of an app’s navigation until it doesn’t meet their expectations. Your job is to implement navigation in a way that supports the structure and purpose of your app without calling attention to itself.”



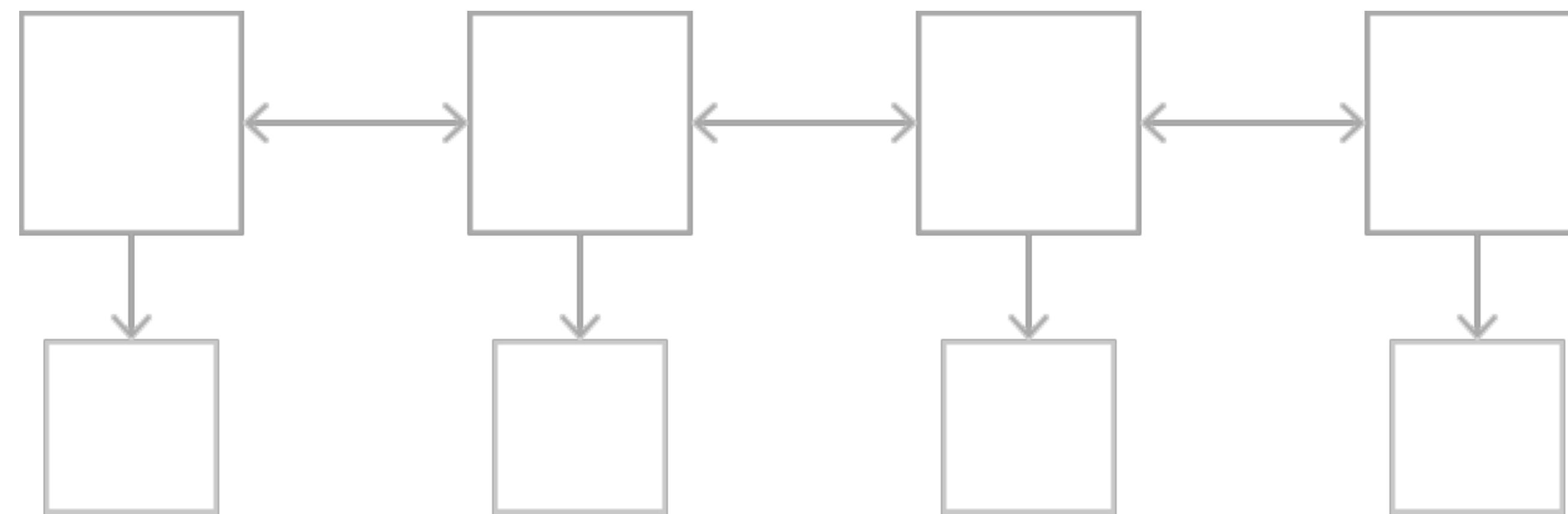
Navigation Design

<https://developer.apple.com/design/human-interface-guidelines/ios/app-architecture/navigation/>



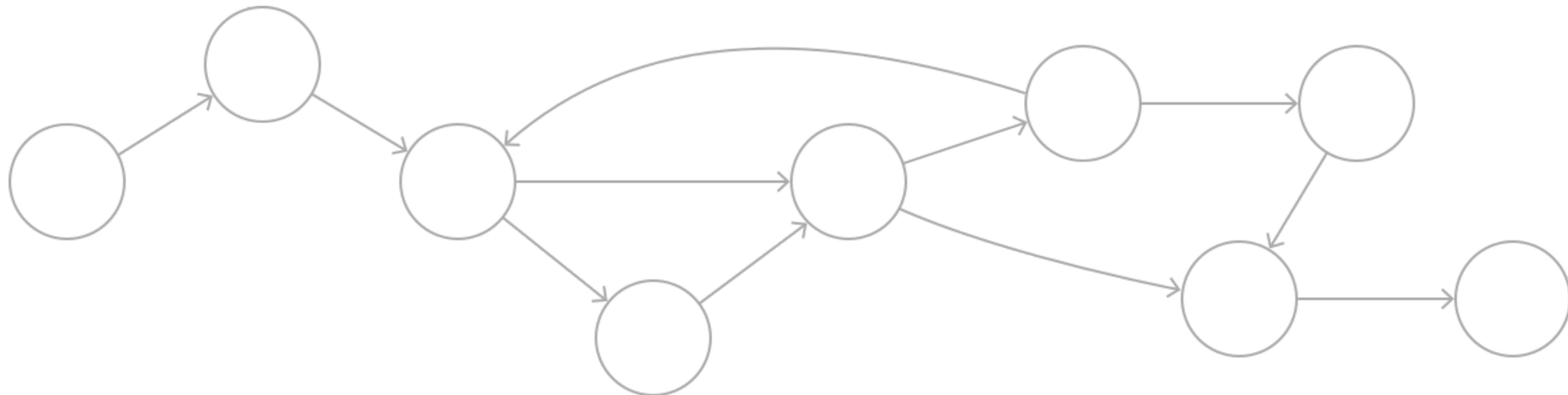
Hierarchical Navigation

Ex. Email, Settings, National Parks app



Flat Navigation

Ex. App Store, Facebook, Twitter, Clock



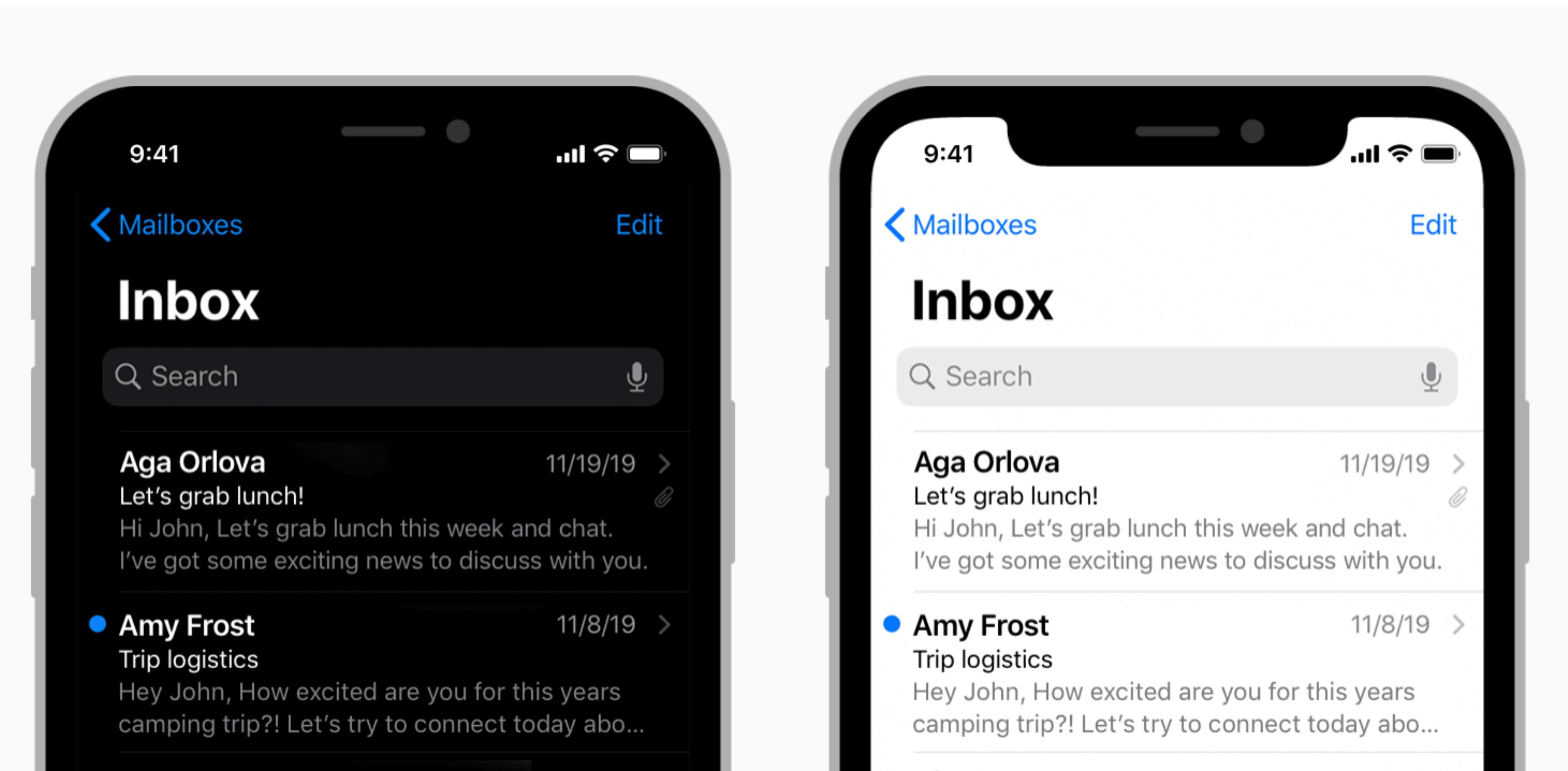
Content-Driven Navigation

Ex. Games, Books, “Experiences”



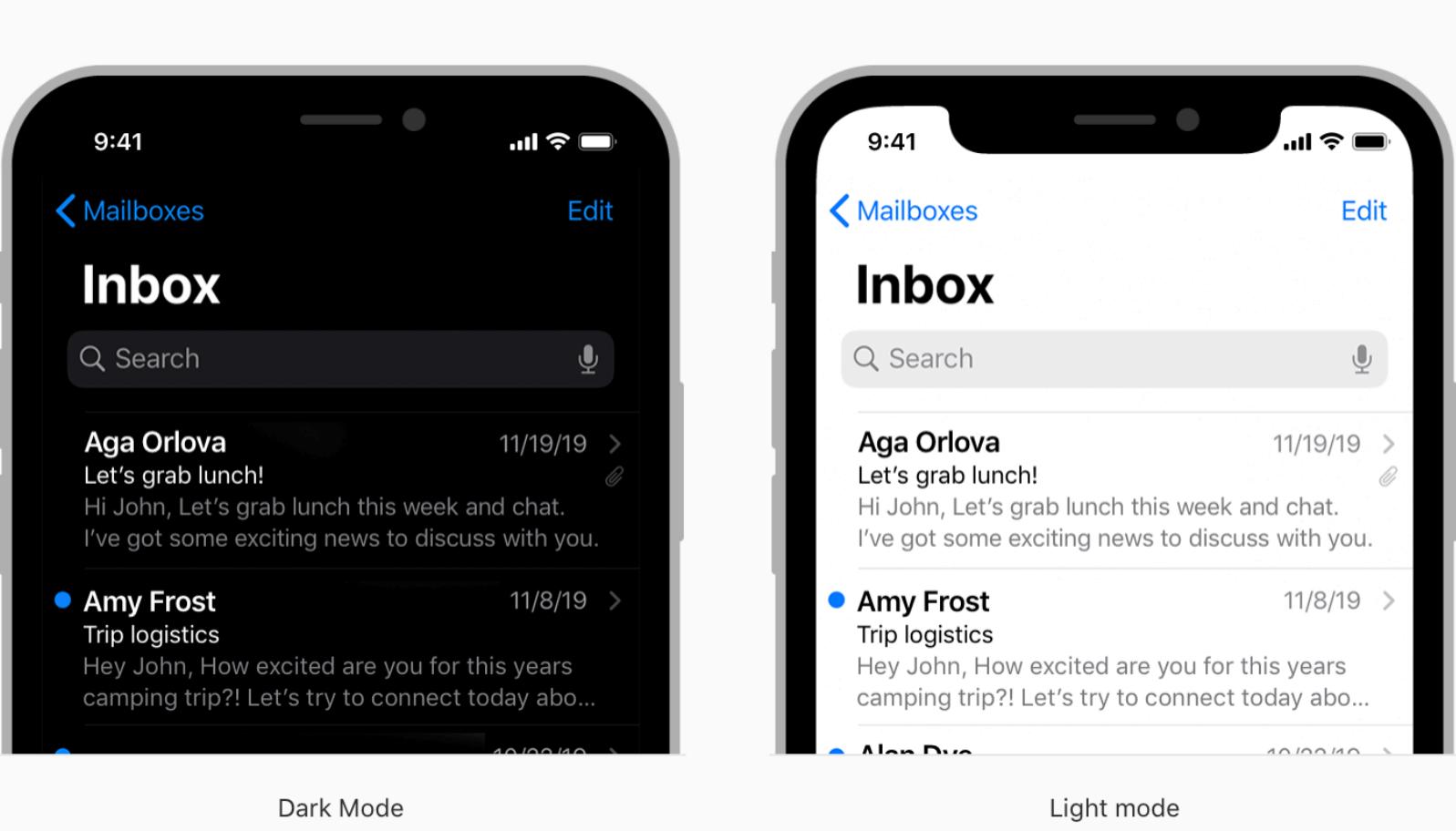
Color

<https://developer.apple.com/design/human-interface-guidelines/ios/visual-design/color>



Dark Mode

Light mode



label

secondaryLabel

tertiaryLabel

quaternaryLabel

Base

label

secondaryLabel

tertiaryLabel

quaternaryLabel

Elevated

label

secondaryLabel

tertiaryLabel

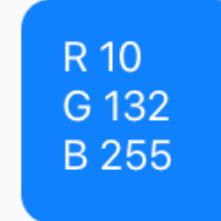
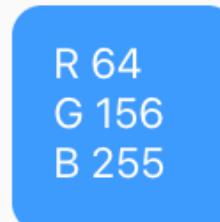
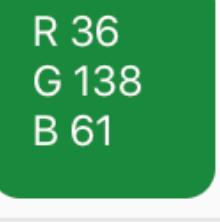
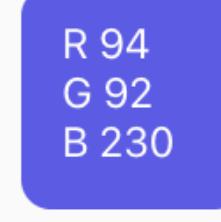
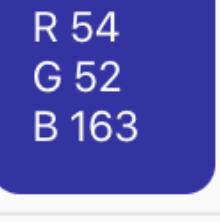
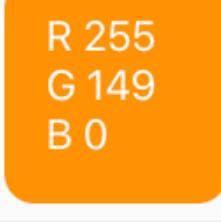
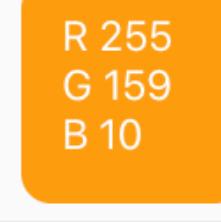
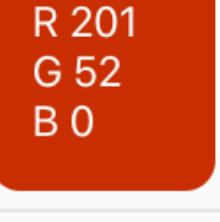
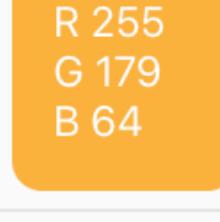
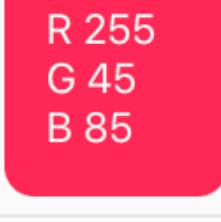
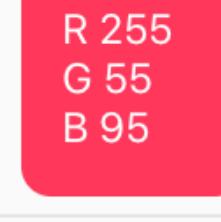
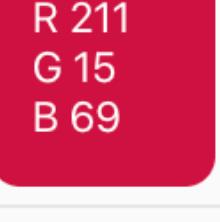
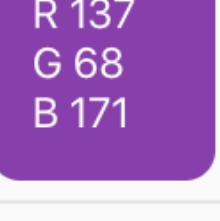
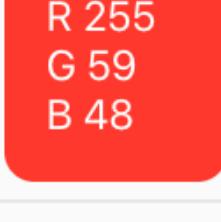
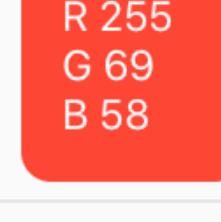
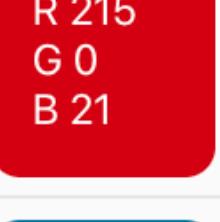
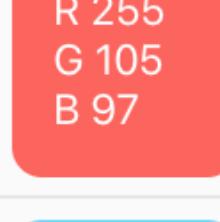
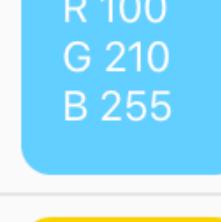
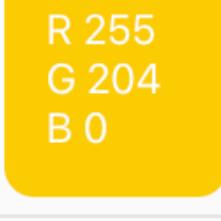
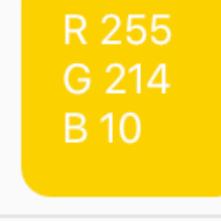
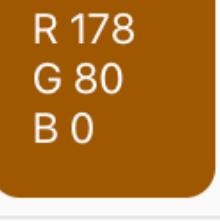
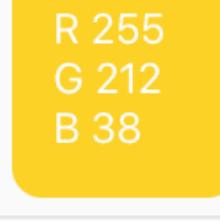
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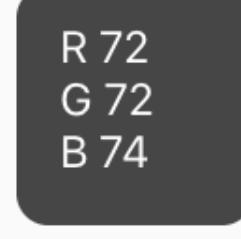
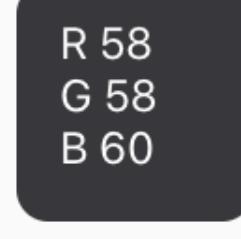
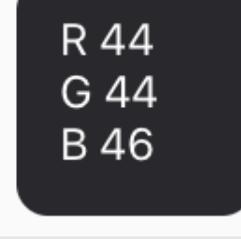
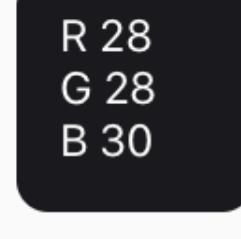
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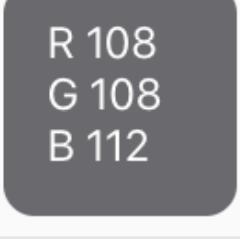
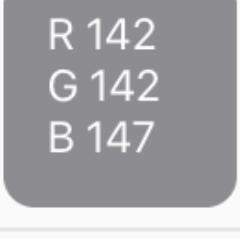
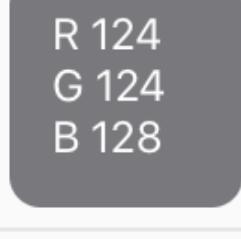
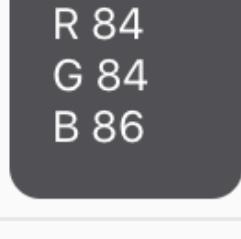
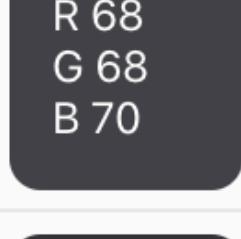
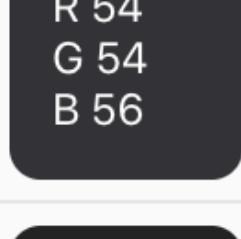
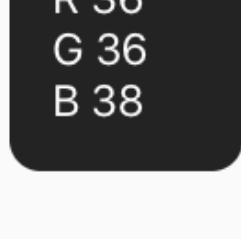
Accessible

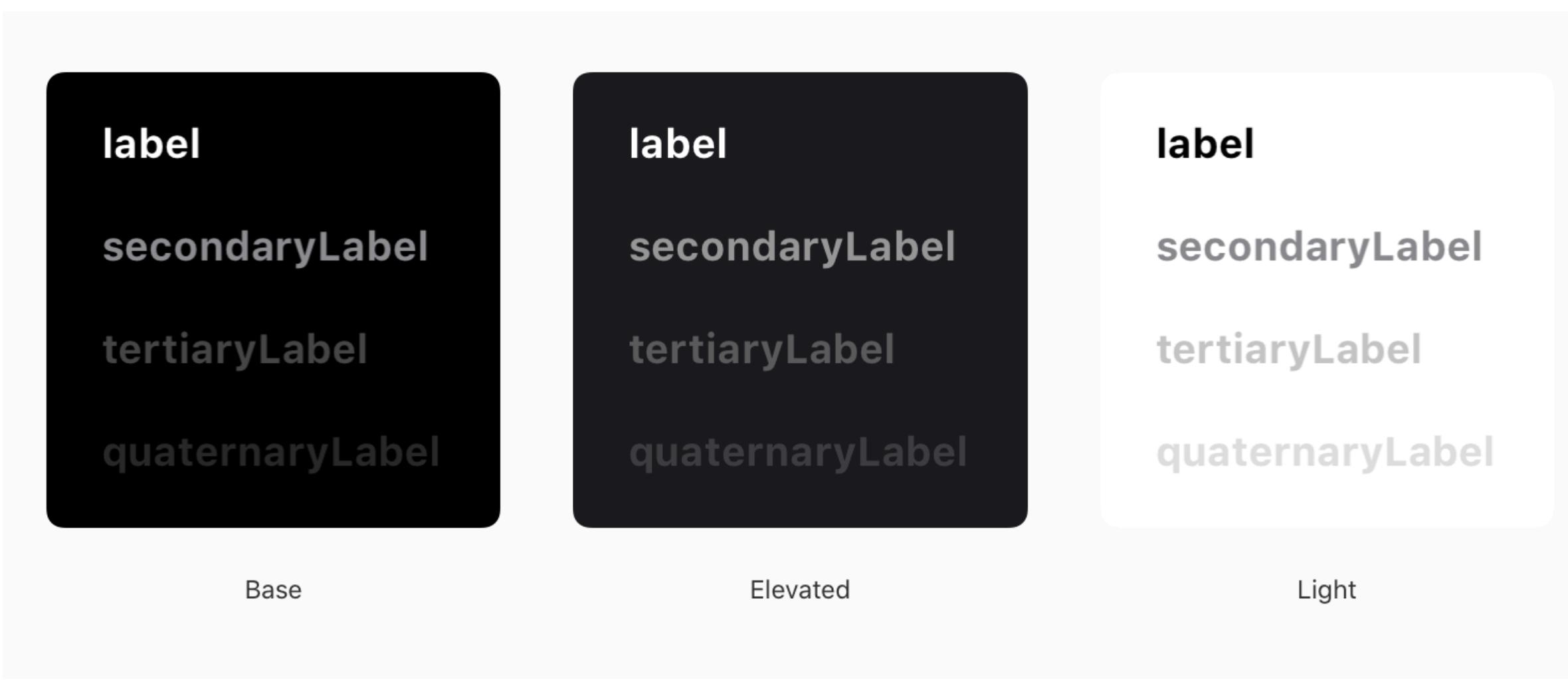
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| Default | | | | Accessible | | | |
|--|--|--------|--------------|--|---|--------|--------------|
| Light | Dark | Name | API | Light | Dark | Name | API |
|  R 0 G 122 B 255 |  R 10 G 132 B 255 | Blue | systemBlue |  R 0 G 64 B 221 |  R 64 G 156 B 255 | Blue | systemBlue |
|  R 52 G 199 B 89 |  R 48 G 209 B 88 | Green | systemGreen |  R 36 G 138 B 61 |  R 48 G 219 B 91 | Green | systemGreen |
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|  R 255 G 45 B 85 |  R 255 G 55 B 95 | Pink | systemPink |  R 211 G 15 B 69 |  R 255 G 100 B 130 | Pink | systemPink |
|  R 175 G 82 B 222 |  R 191 G 90 B 242 | Purple | systemPurple |  R 137 G 68 B 171 |  R 218 G 143 B 255 | Purple | systemPurple |
|  R 255 G 59 B 48 |  R 255 G 69 B 58 | Red | systemRed |  R 215 G 0 B 21 |  R 255 G 105 B 97 | Red | systemRed |
|  R 90 G 200 B 250 |  R 100 G 210 B 255 | Teal | systemTeal |  R 0 G 113 B 164 |  R 112 G 215 B 255 | Teal | systemTeal |
|  R 255 G 204 B 0 |  R 255 G 214 B 10 | Yellow | systemYellow |  R 178 G 80 B 0 |  R 255 G 212 B 38 | Yellow | systemYellow |

| Light | Dark | Name | API |
|-------------------------|-------------------------|----------|-----------------------------|
| R 142 G 142 B 147 | R 142 G 142 B 147 | Gray | systemGray |
| R 174 G 174 B 178 | R 99 G 99 B 102 | Gray (2) | systemGray2 |
| R 199 G 199 B 204 | R 72 G 72 B 74 | Gray (3) | systemGray3 |
| R 209 G 209 B 214 | R 58 G 58 B 60 | Gray (4) | systemGray4 |
| R 229 G 229 B 234 | R 44 G 44 B 46 | Gray (5) | systemGray5 |
| R 242 G 242 B 247 | R 28 G 28 B 30 | Gray (6) | systemGray6 |

| | | Default | Accessible | |
|---|---|----------|-----------------------------|--|
| Light | Dark | Name | API | |
|  |  | Gray | systemGray | |
|  |  | Gray (2) | systemGray2 | |
|  |  | Gray (3) | systemGray3 | |
|  |  | Gray (4) | systemGray4 | |
|  |  | Gray (5) | systemGray5 | |
|  |  | Gray (6) | systemGray6 | |

| | | Default | Accessible | |
|---|---|----------|-----------------------------|--|
| Light | Dark | Name | API | |
|  |  | Gray | systemGray | |
|  |  | Gray (2) | systemGray2 | |
|  |  | Gray (3) | systemGray3 | |
|  |  | Gray (4) | systemGray4 | |
|  |  | Gray (5) | systemGray5 | |
|  |  | Gray (6) | systemGray6 | |



| Color | Used for | API |
|------------------|--|---------------------------------|
| Label | A text label that contains primary content. | label |
| Secondary label | A text label that contains secondary content. | secondaryLabel |
| Tertiary label | A text label that contains tertiary content. | tertiaryLabel |
| Quaternary label | A text label that contains quaternary content. | quaternaryLabel |
| Placeholder text | Placeholder text in controls or text views. | placeholderText |
| Separator | A separator that allows some underlying content to be visible. | separator |
| Opaque separator | A separator that doesn't allow any underlying content to be visible. | opaqueSeparator |
| Link | Text that functions as a link. | link |

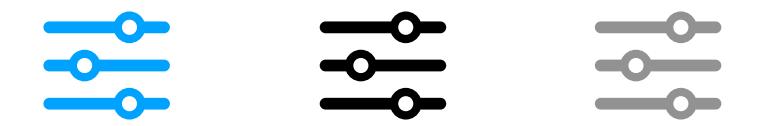
HIGs Excerpts

- Use color sparingly for communications
 - Colors are more effective when used only when needed (buttons are colored, but text is black)
- Choose a limited color palette that coordinates with your app brand
- Use a *tint color* to indicate interactivity throughout your app
 - Avoid using the same color for interactive & non-interactive elements
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HIGs Excerpts

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 - Colors are more effective when used only when needed
(buttons are colored, but text is black)
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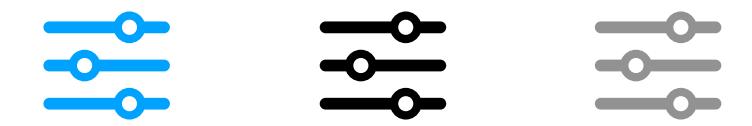
I Look Tappable I Don't



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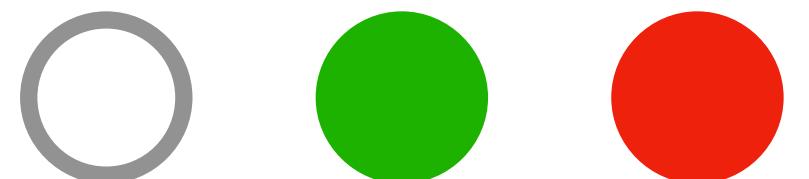
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Blue body text here would be confusing, and should be avoided. That's because we're using the Tint color for both interactive and non-interactive elements.

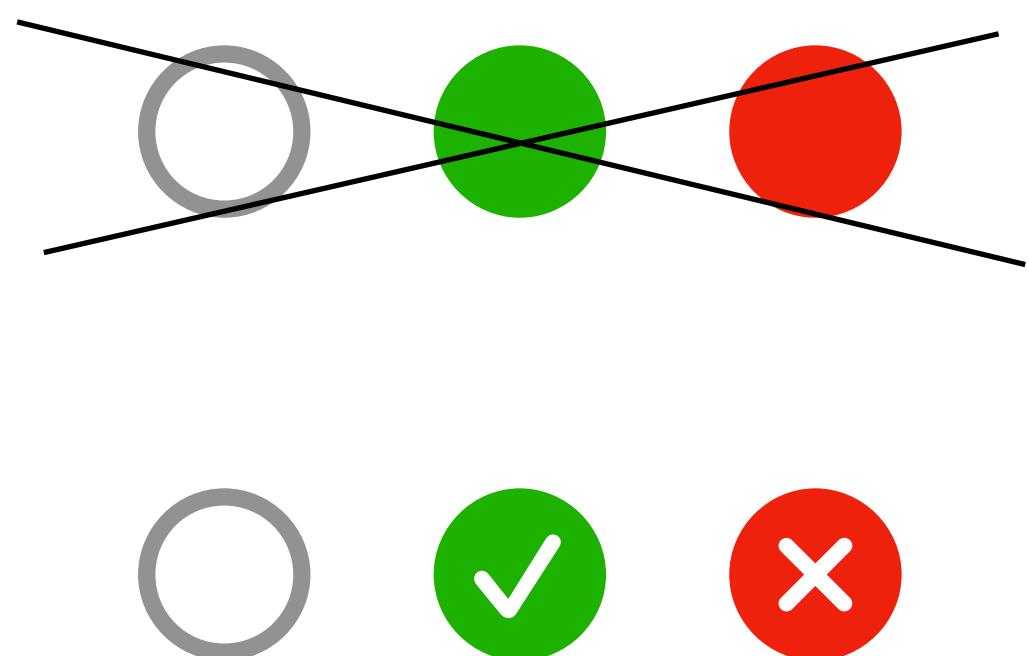
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Final Project Ideas

General Advice

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 - Try to build your features in a “modular” way
 - I'd rather see 3 features fully completed, than 5 half-done features
 - If you're using local storage, try to use UserDefaults

Student Ideas

"I found an api that has a bunch of recipes. ...the user could choose choose a few things they have in their kitchen, and the app would give options about what you could make. The user would be able to save their favorite recipes and I could add a map to show where the recipe was from."

"A yelp for bathrooms mixed with Waze for real-time crowdsourced data on bathroom states Will help people with disabilities and people who are displaced to find bathrooms. Will help the average person in need of a bathroom in a place unfamiliar. Will include finding bathrooms by distance, accessibility, queue time, gender, etc"

“Location-based scavenger hunt: social game app centered around sending custom scavenger hunts to friends, where new clues/messages are unlocked upon arriving at a new location”

"Mood Board App - It's like a 1 second a day, but 1 mood board a day! Users are prompted to create their mood boards daily. Mood boards are collection of photos that the user feel describe their mood that day. Boards are put together via uploading them from their camera roll, or finding somewhere online..? Not sure on how to implement this yet."

"Use your camera to take a still photo and the app will stitch the photos together and convert it into video format. Additionally there will be a "Community" page to share videos with other users..."

*"An app that helps users remember to reply to their texts/messages, by telling users what messages they haven't replied to on Messenger/iMessage/maybe other platforms in a certain time length. **Not sure how feasible this is.**"*

“Sync your phone with others on Spotify so that they play the same song at the same time Will be used in situations when there are no speakers, just use everyone’s phones together. Will use Spotify api”

I **strongly** discourage using Spotify iOS SDK (I think the web api is okay, though).

"an app that presents books in an Instagram-like fashion. You can scroll through the feed to see books of various categories and save books you're interested in. I'd also like to let users log books they've read. (And I'm not sure how to do this) but I'd like to tailor the feed based on saved books and books users have read and enjoyed the most. "

"an app that's kind of like Forest (an app where you grow a tree that dies if you unlock your phone while the tree is growing--you set the length of time). Instead of growing a tree, my app would present the user with a book recommendation after the period ends. It would also feature some sort of goal tracking for reading, where users could try to reach some goal of number of books read."

"A construction tracker of sorts. This app would show a map of sites where there is currently construction going on, and clicking on each of those annotations would bring you to a screen that gives details of what is being built there and when it will be completed. I'm currently looking for a dataset to use..."

"Memory Map: App that has a map with all the places you've traveled to. Each pin will segue to a tableview where you will be able to input images and text(date, description, captions) describing certain memories you had at that place. "

"Homework/Class work track - keeps track of how much time spent on each class and gives analytics about classwork at end of the week (time spent, popular study times, productivity, etc.)"

“app that tracks and displays global and local coronavirus information”

Apple will not let this app onto the App Store

“interior design app that decorates a room for you using AR”

"Meeting Fine system: When2Meet. suits: performing arts group, entrepreneur team, group project, etc

- 1.Used for group discussion/group project*
- 2.input Venmo name/Paypal name, register for an account
(maybe link to venmo api)*
- 3.might link to the calendar and parse calendar content using ics*
- 4.User story: automatically fine a group member according to the extent that they are late. the total fine will be collated and calculated at the end of the project;"*

*“dog api: similar to newsfeed app but showing dogs
for sale from shelters”*

“Tinder for _____”

- many people

Due on Monday

- **Milestone 1: Text Submission**
- **Milestone 1: Code Submission**