

# Lecture 1

# Course Intro & Logistics

# Attendance + Survey

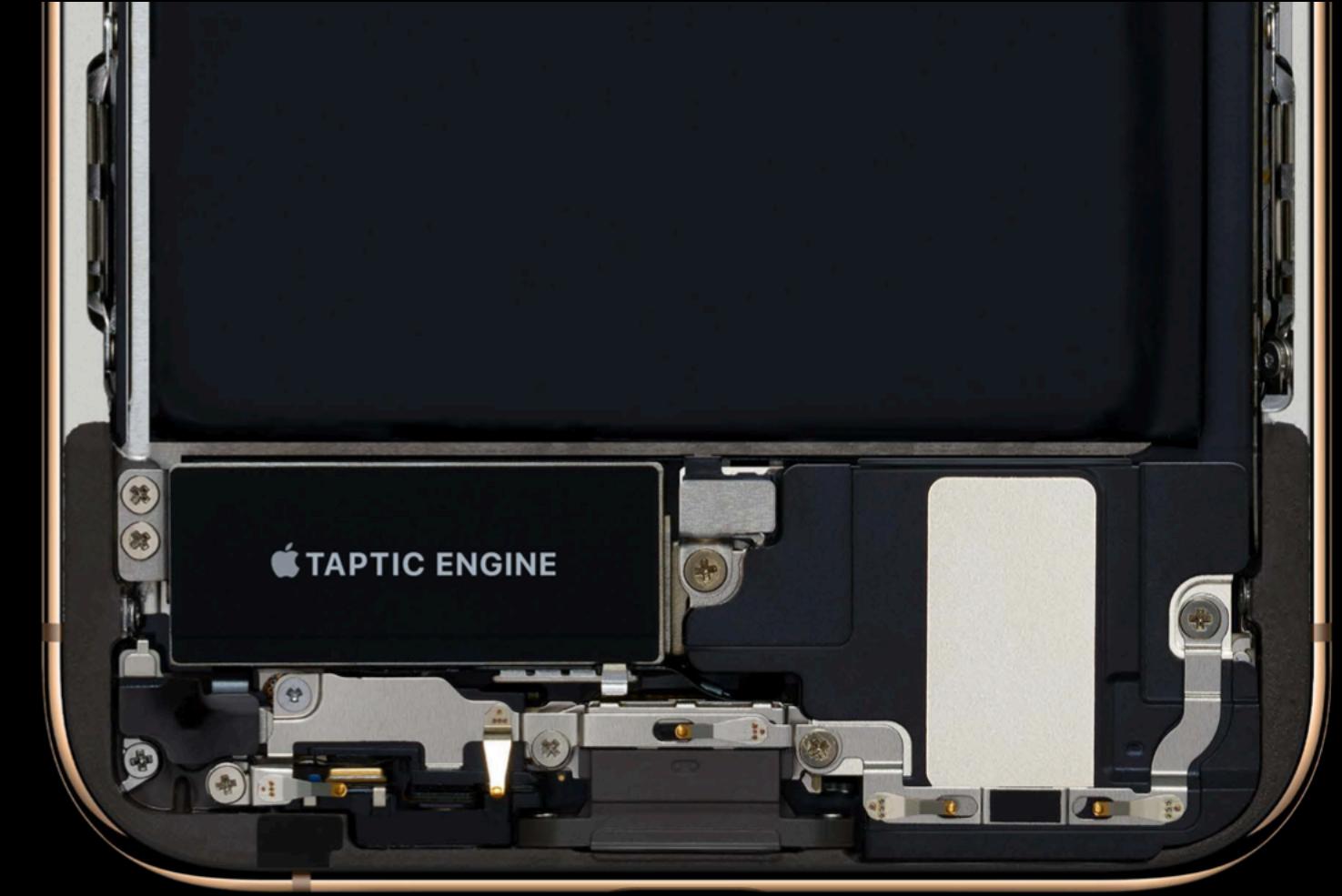
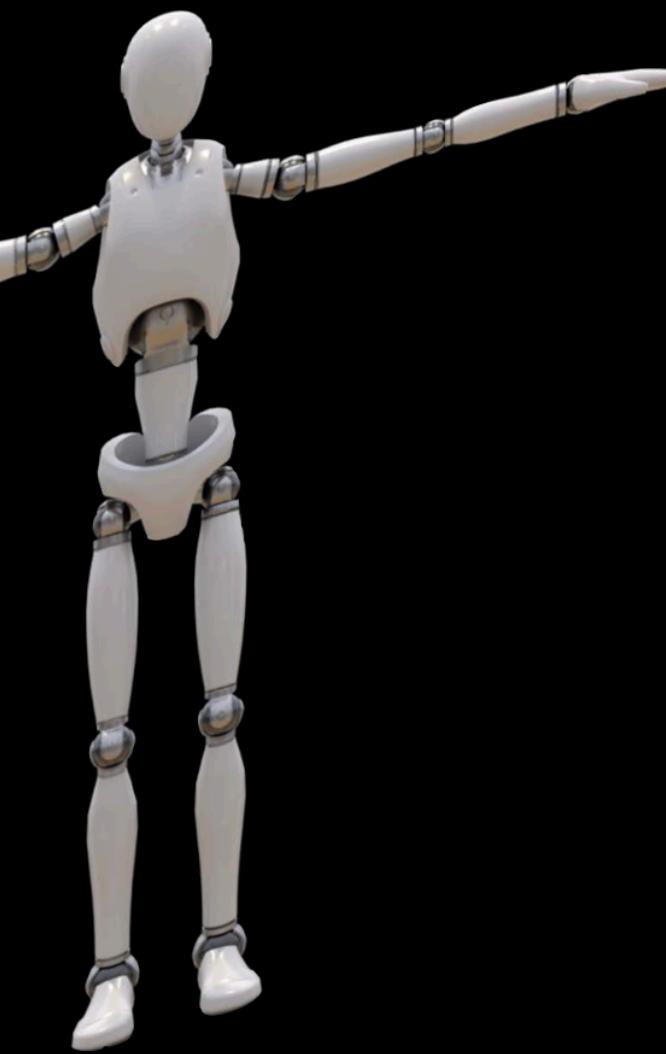
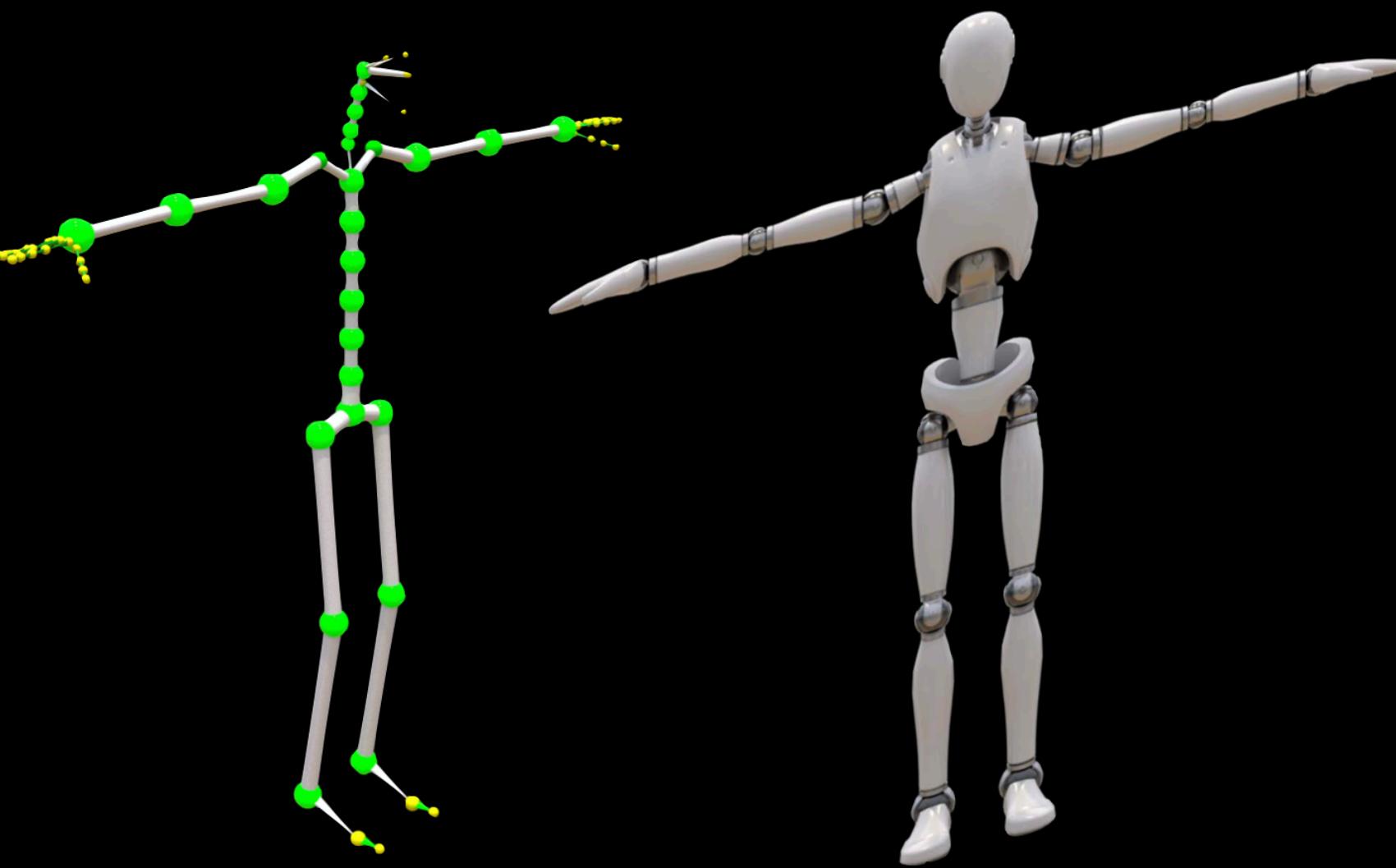
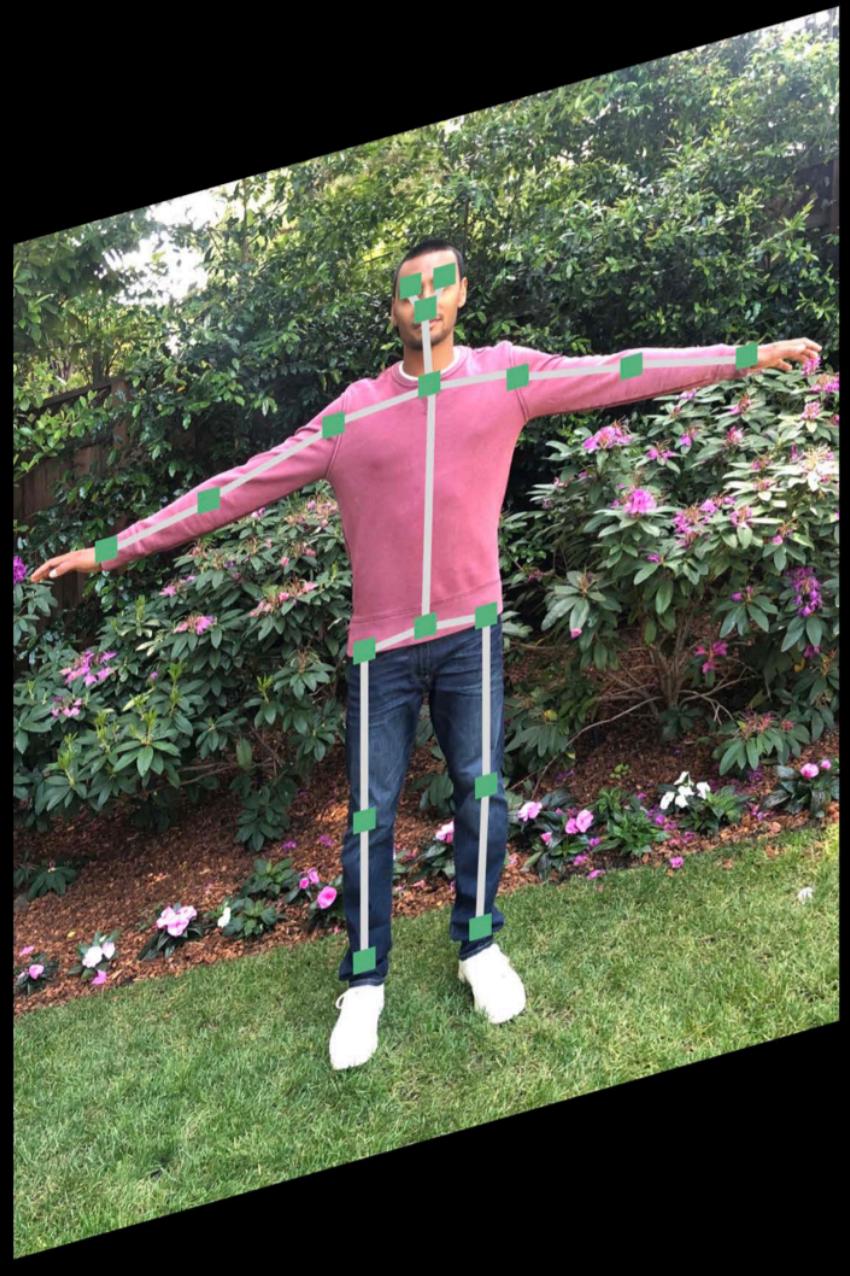
**[tiny.cc/cis195](https://tiny.cc/cis195)**

# Goals for the course

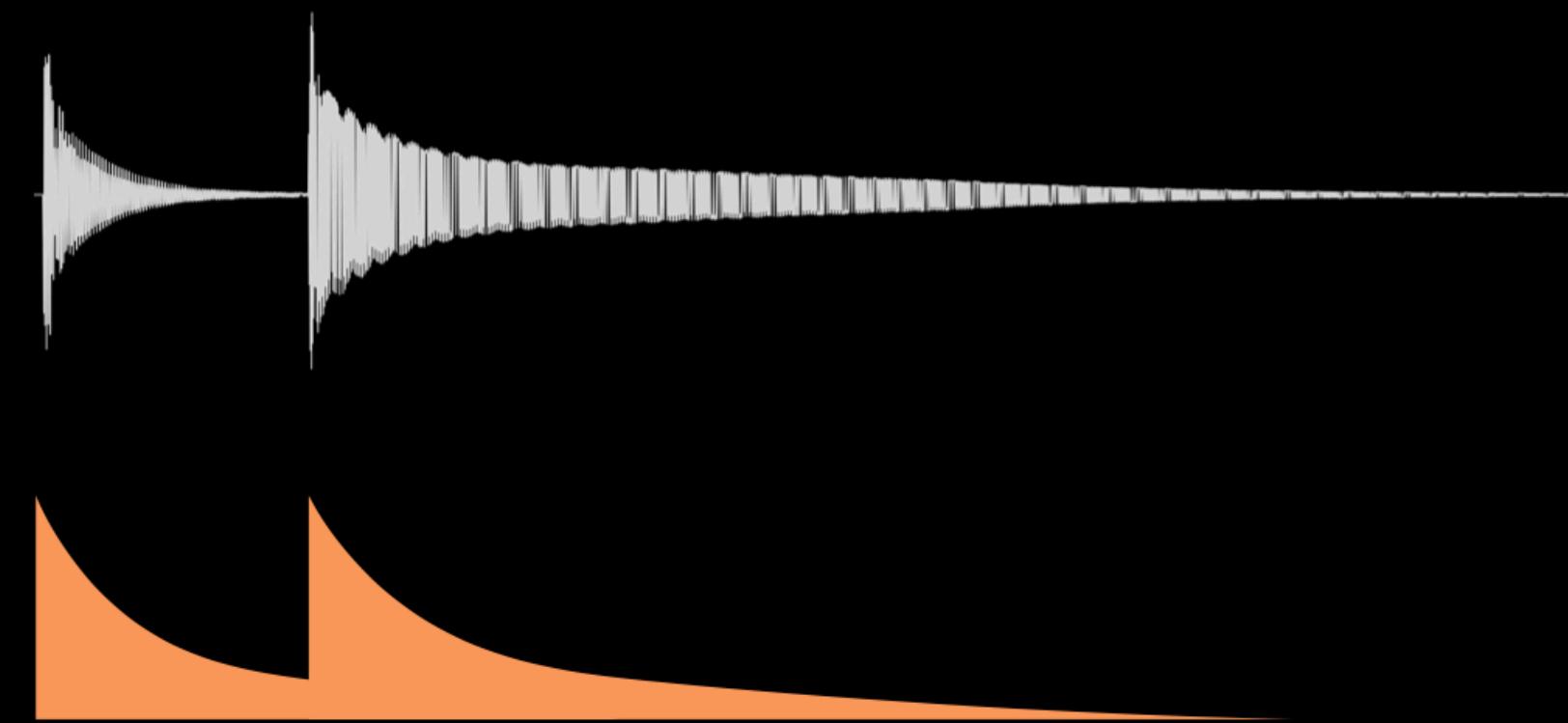
- **Make apps**
  - Learn the Swift Language
  - Learn UIKit, a UI framework for iOS
  - Get exposure to *some* SwiftUI (the brand new, kinda buggy reactive UI framework)
- *By the end: build apps with little/no direction*
- Spec, design, and build a final project

# Why iOS Development?

- Amazing language (Swift)
  - Having a renaissance right now (SwiftUI, Swift for Tensorflow, Vapor)
- Amazing tooling (XCode)
- Access to sensors, processing, and frameworks
  - GPS, compass, A13 Bionic w/ Neural Engine, camera system (w/ depth sensing), graphics and animation frameworks, “Taptic Engine”, ARKit, etc etc etc
- Build **polished, small-scale experiences**
- Valuable in the job market



Sound



Haptic





RealityKit



SceneKit



Metal

# User Interface

Accessibility

Button

Cloud Sync

Multiple

Windows

Rich Notifications

Drag & Drop

Multi-Platform

Radio Group

Switch

Digital Crown

Side Bar  
Gestures

Focus

ScrollView

Split View

Context Menus

Text Field

Layout

Slider

Lists

Modal Presentations

Interactive Animations

Dark Mode

Segmented Control

Stacks

Navigation

Undo

Alerts

Animation

Tab Bar

Pop-Up Button

Touch Bar

Stepper

Size Classes

Pull-Down Button

Menus

Checkbox

Dynamic Type

Date Picker

Multi-Device

# Prereqs

- Object oriented programming experience
  - I'll teach you how Swift is different from Java/Ruby/other — not how to program!
  - **110 required, 120 strongly recommended**
- MacBooks are *very* highly preferred
  - **Must be running MacOS Mojave 10.14.4 or Catalina. This is to run Xcode 11.3**
  - If you don't have one — you *can* use a VM (rented through the cloud). This will be frustrating & you'll be on your own support-wise. The unfortunate reality of iOS dev: it requires a Mac.

# Topics

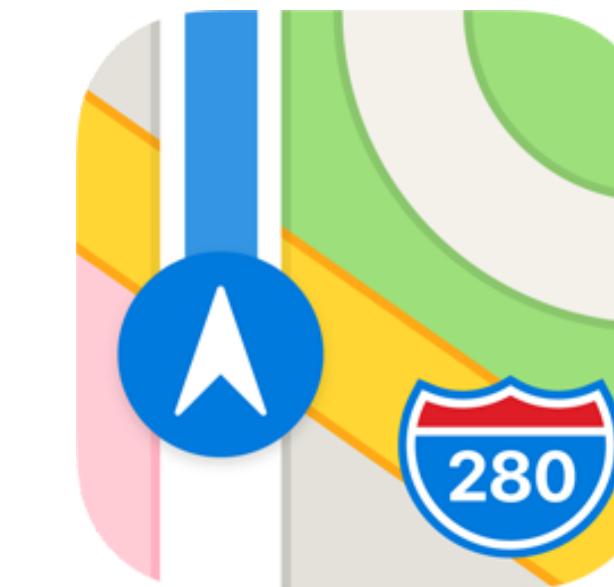
# We will learn...

- **Swift 5**
- XCode IDE
  - Simulating iOS apps
- **UIKit**
  - Protocol-based programming
  - Imperative UI
- ~~We will not be covering SwiftUI this semester! It's awesome but not quite ready for a course :)~~



# We will learn (cont.)

- View layouts and basic tools (picker, switch, button)
  - Lists and dynamic views
- Autolayout constraints
- Navigation and multi-view apps, passing data
- Data storage and persistence
- CoreLocation and MapKit
- Networking & working with APIs + the Codable protocol



# We will learn (cont. cont.)

- Firebase as an sql-less database
- The Human Interface Guidelines
  - Design conventions published by Apple
- Dark mode and accessibility
- If we have time....
  - SwiftUI (basic controls, animation)
  - Basic CoreML (machine learning)



# Course Structure

# 19x Lectures vs Recitations

- The 19x Lecture section is not related to iOS material. It covers tools useful for general development, such as Git and Bash. Common to all 19x courses.
  - The “Lecture” section meets ~3 times.
- 19x “Recitations” are where we cover iOS course material.
- **Recitations are mandatory and attendance is taken.** Lectures are not mandatory (but are very useful!)

# Spring 2020 19x Lecture Topics

- **21 Jan.** — Linux/Unix commands
- **28 Jan.** — Version control with Git + GitHub
- **4 Feb.** — HTML/CSS/Internet Basics
- These are super useful! If you don't know these topics, you should go.

# Before Class

- 60 minute readings to do on your own — **15% of grade**
  - Readings from Apple docs + write-ups from me + selected online tutorials
  - Short ~10 minute deliverables
- **Due before class each week. No late policy.**

# During Class (Recitation)

- I lecture
- I'll post lecture slides each week
  - However slides are NOT a script. If you don't come to lecture, you'll miss things :(
- Attendance taken
- **TLDR: Come to lecture, do the tutorials!**

# After Class — Make an App!

- A small app **every week** — **50% of grade**
  - Always building off tutorial & recitation content
- At first — you'll have plenty of instructions.
  - Reduced over time until you're building an app each week yourself with minimal instruction
- Why?
  - ***Cement the material from recitation, get hands-on experience, and get used to making lots of apps!***

# Advice on the weekly apps

- Take 2++ hours / week
  - Always building off tutorial & recitation content
    - If you do tutorials & absorb lecture: 2 hours
    - If you don't come / don't pay attention... more than that
  - Google and Stack Overflow: **allowed and encouraged.**
    - **Don't copy**

# Advice on the weekly apps (cont.)

- You will get stuck
  - Post on Piazza, come to Office Hours
  - Swift and UIKit can be confusing. Lots of places to get stuck — TAs can help!

# Summary — Weekly Commitment

- 1 hour tutorial before class + deliverable
- 1.5 hours of lecture
- 2++ hours for the app

# Tentative Schedule

- L 1 — Intro to Course, Intro to Swift
- L 2 — Swift and the iOS Ecosystem
- L 3 — MVC and Life Cycle\*\*
- L 4 — Table View Controller\*\*
- L 5 — Autolayout\*\*
- L 6 — Segues and Passing Data\*\*
- L 7 — Networking and Threading\*\*
- L 8 — Codable\*\*
- L 9 — Location Services\*\*
- L 10 — Firebase
- L 11 — Final Project Released\*\*
- L 12 — Bonus Topic I
- L 13 — Bonus Topic II
- L 14 — Demo Days

# Final project

- At the end of the semester, you have **3 weeks** to **build your own app**
- Come up with an original idea & use what you've learned!
  - Think of ideas throughout the course
  - *DOESN'T HAVE TO BE USEFUL.* Just has to be cool & built by you
- **30% of grade**

# Grading

# Grade breakdown

- **5%** attendance (after add/drop ends)
- **15%** tutorial deliverables
- **50%** weekly apps
- **30%** final project

# Logistics

# Office Hours

- Dominic Holmes (Instructor) — [hdominic@seas.upenn.edu](mailto:hdominic@seas.upenn.edu)
- Office hours TBA
- **Please use Piazza to contact us rather than email :)**

# App Late Policy

- Two extensions of two days each
  - After 4 days == zero.
- Applies only to apps, not tutorials
- If you use both extensions, late submissions will be deducted 10% every 24 hours.
  - After 4 days == zero.

# Tutorial Late Policy

- There isn't one 😬
  - 0% if late
- No big deal for tut 0 and tut 1 (if you join late)

# Academic Integrity

- Code of Academic Integrity
- Discuss with peers, but **work by yourself**
- Feel free to use google / stack overflow as resources!
  - But DO NOT COPY CODE. Use the ideas, don't copy.

# Canvas and Piazza

- Canvas — for submissions. Will be up tonight
- Piazza — for all Q&A, announcements, tutorials, and apps
  - If you have a private question — Piazza post >>> email
  - You'll get a faster response + my sanity preserved
  - Join at: <https://piazza.com/upenn/spring2020/cis195201>

# Waitlist

- <https://forms.cis.upenn.edu/waitlist>
- Course cap is **24** this year
  - If you're not sure about the class — please decide soon! If you have a permit but have decided against the class, ***please withdraw your permit.***
- Waitlist placement is based on **attendance**
  - Talk to me if you're on the list, but don't yet have a permit

# Due Before Next Class

- App 0: Download Xcode + Environment Setup

## Links

- Survey: [tiny.cc/cis195](http://tiny.cc/cis195)
- Piazza: <http://piazza.com/upenn/spring2020/cis195201>