CS194A

Android Programming Workshop

Lecture 1: April 8, 2020

Rahul Pandey

Outline

- Goals of CS194A
- Intros
- Course logistics
- The world of Android
- Build an app!

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- **Goals of CS194A**
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Goals of CS194A

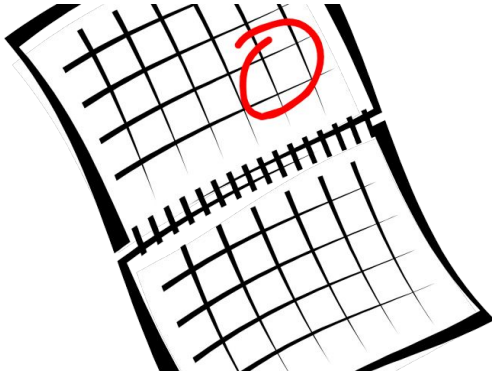
- Give you practical, hands-on experience in building Android apps
- Develop a portfolio of apps that you can show your friends, discuss in interviews, borrow for other apps, etc.
- Provide resources for you to learn more

Non-goals of CS194A

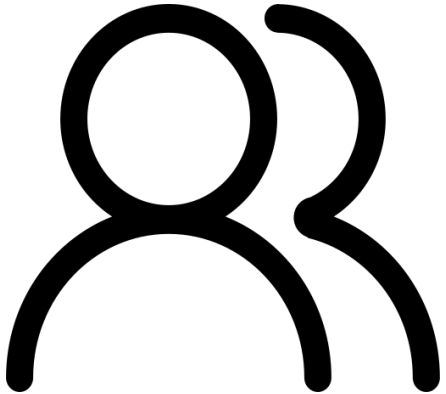
- A deep-dive of Android. Topics we're not covering:
  - Unit testing
  - App architectures
  - Games
  - Much more…
- Production-ready apps. But we won't be too far off!

Accelerate your learning

Accountability



Peer collaboration



Support structure

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Intros - Rahul

- Stanford Alum, CS section leader
- Started out as an ML engineer, then switched to Android
- Android engineer at Facebook, previously at Pinterest
- Instructor at Codepath since 2016

CODE PATH *ORG

Intros

- What are you studying?
- Where are you located?
- Android/iOS breakdown within the class
- Breakout rooms:
  - Say your name and where you grew up
  - Share one quarantine life hack you've learned
  - What are you hoping to get out of the class?

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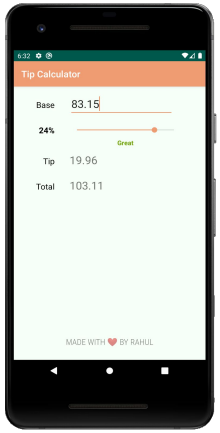
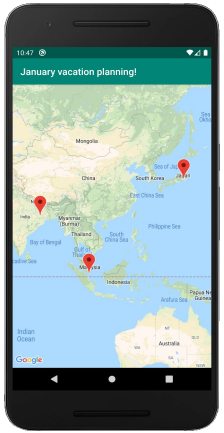
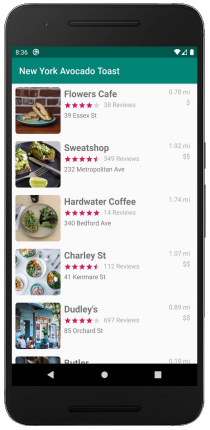
Class meetings

- **Lectures**: 4:30pm-5:50pm on Wednesdays
- **Office hours**: 1-3pm on Sundays
- Two one-off sessions (optional):
  - Android Studio shortcuts: Monday, April 13 6-7pm
  - Using Git and Github: Monday, April 20, 6-7pm







You are here

Assn 1: Tip Calculator

Assn 2: Google Maps

Assn 3: Yelp Clone

Industry panel discussion

1 2 3 4 5 6 7 8 9

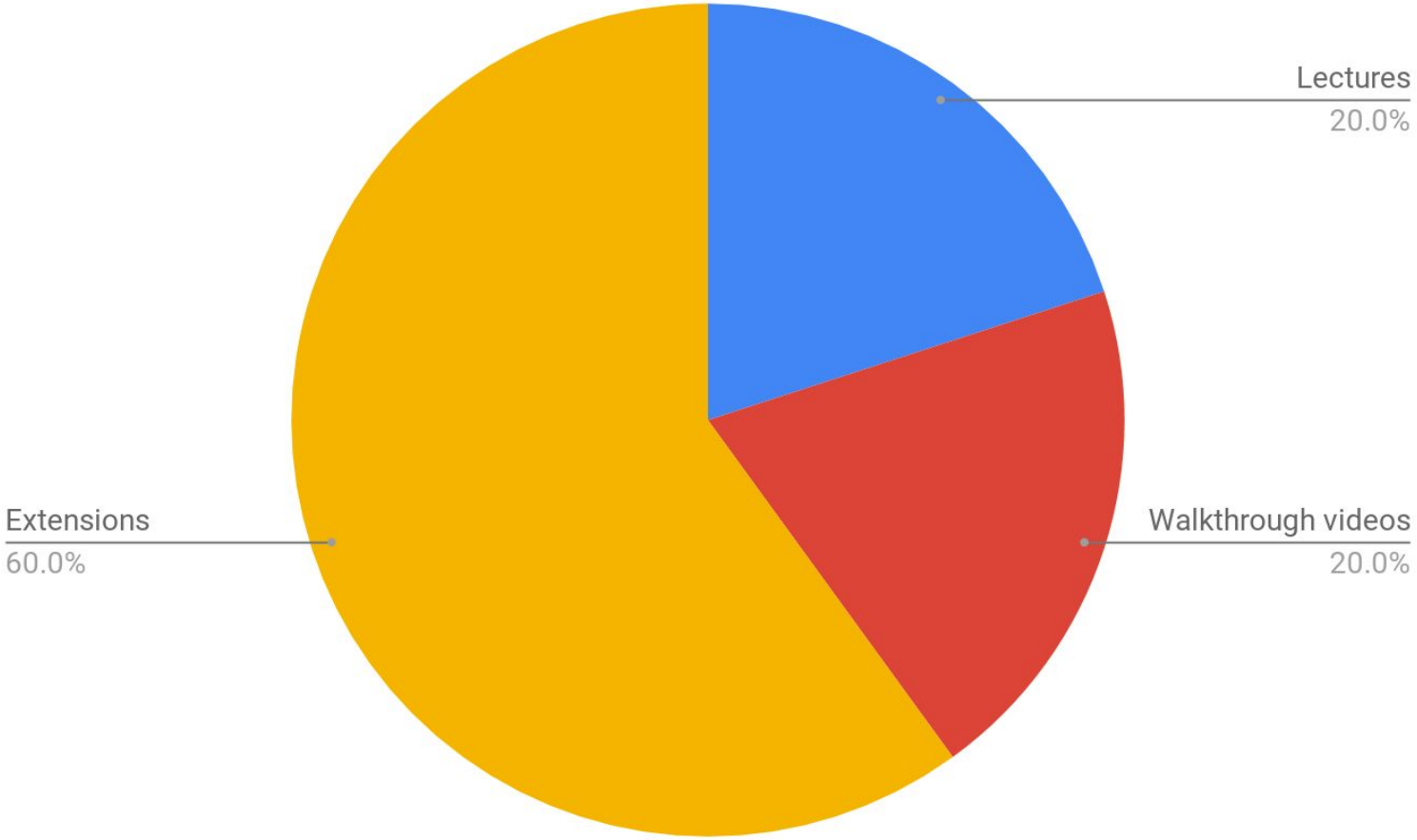
Week #

Assignments

Three parts to each assignment

1. Use the walkthrough video to complete a basic working version of the app
2. Complete ≥ 1 extension. Email the Github repo to me + your assigned partner
3. Submit project feedback for your partner (< 15 minutes)

In order to get credit, you must complete all three assignments.


Lectures
20.0%
Extensions
60.0%
Walkthrough videos
20.0%

Late submissions

Late submissions are not permitted. If you need more time, email me in advance.

Since there are only 3 assignments, and we will be doing peer reviews, it's essential that submissions happen on time.

Collaboration

- The walkthrough videos will guide you through each assignment.
- You may discuss extensions with other students and you may work together to come up with solutions.
- **Do not copy/paste code**! Neither from the walkthrough videos nor from other students.

Piazza

- Use Piazza for questions so anyone can answer and everyone benefits from the discussion.
- https://piazza.com/stanford/spring2020/cs194a/home#
- I'll generally try to respond within 24 hours

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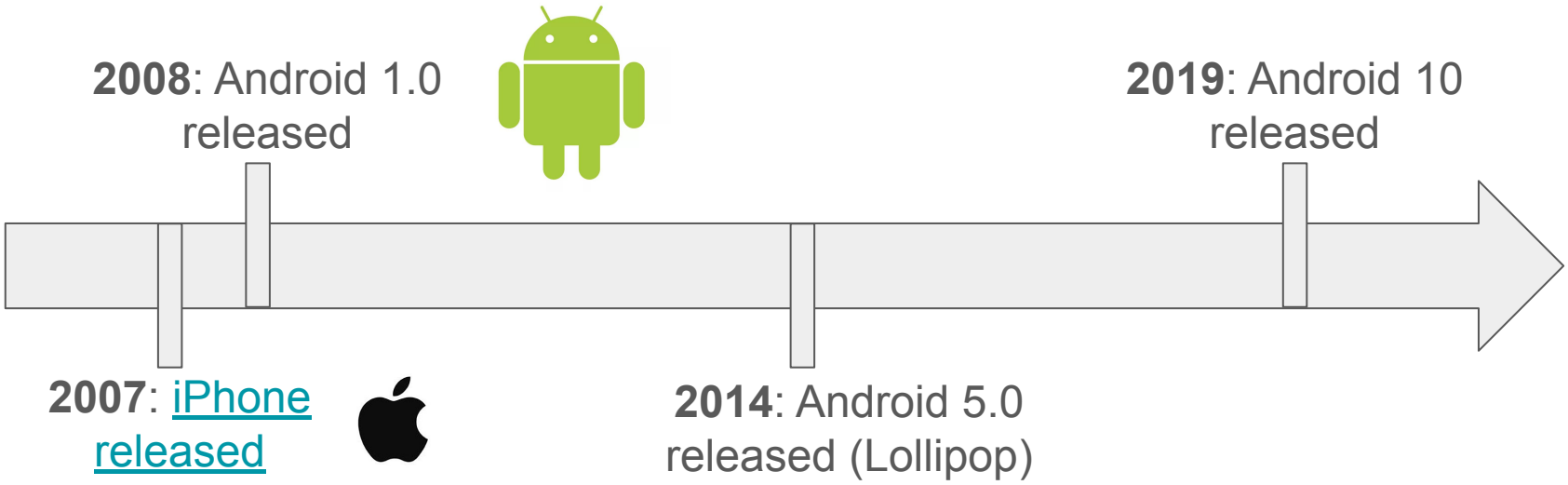
What is Android?

A mobile operating system maintained by Google:

- Open source, code is freely accessible
- Operating system based on Linux, apps written in Java/Kotlin
- More than 2 billion MAUs (monthly active users)
- Google Play Store contains 2.9 million apps

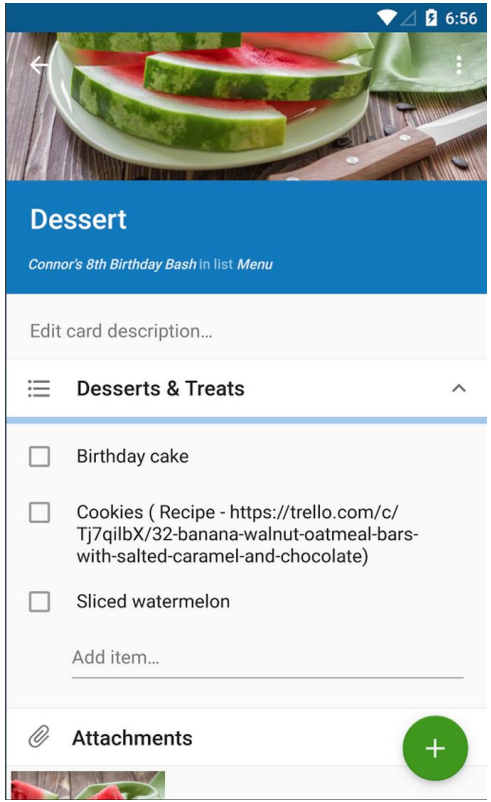
Android: the most popular OS in the world



Android: a changing ecosystem

- **2014**: Android 5.0 introduced major changes:
  - Material Design: guidance on color schemes, iconography, animations, etc
  - ART: improved runtime system, e.g. garbage collection and ahead of time (AOT) compilation

- Flagship phones introduced in recent years (Samsung S10, Google Pixels)



A more open ecosystem

- Android TV
- Android Auto
- Wear OS
- Facebook Portal

Why you should care

- Familiarity with Android allows you to compare and contrast approaches of various platforms
- Free/cheap dev tools, easier to ship
- Many job opportunities, and more expected in the future

Do I need an Android device?

- No, the Android emulator should suffice
- Pros/cons of a physical Android device:
  - Easier to test certain features, experiment with animations
  - Easier to show off what you build
  - Need to plug phone into computer
- Fire HD 8” Tablet is $80

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How to develop Android apps?

- Java or Kotlin?
  - Both run on the JVM, Kotlin is more modern and recommended for all new apps
- Kotlin: statically typed language, interoperates with Java

Java

```
String first = "Joe";
String last = "Smith";
last += "s";
String text = "Mr. " +
last;
```

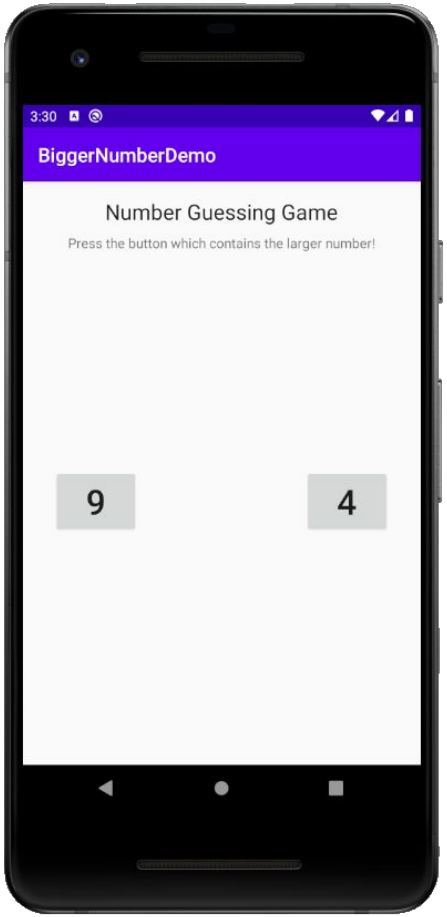
Kotlin

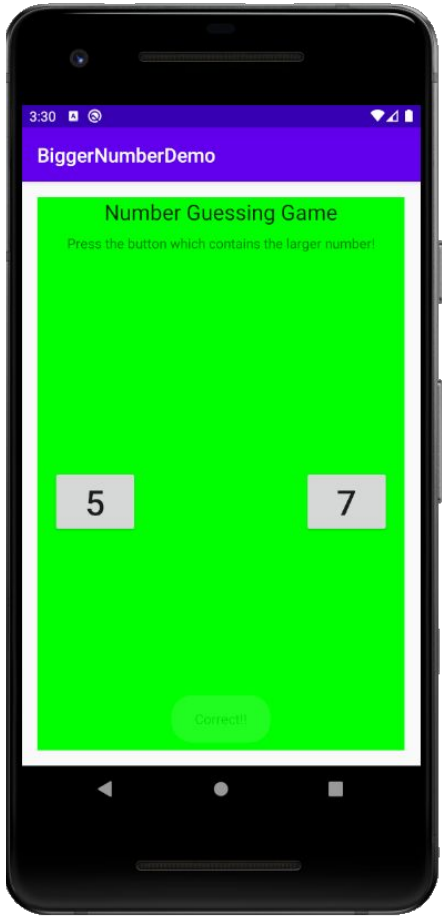
```
val first: String = "Joe"
var last = "Smith"
last += "s"
val text = "Mr. $last"
```

Let’s do a demo!

- Building a layout
- Responding to user input
- Comparison logic
- Code cleanliness

“Bigger number” game (from Marty’s class)





Prep for next week

- Go through the Android Studio video
  - Have Android Studio and an emulator setup before next week.
- (Optional) Read more about Kotlin: https://kotlinlang.org/docs/reference