



CS194A



Android Programming Workshop

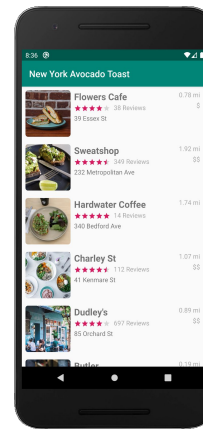
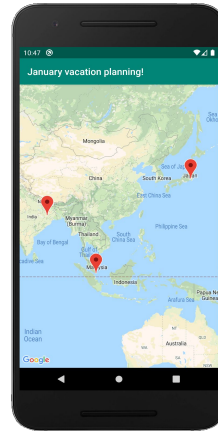
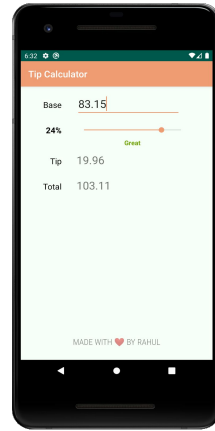
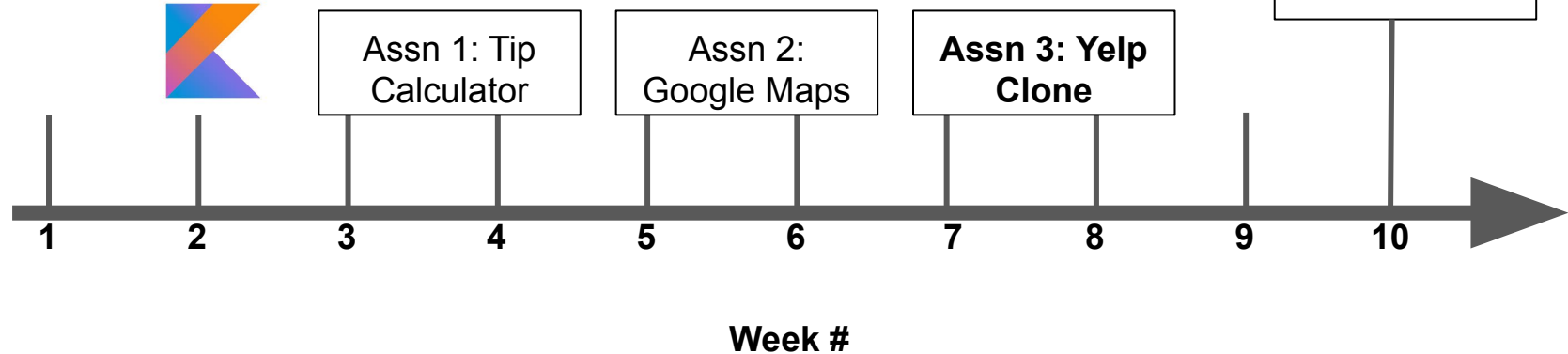
Lecture 8: November 4, 2020
Rahul Pandey

Outline

- Logistics
- Code Review Example
- Remote Databases (Firebase)

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- **Logistics**
- Code Review Example
- Remote Databases (Firebase)



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- Logistics
- **Code Review Example**
- Remote Databases (Firebase)

Code review

- Are there logic errors or edge cases that weren't considered?
 - Is the code written idiomatically so that it follows best practices for the language and can be maintained in the future?
 - Are there alternative (potentially cleaner) approaches to implementing the same functionality?
-
- Company/team socialization!

Code review- what to look for?

- Architecture review
- Tests
- Logic/functionality errors
- Complexity
- Comments
- Style

Try it out: sample [pull request](#)

Outline

- Logistics
- Code Review Example
- **Remote Databases (Firebase)**

Remote Cloud Databases

- Where does the data for your app come from?
 - Local SQLite database
 - Web API
 - Your own backend service
- Remote cloud database: combines benefits of local storage using SQLite and Web APIs



Build your own backend

- Use a technology such as Django (Python), Ruby on Rails, Node (Javascript), etc. to create your own backend, hosted on a server
- Lots of headaches, and requires expertise in various domains:
 - Redundancy/robustness: database backups
 - Scaling: what happens when your app becomes popular?
 - Security: database passwords, key rotation, etc.

BaaS = Backend as a service

- Platforms for database/service hosting, management, deployment, etc.
- Free for most student/toy projects, you only get charged for usage beyond the free tier.
- Features:
 - Easy setup and integration with mobile apps
 - Web UI to view/modify data
 - APIs to perform CRUD operations on the data
 - As a developer, you must comply with the limitations around querying

NoSQL databases

- NoSQL databases: does not use SQL to access the data, there is no strict schema
 - **Benefits:** simplicity, flexibility, “horizontal” scalability to many servers
 - **Drawbacks:** some queries are more expensive, less structure around data may lead to data inconsistency, lack of “ACID”

Firebase

- Remote database management platform, owned by Google
 - Has become more popular since Facebook stopped managing Parse
 - Incorporates many services to develop your app, grow your user base, and monetize.
 - Popular among hobbyists and for early-stage startups



Build your app



Cloud Firestore

iOS



ML Kit

iOS



Cloud Functions

iOS C++



Authentication

iOS C++



Hosting



Cloud Storage

iOS C++



Realtime Database

iOS C++



Improve app quality



Crashlytics

iOS



App Distribution

iOS



Performance Monitoring

iOS



Test Lab

iOS



Grow your business



Analytics

iOS C++



Extensions

iOS C++



Predictions

iOS C++



Firebase A/B Testing

iOS C++



Cloud Messaging

iOS C++



In-App Messaging

iOS



Remote Config

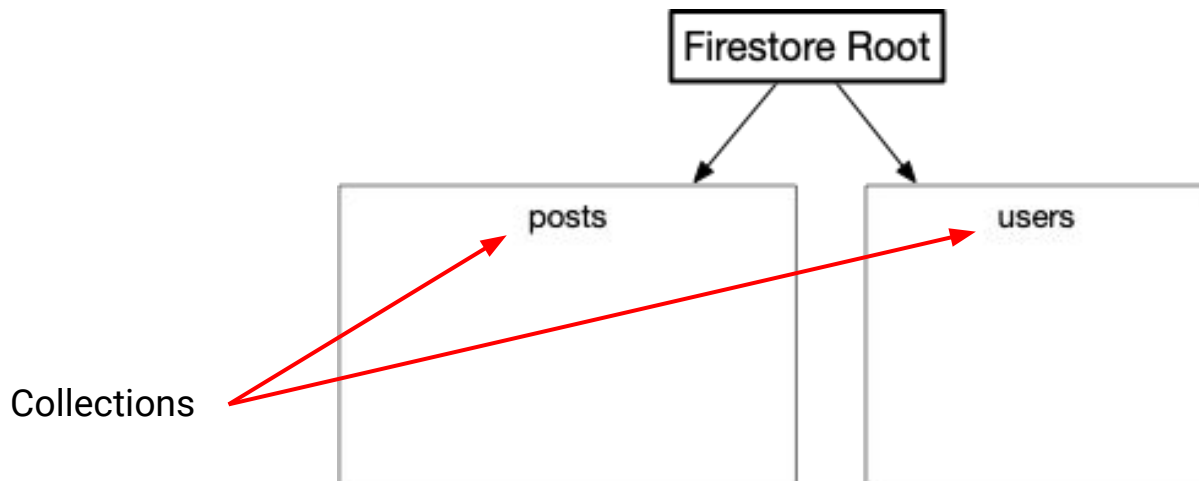
iOS C++

Firestore

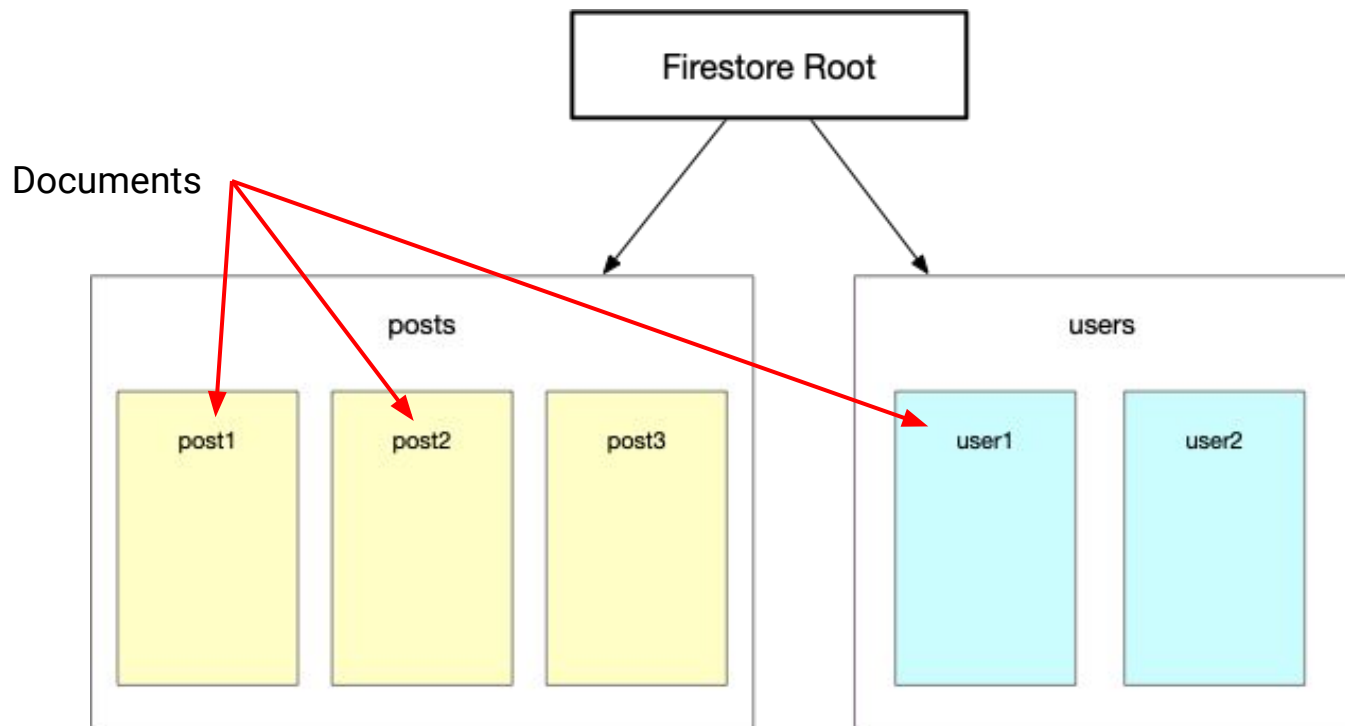
- “Flexible, scalable database for mobile, web, and server development”
- Keeps data in sync across clients through real time updates
- Automatic offline support

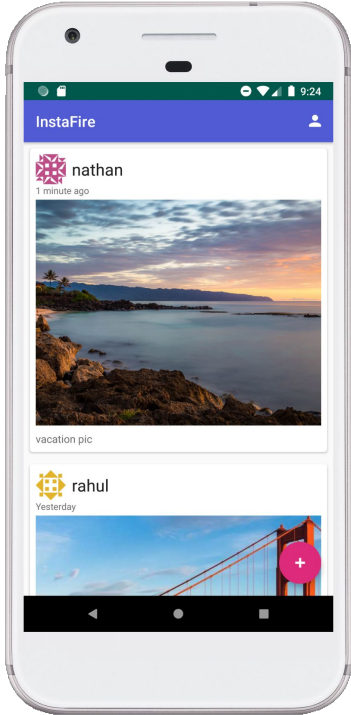
Firestore

- NoSQL cloud database to store and sync data
- Made up of documents and collections
 - Documents are like JSON objects which have fields of various types
 - Collections are a group of documents



- Documents define the attributes for that object





I want posts by all users in the
InstaFire app



- Here's a list of posts:
1. Post "vacation pic!"
 2. Post "Golden Gate"
 3.



Cloud
Firestore

Cloud Firestore

 posts  	 B1opdc3u8n8a0Cqi6ytA 
 Add document	 Start collection
B1opdc3u8n8a0Cqi6ytA  LeRGBGreNJ6EF42wqqYw UCF8r54pAs2uXdq1bWWN VIJ9Ly0kfiGLJ3xWOIKW mwu46q00Tpnufhit3MG t55wS4P4sn3rgQiz1Nyg tSE4LIXVIkzKswiUSdGd vX8qTOLyl6CBtWBg9F7s	 Add field creation_time_ms: 1584175245800 description: "lovely views :)" image_url: "https://firebasestorage.googleapis.com/v0/b/instafire-de474.appspot.com/o/images%2FgoldenGate.jpg?alt=media&token=bcf178a5-3392-4d38-ba5b-4bac9534d371"  user age: 24 username: "nathan"



posts



+ Add document

B1opdc3u8n8a0Cqi6ytA

LeRGBGreNJ6EF42wqqYw



UCF8r54pAs2uXdq1bWWN

VIJ9Ly0kfiGLJ3xW0IKW

mwu46q00Tpnufhit3MG

t55wS4P4sn3rgQizlNxc

tSE4LIXVIkzKswiUSdGd

vX8qTOLyl6CBtWBg9F7s



LeRGBGreNJ6EF42wqqYw



+ Start collection

+ Add field

creation_time_ms: 1584174995435

description: "My hipster look"

image_url: "https://firebasestorage.googleapis.com/v0/b/instafire-de474.appspot.com/o/images%2Fhipster.jpg?alt=media&token=057e03cd-99d8-4a20-9532-7d4c90d4d3fb"



user

age: 52

is_celebrity: false

username: "rahul"

Prep for next week

Optional: Go through the [Instagram clone](#) using Firebase

