

FireTweet

Android Programming Project Proposal

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Overview

FireTweet is a social media Android app that leverages Firebase backend services to manage users, authentication, and tweets (posts). Users can share text-based tweets and view a live feed of posts by other users. The app will also allow users to explore trending topics using hashtags and customize their own profile page.

Major Subsystems

1. **User Authentication:** Leveraging Firebase Authentication for user sign-up and sign-in processes.
2. **Content Management System:** Firestore will be used to store, retrieve, and manage tweets and user profiles.
3. **Tweet Feed:** A feed displaying tweets from users.
4. **Trending Topics:** Algorithmically generated view of trending hashtags.
5. **User Profile Management:** Allows users to view and edit their profile, including their posted tweets.

Major Challenges:

- **Data Management and Synchronization:** Ensure tweets are properly managed by the Firebase backend and that updates are handled correctly.
- **Scalability:** Designing the backend to efficiently handle growing data.
- **User Interface:** Creating an intuitive and responsive UI.

User Interface Sketches

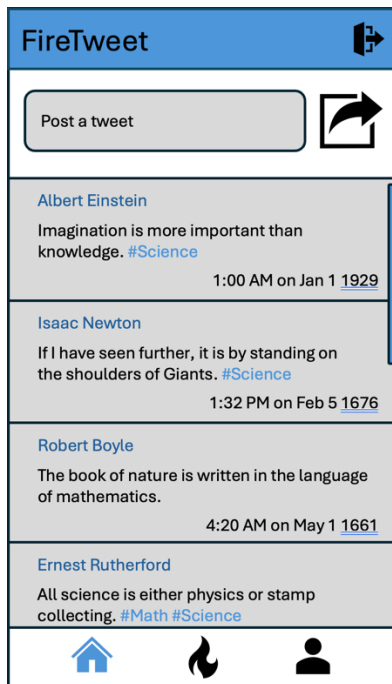


Figure 1: Feed

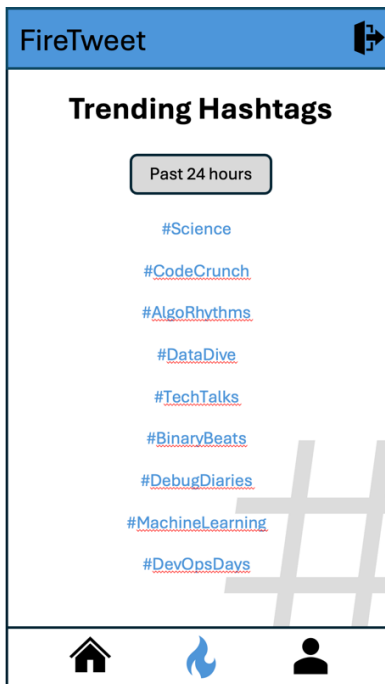


Figure 2: Trending

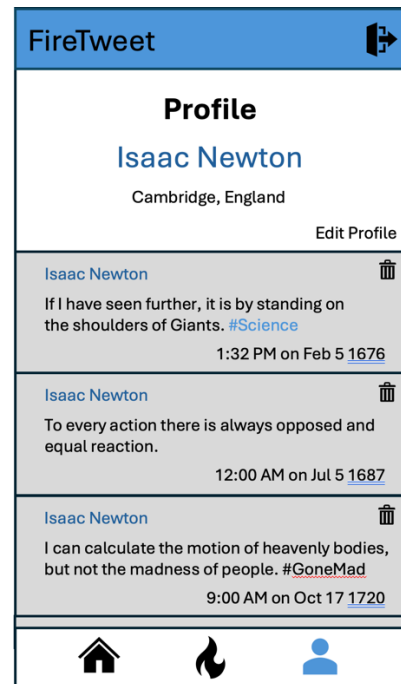


Figure 3: Profile

Kotlin and XML Files

MainActivity.kt	Orchestrates navigation between the app's primary features (feed, trending, profile)
TweetsFragment.kt	Manages posting and display of tweet feed and posting area
TrendingFragment.kt	Displays trending hashtags through Firestore queries
ProfileFragment.kt	Shows user profiles including tweet history and user info
TweetAdapter.kt	Adapter for the RecyclerView used in TweetsFragment to display tweets
FirebaseAuthHelper.kt	Manages Firebase Authentication for user sign-up, sign-in, and sign-out
FirestoreHelper.kt	Manages Firestore interactions such as posting new tweets, fetching tweets, and handling user data
User.kt	Data class representing the user details
Tweet.kt	Data class representing a tweet

activity_main.xml	Layout file for MainActivity including Navigation Host Fragment and the Bottom Navigation View
fragment_tweets.xml	Layout for TweetsFragment that displays the post tweet area and the RecyclerView for the tweets feed
fragment_trending.xml	Layout for TrendingFragment that displays trending hashtags
fragment_profile.xml	Layout for ProfileFragment that displays user info and tweets
item_tweet.xml	Layout for each item in the tweets list
bottom_nav_menu.xml	XML file for the bottom navigation menu
nav_graph.xml	Defines the navigation graph

Weekly Schedule

Week	Tasks
March 31 – April 6	Project setup, create initial UI framework, Firebase integration.
April 7 – April 13	Core components including tweet feed, posting, and user profiles.
April 14 – April 20	Trending topics component, UI polishing, testing, and debugging.
April 21 – April 22	Create the final presentation and report.

API Usage

- **Firebase Authentication API:** User sign-up, sign-in, and management.
- **Firestore Database API:** To store and retrieve tweets and user data.
- **Firebase Storage API** (Extended Goal): To incorporate media uploads in tweets.

Demo Deliverable

- A functional version of "FireTweet" that showcases user sign-up/sign-in, posting tweets, tweet feed, and trending topics. The demo will showcase multiple users, several variations of posts with hashtags, and profile editing. The demo will also show how the data is handled in real-time through Firebase.

Similar Apps and Inspiration

X/Twitter is the primary inspiration for FireTweet. The app will closely model this microblogging approach and copy functionality including trending topics and user profiles.