BU Events Planner: Project Report

Jialong Ke, Yuchen Cao, Zihan Li

App Purpose and Target Audience

The BU Events Planner was designed to enable Boston University students and staff to stay informed about campus events effortlessly. Its primary purpose is to provide a centralized platform where users can browse, register for, and track events, enhancing their university experience.

Key Features and Functionalities

- Authentication: Firebase Authentication for user registration and login, supporting email and password login and Google Sign-In integration.

- Event List and Details: Browse events with detailed information, including registration options and Google Maps integration for location details.

- Personalized Homepage: Displays past attended events, upcoming added events, and profile editing functionality.

- Image upload: User can upload their images from their phones to the Firebase Storge, and use stored image as profile photo

- Real-Time Data Sync: Firebase Firestore ensures data synchronization across devices with Room caching for offline functionality.

- Interactive Calendar: Weekly calendar view with color-coded events based on registration status and navigable by week or month.

- Event Registration History: Tracks and displays attended and registered events in user profiles.

- Location Integration with Google Maps: Displays event locations on interactive maps using Geocoding API.

- Data Persistence and Background Syncing: Room for offline data caching and real-time updates.

- Search and Filtering: A search bar with filters to find events by title, description, or location.

Technical Implementation

Tech Stack:

Language: Kotlin

UI Framework: Jetpack Compose

Database: Firebase

Networking: Retrofit with Coroutines

Data Persistence: Room

Testing: JUnit and Espresso

External Libraries:

- Google authentication, Google map, Google calendar.

- Firebase Authentication and Firestore for authentication and real-time data sync.

- Retrofit for handling API calls, including Geocoding.

- Coil for efficient image loading.

- Jetpack Navigation for managing multi-screen navigation.

- Firebase Crashlytics for monitoring app crashes.

Challenges and Solutions

- UI Responsiveness: Adapting the UI for both portrait and landscape modes. Solution: Used Jetpack Compose's responsive design and adaptive layouts.

- Event Address to Map Integration: Translating event addresses to coordinates. Solution: Integrated Google Geocoding API with error handling.

- Real-Time Data Sync: Managing synchronization between local and remote data. Solution: Combined Room with Firestore and implemented syncing strategies.

- Offline Functionality: Maintaining functionality with limited connectivity. Solution: Implemented caching with Room for essential data.

- Error Handling and Retry Logic: Managing network errors gracefully. Solution: Added error states and retry mechanisms.

Modified or Omitted Features

Modified:

- Calendar feature to make this app more useful.

Omitted:

- Complete offline event registration due to dependency on Firestore.

- Usage of the camera as sensor due to no necessary of the check-in feature.

Future Enhancements

- Expanded Offline Mode: Full offline registration with local sync upon reconnection.

- Social Features: Event sharing and discussion forums for attendees.

- Advanced Filters: Multi-criteria filtering for event discovery.

- Event Recommendations: Personalized recommendations using Firebase Analytics and ML.

- BU authentication login

Summary

The BU Events Planner meets its core objectives by enabling users to browse, register, and track university events. It adheres to modern design standards using Jetpack Compose and Firebase for a seamless, responsive experience. Challenges were addressed with scalable solutions, ensuring the app is robust and user-friendly.

This project exemplifies the integration of Firebase, Jetpack libraries, and third-party APIs to create a practical and impactful app for university students.