19CSE463 Mobile Application Development

PROJECT REPORT

AAHAAR APP

(Food Donation)

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1. Introduction

Aahaar is an innovative Android-based mobile application aimed at addressing food wastage in highly populated countries like India by bridging the gap between surplus food providers and needy recipients. Built using **Android Studio**, the app leverages **Java** as the programming language, **Firebase** as the backend database, and **Google Location APIs** for real-time mapping.

The app provides a platform for restaurants, cafes, and individuals to donate surplus food and for organizations like orphanages and shelters to receive donations, fostering a more sustainable society by reducing wastage.

2. Objective

The primary objective of Aahaar is to:

- Minimize food wastage by enabling donations to needy organizations or individuals.
- Provide an easy-to-use interface for managing donations.
- Offer real-time location tracking of donors and recipients for efficient pickup and delivery.

3. Features and Functionalities

1. **Dashboard Options**
    - **Donate**: Allows users to donate surplus food by marking their location on the map.
    - **Receive**: Enables recipients to request donations by placing their location on the map.
    - **Food Map**: Displays all donors (green pins) and recipients (blue pins), along with the user's current location (red pin).
    - **My Pins**: Allows users to view, edit, or delete the pins they have added to the map.
    - **History**: Tracks user activity, showing when and where donations or requests were made.
    - **Contact**: Provides a form for users to reach out to the developers with queries or feedback.
    - **Logout**: Ends the user session securely.

2. **Key Features**
    - **Real-Time Location Tracking**: Integrates Google Location APIs for precise pin placement.
    - **Firebase Integration**: Manages user data, pins, and history with seamless cloud storage.
    - **Role Switching**: Users can act as both donors and recipients based on their needs.

4. Technology Stack

Component	Technology Used	Purpose
Frontend	Android Studio (Java)	User interface and app development
Backend	Firebase Firestore	Cloud database to store user data, pins, etc.
APIs	Google Location APIs	Mapping and real-time location tracking
Authentication	Firebase Authentication	Secure login/logout system
Hosting	Firebase Hosting (Optional)	Backend support and analytics (if enabled)

5. Implementation Overview

1. **User Authentication**
    - Users register/login using Firebase Authentication.
    - Ensures a secure system with email/password credentials.
2. **Location Mapping**
    - **Google Location APIs** are utilized to fetch real-time user coordinates.
    - Pins are categorized as:
        - **Green**: Donor locations.
        - **Blue**: Recipient locations.
        - **Red**: Current user location.
3. **Database Structure (Firebase)**

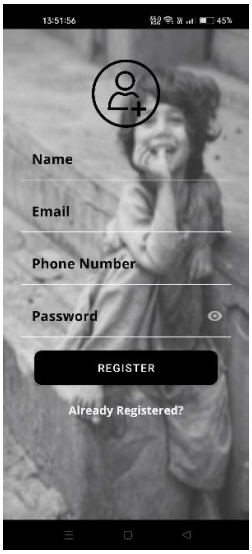
- **Authentication Collection**: Stores user profiles and authentication details.
- **User Data Collection**: Records donation/recipient pins with metadata like timestamp, user ID, and location.
- **Contact Collection**: Maintains data of user quires.

4. **Donation Flow**
   - A user selects "Donate" from the dashboard, fills in donation details, and places a pin on the map.
   - Recipients browse the **Food Map** to find nearby donations and contact donors.
5. **Recipient Flow**
   - A user selects "Receive" from the dashboard, specifies their requirements, and places a pin on the map.
   - Donors browse the **Food Map** to identify recipients in need.

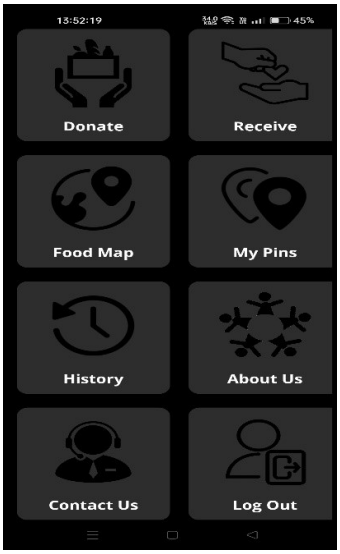
- **Total Activities in the App**:
  - **Login**
  - **Register**
  - **Dashboard**
  - **Donate Activity**
  - **Receive Activity**
  - **Food Map Activity**
  - **My Pins Activity**
  - **History Activity**
  - **Contact Activity**
  - **About Us Activity**

- **Threads Usage**:
  Threads were used to handle background tasks such as fetching data from Firebase, updating the UI, and managing location API calls without blocking the main thread. This ensures smooth app performance and responsiveness during real-time operations.

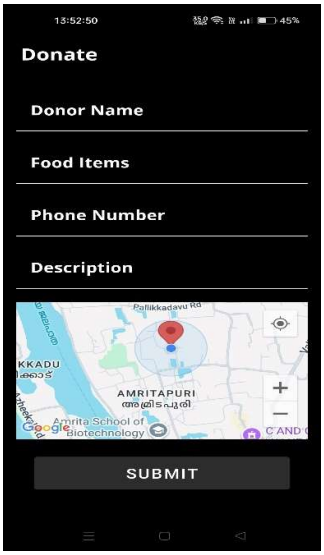
Login



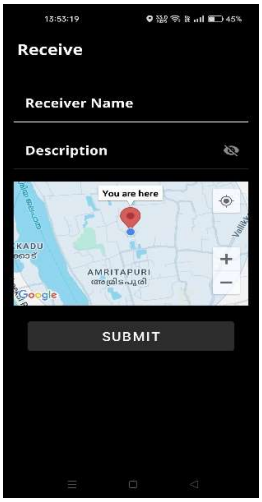
Registration



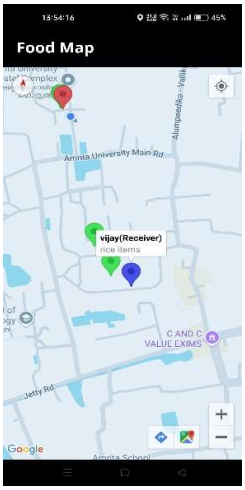
DashBoard



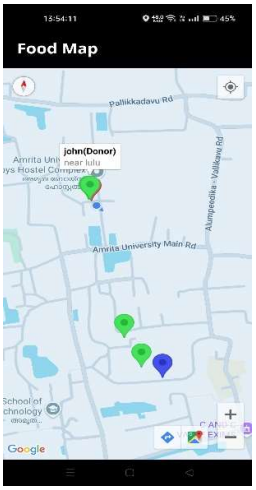
Add Donar



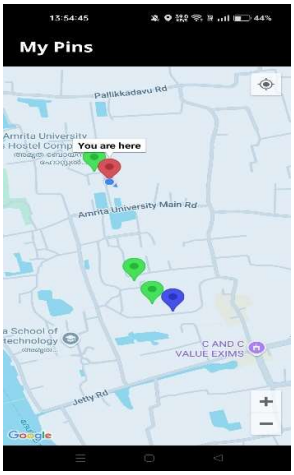
Receive



Food Map1



Food Map2



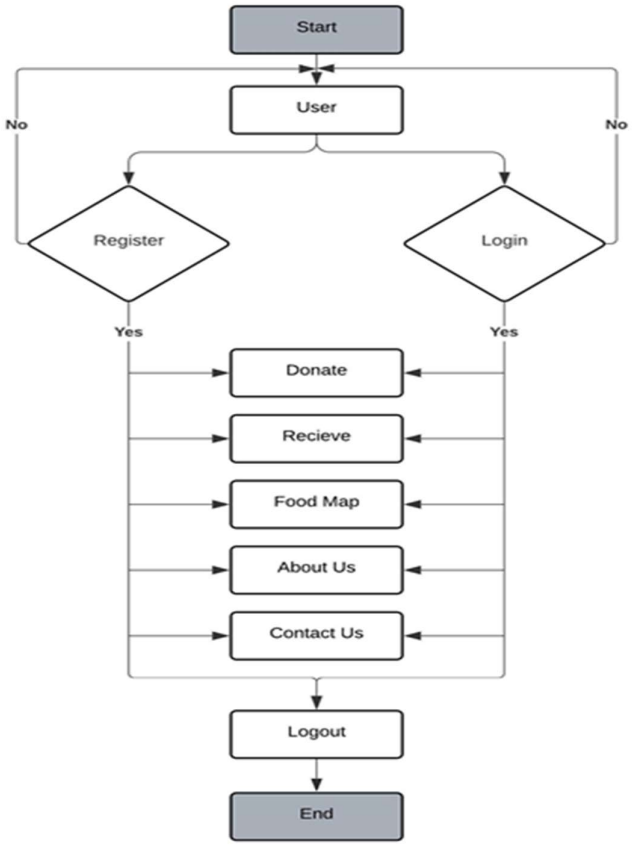
My Pins

History

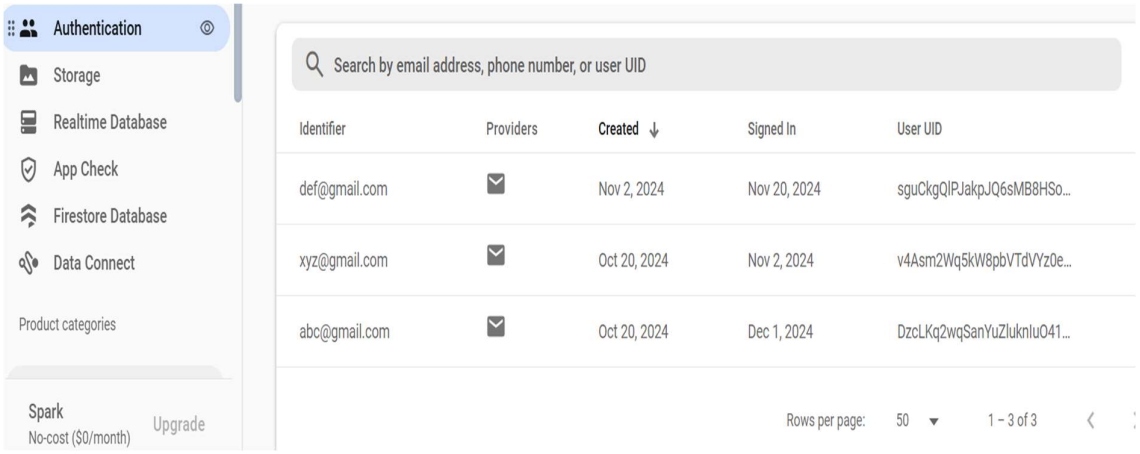
FAQ

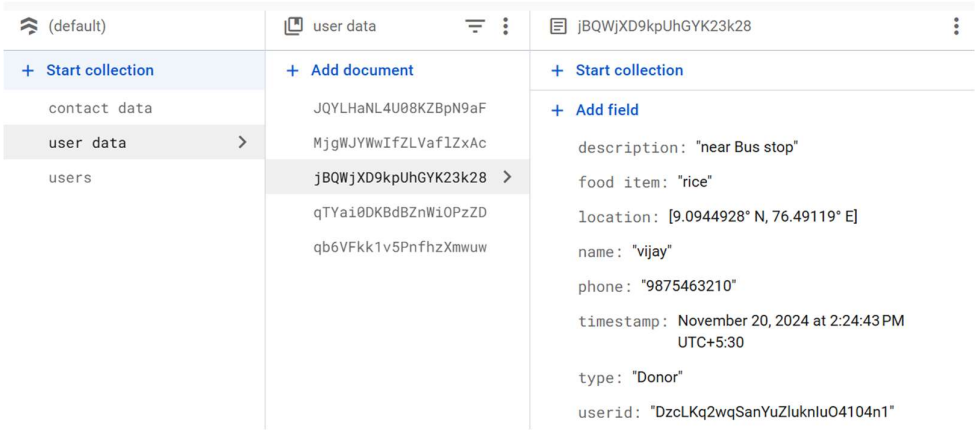
About

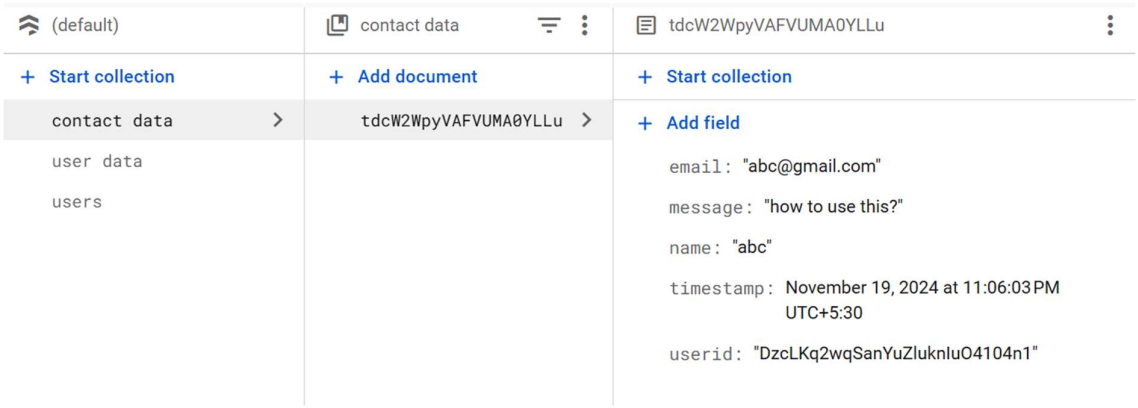
Flowchart of the working of the application



FireBase Database







6. Advantages

- **Social Impact**: Reduces food wastage and feeds the needy.
- **Ease of Use**: User-friendly interface with intuitive navigation.
- **Sustainability**: Encourages mindful consumption and waste reduction.
- **Real-Time Updates**: Accurate data synchronization using Firebase and Google APIs.

7. Challenges Faced

1. **Integration of Google APIs**
    - Ensuring accurate location data for pins required careful handling of API responses.

2. **Efficient Data Handling**
    - Managing real-time updates in Firebase while ensuring data consistency across users.
3. **Role Switching**
    - Designing the system to allow users to seamlessly act as both donors and recipients.

8. Conclusion

Aahaar is a step forward in tackling food wastage and supporting sustainable practices. Built using a simple yet powerful tech stack, the app is scalable, user-friendly, and impactful. Its implementation showcases how technology can be harnessed for social good, aligning with global efforts to minimize waste and promote equitable food distribution.