**ChatApplication**

GROUP MEMBER

SAMIULLAH KHAN(21-ARID-775)

KHURRAM ABBASI(21-ARID-723)

M ARIF WAZIR(21-ARID-740)

**Key Feature Functionalities**

1. **User Authentication**
   * **Login**: Provides a secure login interface where users can log into the application using their email and password. The application uses Firebase Authentication to manage user credentials and sessions.
   * **Registration**: New users can register for an account by providing their email, password, and other necessary details. The registration process ensures that all user data is stored securely in Firebase.
   * **Firebase Authentication Integration**: The application leverages Firebase Authentication to handle all aspects of user authentication, including password reset, email verification, and account management.
2. **Messaging**
   * **Send Message**: Users can send text messages to other users within the application. The messaging interface is user-friendly and supports real-time updates.
   * **Real-time Messaging**: Messages are updated instantly using Firebase Realtime Database, ensuring that conversations are always up-to-date. This feature provides a seamless chat experience similar to popular messaging apps.
3. **Media Sharing**
   * **Send Picture**: Users can share pictures with other users. This feature includes options to choose images from the device gallery or take new photos using the device camera.
   * **Image Preview**: Before sending, users can preview the selected image to ensure they are sending the correct file. This feature helps to avoid mistakes and enhances the user experience.
4. **Profile Management**
   * **Update Profile Picture**: Users can update their profile picture, which is stored in Firebase Storage. This allows users to personalize their accounts and make them more recognizable.
   * **Delete Profile Picture**: Users have the option to delete their profile picture if they no longer wish to display one. The application ensures that the profile picture is removed from both the user interface and Firebase Storage.
   * **Edit Profile**: Users can edit their profile information, such as display name and status. This feature allows users to keep their profiles up-to-date and reflective of their current information.

**Dependencies and Libraries**

1. **Firebase Authentication**
   * Provides the necessary tools to manage user authentication and authorization.

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implementation 'com.google.firebase:firebase-auth:21.0.1'

1. **Firebase Realtime Database**
   * Facilitates real-time data synchronization and storage of chat messages.

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implementation 'com.google.firebase:firebase-database:20.0.2'

1. **Firebase Storage**
   * Used for storing user profile pictures and other media files.

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implementation 'com.google.firebase:firebase-storage:20.0.0'

1. **Glide**
   * An image loading and caching library for Android that simplifies the process of displaying images.

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implementation 'com.github.bumptech.glide:glide:4.12.0'

annotationProcessor 'com.github.bumptech.glide:compiler:4.12.0'

1. **Material Design**
   * Provides modern UI components and layouts to create a visually appealing and user-friendly interface.

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implementation 'com.google.android.material:material:1.3.0'

1. **RecyclerView**
   * A flexible and efficient component for displaying a large collection of data sets in a scrollable list.

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implementation 'androidx.recyclerview:recyclerview:1.1.0'

1. **Firebase UI**
   * Offers UI bindings for Firebase, simplifying the integration of Firebase with Android UI components like RecyclerView.

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implementation 'com.firebaseui:firebase-ui-database:7.2.0'

**Application Architecture**

1. **Login Activity**
   * Handles the user login process using Firebase Authentication. It includes input validation and provides feedback to users in case of errors (e.g., incorrect password, invalid email format).
2. **Registration Activity**
   * Manages the registration of new users. It collects user details, performs validation, and stores the information securely in Firebase Realtime Database. Successful registration results in automatic login and navigation to the chat interface.
3. **Chat Activity**
   * Displays a list of messages using RecyclerView. Users can send text and picture messages, which are updated in real-time thanks to Firebase Realtime Database. The chat interface is designed for ease of use, ensuring that messages are easy to read and send.
4. **Profile Activity**
   * Allows users to update their profile information, including their profile picture and display name. The activity interacts with Firebase Storage to upload and retrieve profile pictures. Users can also delete their profile picture if they choose to.

**GitHub Repository**

The complete source code for this project is available on GitHub:

https://github.com/khurramMustafa1/semesterproject.git

This repository includes:

* **Source Code**: The complete implementation of the chat application, including all activities and features mentioned above.
* **Configuration Files**: Necessary configuration files for setting up Firebase and other dependencies.







