

StudyCircleApp

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Project Documentation: StudyCircle – Study Group Finder App

1. Project Overview

StudyCircle is a mobile application designed to help university students **create, discover, and join study groups** based on their courses. The app enables students to connect with classmates, collaborate on academic topics, and organize study sessions effectively.

This project was built for the **COMBITS Mobile Application Development Competition**, where the objective was to develop a functional app prototype within **6 hours**, adhering to the given theme.

2. Objective

The main goal of **StudyCircle** is to:

- Simplify how students connect with peers studying similar subjects.
- Enable easy group creation and management.
- Provide an organized dashboard for study sessions and collaboration.

3. Tools & Technologies Used

Category	Tools / Frameworks
Frontend Framework	React Native (Expo / React Navigation)
Backend & Database	Firebase (Authentication, Firestore, Storage)
Programming Language	JavaScript (ES6)
Design Libraries	React Native Components
Authentication	Firebase Authentication (Email & Password)
Database	Firebase Firestore
Storage	Firebase Storage (for profile images, if needed)

4. System Architecture

The app uses **client-side rendering** with **Firebase backend**.

Below is the flow of the app:

[User Interface]



[Firebase Authentication] – for Login & Signup



[Firebase Firestore] – stores users, groups, and sessions



[React Navigation] – handles screen transitions

5. Firebase Configuration

A Firebase project was initialized with:

- **Authentication** (Email/Password)
- **Cloud Firestore** (to store users, groups, and sessions)
- **Cloud Storage** (for profile images if extended)

Firestore Collections:

- users → stores user profiles (name, department, semester, etc.)
- groups → stores study group details
- sessions → stores scheduled study sessions for each group

6. App Navigation Structure

Stack	Description
AuthStack	Handles Login and Register screens.
MainStack	Contains main app screens (Dashboard, Groups, Profile, etc.).
NavigationContainer	Root navigator connecting all stacks.

Files:

- App.js → Root entry point, wraps navigation.
- AuthStack.js → Manages authentication flow.
- MainStack.js → Manages main app screens and logout.

7. Feature-Wise Explanation

7.1 User Authentication & Profile

Files: LoginScreen.js, RegisterScreen.js, ProfileScreen.js

- **Register:** Users create an account with name, email, password, department, and semester.
→ Data stored in Firestore under users/{uid}.
- **Login:** Authenticates using Firebase Authentication.
- **Profile:** Allows users to view and update profile information.

Firebase Collections Example:

```
"users": {
  "uid123": {
    "name": "Ali Khan",
    "email": "ali@example.com",
    "department": "CS",
    "semester": "5"
  }
}
```

7.2 Study Group Management

Files: GroupCreateScreen.js, GroupDetailScreen.js

- Users can **create a new group** with course details, meeting schedule, max members, and privacy type.
- **Public Groups** → anyone can join instantly.

- **Private Groups** → join requests require creator approval.
- Group creators can **edit, approve/reject join requests, or delete** the group.

Firestore Example:

```
"groups": {
  "group123": {
    "name": "AI Study Group",
    "course": "Artificial Intelligence",
    "courseCode": "CS401",
    "department": "CS",
    "members": ["ali@example.com"],
    "creator": "ali@example.com",
    "private": true,
    "joinRequests": []
  }
}
```

7.3 Group Discovery & Joining

Files: GroupsListScreen.js, GroupCard.js

- Displays all available groups with **search and filters** (by department or course).
- Each card shows name, course, members, and privacy type.
- Clicking on a group opens its detail view with join/leave options.

7.4 Study Session Scheduling

File: GroupSessionsScreen.js

- Members of a group can **create study sessions** with title, topic, date, time, and agenda.
- Members can **RSVP (Attending, Maybe, Cannot Attend)**.

- Session creator or admin can **cancel sessions**.

Firestore Example:

```
"sessions": {  
    "session123": {  
        "groupId": "group123",  
        "title": "AI Revision Session",  
        "topic": "Neural Networks",  
        "date": "2025-11-10",  
        "time": "10:00 AM",  
        "creator": "ali@example.com",  
        "attendees": ["fatima@example.com"],  
        "maybes": [],  
        "cannotAttend": []  
    }  
}
```

7.5 Dashboard

File: DashboardScreen.js

- Displays:
 - **Active study groups** the user has joined.
 - **Upcoming study sessions** for the week.
 - **Quick access buttons** to profile and group list.

This serves as the student's **main control panel**.

8. Data Flow

Action	Firebase Interaction
Register	createUserWithEmailAndPassword() → setDoc(users)
Login	signInWithEmailAndPassword()
Create Group	addDoc(groups)
Join Group	updateDoc(groups) (arrayUnion)
Create Session	addDoc(sessions)
RSVP	updateDoc(sessions)
Update Profile	updateDoc(users)

9. UI & UX Highlights

- Simple, minimal UI for fast navigation.
- Modal forms for creating sessions.
- Lists and buttons with clear layout and responsive design.
- Alerts for success/error messages.

10. Challenges & Solutions

Challenge	Solution
Managing real-time updates	Used Firestore's asynchronous fetch with getDocs() and updateDoc().
Handling authentication state	Used Firebase Auth currentUser and navigation redirects.
Limiting group size	Validation in group creation and join logic (maxMembers).
Filtering groups efficiently	Implemented local filtering by department, course, and name.

11. Future Enhancements

- Add **real-time listeners (onSnapshot)** for live updates.

- Enable **profile image upload** via Firebase Storage.
- Add **push notifications** for new sessions or approvals.
- Implement **chat feature** within study groups.
- Add **calendar view** for session schedules.

12. Conclusion

StudyCircle successfully fulfills the competition's objectives by providing a working prototype of a **Study Group Finder App** with:

- Secure authentication
- Group creation & management
- Study session scheduling
- Dashboard for students

It demonstrates strong use of **React Native**, **Firebase**, and **modular architecture** suitable for further development and scaling.