

UNIHIVE

- WHERE KNOWLEDGE BUZZES AND COMMUNITIES THRIVE

A PROJECT REPORT

BY

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DECLARATION

I/We hereby declare that the work which is being presented in the report entitled “Unihive - Where Knowledge Buzzes and Communities Thrive”, is an authentic record of my/our own work carried out during the period from JAN, 2024 to April, 2024 at School of Computer Science and Engineering and Technology, Bennett University Greater Noida.

The matters and the results presented in this report has not been submitted by me/us for the award of any other degree elsewhere.

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ABSTRACT

UniHive is a University-based application that aims to increase student community participation on university campuses. UniHive, using a user-centered design approach, provides a variety of features to meet the diverse needs of students, including an e-commerce platform (ThriftIt) for buying, selling, and renting items, a social networking platform (MyGang) for connecting with peers, and an event management system (Event Calendar). This project intends to change the university experience by instilling a sense of belonging and empowerment in students.

UniHive's initial goals were met effectively, resulting in the creation of a user-friendly registration and login system, solid error handling systems, and a visually appealing home page interface. Our app is built on various features, giving students tools for academic support, resource sharing, and community interaction. The project used Android Studio for frontend development and Firebase for backend infrastructure, resulting in scalability, real-time data synchronization, and seamless integration.

UniHive plans to expand its functionality in the future, including the completion of features such as Academics, TutorPoint, and Geektalks, as well as the implementation of a university administration system. The initiative highlights mobile applications' potential to transform the university experience, making it more enriching, inclusive, and interconnected for students.

1. INTRODUCTION

Universities are not just the place for academic learning but also for personal growth and development. Students seek for connections, resources and opportunities. Here, we present a University-based Application to enhance the student community engagement within university campuses. Our application - UniHive, offers a range of features that meet the diverse needs of students, including an e-commerce platform for buying, selling, and renting items (Thrift It), a social networking platform where students can connecting with their peers (MyGang) and many more. Through user-centered design principles, the application provides a seamless and intuitive experience, encouraging active participation and collaboration among users. The main objective of our project is to transform the students' university experience, making it more enriching, inclusive and interconnected by giving a sense of belonging and empowerment.

1.1. Problem Statement

Students may find it difficult to adjust to a new environment, academic obstacles, and social interactions when they first start university. However, one important barrier is the difficulty of discovering and interacting with like-minded people among a huge student population. Financial concerns add to the stress. Students frequently require clothes, accessories for events that they can't afford or have extra stuff in their rooms that they don't use or need but can't do anything other than throwing it away. Also, colleges have tons of events, but it's hard for students to keep track of them all. Students lack a common platform to solve these issues.

2. BACKGROUND RESEARCH

2.1. Proposed System

This project aims to provide users with a collection of interesting features. We have built a system which is not only user friendly but also solves various everyday problems of a normal college going student.

2.2. Goals and Objectives

Table 1: Goal and Objectives

#	Goal or Objective
1	Develop an app culminating various features like Academics, Tutorpoint, ThriftIt, MyGang, GeekTalks, Event Calendar
2	Provide system support through a manual accessed using 'i' button
3	Provide user experience by building an easy to use and user friendly app
4	Build a prototype that demonstrates the user interface and functioning of the app to regularly test and update the features and
5	Learn android app building with this project
6	Develop an app that can be put to real world use
7	Have fun building the app

3. PROJECT PLANNING

3.1. Project Setup

Table 2: Decisions made while project setup

#	Decision Description
1	Windows 11 with good ram and fast processor to be used
2	Use Android Studio as the primary development platform due to its robust features and compatibility with Android devices
3	Firebase was chosen as the backend infrastructure for its scalability, real-time data synchronization capabilities, and seamless integration with Android Studio
4	Clear flowcharts and layouts for user friendly UI were made

3.2. Stakeholders

Table 3: Stakeholders

Stakeholder	Role
Dr. Garima Jaiswal	Mentor
Aashna Dogra	Developer
Bhavana B S	Developer

3.3. Project Resources

Table 4: Resources used with description

Resource	Resource Description	Quantity
Capstone Team	Our team of students who will be the primary developers of the project.	2
Technical Mentor	The mentor who will be able to provide us with technical assistance.	1
Windows Laptop	Workstation to work on Android Studio to build the app and connect to server	1
Firebase Account	Use firebase as the primary backend configuration system for database connectivity	1
Android Phone	Android phones to be used as test hardware for the mobile app.	2 - 3

3.4. Assumptions

Table 5: Assumptions

#	Assumption
A1	The capstone team will be able to meet face to face multiple times in a week to work on the project

A2	Firestore will be available for trial to the team
A3	Team members have worked on java previously
A4	Team will have sufficient time to complete a working model by the end of the semester
A5	Team members themselves being college students will be able to identify and get feedback from their friends on the app regularly
A6	Team members will have android phones and test the app

4. SYSTEM ANALYSIS AND DESIGN

4.1. Overall Description

The project's goal is to create an app that solves to the diverse needs of university students. Built with Android Studio and Firebase, the app acts as a centralized platform for improving social relationships, encouraging resource sharing, and expediting event management within the campus community.

At its core, the app stresses social networking by offering users personalized profiles and comprehensive search capabilities based on their hobbies, majors, and extracurricular activities. Also our system includes a thrifting marketplace where students can buy, sell, or rent textbooks, apparel, and event materials. This not only saves students money, but it also promotes environmental sustainability by encouraging resource reuse and recycling. Furthermore, the app has a dynamic event calendar that displays campus-wide events, club meetings, and academic deadlines.

Our application is being developed using Android Studio for the frontend interface and Firebase for the backend infrastructure. Android Studio offers a powerful development environment with a wide range of tools and resources for creating native Android applications. It enables the building of user-friendly interfaces using XML layouts and smooth integration with Firebase

services. Firebase serves as the backend platform, providing a set of tools and services that speed up development, improve app performance, and enable real-time data synchronization. Firebase Authentication is used to securely manage user authentication and authorization, allowing only authenticated users to access the app's features and data. User profiles and preferences are saved in Firebase Realtime Database, a NoSQL cloud database that allows for efficient data storage and retrieval. Additionally, Firebase Storage is used to store and serve multimedia material, such as photographs and movies relevant to thrifting.

4.2. Users and Roles

Table 6: Roles of various users

User	Description
Developers	2 developers will be building the frontend and backend of the app. They will be continuously using the app making necessary changes.
University Administration	The university administration will be using the app for the database providing access to only their university students and features like Academics will be updated by them.
Students	A student is going to be out end user who will be able to access and use all the features strictly viewing in Academics section. The login will be provided by the admin.

4.3. Design diagrams/Architecture/ UML diagrams/ Flow Charts/ E-R diagrams

4.3.1. Use Case Diagram

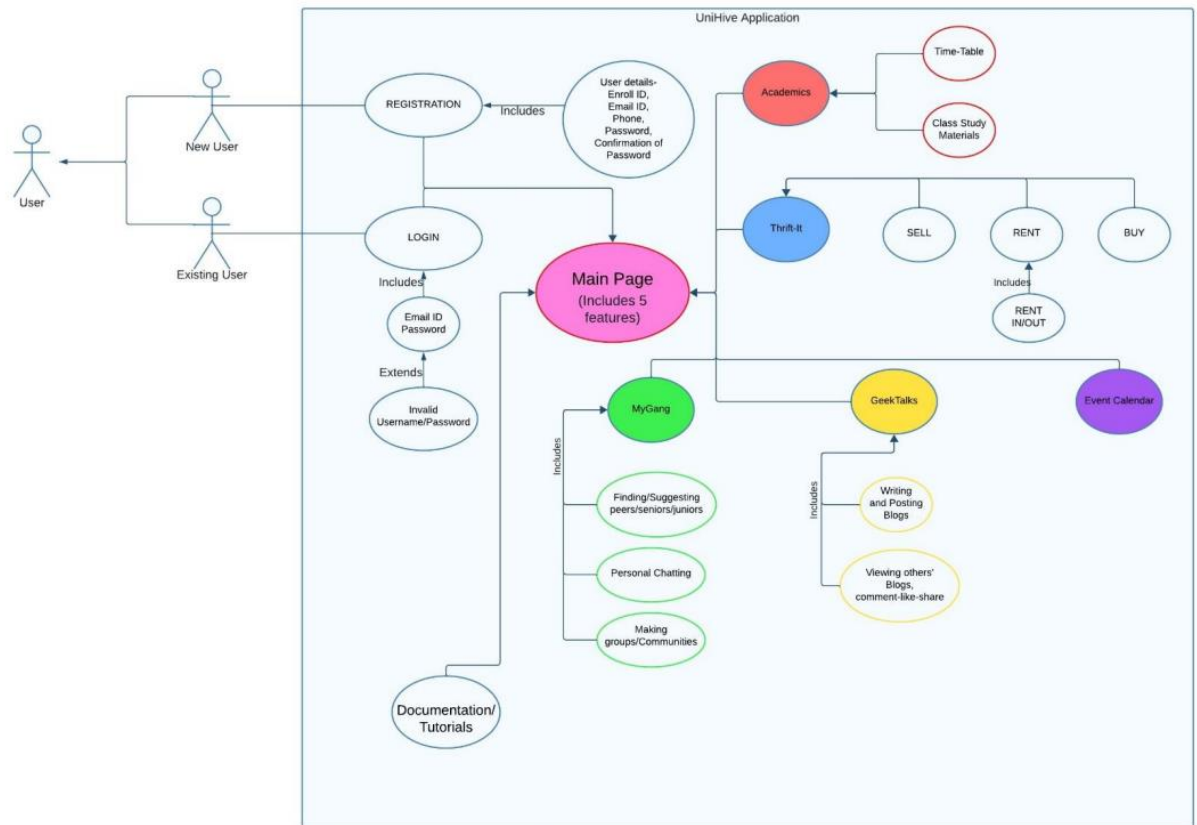


Figure 1: Use-case diagram

In UniHive application, there are two types of users – New User and Registered User. User is generalized to New User and Registered User. When New User registers, they have to fill their details like enroll_id, email_id, contact and create a strong password. While the Registered ones have to login that includes only id and password. If user fills with invalid details, it extends to the message displaying error. Then the app leads user to the main page that is where all features are located. Here, Academics, TutorPoint, ThriftIt, GeekTalks, MyGang, Event Calendar and info. Button are all generalized to the main page. Academics is generalized to Time-table and Study materials officially generated from the university. TutorPoint will show study materials uploaded by fellow peers and options to tutor each other. ThriftIt is generalized to Sell, Rent and Buy, where Rent is extended to Rent-In and Rent-Out. MyGang is generalized to Finding peers, Messaging and Community. Geektalks includes writing and posting blogs and reviews others' as well.

EventCalendar for showing details regarding upcoming events and ability to add events. And ‘info-button’ for documentation and tutorials.

5. USER INTERFACE

5.1. UI Description

The UI of this app is extremely user friendly. UI Description for UniHive Application:

Registration/Login Form: Asks user to enter email-id and password

Main Page consists of various sections. At the top left corner the user’s profile photo is displayed with their name in the center and the logout option to the right. The central page consists of 6 clickable options –

TutorPoint – Leads to a page where user can view other’s and upload their notes

Academics – Leads to the page where students can see their timetable and material uploaded by the university

ThriftIt – Leads to a page which contains Home page, where they can view available items, Chats, where they can chat with the person and fix a meeting point in college, Plus(+) sign, which opens a form allows them to add their item to sell/rent, Basket, acts as cart, Account, with their details.

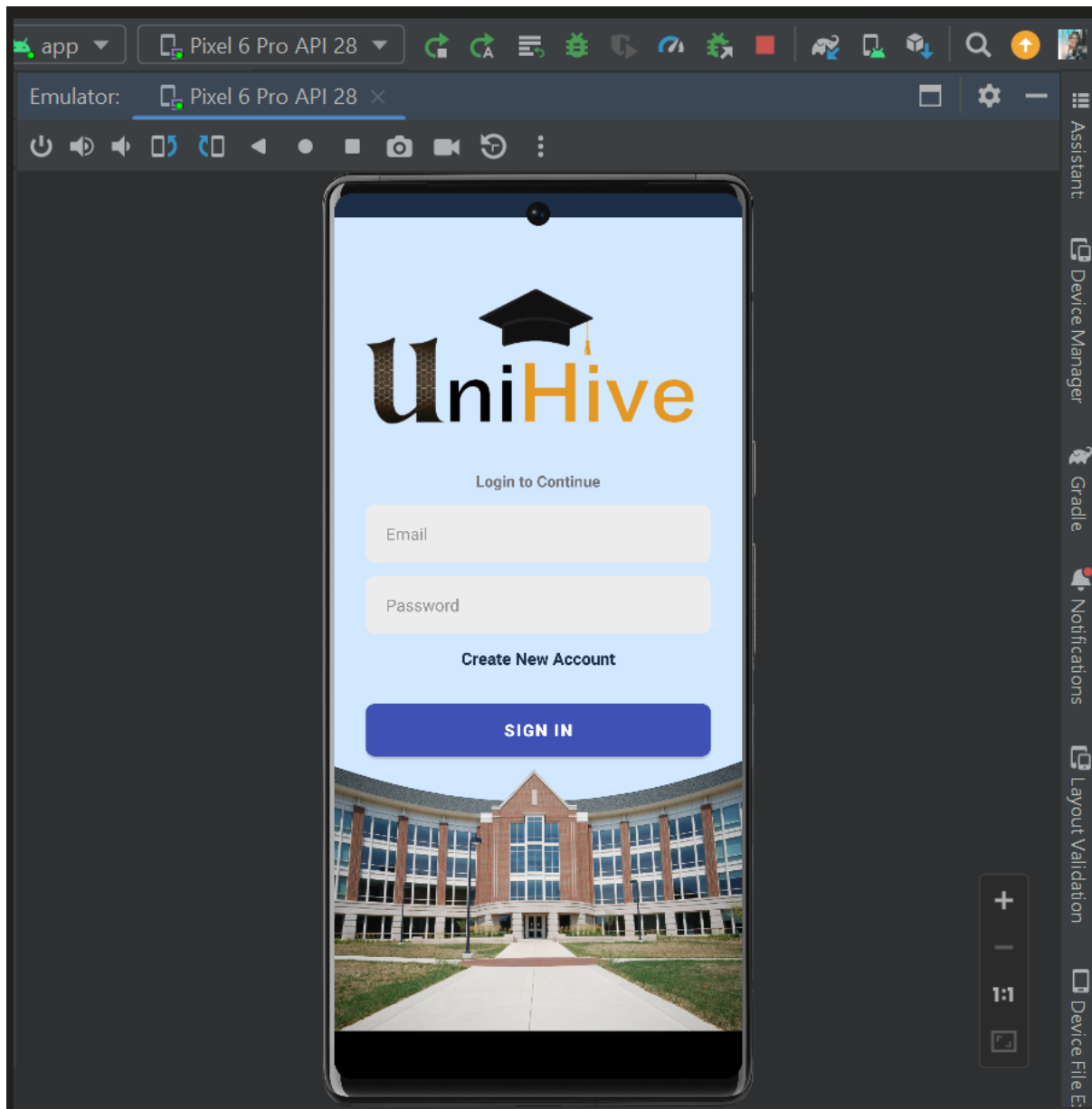
MyGang – This leads to a page where user can select a person and chat with them.

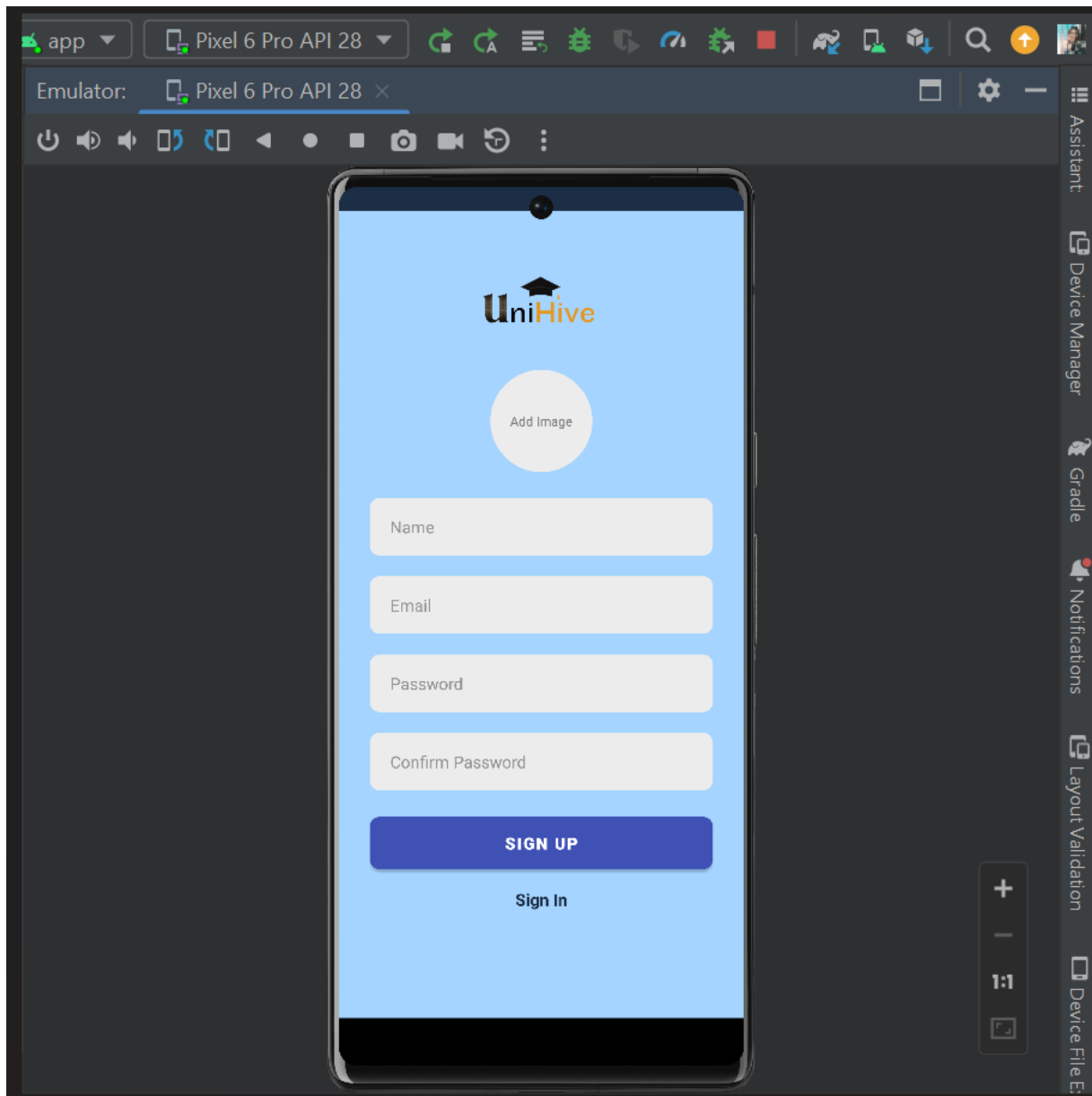
GeekTalks – Leads to blogs posted by students

Event Calendar – Opens a calendar where cultural/ technical events can be added.

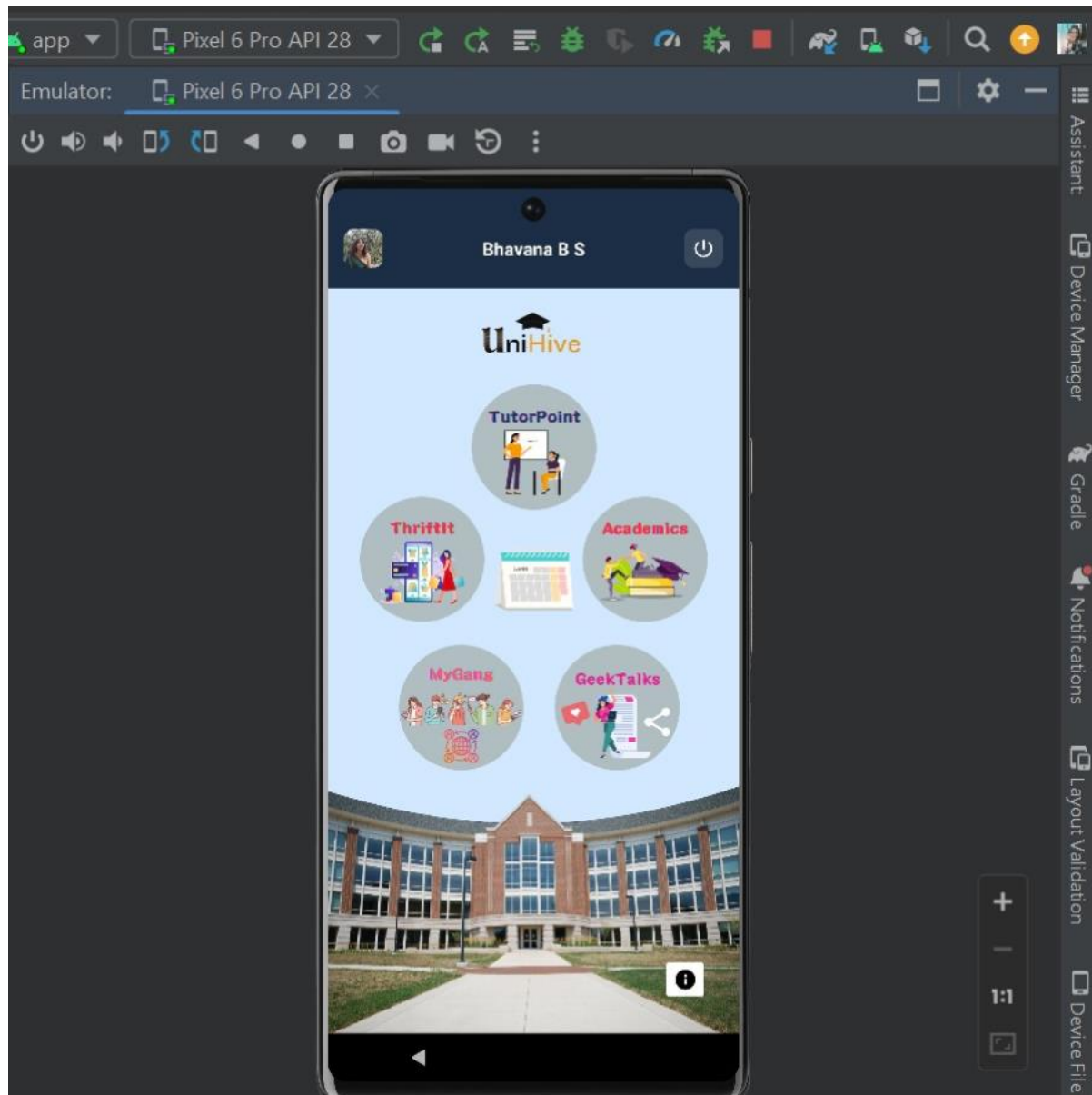
5.2. UI Mockup

Login/Register

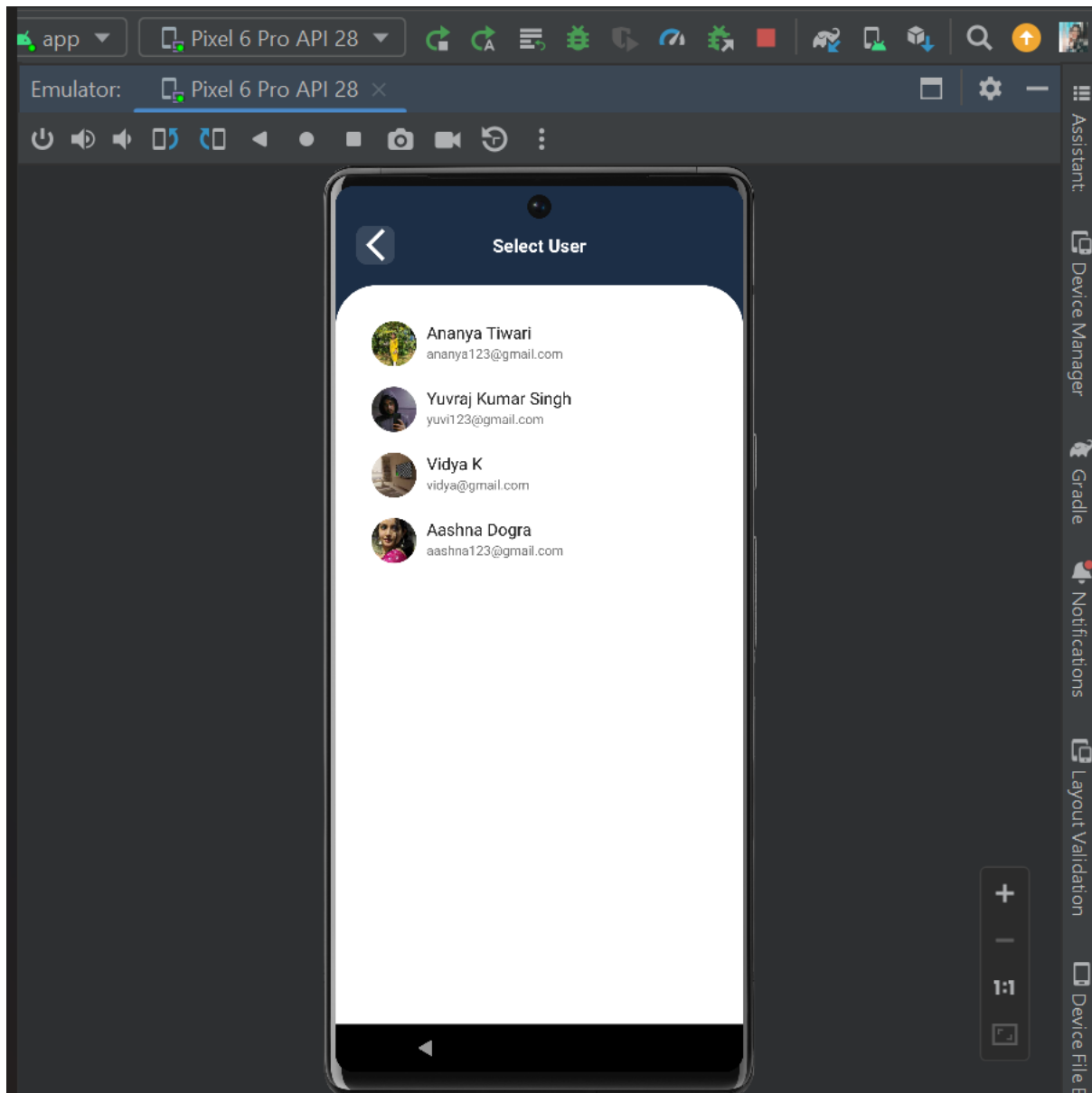




Home Page



MyGang



ThriftIt selling form:

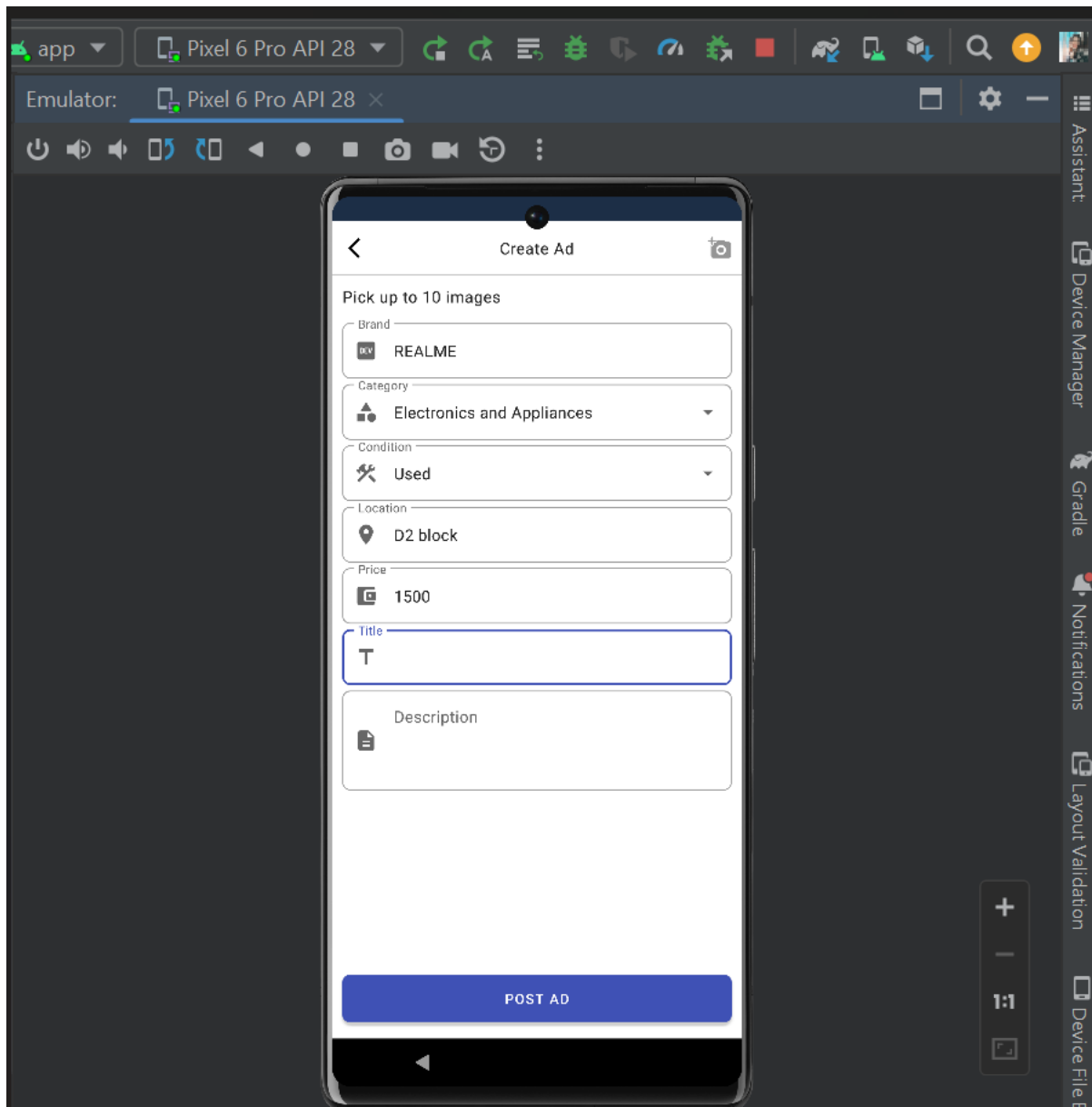


Figure 2: UI designs

6. ALGORITHMS/PSEUDO CODE

```
class UniversityApp {
    public static void main(String[] args) {
        UserInterface ui = new UserInterface();
        Database database = new Database();
        UserSession session = new UserSession();

        ui.displayLoginRegisterScreen();

        while (!session.isLoggedIn()) {
            UserInput input = ui.getUserInput();
            if (input.getAction() == Action.LOGIN) {
                if (database.validateUser(input.getUsername(), input.getPassword())) {
                    session.setLoggedInUser(input.getUsername());
                    ui.displayMainMenu();
                } else {
                    ui.displayErrorMessage("Invalid username/password. Please try again.");
                }
            } else if (input.getAction() == Action.REGISTER) {
                database.registerUser(input.getUsername(), input.getPassword());
                ui.displaySuccessMessage("User registration successful. Please log in.");
            }
        }

        ui.displayMainMenu();

        while (session.isLoggedIn()) {
            UserInput input = ui.getUserInput();
            if (input.getAction() == Action.VIEW_MY_GANG) {
                ui.displayGangMembers(database.getGangMembers(session.getLoggedInUser()));
            } else if (input.getAction() == Action.ACCESS_THRIFT_IT) {
```

```

        ui.displayThriftItems(database.getThriftItems());
    } else if (input.getAction() == Action.ACCESS_ACADEMICS) {
        ui.displayTimeTableItems(database.getAcademics());
    } if (input.getAction() == Action.VIEW_GEEK_TALKS) {
        ui.displayGeektalkers(database.getGeektalkers(session.getLoggedInUser()));
    } else if (input.getAction() == Action.ACCESS_TUTOR_POINT) {
        ui.displayclassResources(database.getClassResources());
    } else if (input.getAction() == Action.ACCESS_EVENT_CALENDAR) {
        ui.displayEventCalendar(database.getEventCalendar());
    } else if (input.getAction() == Action.LOGOUT) {
        session.logout();
        ui.displayLoginRegisterScreen();
    }
}
}
}
}

```

7. PROJECT CLOSURE

7.1. Goals / Vision

The UniHive project's initial goals included creating a user-friendly registration and login system, implementing error handling mechanisms, designing a main page interface for accessing various features, integrating Academics functionalities, developing ThriftIt functionality, implementing MyGang features, creating GeekTalks functionality, developing an Event Calendar feature, and providing an Info button for documentation and tutorials. These objectives were met successfully, resulting in the implementation of a robust user registration and login system, robust error handling mechanisms, a visually appealing main page interface, seamless integration of Academics functionalities, a fully functional ThriftIt marketplace, comprehensive MyGang features, interactive GeekTalks functionalities, an informative Event Calendar, and an accessible Info button, enhancing the overall user experience of the UniHive app.

7.2. Delivered Solution

Our solution is a fully delivered app that is a culmination of various features. The database connectivity and backend configuration is done. A user can successfully register and login to our app and build their profile by adding their profile photo as well. Upon logging in the user will be redirected to the home page where they can access the various features. The user can use all the features ThriftIt, MyGang, Event Calendar, Academics, TutorPoint, Geektalks.

7.3. Remaining Work

We created a functional app with some features fully functioning like ThriftIt, MyGang, Event Calendar which were part of our main problem statement. We have partially built all the other features like Academics, TutorPoint, Geektalks. The prototype of the app to be used by the user is developed but the system to be used by the university administration is yet to be made.