AN-NAJAH NATIONAL UNIVERSITY

Faculty of Engineering & Information Technology

Computer Engineering Department

Software Graduation Project

Tech Ties

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Supervisor:
Dr.Abdallah Rashed

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Computer Engineering.
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Acknowledgment

We are to begin by giving thanks and praise to Allah for providing us with the knowledge, persistence, strength, and other resources needed to work on and finish this endeavor, among other things.
Second, we would like to express our gratitude to our supervisor for all of his help and guidance this semester. Finally, we would want to express our gratitude to our family and friends for their steadfast support and for always being there for us.

Disclaimer

This report was written by Ana'a Bouzia and Salsabeel Mohammad at the Computer Engineering Department, Faculty of Engineering, An-Najah National University. It has not been altered or corrected, other than editorial corrections, because of assessment and it may contain language as well as content errors. The views expressed in it together with any outcomes and recommendations are solely those of Ana'a and Salsabeel.

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Abstract

We are now in an era of speed and technology, where the world has become a small village. It is easy to find and retrieve information at record speeds via the internet. Through our platform, "TechTies" engineering students will be able to access all the information and files they may need during their studies.

Through the TechTies platform, many issues faced by engineering students in various aspects have been addressed. The process of finding suitable and acceptable housing has been streamlined, reducing the stress and pressure associated with securing accommodation. Additionally, the exchange of resources such as presentations, hardware tools, and other course materials has been facilitated. Overall, significant obstacles in the academic lives of engineering students have been overcome by TechTies, allowing for greater focus on academic achievements and the development of engineering skills.

This platform is characterized by enabling students to share all their academic resources, such as presentations, files, books, and summaries, in addition to providing an opportunity for their small businesses to be advertised and their academic abilities to be leveraged to achieve personal and professional success.

TechTies' primary goals were to help engineering students interact with one another, enhance intercollegiate collaboration, support small businesses, and provide an online platform for instructional materials. The development process included gathering requirements, designing, implementing, testing, and deploying.

In the TechTies platform, technology was effectively utilized, where modern techniques and tools were employed to create a remarkable and distinctive platform. The platform comprehensively meets the students' needs with inclusivity and effectiveness, helping them achieve academic and professional success through innovative and advanced methods. Additionally, interaction and collaboration among students are promoted by TechTies, enhancing their collective learning experience and fostering their social and communicative skills.

Chapter 1: Introduction

1.1 General Background

Technology plays an important role in education today. Regardless of the common issues students face when dealing with social interactions, obtaining educational materials, and finding suitable accommodation, the creation of Tech Ties as an application facilitates the sharing of materials, finding housing, and enhancing academic collaboration to meet these needs. Additionally, it provides students with the opportunity to market their handmade and personal products.

1.2 Objectives

The main objectives of Tech Ties are to facilitate the sharing of materials and resources among engineering students, enable them to choose suitable accommodation, support student small businesses by allowing them to sell their products and generate income, and enhance collaboration among students. Overall, the application aims to improve the educational experience for students.

1.3 Significance

Tech Ties is important because it has addressed several challenges faced by students. By simplifying the process of choosing accommodation and facilitating the sharing of study materials among students, it has enhanced collaboration. It has also encouraged students to pursue their own projects and earn money from them, thus providing a suitable learning environment for students in the College of Engineering.

1.4 Organization

This report has been structured into several sections, beginning with the introduction. This section is further divided into subsections covering the general background of the project, its objectives, and its significance. The report then proceeds with a chapter on constraints, standards, and previous coursework. The third chapter summarizes the methodology used in developing the project. Following this, the report presents the results and analyses derived from the project's implementation, including a discussion of the entire development process. This is followed by a conclusion chapter and recommendations for future work. Finally, the report ends with the references.

Chapter 2: Theoretical Background and Previous Work

Several systems now in use have addressed various aspects of the challenges faced by engineering students. Certain systems place more emphasis on social networking and student interaction than others, for example, and focus more on resource and course material sharing. These techniques have demonstrated the value of peer-to-peer help and the benefits of centralized repositories for instructional materials.

However, many of these methods have drawbacks. To bridge this gap, Tech Ties offers a comprehensive platform that addresses various aspects of student life. It provides several services in one place, including resource sharing, accommodation selection, academic collaboration, and personal projects. Tech Ties aims to provide engineering students with an all-inclusive solution that enhances their educational experience.

Chapter 3: Methodology

Tech Ties was created to meet the academic and social needs of engineering students. Initially, we gathered the challenges faced by students, their housing preferences, and the academic resources they require. Then, we started working on the application.

The process used to create "TechTies" was methodical and iterative overall, with an emphasis on satisfying the many demands of engineering students and improving their social and academic experiences.

3.1 Standards and Specifications(codes):

The documentation for Flutter and Node Js only covers the basics, necessitating additional research to achieve our goals. Furthermore, to work with these technologies, you must be familiar with Android Studio and other libraries. Using Mongo database involves tremendous work and research for optimal outcomes.

3.1.1 Flutter Front-end Application

We chose to use Google's Flutter framework, for the front-end development of our graduation project. Using a single codebase, Flutter excels at creating natively built desktop, web, and mobile apps. Its main advantage is that it uses widgets to create aesthetically pleasing and responsive user interfaces.

Declarative design is used by Flutter, enabling expressive and adaptable user interface designs. Our development process was greatly eased by the hot reload capability, which allowed us to iterate rapidly and effectively.

The programming language used by Flutter, Dart, turned out to be a strong and clear language, making it easy to implement the logic of our project. Our development experience was greatly aided by the thorough documentation that Flutter supplied, which gave our team clear direction and made the learning curve go more smoothly. Flutter was the best option for front-end development of our application as it could provide a consistent and excellent user experience on a variety of platforms.
The active and helpful MongoDB community made sure we had access to important tools and support over the whole development process. We also integrated Firebase Realtime Database into our backend to add real-time chat features. Building features like real-time chat in our application is made easy using

Firebase Realtime Database, a Google development that provides real-time data synchronization. It's crucial to remember that MongoDB was the main database used for maintaining other parts of our data, while Firebase Realtime Database was used for our real-time functionality. Firebase Realtime Database, in conjunction with Node.js and MongoDB, offered a strong and adaptable backend architecture for our project.

3.1.2 Database Back-end

For our project, we decided on Node.js as our serverside platform in order to guarantee a cutting-edge and effective architecture. It was the best option for our application because of its lightweight design and quick performance.

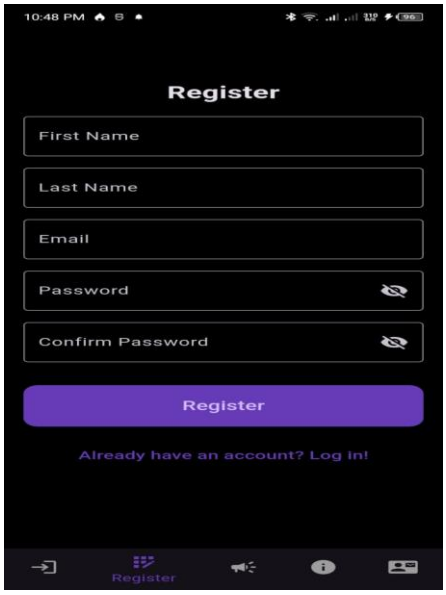
In the industry, Node.js has become widely used, and well-known organizations like LinkedIn rely on its features. We chose MongoDB, a well-known NoSQL database, to manage our database. MongoDB offers flexibility and scalability while managing unstructured and semi-structured data with ease. Its dynamic schema and document-oriented paradigm were just what our project needed.

3.2 System Features Implementation

3.2.1 Mobile Application

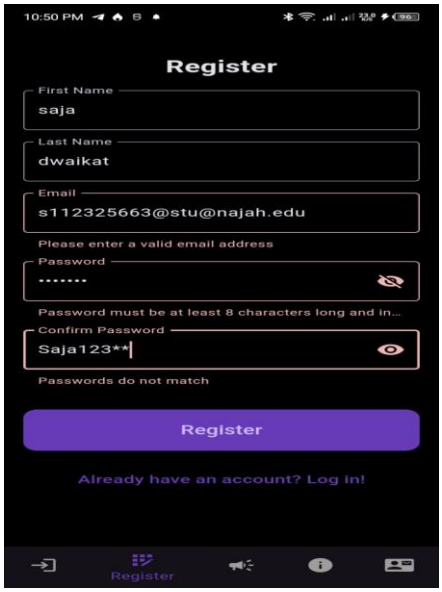
The mobile application, named “Tech Ties” was developed to improve the academic and social experiences of Faculty of engineering students.

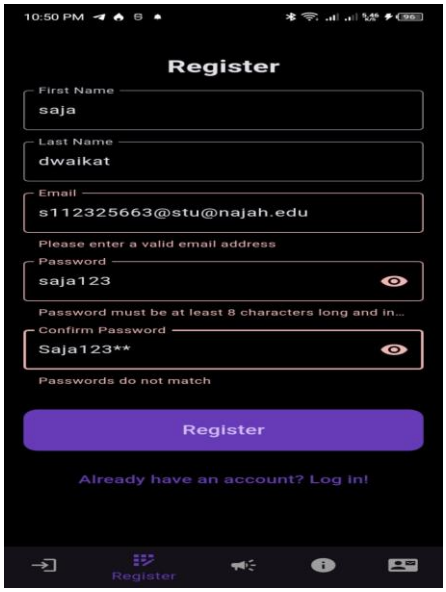
- **Sign-up page:** the student can register for the application with the required information.

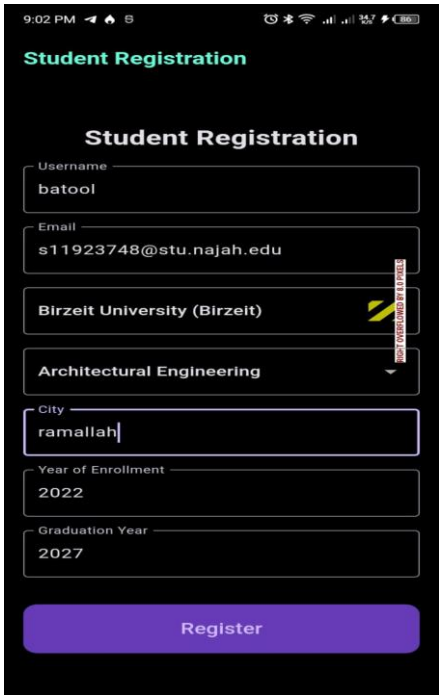


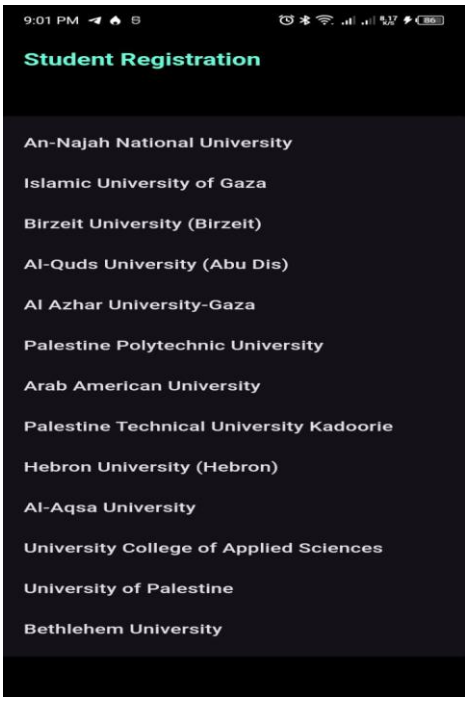
Sing up

For students, a sign-up website has been put in place to make sure the necessary data is appropriately entered.



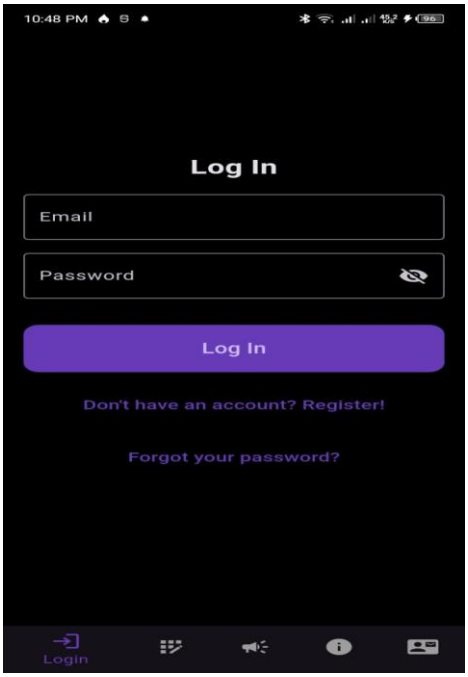






student registration

For the login page, the user can only log in if he was previously registered either as a technician or client



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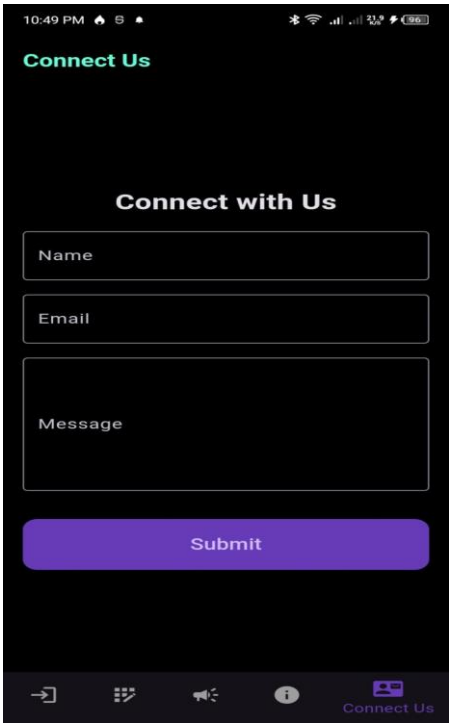
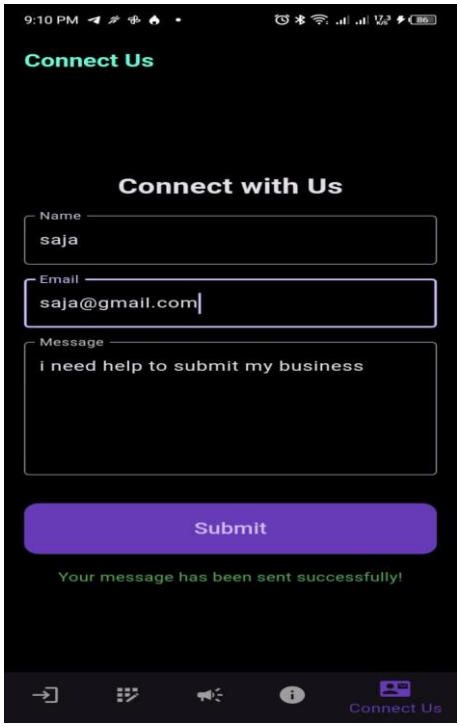
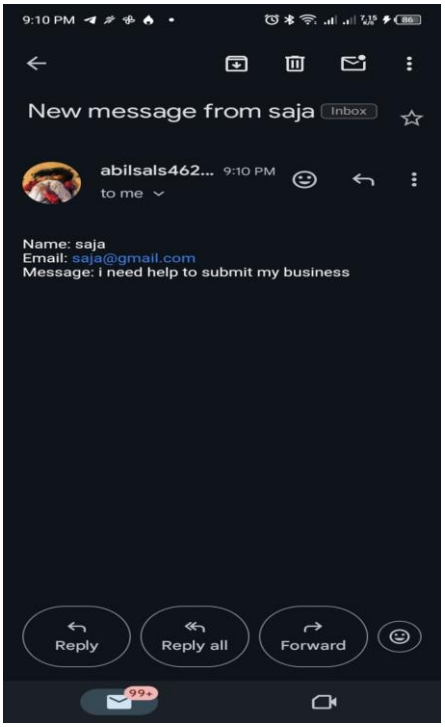
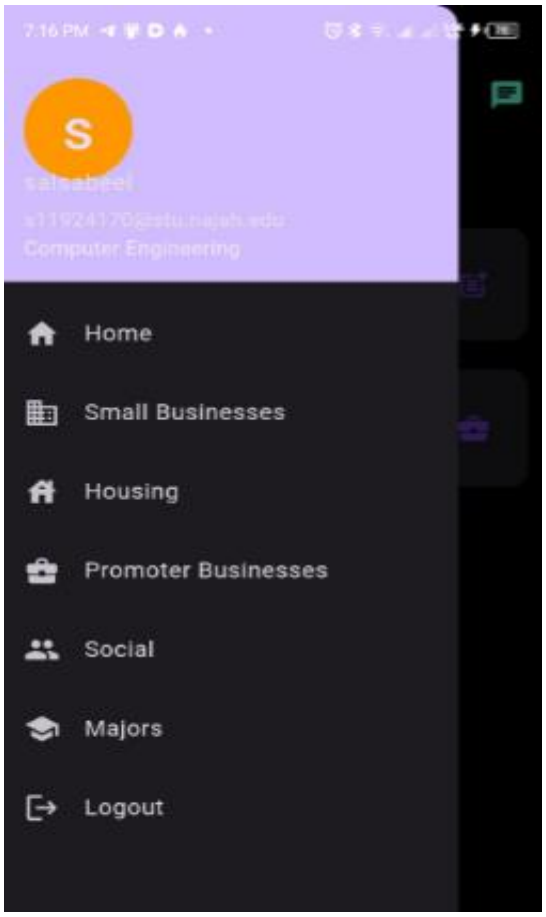






Contact with us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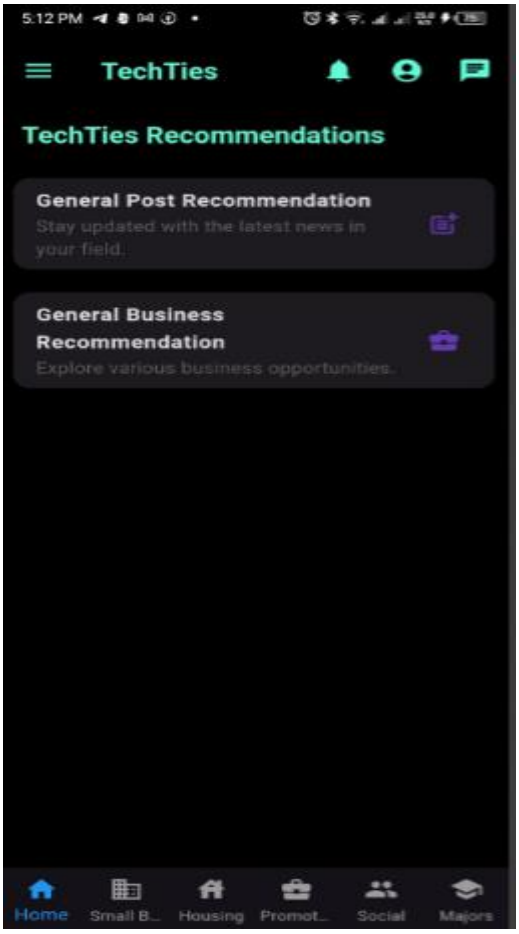
Computer Engineering
Home
Small Businesses
Housing
Promoter Businesses
Social
Majors
Logout


TechTies
TechTies Recommendations
General Post Recommendation
Stay updated with the latest news in your field.
General Business Recommendation
Explore various business opportunities.
Home
Small B...
Housing
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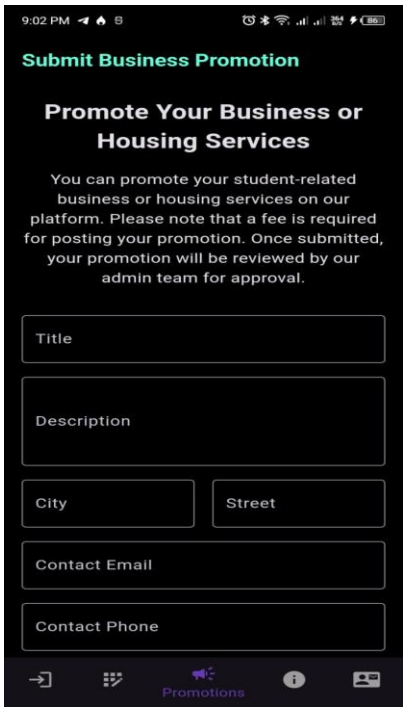
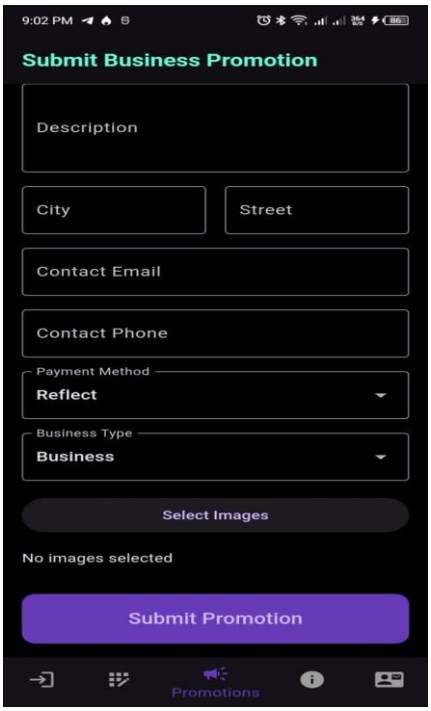
Social
Majors

Home Page


Computer Engineering
Collaboration
Course Materials
Entrepreneurial Forum
Internship
Practical Training
CTA


Submit Business Promotion
Promote Your Business or Housing Services
You can promote your student-related business or housing services on our platform. Please note that a fee is required for posting your promotion. Once submitted, your promotion will be reviewed by our admin team for approval.
Title
Description
City
Street
Contact Email
Contact Phone
Promotions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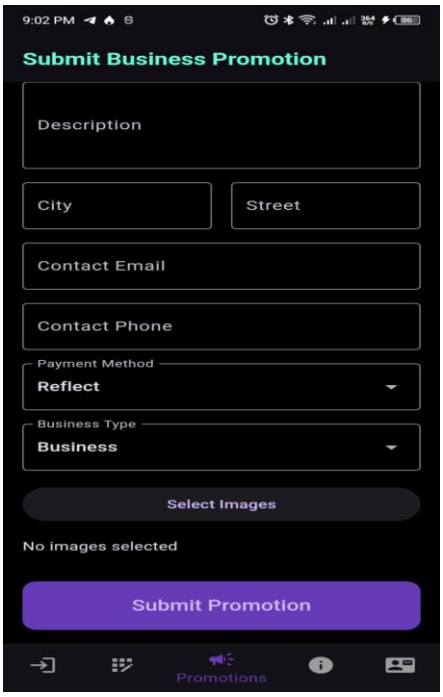
Promotions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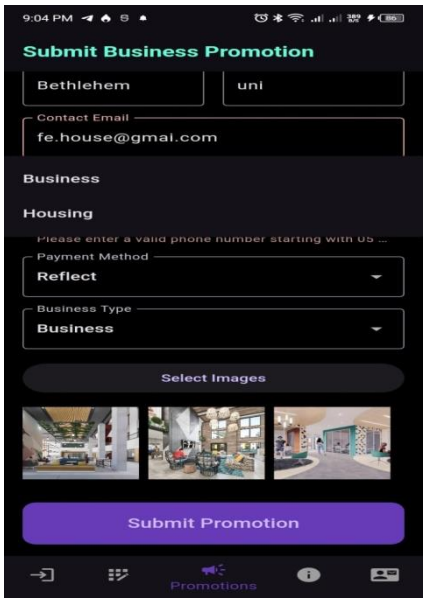
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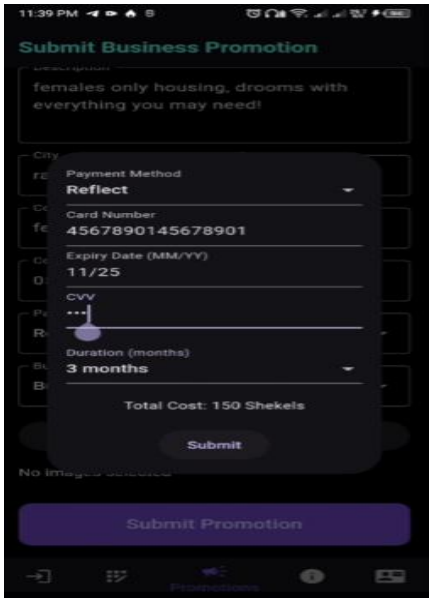
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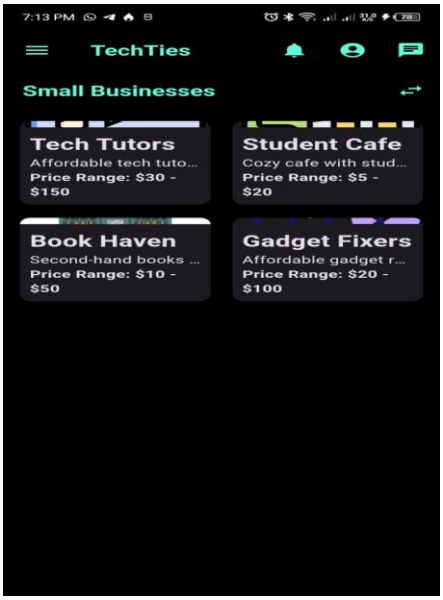
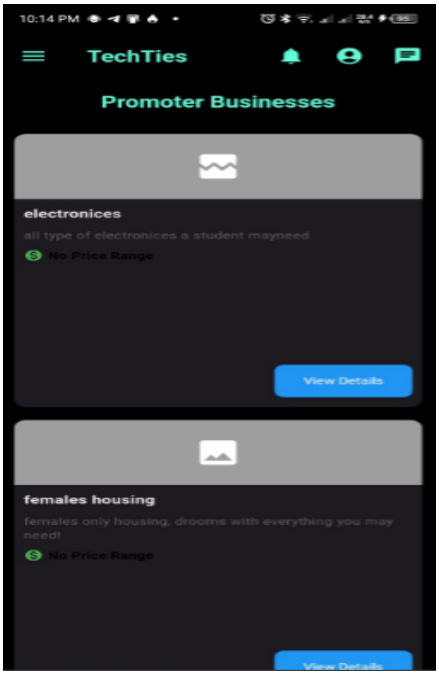
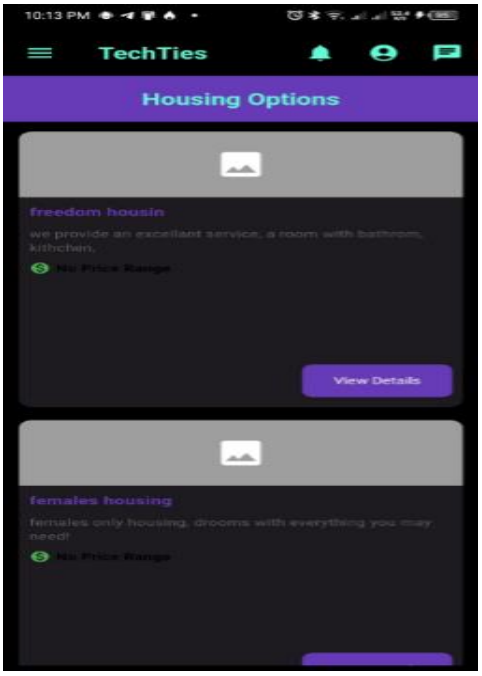
Submit Promotion


TechTies
Small Businesses
Tech Tutors
Affordable tech tuto...
Price Range: $30 - $150
Student Cafe
Cozy cafe with stud...
Price Range: $5 - $20
Book Haven
Second-hand books ...
Price Range: $10 - $50
Gadget Fixers
Affordable gadget r...
Price Range: $20 - $100

Bussiness



Promoter Businesses



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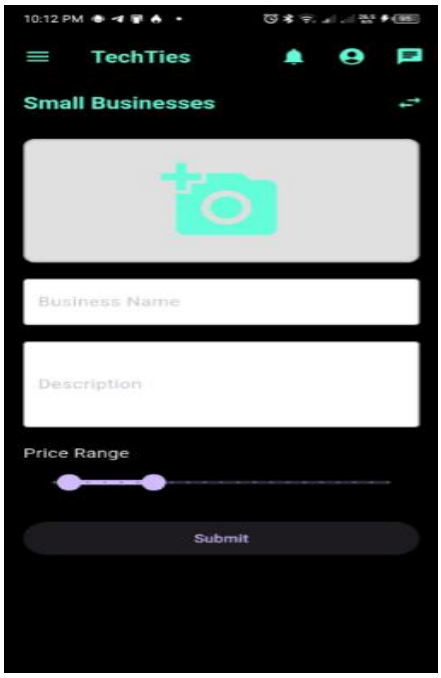

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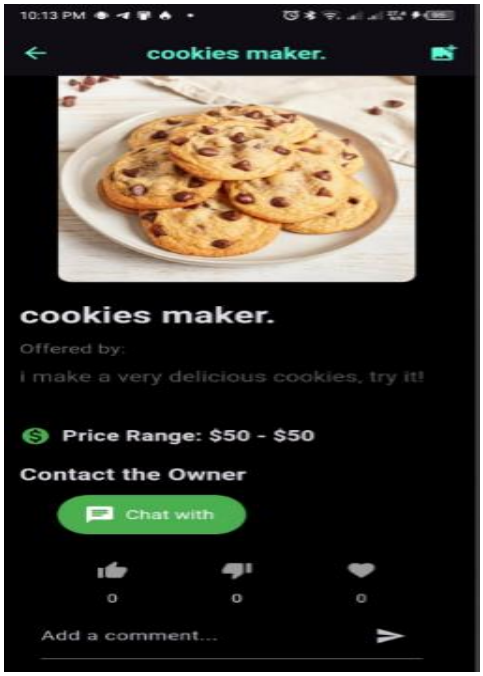

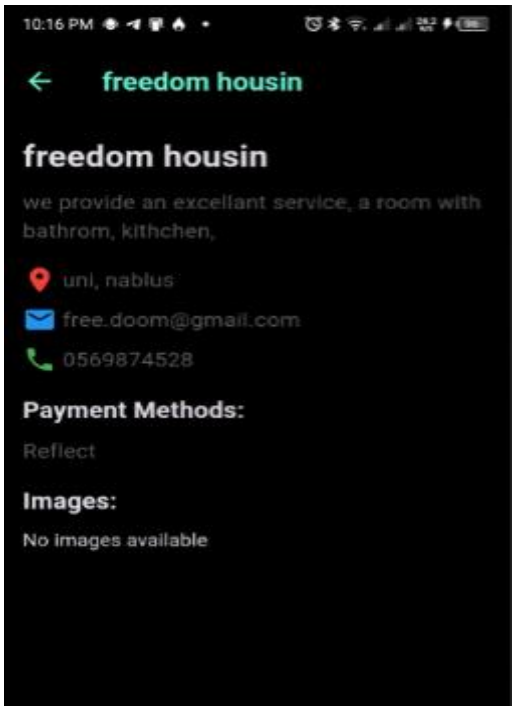

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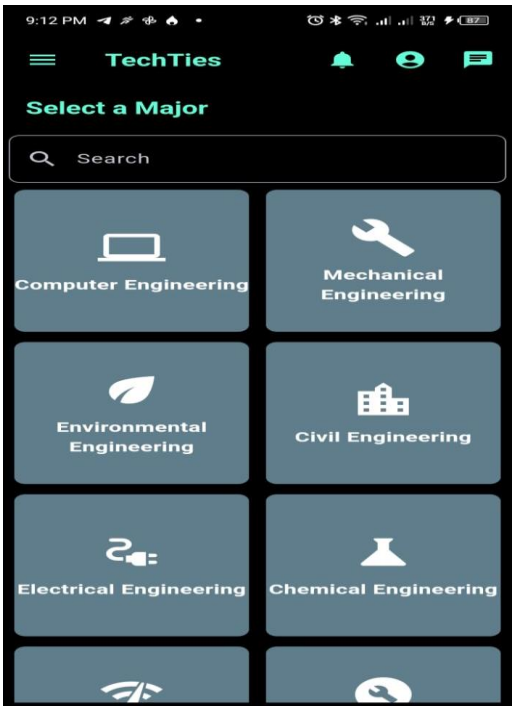

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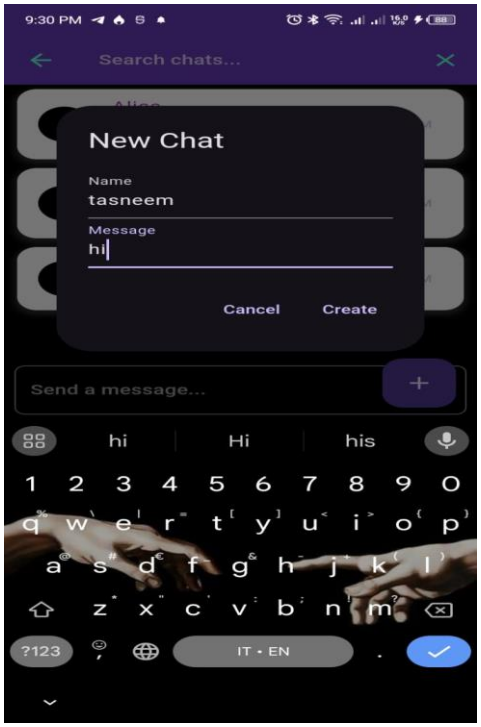

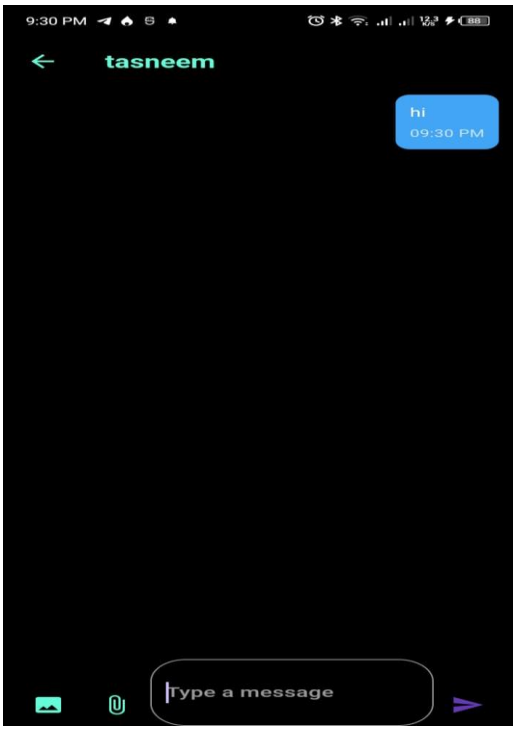

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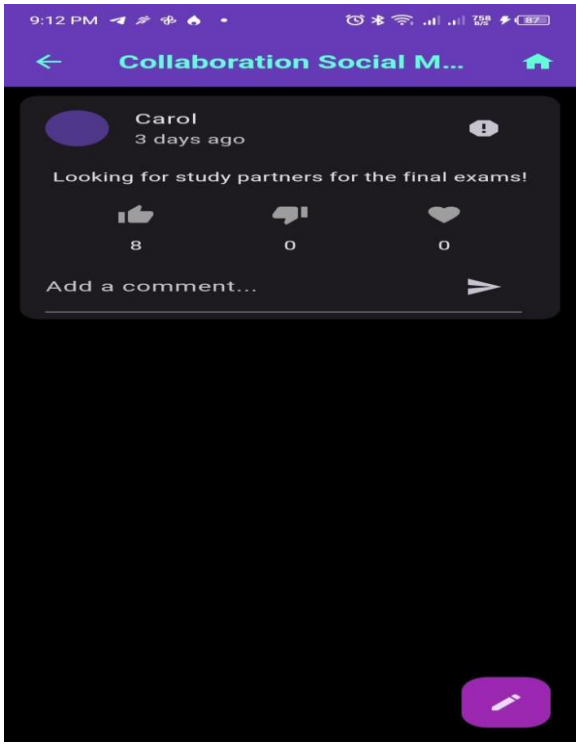

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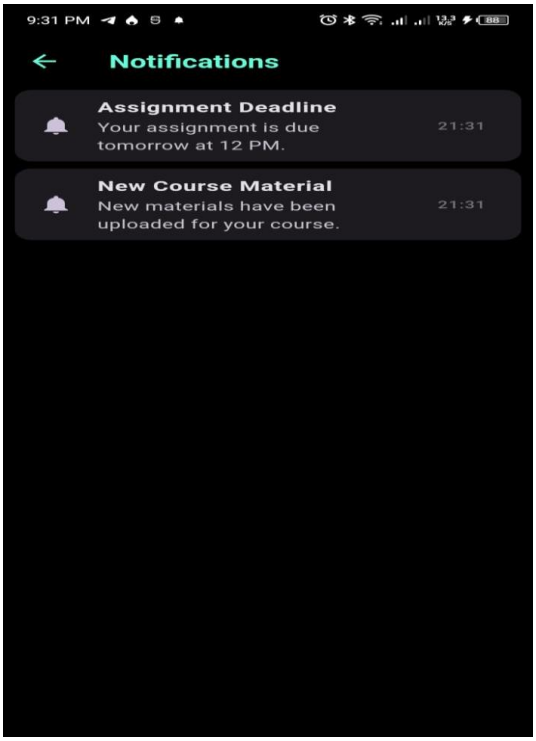

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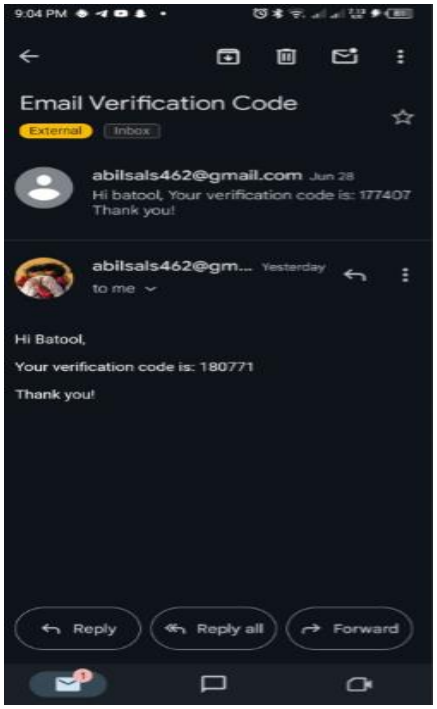
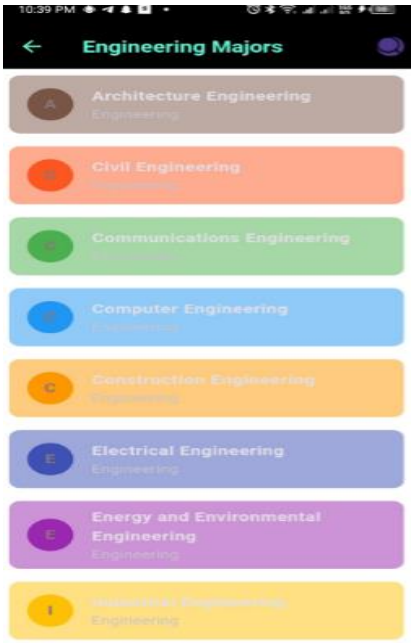


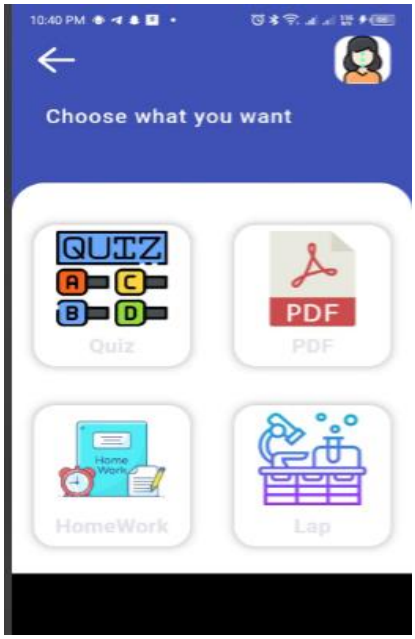
Verification Code

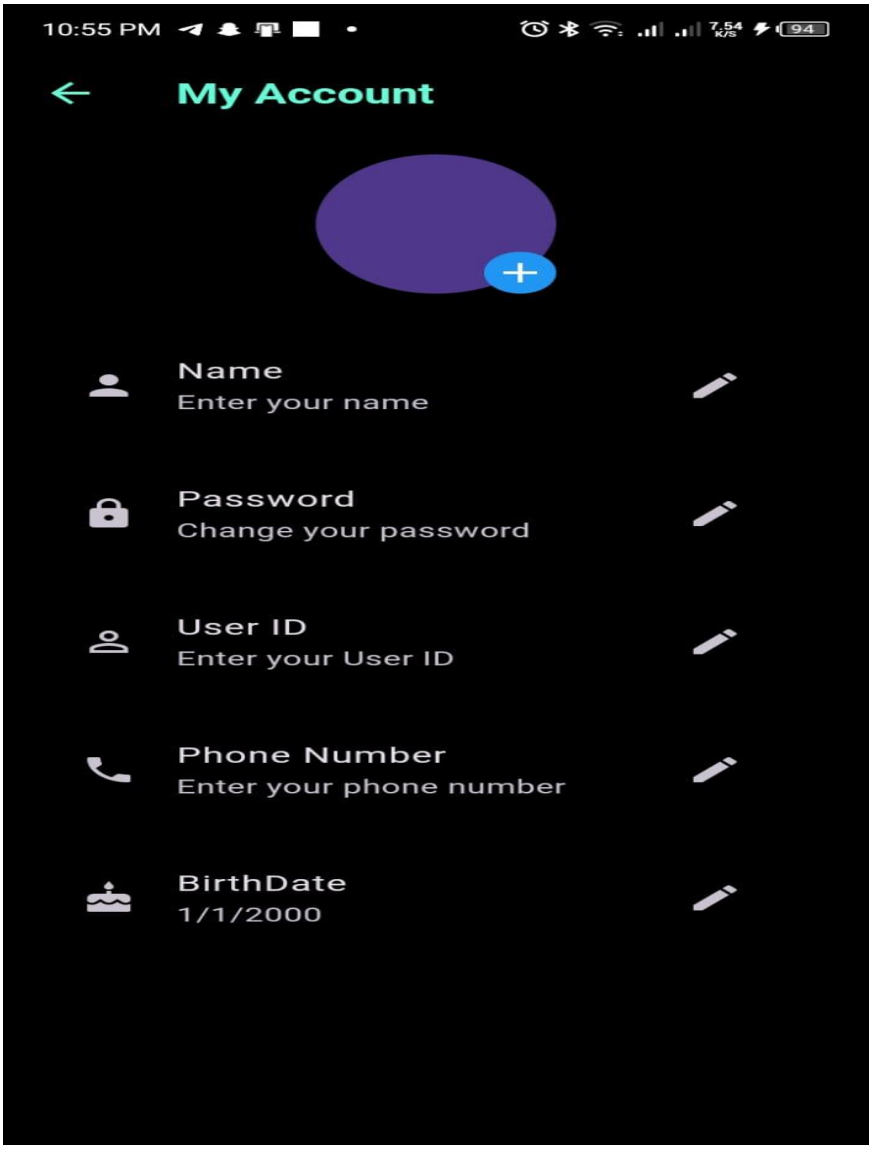

TechTies
SCIENCE


Engineering Majors
Architecture Engineering
Civil Engineering
Communications Engineering
Computer Engineering
Construction Engineering
Electrical Engineering
Energy and Environmental Engineering


الهندسة المعمارية


التصميم بواسطة الحاسوب (2)
العمارة الداخلية
تخطيط الموقع
التحليل البصري العمراني
مقدمة في التخطيط
التخطيط الحضري والاقليمي


Choose what you want
Quiz
PDF
HomeWork
Lap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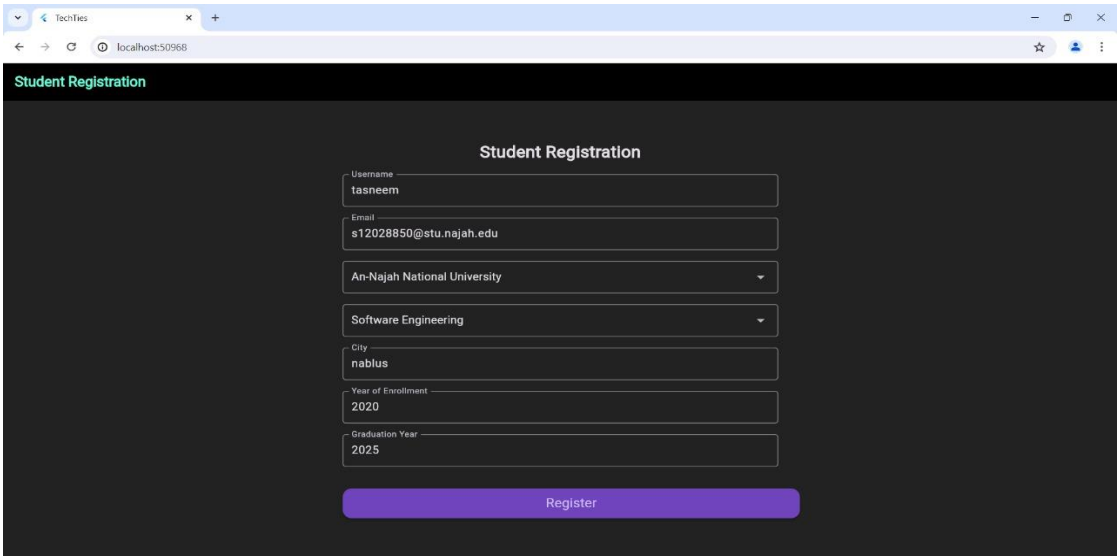
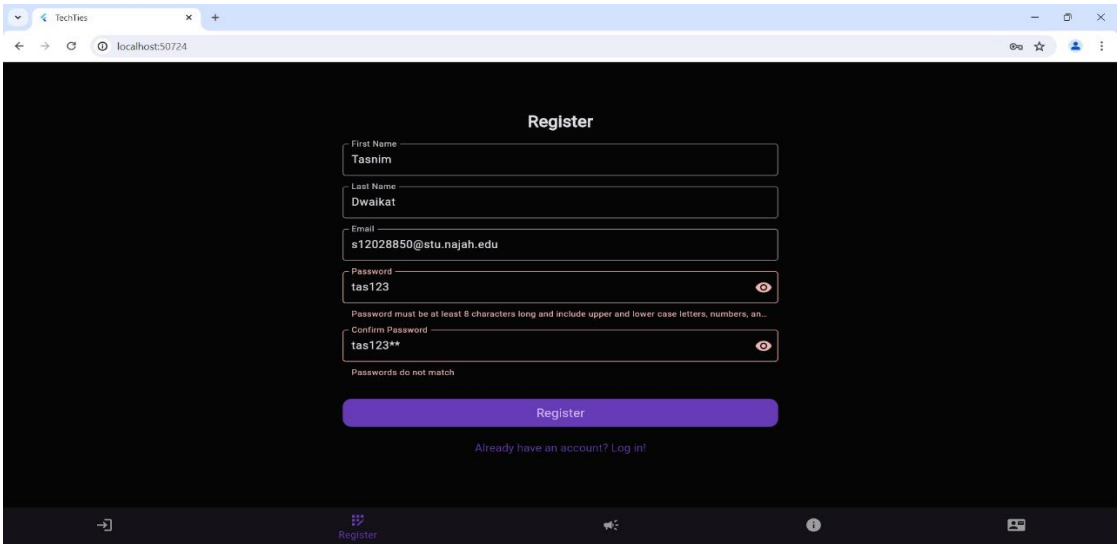
My Account
Name
Enter your name
Password
Change your password
User ID
Enter your User ID
Phone Number
Enter your phone number
BirthDate
1/1/2000

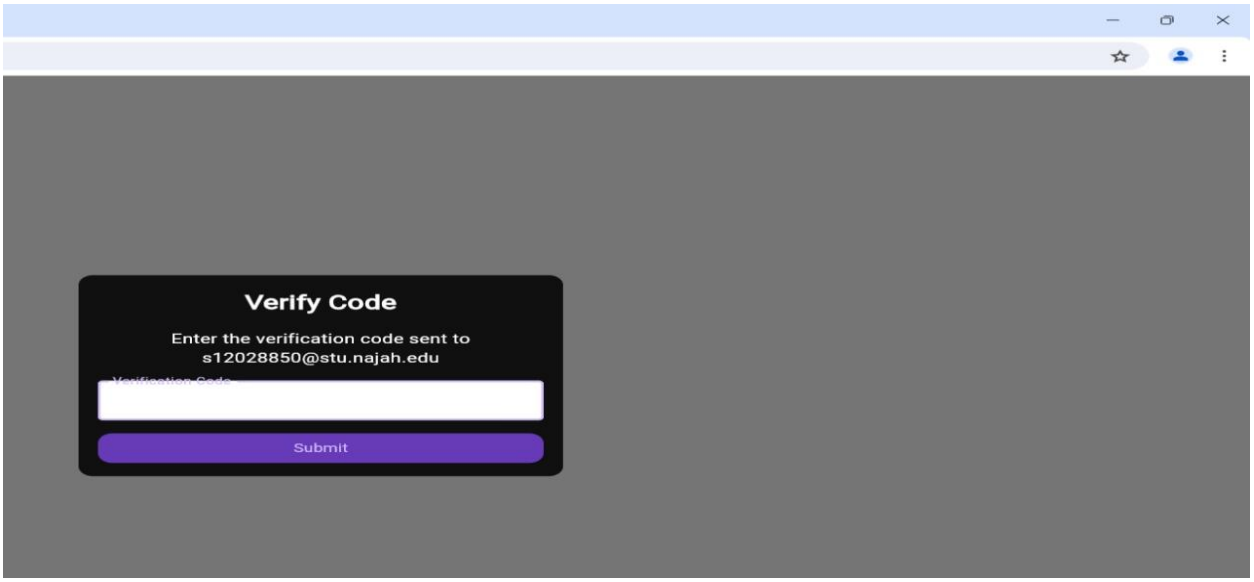
Account

3.2.2 Website

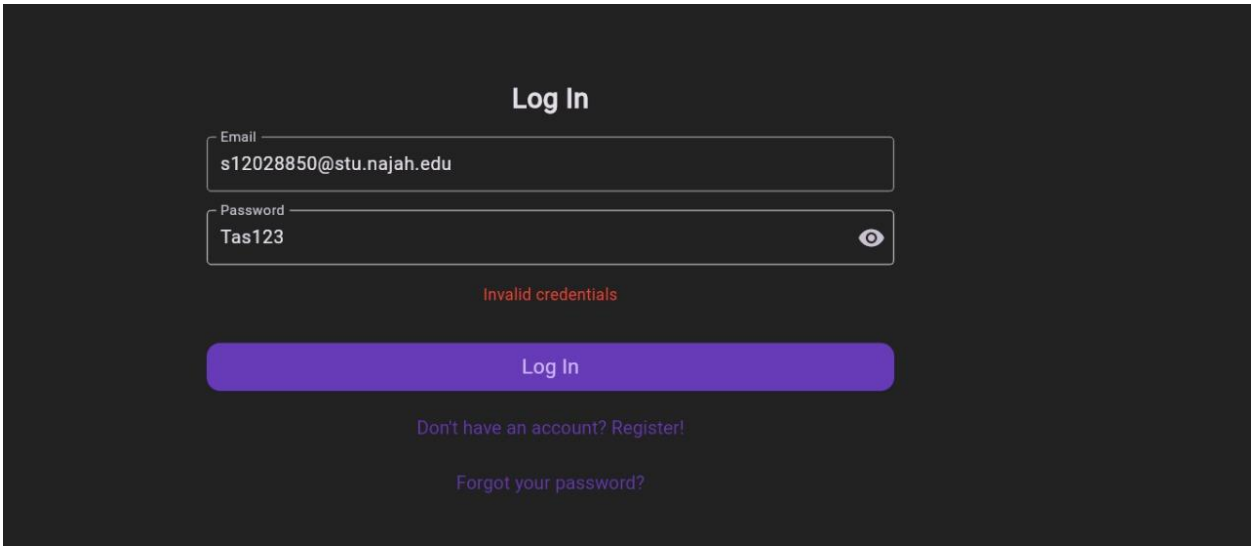


Registration for student

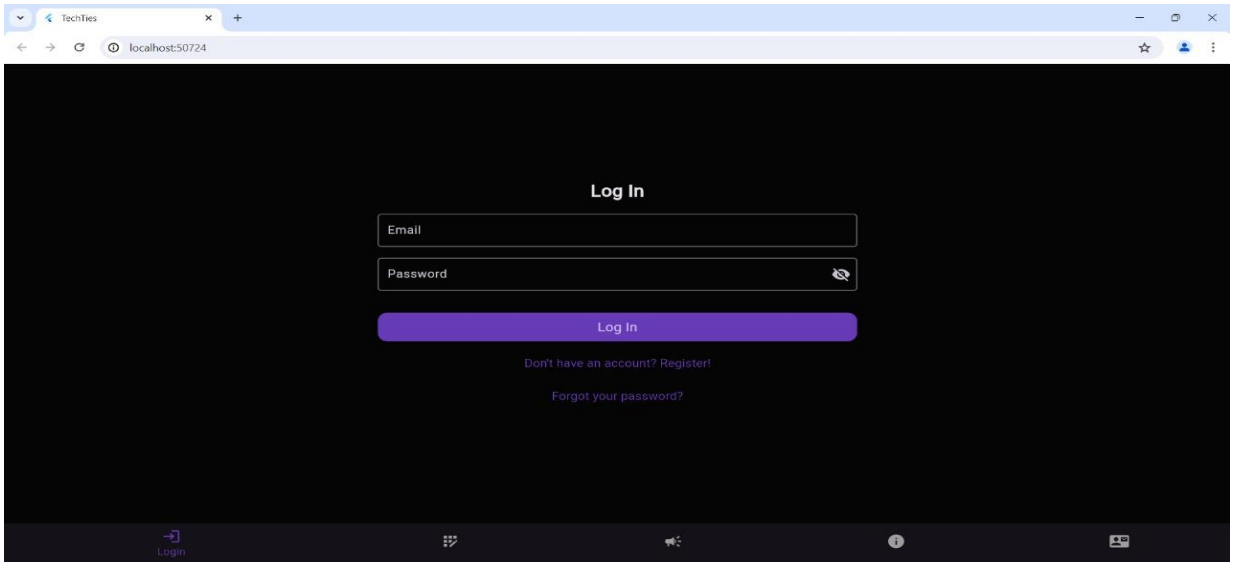


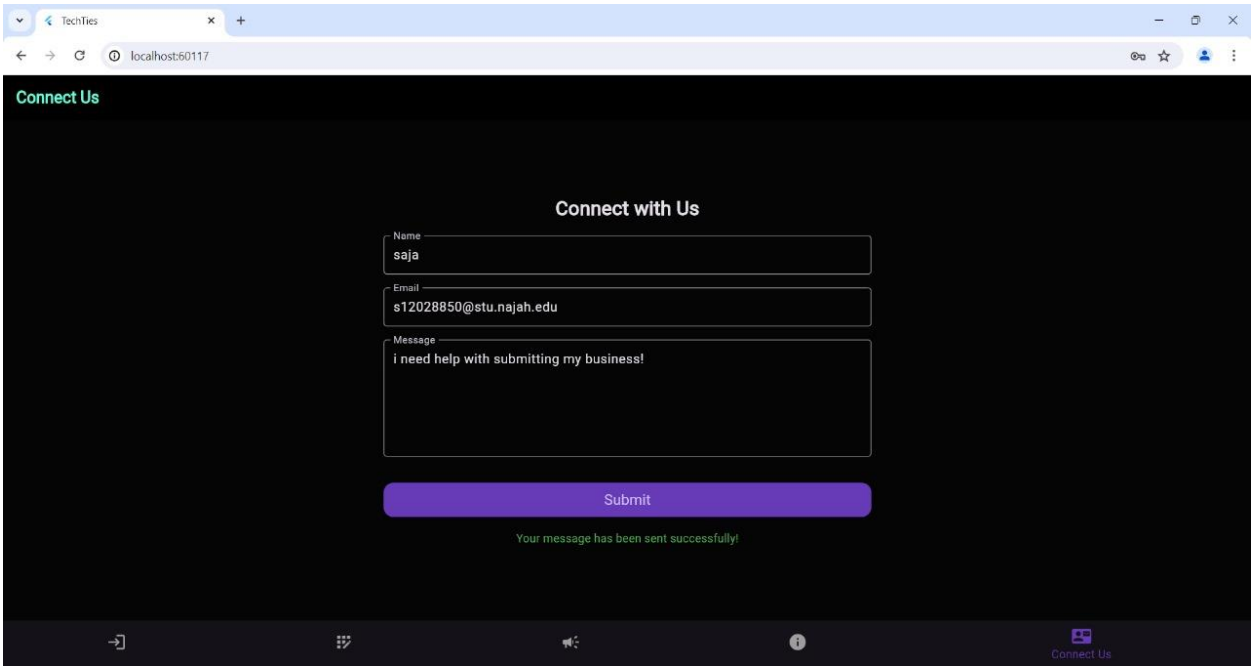


Verify Code



Log in


TechTies
localhost:50724
Log In
Email
Password
Log In
Don't have an account? Register!
Forgot your password?
Login


TechTies
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Connect Us
Connect with Us
Name
saja
Email
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Message
i need help with submitting my business!
Submit
Your message has been sent successfully!
Connect Us


TechTies
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t
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s12028850@stu.najah.edu
Software Engineering
Home
Majors
Housing
Small Businesses
Connect Us
Small Businesses
Housing
Promoter Businesses
Social
Majors


TechTies
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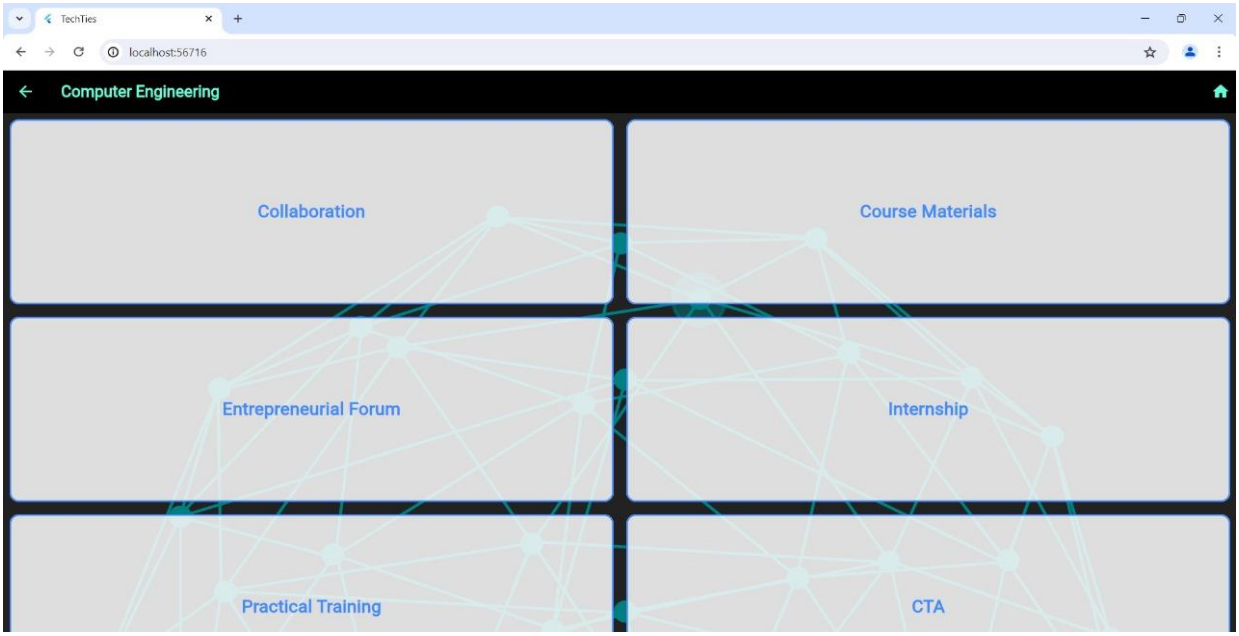
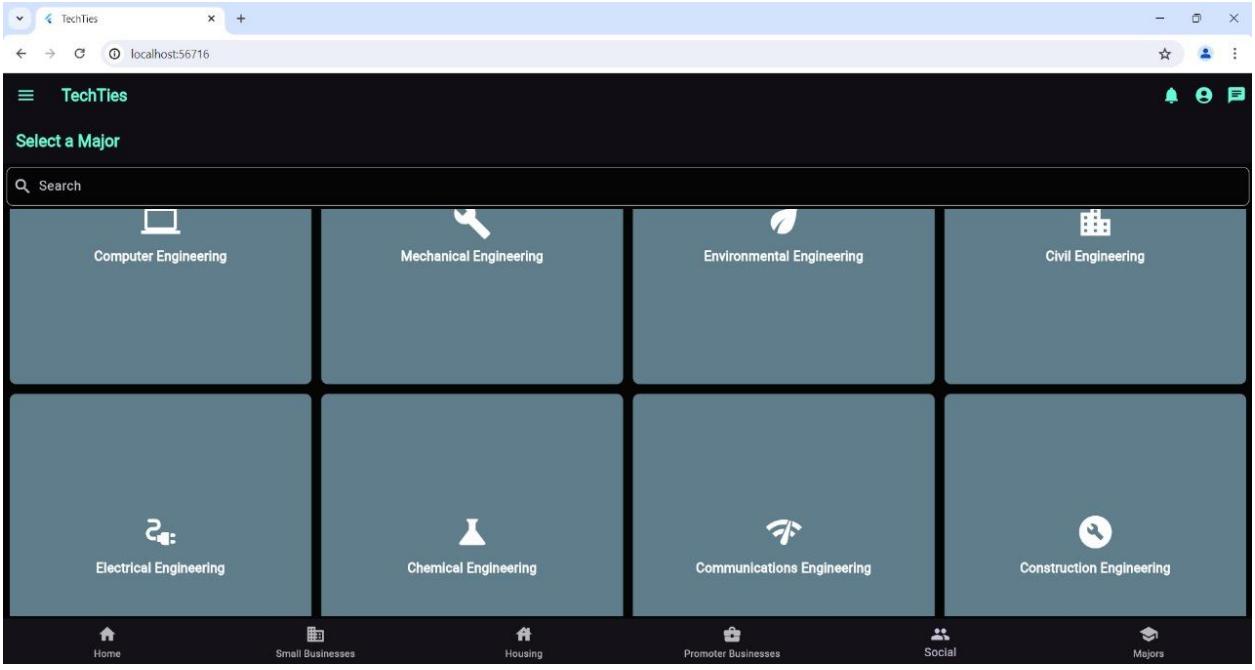
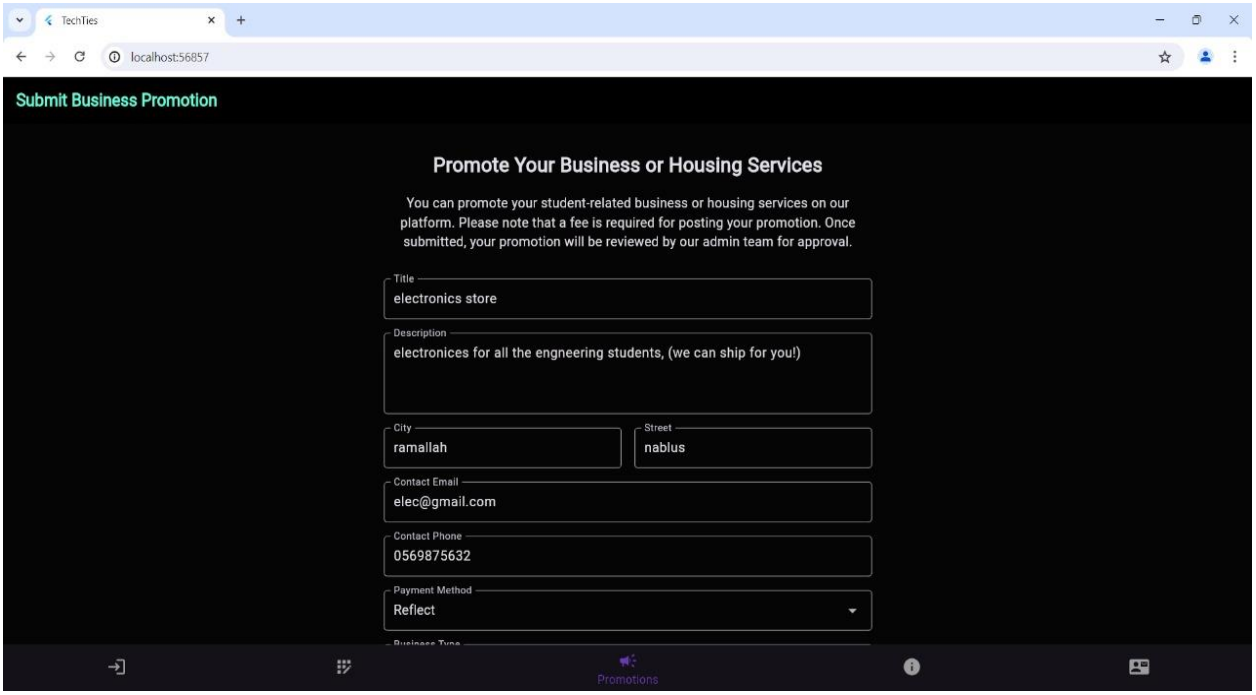
TechTies
TechTies Recommendations
General Post Recommendation
Stay updated with the latest news in your field.
General Business Recommendation
Explore various business opportunities.
Home
Small Businesses
Housing
Promoter Businesses
Social
Majors

Home Page

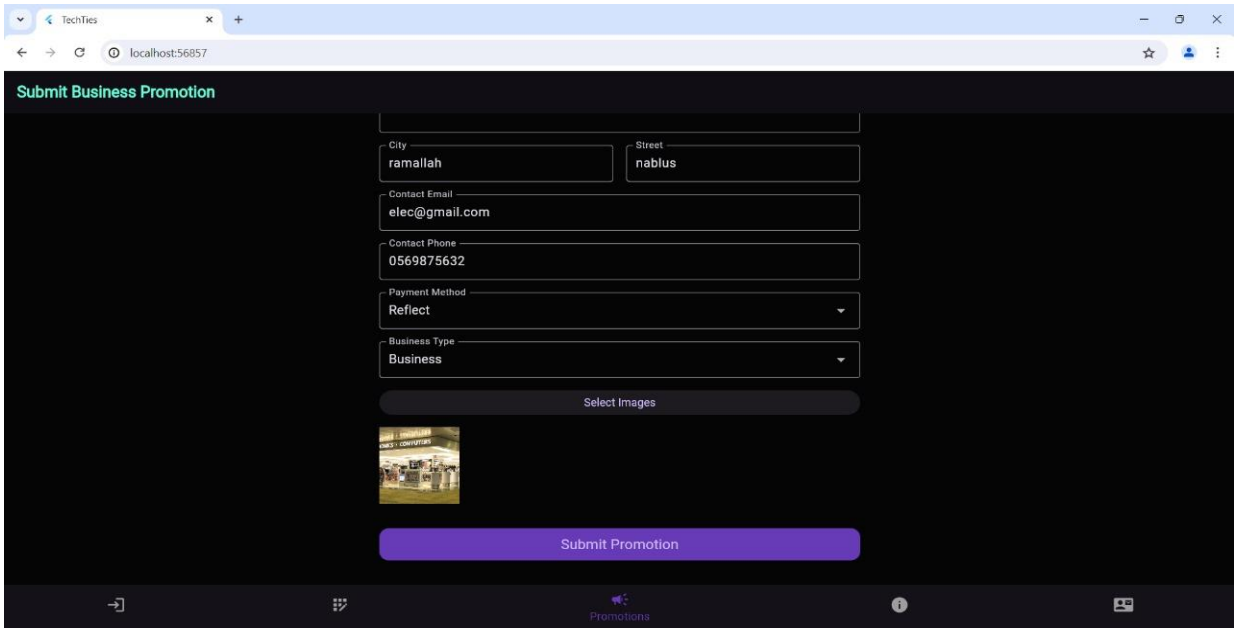


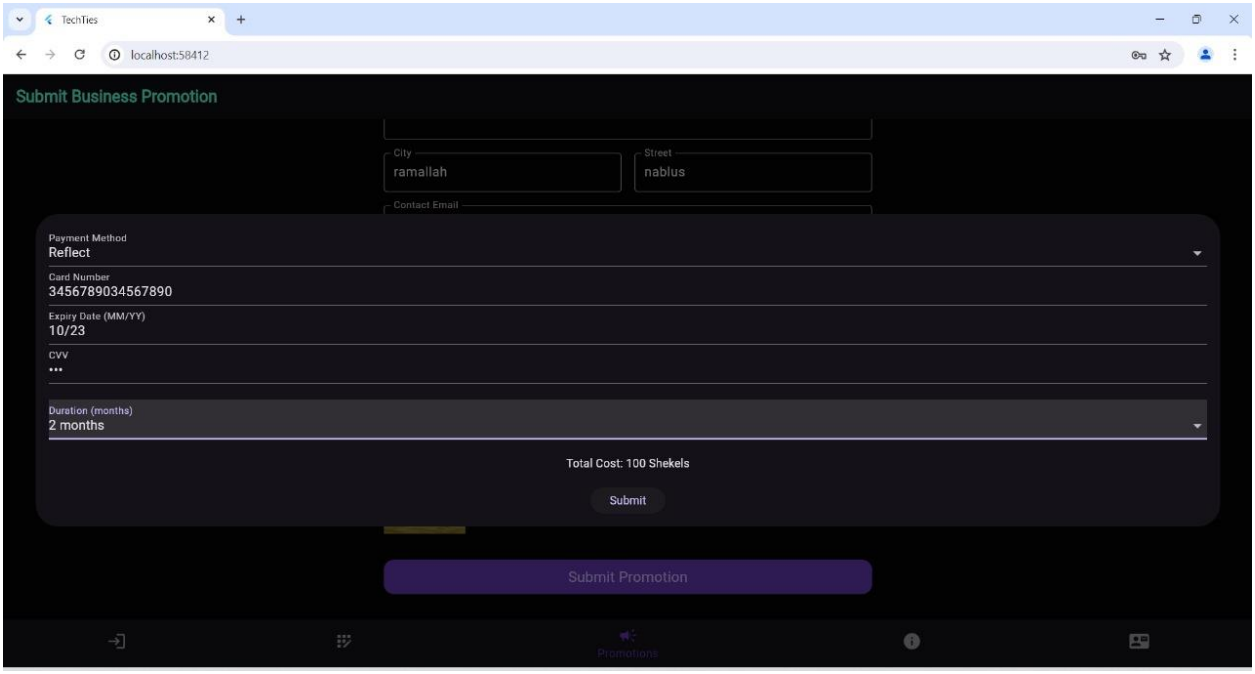


Engineering majors

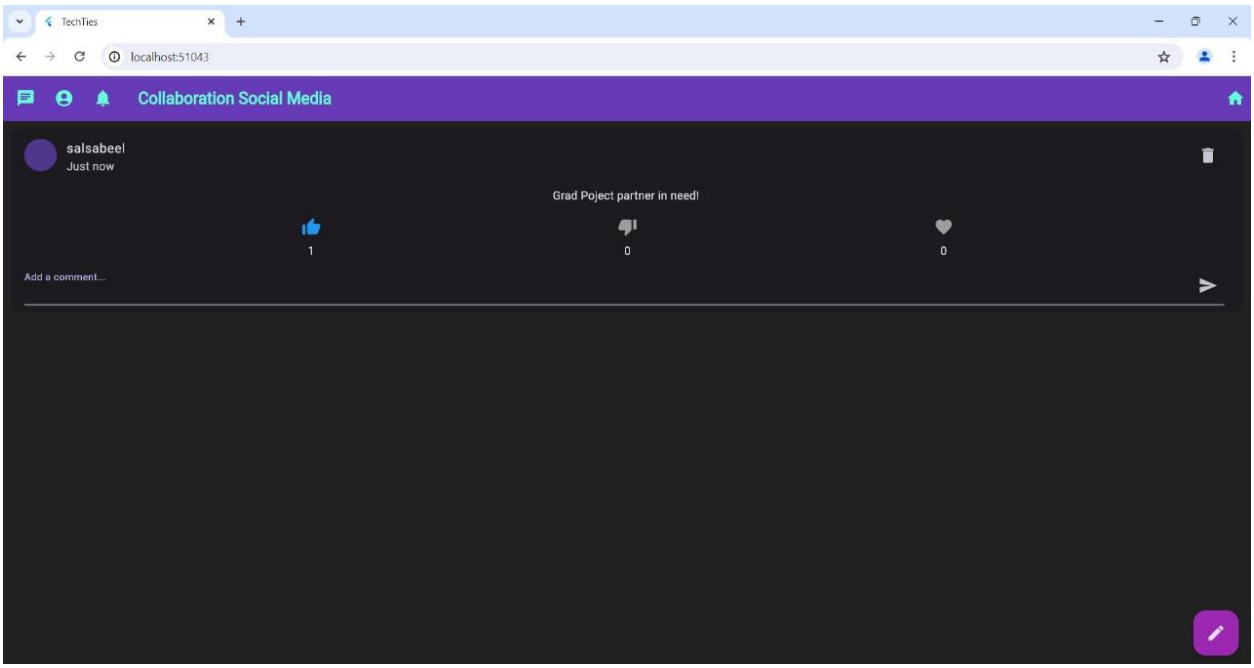

TechTies
localhost:56857
Submit Business Promotion
Promote Your Business or Housing Services
You can promote your student-related business or housing services on our platform. Please note that a fee is required for posting your promotion. Once submitted, your promotion will be reviewed by our admin team for approval.
Title
electronics store
Description
electronices for all the engneering students, (we can ship for you!)
City
ramallah
Street
nablus
Contact Email
elec@gmail.com
Contact Phone
0569875632
Payment Method
Reflect
Promotions

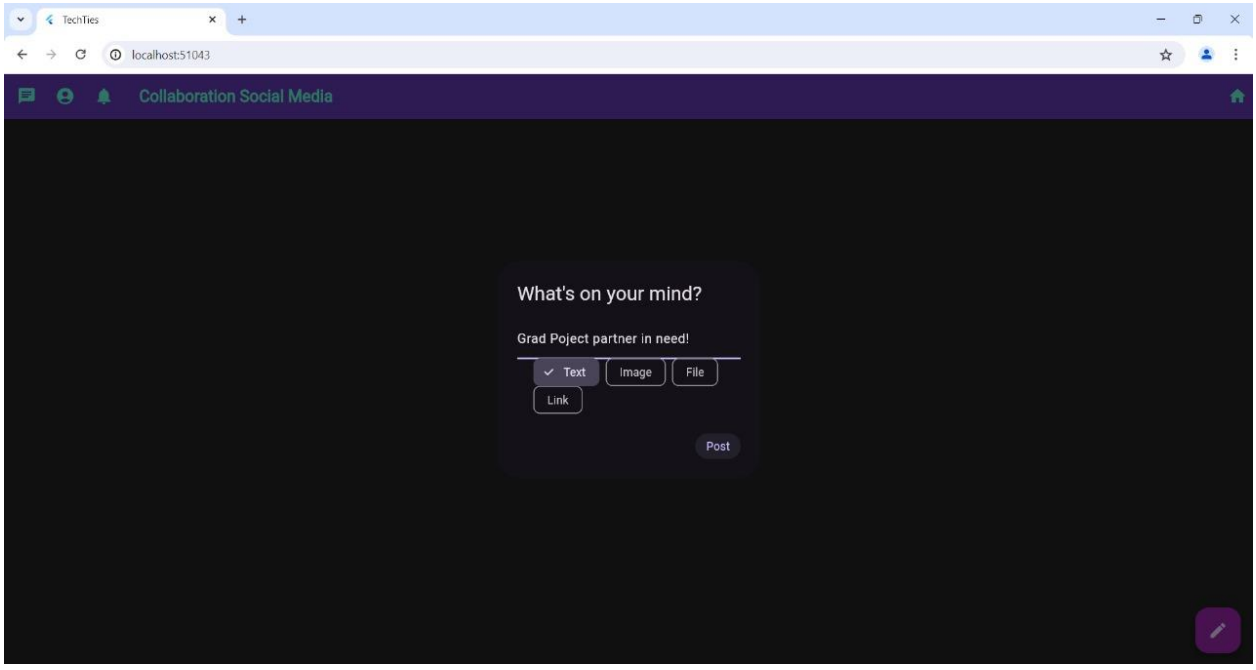
Business

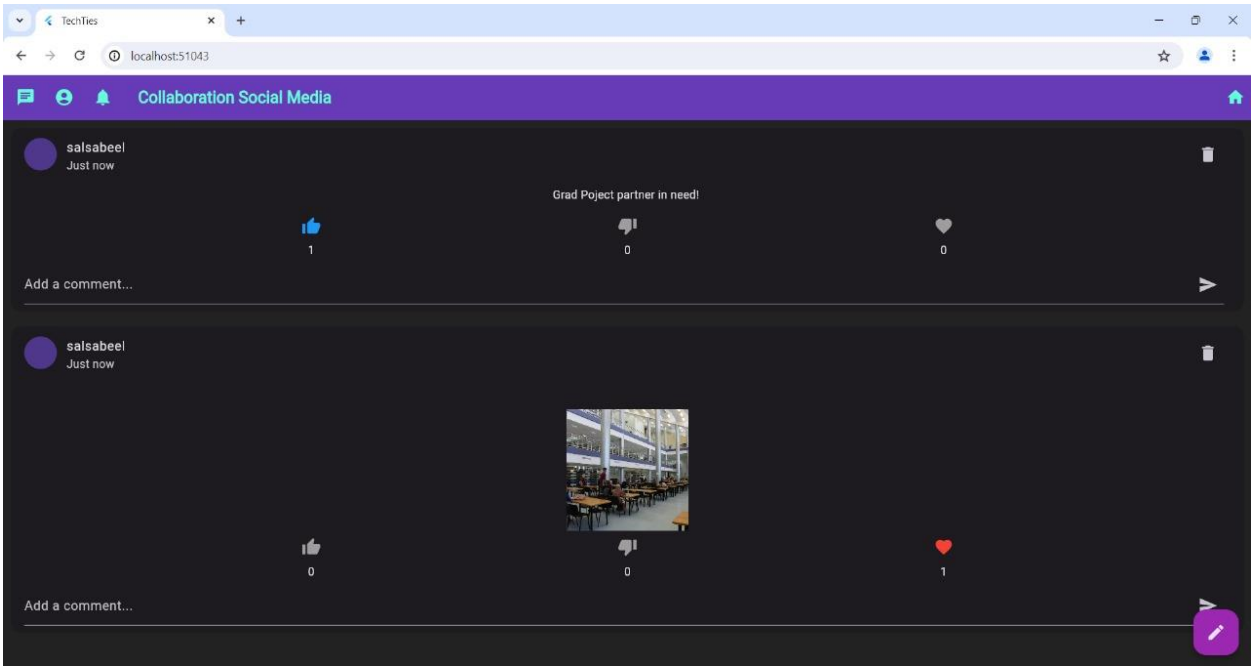

TechTies
localhost:56857
Submit Business Promotion
City
ramallah
Street
nablus
Contact Email
elec@gmail.com
Contact Phone
0569875632
Payment Method
Reflect
Business Type
Business
Select Images
Submit Promotion
Promotions

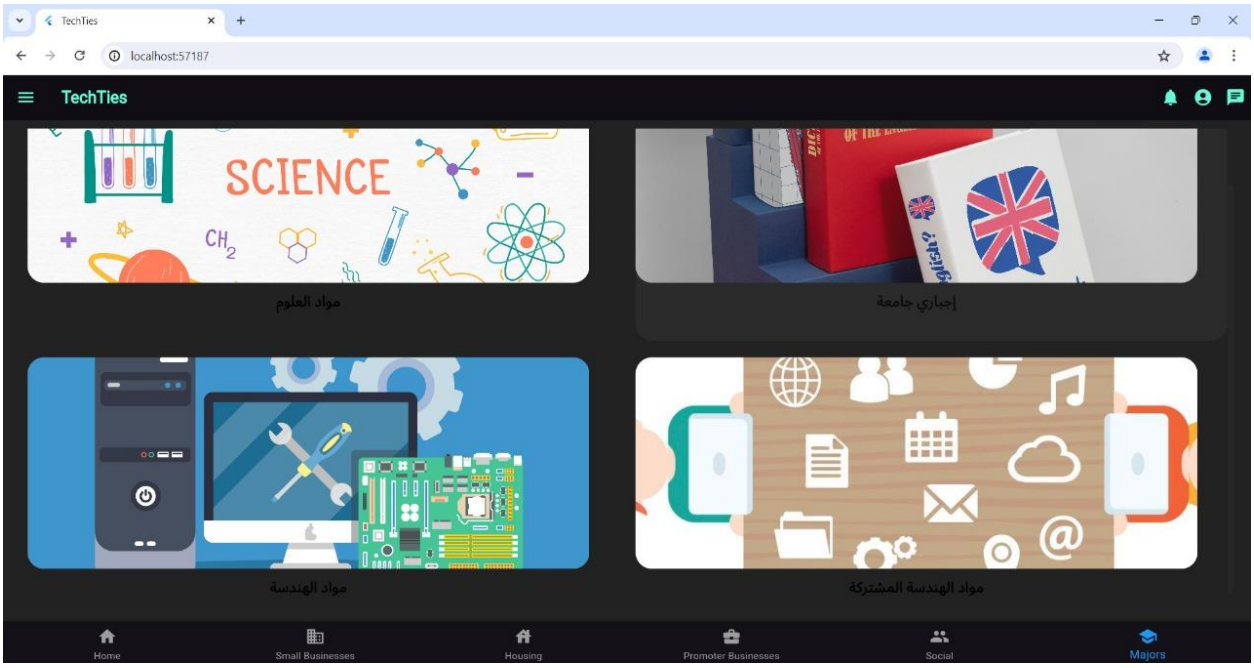

TechTies
localhost:58412
Submit Business Promotion
City
ramallah
Street
nablus
Contact Email
Payment Method
Reflect
Card Number
3456789034567890
Expiry Date (MM/YY)
10/23
CVV
•••
Duration (months)
2 months
Total Cost: 100 Shekels
Submit
Submit Promotion
Promotions

Payment


TechTies
localhost:51043
Collaboration Social Media
salsabeel
Just now
Grad Poject partner in need!
1
0
0
Add a comment...

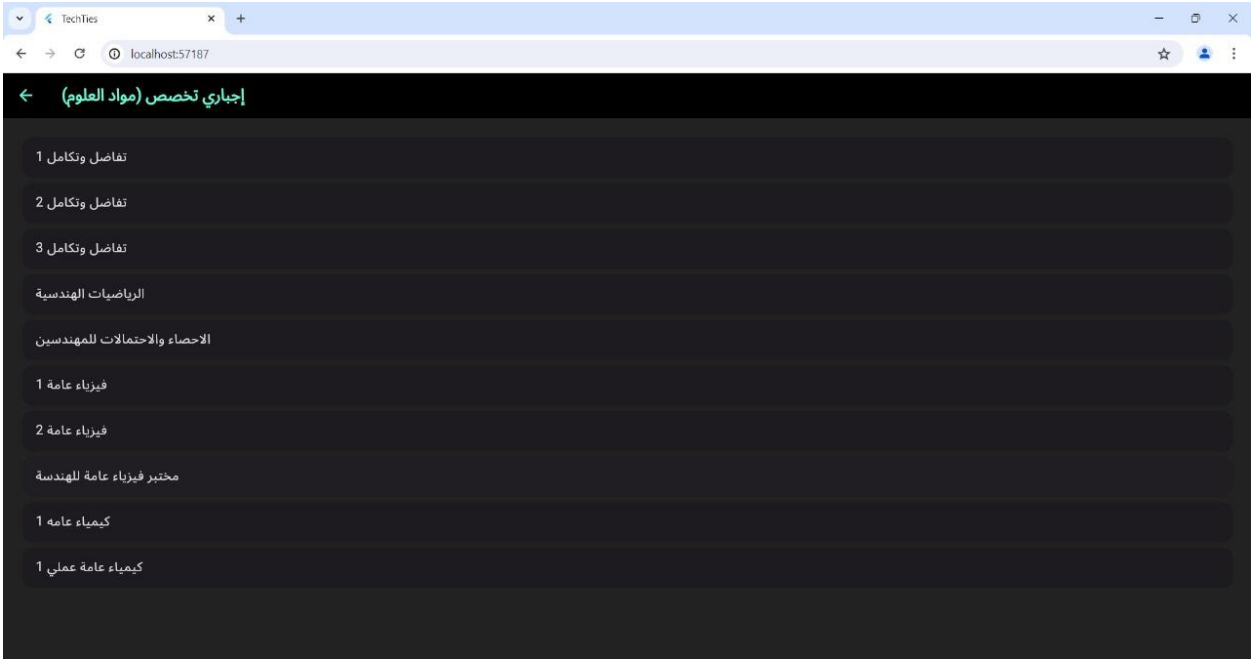

TechTies
localhost:51043
Collaboration Social Media
What's on your mind?
Grad Poject partner in need!
Text
Image
File
Link
Post


TechTies
localhost:51043
Collaboration Social Media
salsabeel
Just now
Grad Poject partner in need!
1
0
0
Add a comment...
salsabeel
Just now
0
0
1
Add a comment...

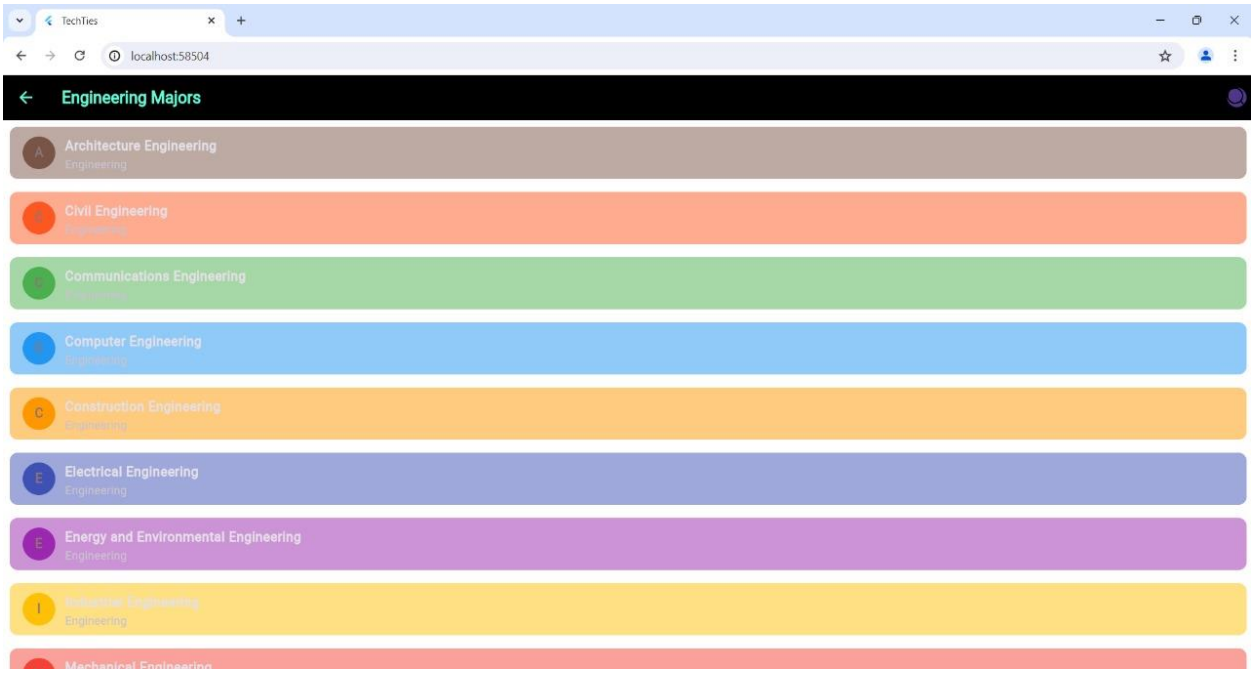


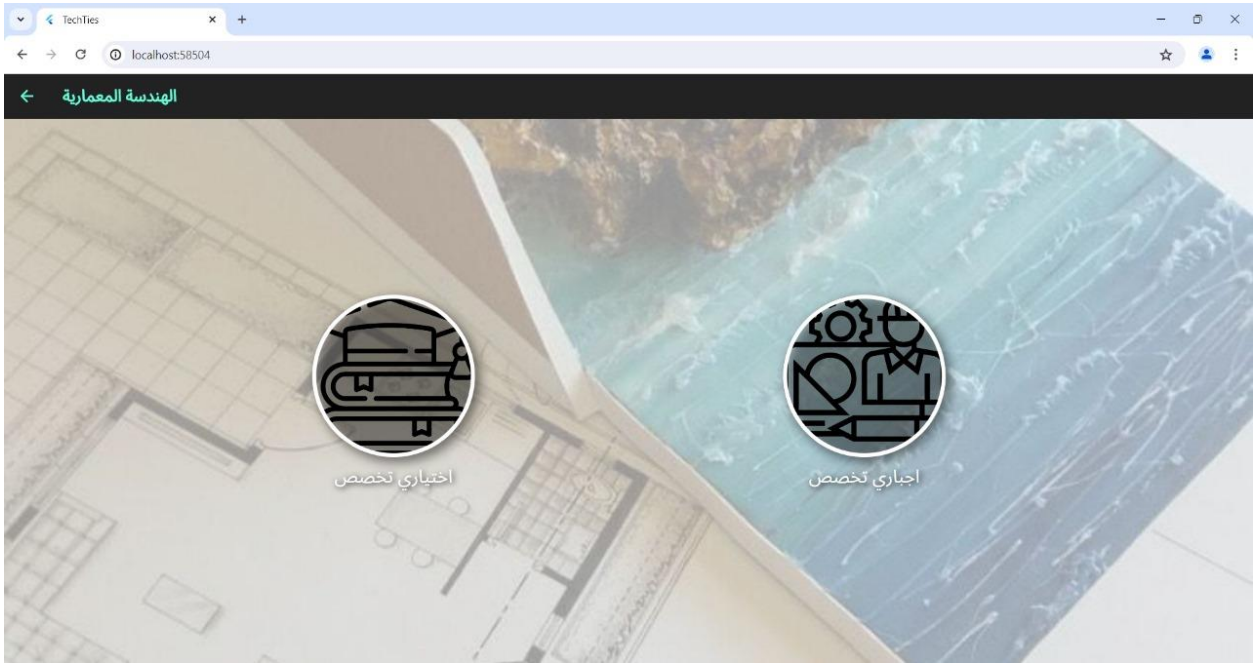
Majors:

when click on (مواد العلوم)

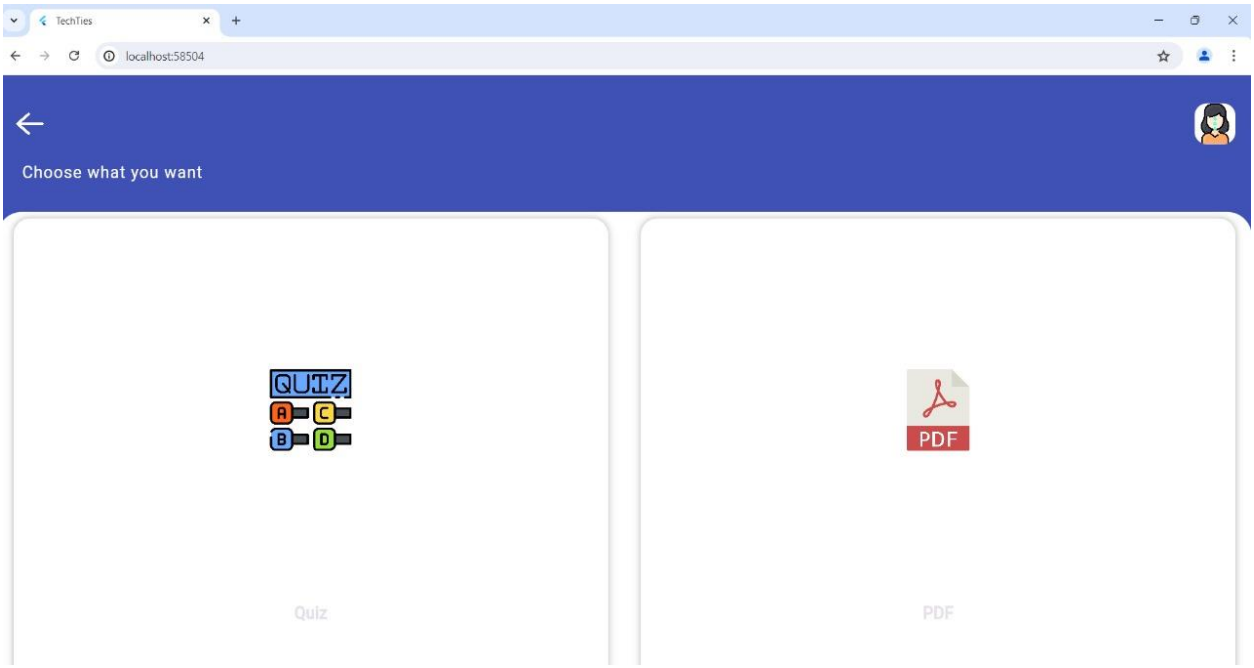


when click on (مواد الهندسة)



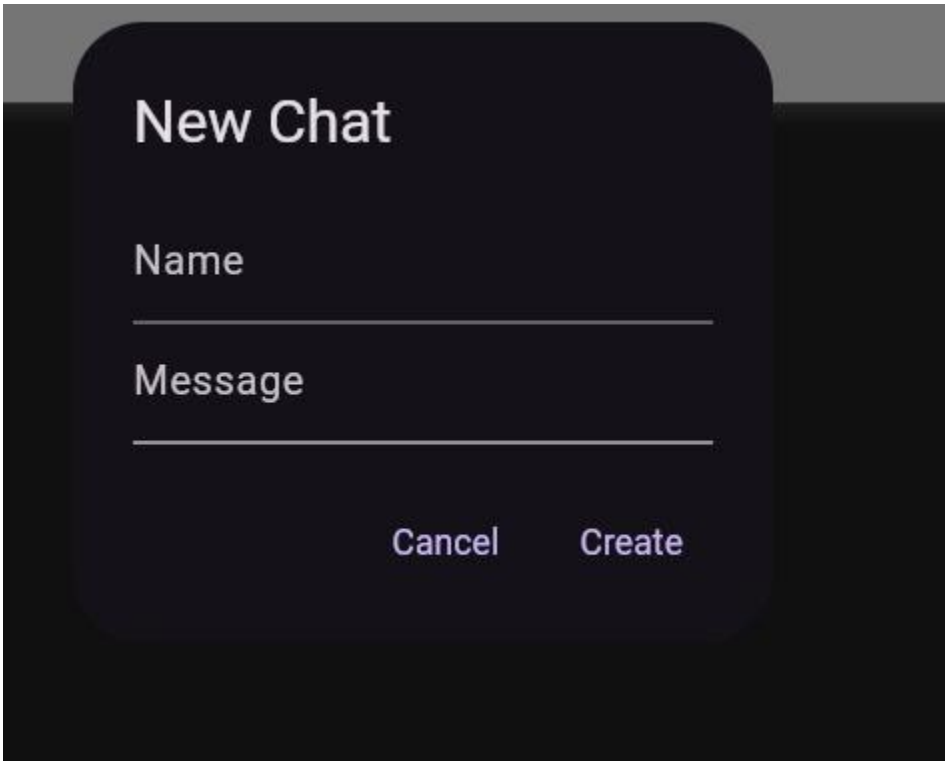



TechTies
localhost:58504
التصميم بواسطة الحاسوب (2)
العمارة الداخلية
تخطيط الموقع
التحليل البصري العمراني
مقدمة في التخطيط
التخطيط الحضري والاقليمي
العمارة الطبيعية
موفولوجية الشكل الحضري

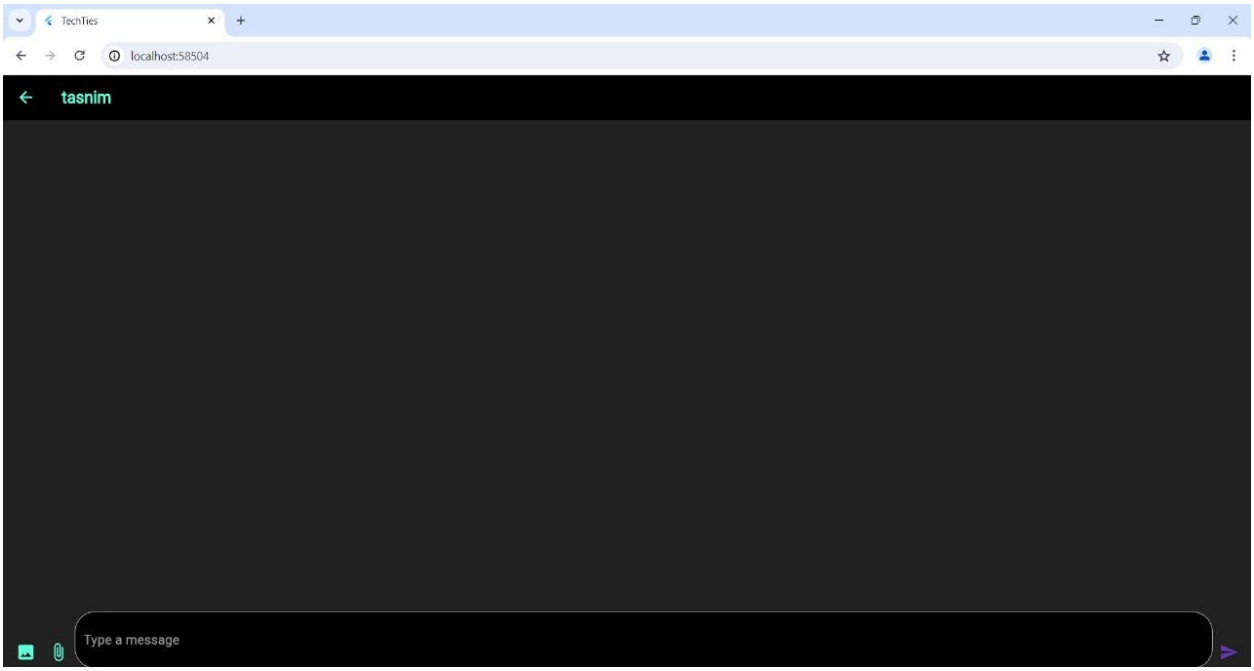

TechTies
localhost:58504
Choose what you want
QUIZ
PDF
Quiz
PDF

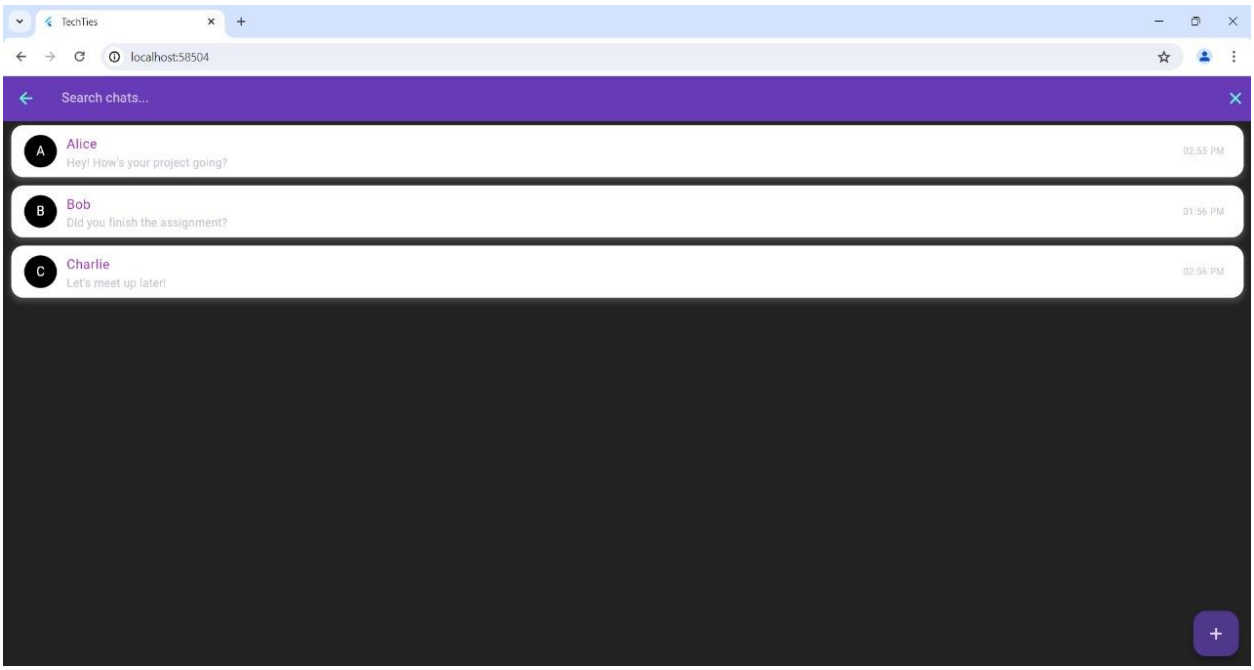

TechTies
localhost:58504
HomeWork
Lap

Chatting:

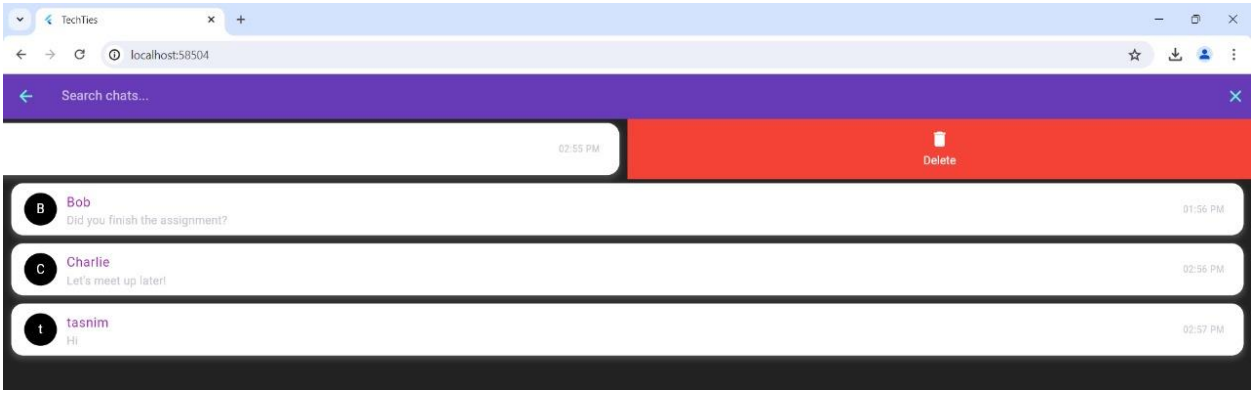

New Chat
Name
Message
Cancel
Create


TechTies
localhost:58504
tasnim
file-1719489460149.dart
8.7 KB • Done
02:57 PM
02:57 PM
Type a message

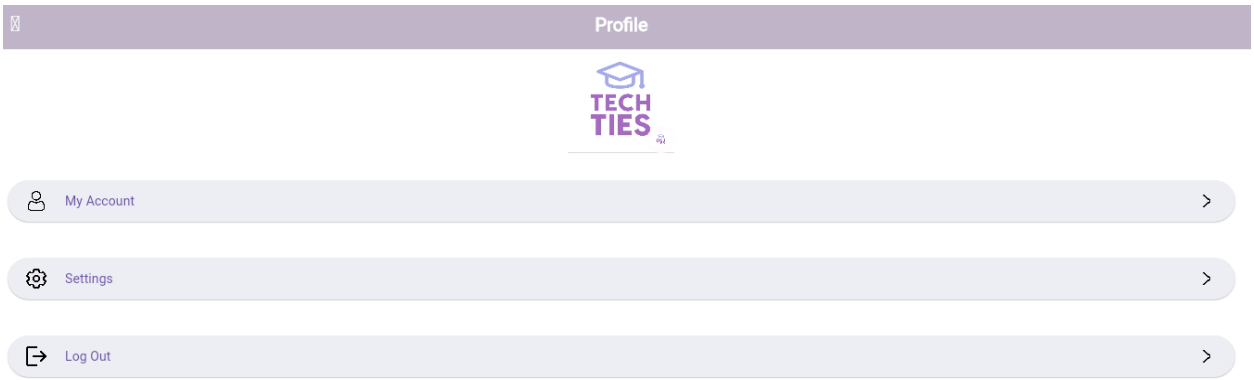

TechTies
localhost:58504
tasnim
Type a message

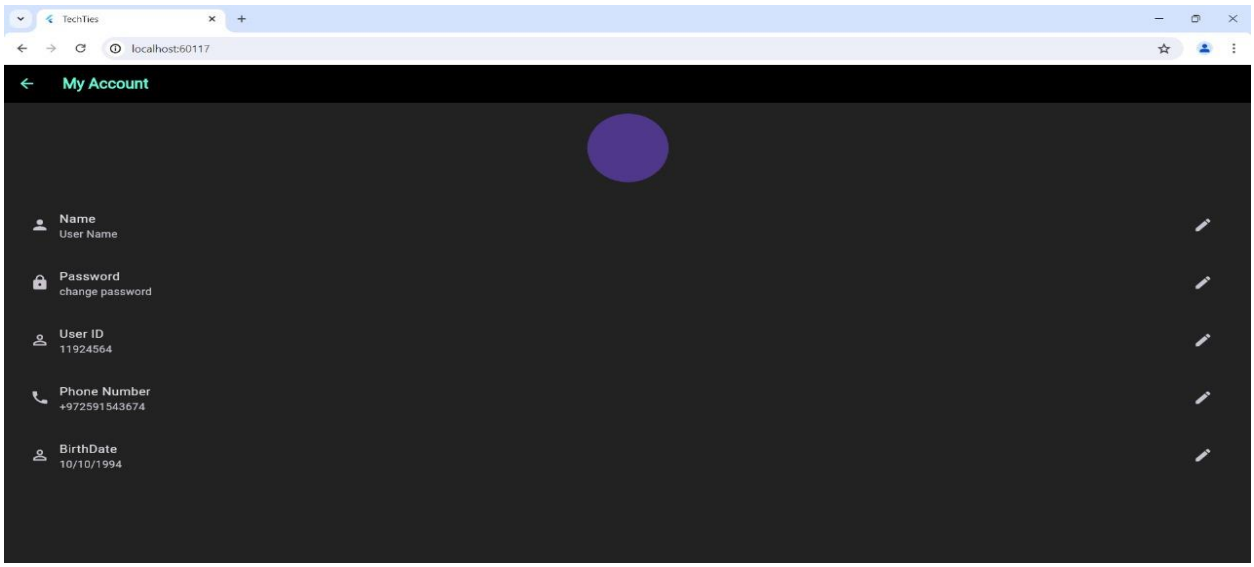


when slide left, chat delete.

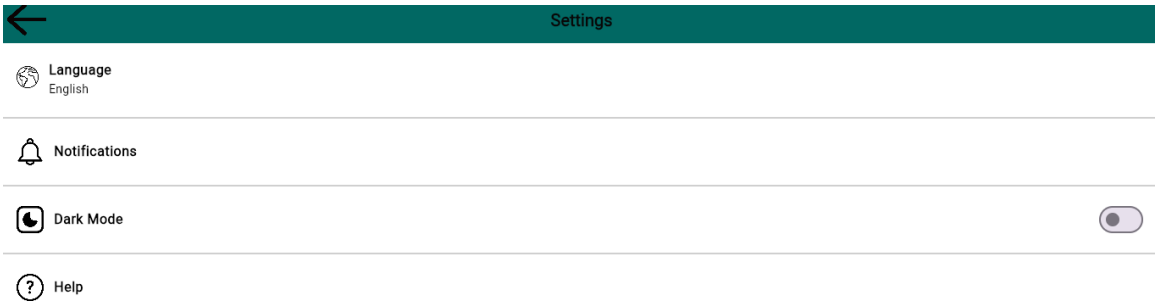


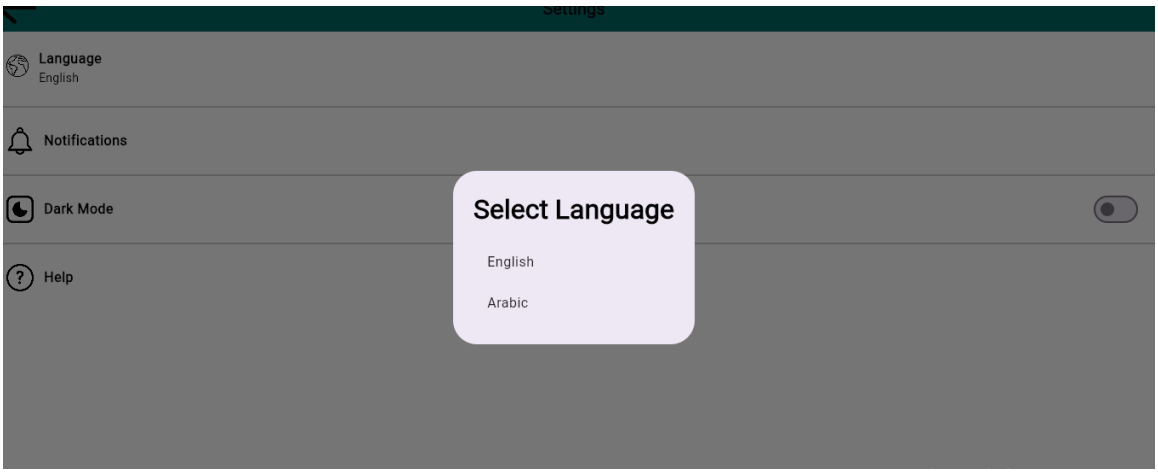
Profile


Profile
TECH TIES
My Account
Settings
Log Out


TechTies
localhost:60117
My Account
Name
User Name
Password
change password
User ID
11924564
Phone Number
+972591543674
BirthDate
10/10/1994

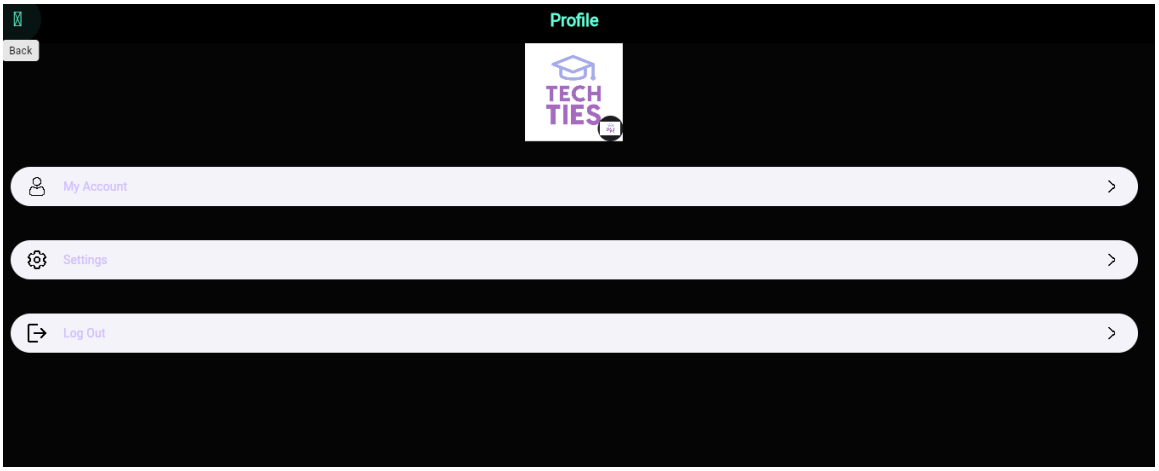
Setting


Settings
Language
English
Notifications
Dark Mode
Help

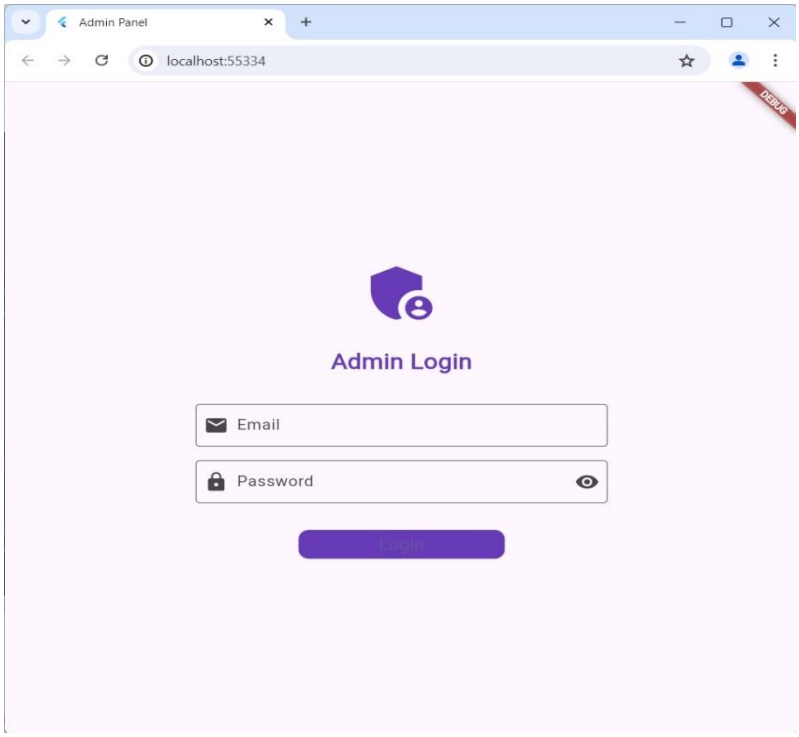

Language
English
Notifications
Dark Mode
Help
Select Language
English
Arabic


الإعدادات
اللغة
العربية
الإشعارات
الوضع الداكن
مساعدة

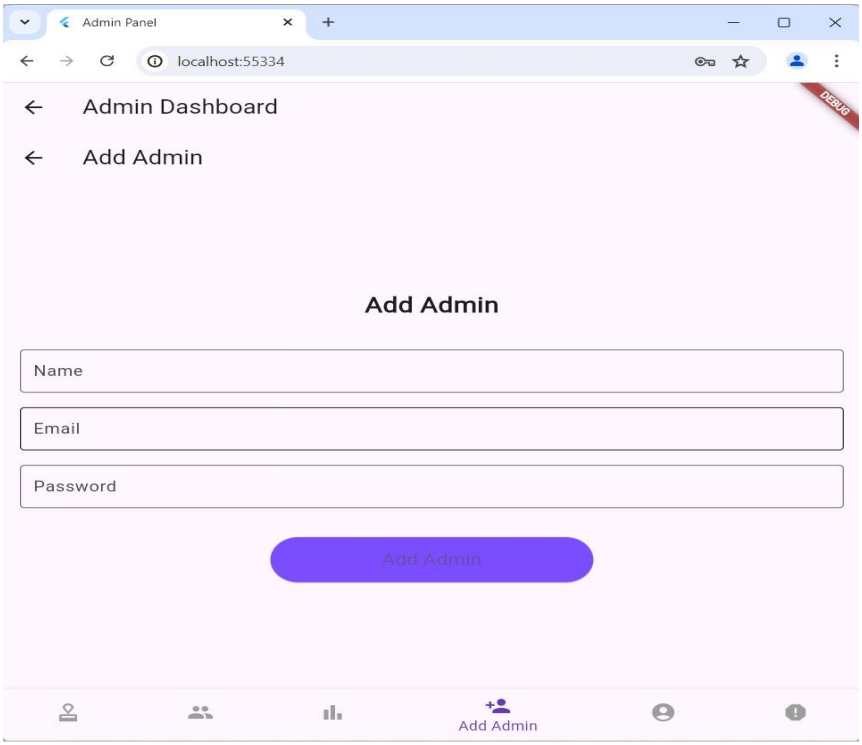
When available dark mode , all page convert to dark mode.

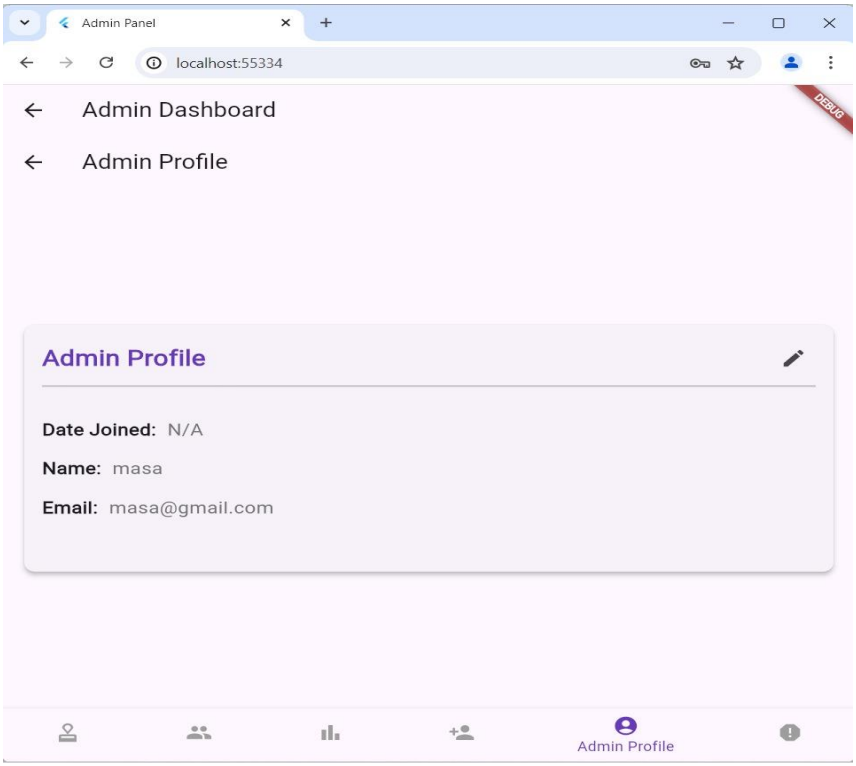


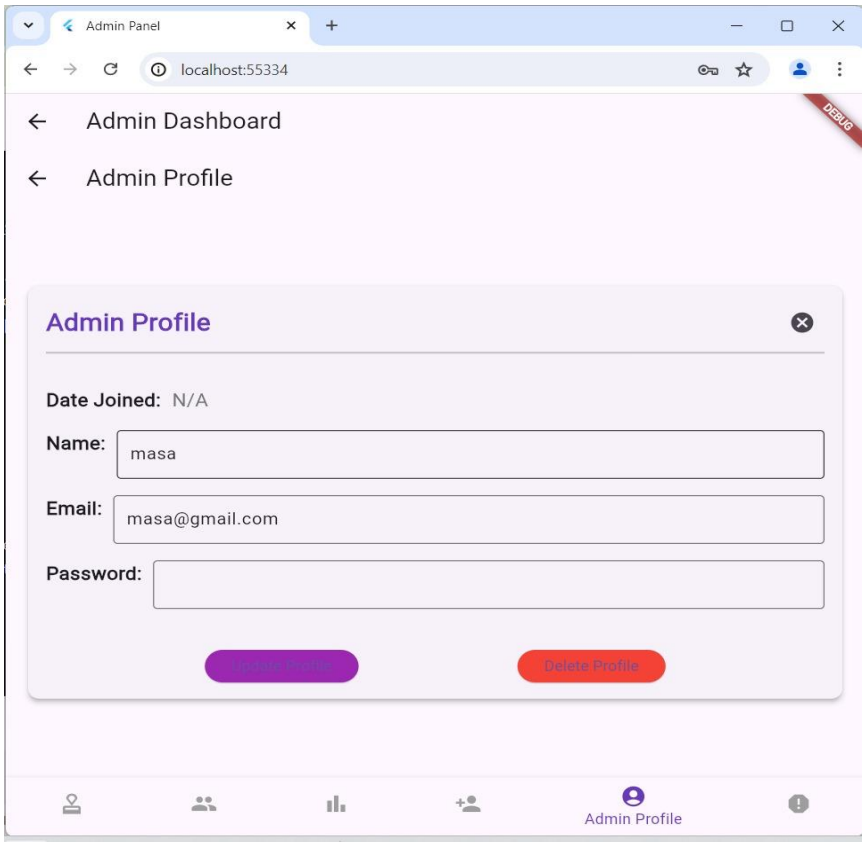
Admin

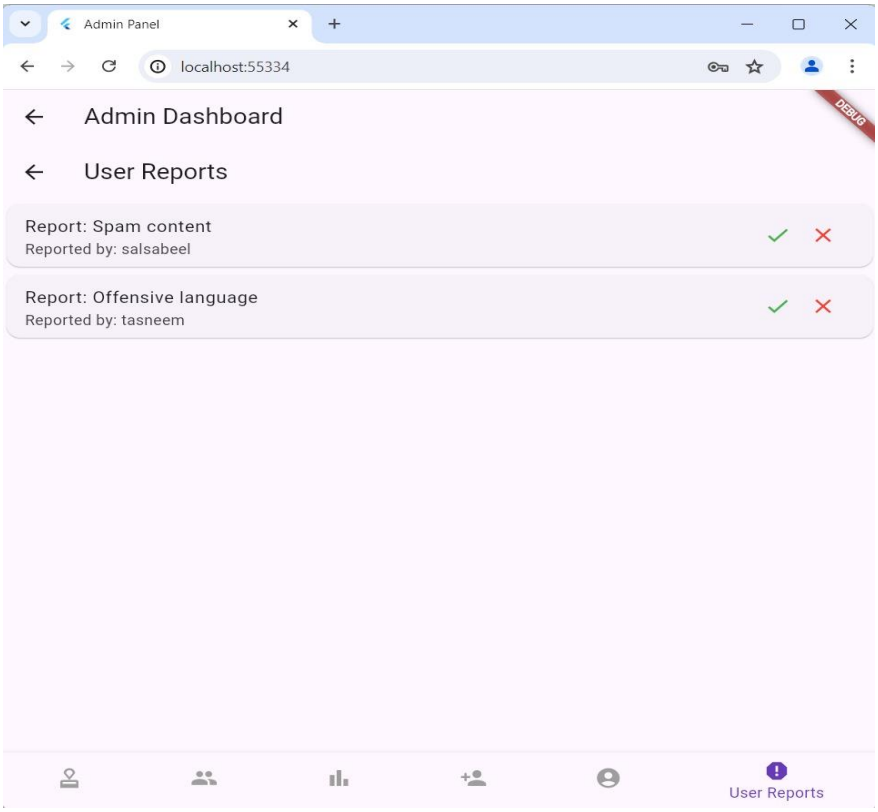


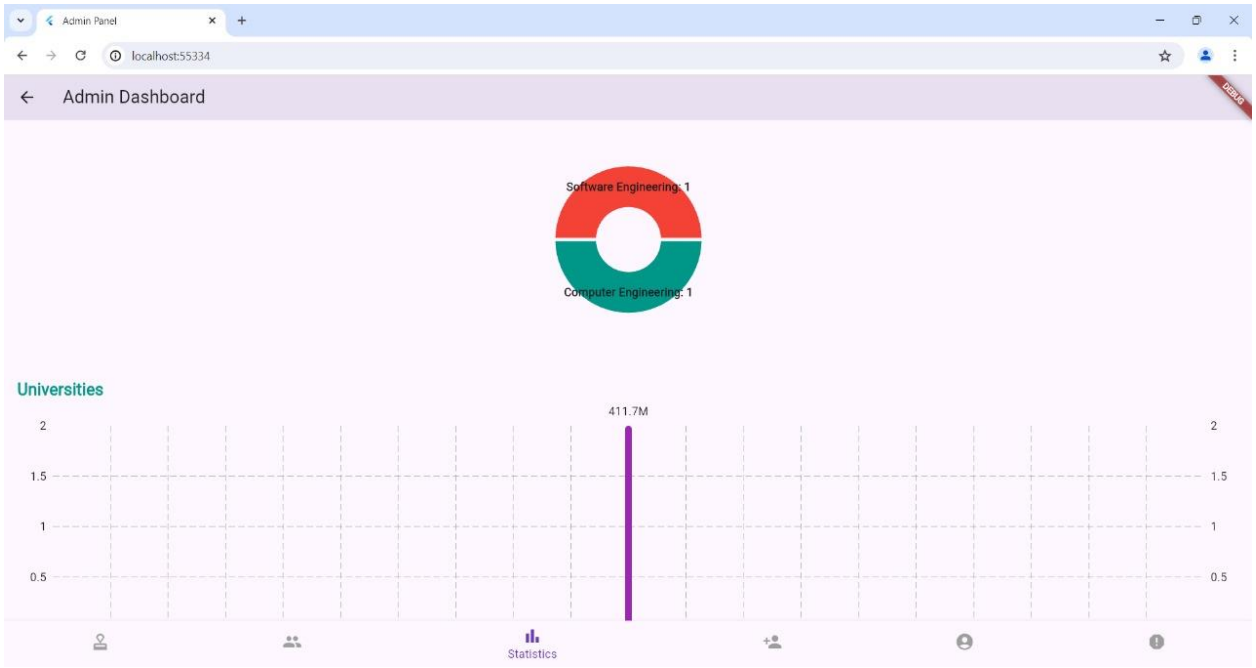
Add Admin

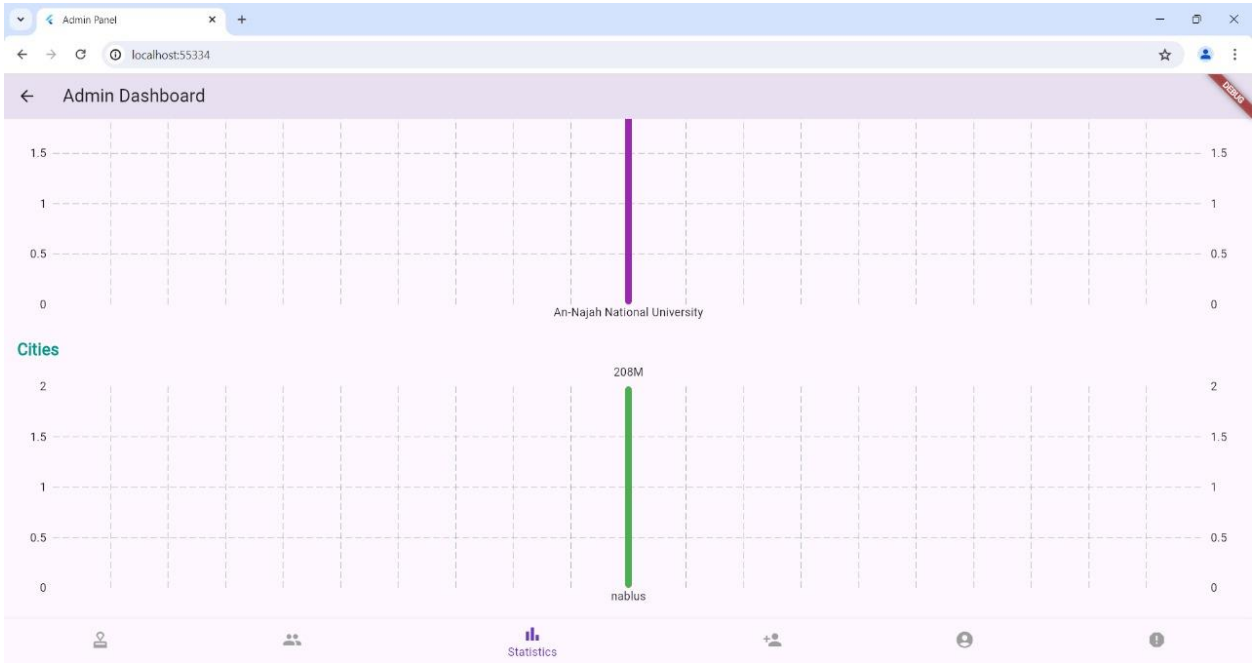

Admin Panel
localhost:55334
Admin Dashboard
Add Admin
DEBUG
Add Admin
Name
Email
Password
Add Admin
Add Admin


Admin Panel
localhost:55334
Admin Dashboard
Admin Profile
DEBUG
Admin Profile
Date Joined: N/A
Name: masa
Email: masa@gmail.com
Admin Profile


Admin Panel
localhost:55334
Admin Dashboard
Admin Profile
DEBUG
Admin Profile
Date Joined: N/A
Name:
masa
Email:
masa@gmail.com
Password:
Delete Profile
Admin Profile


Admin Panel
localhost:55334
Admin Dashboard
User Reports
DEBUG
Report: Spam content
Reported by: salsabeel
Report: Offensive language
Reported by: tasneem
User Reports


Admin Panel
localhost:55334
Admin Dashboard
DEBUG
Software Engineering: 1
Computer Engineering: 1
Universities
411.7M
2
1.5
1
0.5
Statistics


Admin Panel
localhost:55334
Admin Dashboard
DEBUG
1.5
1
0.5
0
An-Najah National University
Cities
208M
2
1.5
1
0.5
0
nablus
Statistics


Admin Panel
localhost:55334
Admin Dashboard
DEBUG
Year of Enrollment
222.2M
259.8M
1
0.8
0.6
0.4
0.2
0
2020
Year of Graduation
44.4M
342.4M
Statistics

3.3 Constraints

Starting a project inevitably leads to challenges. We began with the goal of completing a project that includes both the front-end and back-end for mobile and web platforms. We used Mongo DB that require internet access for data storage and quick retrieval. Another challenge was transferring the project between team members. To address this, we uploaded the work to GitHub, which helped us track and collaborate on the project seamlessly and efficiently.

Chapter 4: Results, Analysis, and Discussion

This project's primary objective was to create a system with all the capabilities required by a user for study planning and an administrator for administration. Utilizing the platform is helpful, simple, and straightforward. It provides a wealth of capabilities that no other competitive program has, taking care of every little aspect related to studying and job planning. The online and mobile versions of the system are similarly user-friendly.

With the development of such an extensive and expansive system, came many challenges including:

1. Lag: Because of the project's size, running and testing it was frequently very difficult and time-consuming, especially using the Android emulator. It needed a great Wi-Fi connection and enough disk space to function properly, which wasn't always possible.

2. Variety: A variety of middleware, languages, and different technological frameworks were used by the platform, leading to multiple issues in compatibility and integration between these elements. As a result, errors and exceptions became widespread, making the work on the platform more complex and challenging.

Chapter 5: Conclusions and Recommendation

In this project, a variety of modern tools and technologies were implemented, where numerous challenges faced by students throughout their academic journey were identified. These challenges were addressed through the platform that was developed. It is believed that this platform will be a remarkable transformation for students, contributing significantly to the enhancement of their educational experience in an innovative way.

To further enhance the performance and usability of TechTies, several cost-effective and feasible improvements are recommended. First off, there are a number of ways to increase backend speed, especially when working with massive datasets. These include implementing sophisticated caching methods and streamlining database queries to greatly reduce latency and improve response times. Second, a smooth and intuitive user experience on online and mobile platforms may be guaranteed by consistently improving the user interface in response to user feedback. A larger variety of users will gain from resource sharing if it is expanded to encompass more categories including research articles, project templates, and software licenses. This will also increase the breadth of cooperation.

5.1 Future Work

To further improve TechTies, a number of directions for future research and development have been identified. First off, creating native applications for iOS and Android would enable developers to better serve the expanding mobile user base by offering an even more responsive and optimized user experience. Second, by including artificial intelligence, the platform may be further customized to meet the needs of each unique user by providing individualized suggestions for study materials, lodging choices, and cooperative possibilities. Further enhancing community participation and assistance will be the addition of extended community tools including forums, discussion boards, and real-time chat capabilities.Expanding the platform's multilingual capabilities to serve a wider range of users, improving accessibility features to accommodate users with impairments, and incorporating advanced analytics to track and display user progress and interactions are some other potential upgrades. These next paths will contribute to the development of a more thorough, welcoming, and easy-to-use platform that better meets the social and academic requirements of engineering students.

References

1. YouTube : YouTube website:
https://www.youtube.com/watch?v=EhGW4UYpKSE
https://www.youtube.com/watch?v=rHIFJo4IbOE&t=1259s
https://www.youtube.com/watch?v=zTTP8XBR6fI&list=PLf-j0Hs0PF3uxzMCFLlfJ9W3hRxLzHPGX

2. MongoDB: MongoDB website.
https://www.mongodb.com/