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Faculty of Engineering & Information Technology

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Computer Engineering

Graduation Project 1



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Abstract

In the rapidly evolving world of technology, it's important for students to stay informed and connected with their peers, especially computer engineering students. With the university courses that need cooperation and participation most of time, there was a need for a platform to achieve this.

So, TechSync is a platform that came to help computer engineering students on their learning journey. This platform enables students to access their courses materials, quizzes, and make a discussion with other members about the course. Also, user can come to offer a paid/ free course on related fields. And there is a code editor to enable students to test their code online, and collaborate with other colleagues.

In this platform user can create a project and add its tasks then can divide the tasks between team members which make it easy for the team to collaborate and work together. Also, users can share their experience, tips, with other users to help them growth. And from the platform users can offer their hardware components, books, slides, etc... to share it with others and sell it. And help them share bugs and problems they faced and get suggested solutions from other users.

This platform makes it easy for computer engineering students to study and share knowledge with their colleagues and access a resource in fast and easy way.

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Chapter 1: Introduction

1.1 Statement of the problem

Due to the increasing number of programming students, there was a need to a platform that combined everything that students needed to help them during their studies. The majority of existing platforms provide only some of the things students could need, for example, courses only or project management only etc. However, on our platform, called TechSync, we have combined all these aspects in one place in an efficient way that helps students access all these resources and tools.

1.2 Objectives

The main objectives of this platform are:

- **Empowering Instructors:** Enable instructors to announce new programming courses, track student progress, and manage courses effectively by adding quizzes, assignments, materials, and other content easily and efficiently.
- **Facilitating Student Access:** Allow students to explore available courses, request to join their preferred courses, and access course content seamlessly.
- **Integrated Online Compiler:** Provide an online compiler that supports four major programming languages: Java, C++, Python, and JavaScript, enabling students to practice coding directly on the platform.

- **Project Management Tools:** Offer dedicated pages for project management to help students plan, organize, and assign tasks among team members, fostering efficient collaboration.
- **Problem and Bug Sharing:** Create a space for students to share challenges, bugs, and issues they face, allowing peers to provide assistance and collaborate on solutions.

1.3 Scope of work

The system has three user roles: Admin, Instructor and Student. for each one there are different features based on user role.

This platform offers many services:

- 1- Courses Management.
- 2- Online Compiler.
- 3- Collaborative whiteboard.
- 4- Real time meeting.
- 5- Real time chatting & Notifications.
- 6- Bugs sharing.
- 7- Projects & Tasks management.
- 8- To-Do list & calendar.
- 9- Find & register on latest events.

1.3 Significance

The platform "TechSync" provides a collection of most important features that each programmer needs, with user friendly website and mobile application to make reach them easily and efficiency.

1.4 Organization of the report

This report is well structured to explain all the ideas of each feature on the platform. It starts with highlight the problem that cause us to choose this idea, then give a general background of the work, and the objectives of it. Following this, the methodology section will provide an explanation of the resources and techniques at our disposal. Then explain the results of testing the work and followed it with a discussion that analyzes these results in relation to the objectives of the project. Finally, the conclusion section recaps the main ideas and suggestions to the future work.

Chapter 2 Constraints, Standards, and Earlier work

2.1 Constraints and limitations

9.1.1 **Coast Constraints:** we were limited by budget so the scope of features and api's to be used.

9.1.2 **Incompatibility between various libraries and versions in react & react native,** as we know react libraries updated rapidly and this because some features not work and we forced to update it.

9.1.3 **Time Constraint:** we build website using react and mobile application using react native so, we work on separate two projects and this consumed lot of time to achieve it.

9.1.4 **Version Control Issues:** during collaborative development, managing and combining several branches in the version control system occasionally caused disputes and delays.

2.2 Earlier Coursework

During us academic journey, we have undertaken various courses and projects that provided us with foundational knowledge and skills essential for the development of this platform. These courses were interconnected, each building upon the other to enhance our capabilities in different aspects of software and platform development. Engineering software was one such course that provided information on software development life cycles, project management, and requirements gathering. Effective project organization and structure were made possible by these ideas. Building on this basis, database management systems gave us the ability to create, implement, and query databases, which allowed us to create effective platform data storage and retrieval systems.

These abilities were further enhanced by the understanding of web development, which covered front-end and back-end technologies that were essential for building the platform's web inter- face. We used concepts from sophisticated data structures and algorithms to

optimize essential features like the online compiler and real-time capabilities, which enhanced our problem-solving skills.

Ultimately, everything came together because of our familiarity with collaborative tools and agile processes. We brought this platform to life by utilizing platforms like GitHub and iterative development procedures to guarantee seamless collaboration and a streamlined workflow.

Chapter 3 Literature Review

The integration of technology into all spheres of life has invited ingenious solutions to some of the nagging problems. Students and instructors alike face numerous challenges in teaching and learning contexts, which range from a lack of access to good learning materials, ineffective means of communication, to traditional assessment methods. The review provides literature on the innovations used in educational tools; applications that promote accessibility, collaboration, and learning outcomes will be highlighted.

For instance, Google Classroom have completely revamped how teachers can organize and deliver lessons. According to a study by Zhao et al. (2020), Google Classroom affords teachers an easy, intuitive, yet powerful method to assign resources, monitor student progress, and foster effective communication. Meanwhile, the platform is highly criticized for the absence of advanced collaboration functions, low integration with other technologies turning into gaps in interactive learning.

Similar to this, Edmodo is highly renowned for its social learning environment in which structured interaction between teachers and students can take place. According to Wang and Huang (2019), Edmodo places great emphasis on encouraging conversation, and this, in addition to the intuitive interface, has been important for its success. This platform does not fully cover real-time tools and sophisticated project management features that, in the modern context of education, become increasingly relevant.

On the other hand, TechSync builds upon the advantages and disadvantages of these platforms by providing a wide array of tools suited for contemporary educational requirements. With the integration of state-of-the-art technologies such as React, React Native, and Firebase, it allows perfect online and mobile application integrations. TechSync is offering a real-time chat and video conferencing capabilities, unparalleled in other platforms, so teachers and students can communicate effectively and with ease.

Apart from this, it has an online compiler with several programming languages, the feature requested by the current urgent demands of practical skills in programming classes. Indeed, the findings of Xu et al. (2021) justify including coding environments into the educational platforms as it gives a boost to enhance the development of skills and amplifies students' involvement.

Moreover, TechSync allows students to manage both tasks and projects, thus enabling them to work in an orderly fashion on course work and projects involving group work. This is in line with the recommendations of Dillenburger et al. (2019), who emphasize that such collaborative tools would support students in the development of problem-solving skills and teamwork.

One of the most inventive features of this tool is the bug-sharing interface, which will allow students to discuss problems and immediately request peer or teacher help. It not only whets problem-solving skills but also creates a mutual learning environment.

Last but not least, TechSync bridges the gaps of existing systems by amalgamating the latest technology with traditional learning management systems. It will lead to good communication, judicious use of available resources, and learning through cooperation by creating a congenial environment for both teachers and students. Thus, it is one of the strongest options that can be considered for remarkably improving learning opportunities.

Chapter 4 Methodology

4.1 Development Tools and Technologies

4.1.1 Tools

- **Visual Studio Code:** It has been used throughout, for the development of both the front and backend; it provided a common environment to manage the project and edit the code.
- **Firebase:** Sent message and notification creation.

- **Postman:** This has been used as a tool for simplifying the handling of HTTP requests and responses as an API interface. This was pretty instrumental in developing the functionality and testing for variations efficiently and systematically.
- **Android Studio:** This is majorly used as an emulator for compatibility testing and checking smooth functioning on a wide range of virtual devices.
- **GitHub:** Is the environment in which file sharing could be enabled to allow the team to work on version control, managing changes in a codebase with ease.
- **Cloudinary:** It is a cloud-based service included for effective file management and storage to ensure maximum efficiency, scalability, and safety in uploading and retrieving media data, including audio, video, and picture files.
- **MySQL Database:** An open-source relational database management system that is widely used for storing, organizing, and retrieving data. It follows most of the standards under SQL, or Structured Query Language, which makes it easy to learn and integrate into various applications.
- **Docker:** is an open platform for developing, shipping, and running applications. We use Docker to isolate the code compilation environment from the main server. This ensures secure and consistent execution by running user-submitted code in containerized environments.

4.1.2 Programming Languages and Technologies

We have used various programming languages and frameworks for the development of the mobile application and the website platform. These tools were selected to ensure efficient development, scalability, and a user-friendly platform. The technologies are categorized into client-side and server-side for both the mobile application and website.

Client-Side Development

Mobile Application: The mobile application is built using **React Native**, a popular JavaScript framework for building cross platform natively rendered mobile apps for both Android and iOS platforms. For styling, we used **Tailwind CSS**, a utility-first CSS framework adapted for React Native to create a visually appealing and responsive user interface.

Website: The website is developed using **React.js**, a powerful JavaScript library for building dynamic and interactive user interfaces. **Tailwind CSS** was utilized for styling to ensure a modern, responsive, and consistent design.

Server-Side Development

Backend: For the server-side we used **Node.js** for both the mobile application and web- site. **Node.js**, a runtime environment that allows the execution of JavaScript on the server. **Express.js**, a lightweight and flexible Node.js framework, was employed to simplify the development of RESTful APIs and to handle server-side logic efficiently.

4.1.3 Architecture

Server-Side Processing

The server is built using **Node.js**. It stands to the principles of a **RESTful API** architecture to efficiently handle requests from client applications, whether they came from the mobile application or the website. And take the consideration of efficiency, scalability, security.

Client-side Processing

The client side of the platform built using react for website and react native for mobile. And we managed to make it user-friendly, fast, and scalable. Also, validate data before sending it to server and avoid unnecessary rendering.

4.1.4 Implementation

Mobile application

The application is designed on many key pages, each of which has its own purpose and tries to improve the user's experience.

Screen Splash:

The first screen one sees when an application opens. This has the striking animation of the logo of the platform that gives one a very clean, inviting first impression. Once the animation is complete, this screen actually fades to lead him to either the Sign-Up or the Sign-In page, whether the user is logging in for the first time or already has an account; this assures the transition will be really smooth and simple in design.



Figure 4.1: Splash Screen

Signup/Signing page:

In this page, if the user already has an account, they can click the "Sign In" button to open the login page. Otherwise, if the user has not joined this platform yet, they can click the "Sign Up" button to create a new account.



Figure 4.2:
SignUp-SignIn
Page

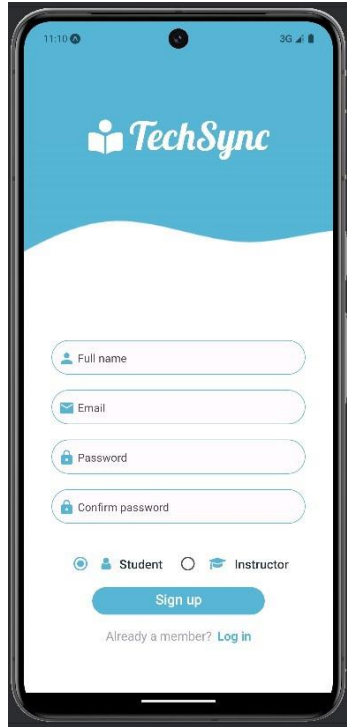


Figure 4.3: SignUp
Page

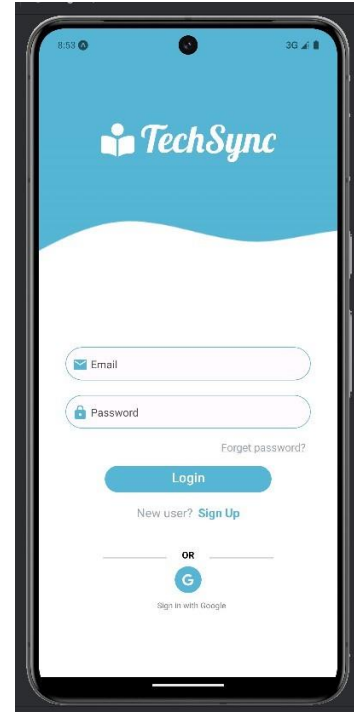


Figure 4.4: Login
Page

When user click to "Sign Up" this page is open, and the user while enter all information like (name, email, password, confirm password, role as student or instructor) all these needed to great new account successfully.

Login page:

In this page the user enters your username, password, and there are cover many different cases. also, user can do login using google (Gmail).

case 1: if user enter email or password or both are incorrect.

Invalid username or password

Figure 4.5: email-password incorrect

case 2: if user forget your password, you can restoration it by email when click to forget password.

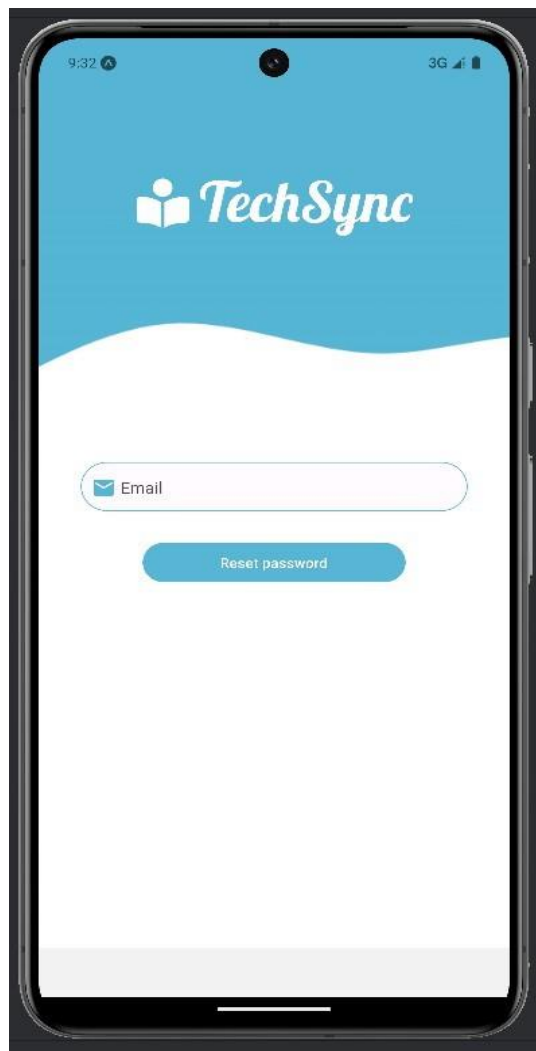


Figure 4.6: Reset Password

User Preferences Screen

After success login, user moved to this screen. It shows events, tasks for today, and recommended courses for students based on their recent search and interests. This screen keeps track of user interesting and daily tasks.

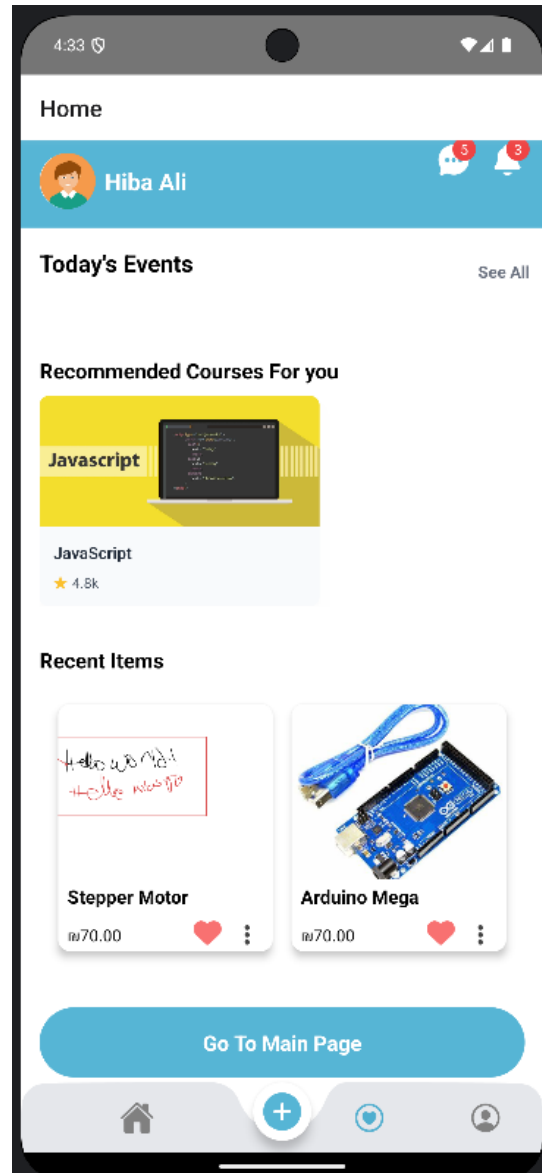


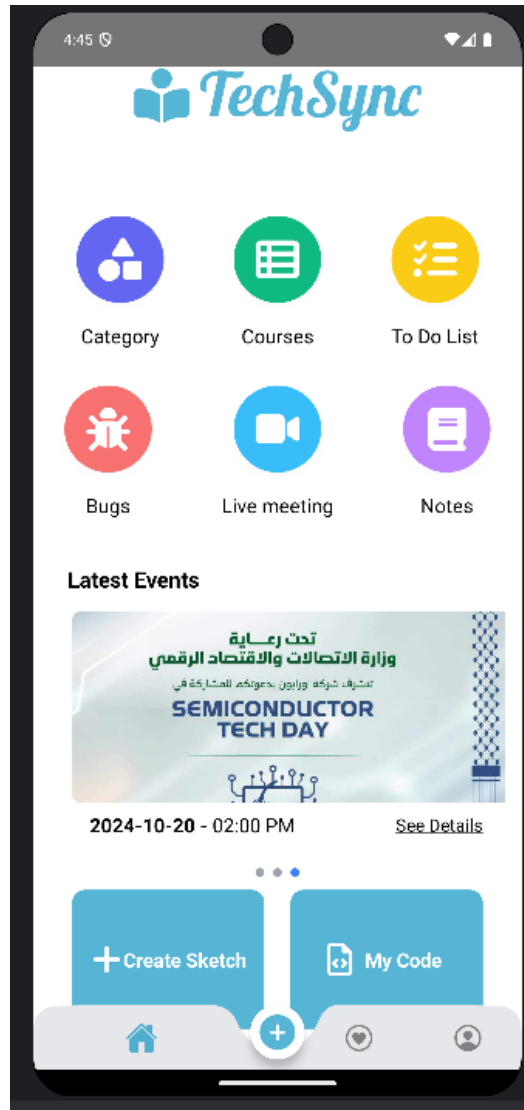
Figure 4.7: Preferences Screen

Home page:

The home page is one of the most crucial sections of the platform, as it includes a variety of features that highlight the core functionalities offered, such as:

- **Courses**

- **Live Meeting**
 - **Create Sketch**
 - **Compile and Test Code**
 - **Events**
 - **Bugs**
 - **Practical Training**
 - **Team Work**
- Each of these features will direct the user to a specific page, where a complete view and interaction with the functionality will be enabled. This layout is targeted at ensuring smooth navigation, and that users will have an easy time getting to the pages. Whether one wants to access courses, attend live meetings, or collaborate on team projects, the home page is a gateway toward each of these important sections, offering smooth passage to areas he or she may be interested in.



• Figure 4.8: Home Page

Category page:

On this page, the user can see all the categories related to computer engineering, each of this category contains the courses related to it. and at end of this page, we show the recently page visited, also you can search of any category needed.

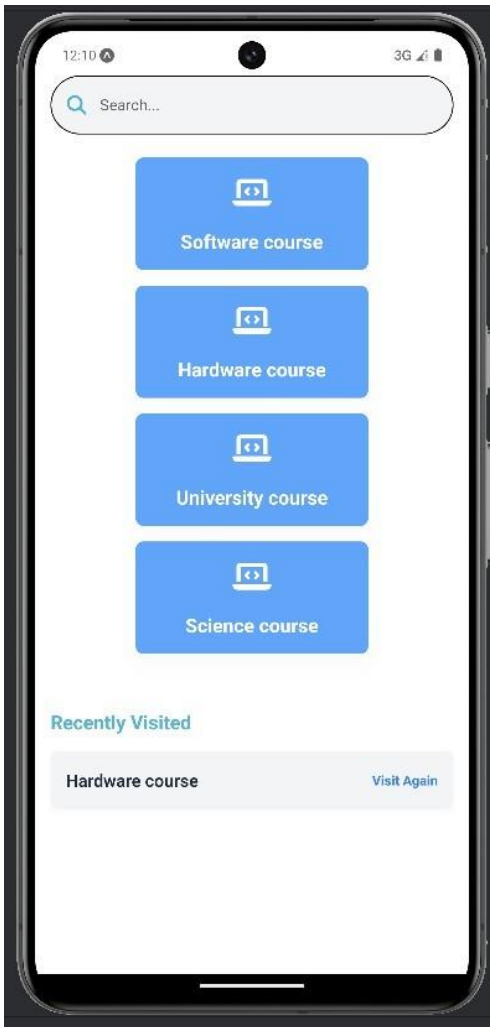


Figure 4.8: Category Page

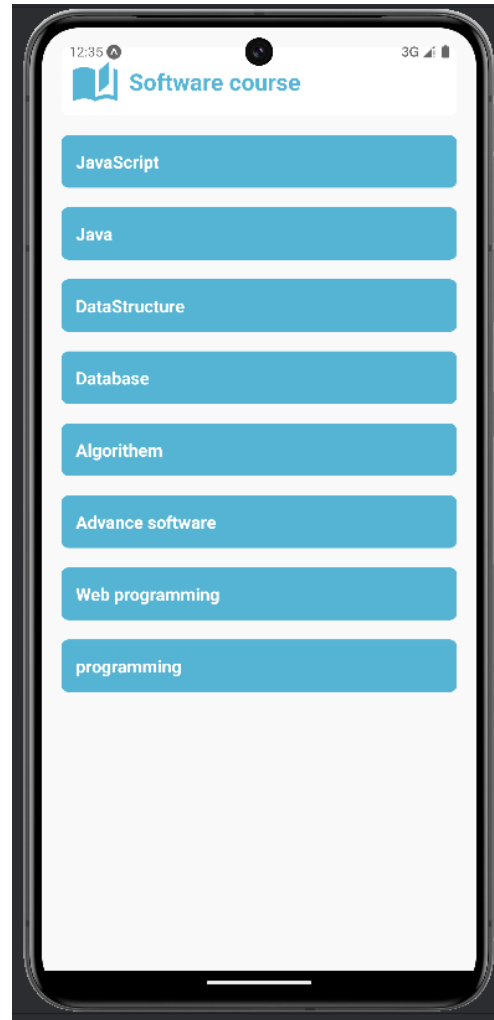


Figure 4.9: Software Course

each of categories like software course includes courses and each course contains slides, lectures, assignments. When click to slides, slides page handle with all pdf file material of this course, and you can download file. Else if click lectures you can show all lectures available of this course and open it to watch. In addition, button assignments when click to it you can show all assignments of last semester to gain Benefit from its Button assignments when click to it you can show all assignments of last semester to gain Benefit from it also you can upload file of any field if you have from last semester that help students, and any note that can improve or help them to study.



Figure 4.10: Course Page



Figure 4.11: Slides Pag



Figure 4.12: Assign- ments Page



Figure 4.13: Lectures Page

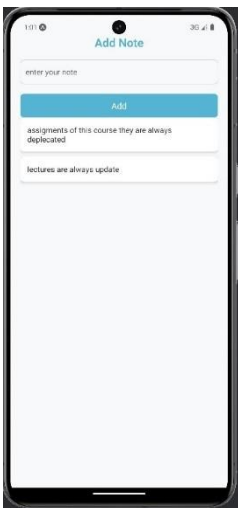


Figure 4.14:Note



Added Figure 4.15: Add Note

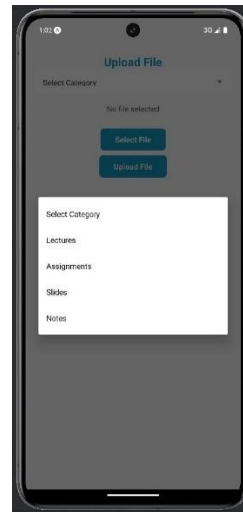


Figure 4.16: Upload Figure



Figure: 4.17: Download Assignment

Courses page:

When course page open, you can see the courses of the current user, registered in them, in addition to another tap where we can see all the available courses and register in them or view their details.

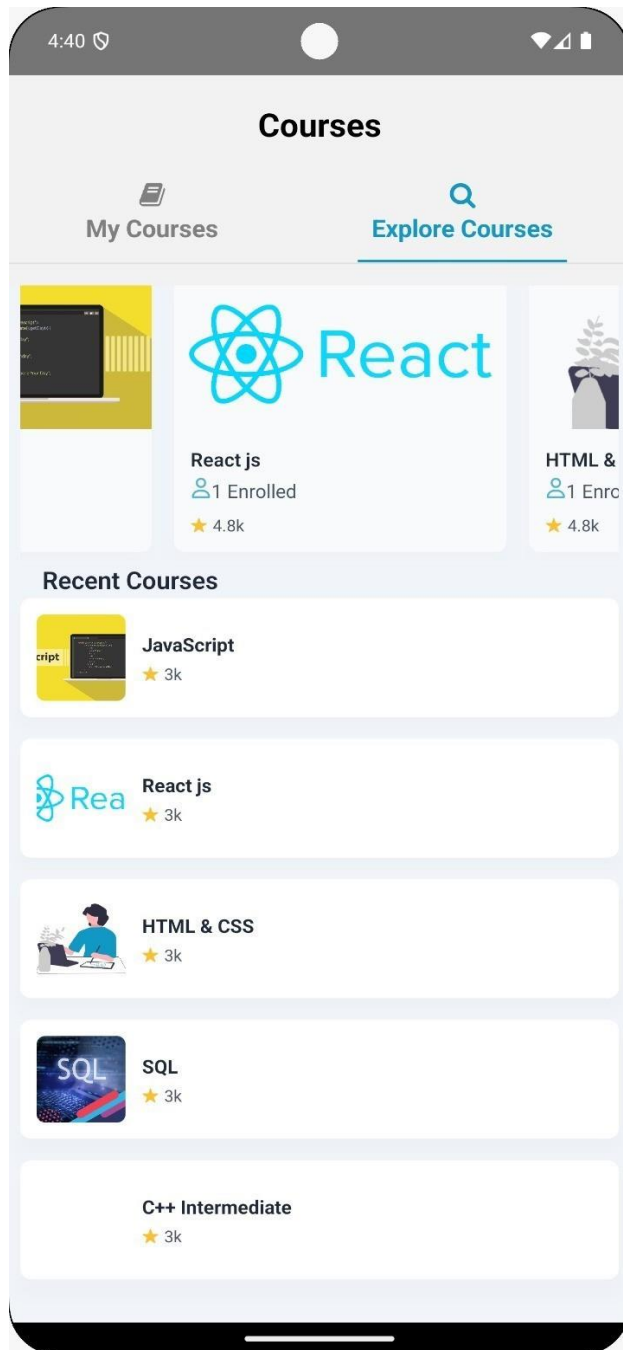


Figure 4.18: Courses Page

User-specific courses and their completion rate, and show explore tap when click to it.



Figure 4.19: My Courses Tap

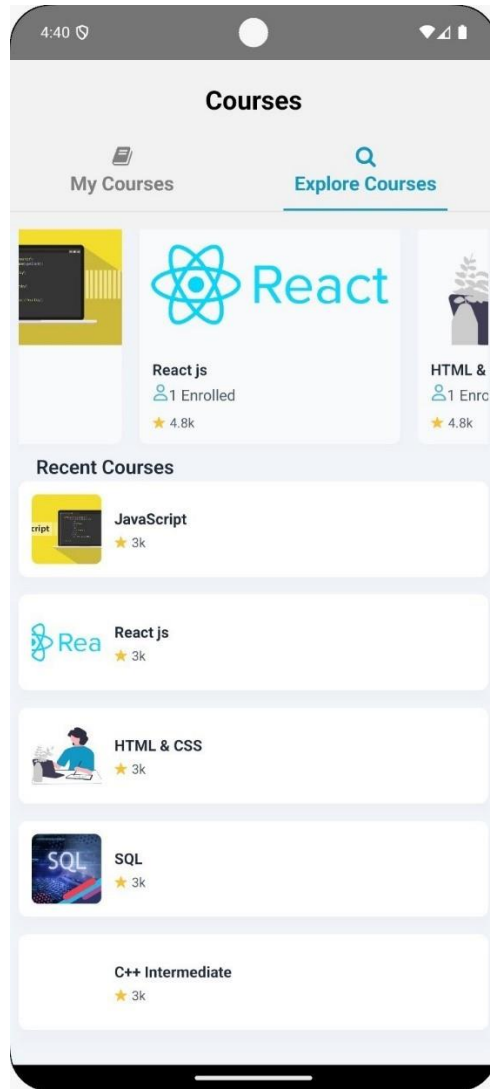


Figure 4.20: Explore Courses Tap

When student click to course you can show all information related to like time, total hour, files, videos lectures, and who are studding this course, also the opinion of student who are studied this course, zoom meeting and location .At the top of page you can see name of course and menu to selected what you want to show (materials, to do discussion with instructors and students, your assignments and quizzes, and finally your record lectures).

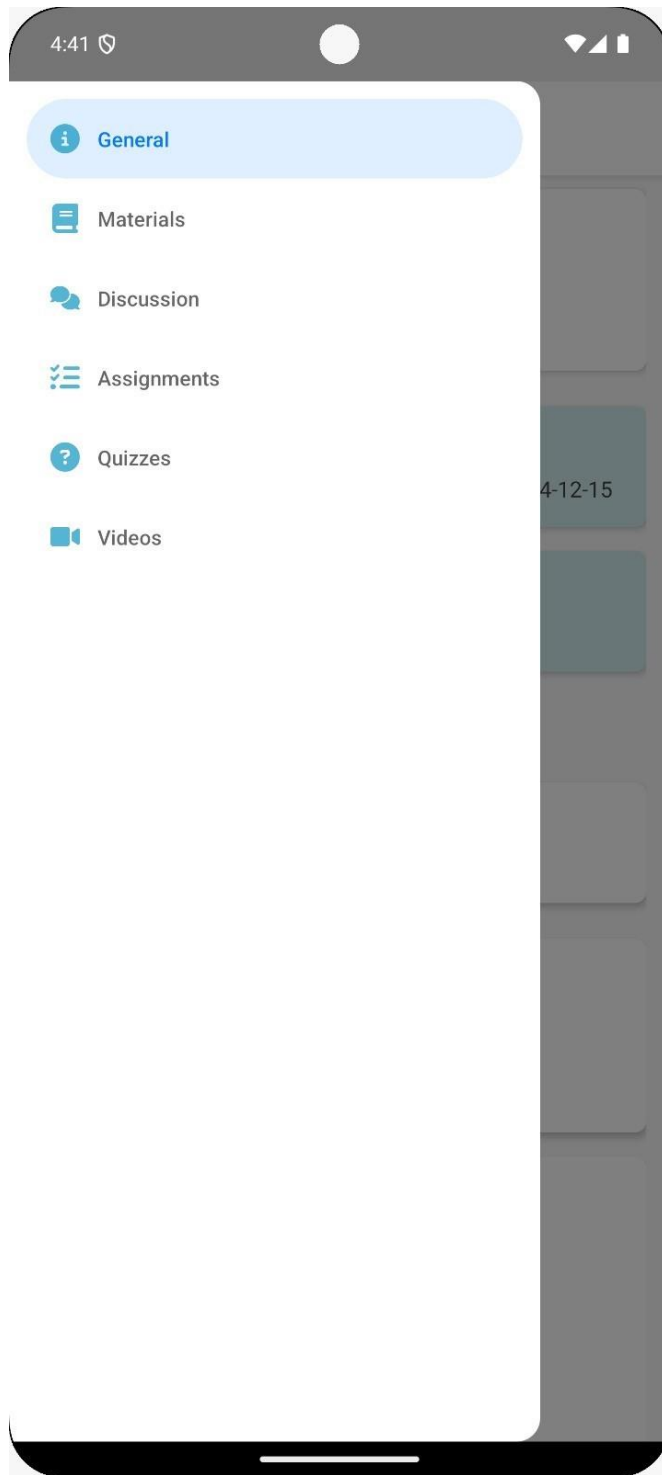


Figure 4.21: menu courses

course general information shows like this picture.

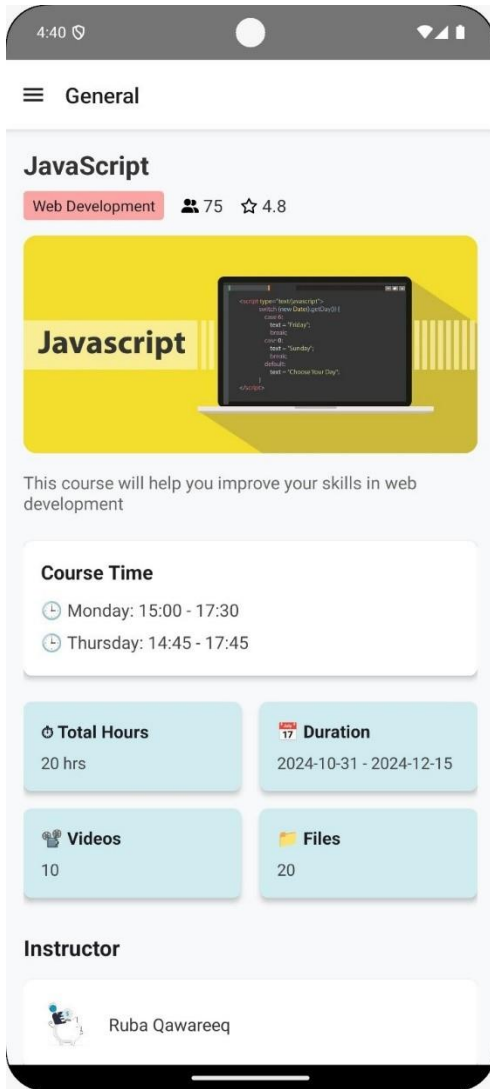


Figure 4.22: general information

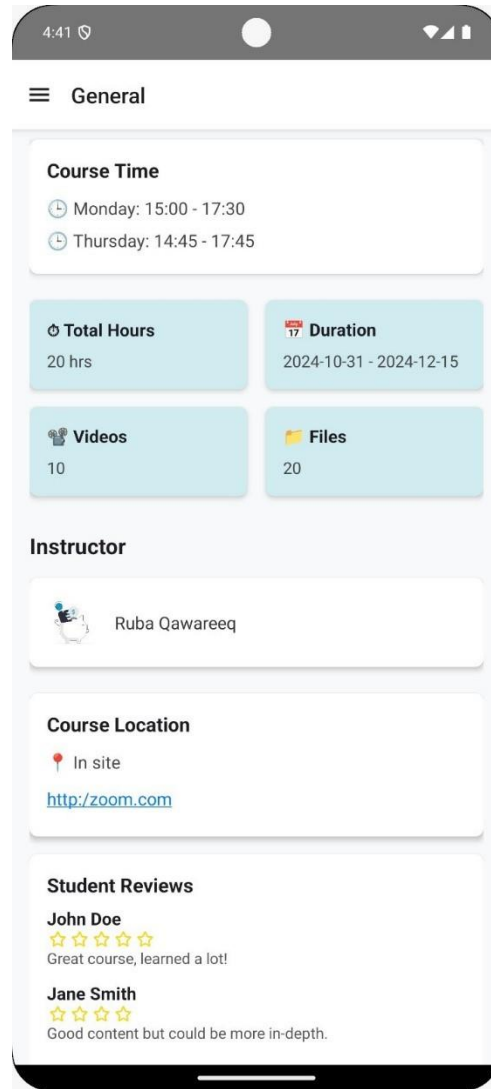


Figure 4.23: general information 2

Now. Let's show you the pages that will open when I choose from the menu.

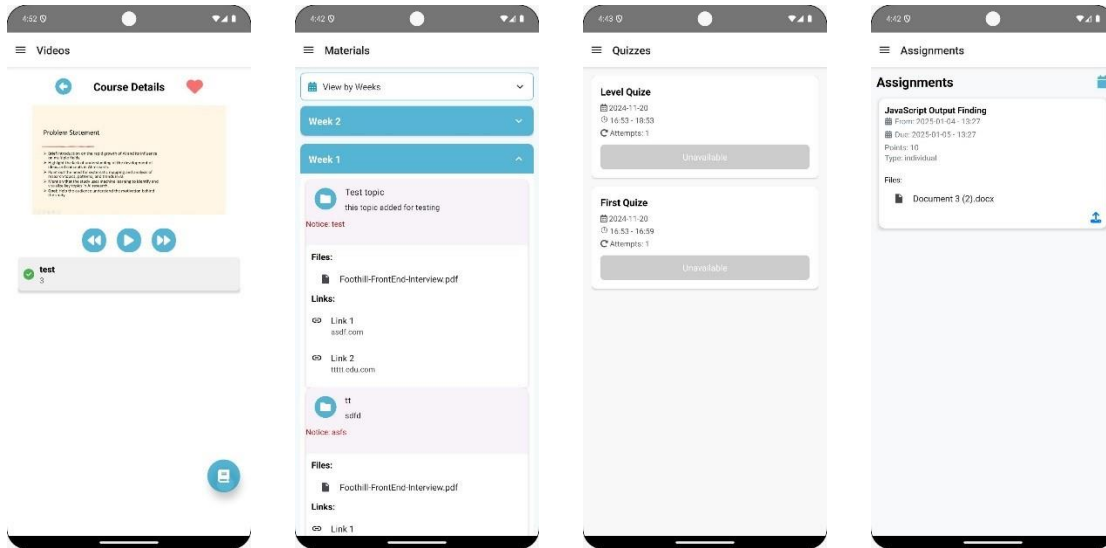


Figure 4.24:Videos page Figure 4.25: Materials Page Figure 4.26: Quizzes page Figure 4.27: Assignments Page

You will see the discussion page later with its details. Now we are show details about pages: material page: allow to student to show week and material from this week, and our link meeting and files of topic.

Assignments page: allow to students to show start date, end date, marks, and file describe these assignments.

Quizzes page: Show all quizzes related to topic from students and when it is available and number of attempt and time.

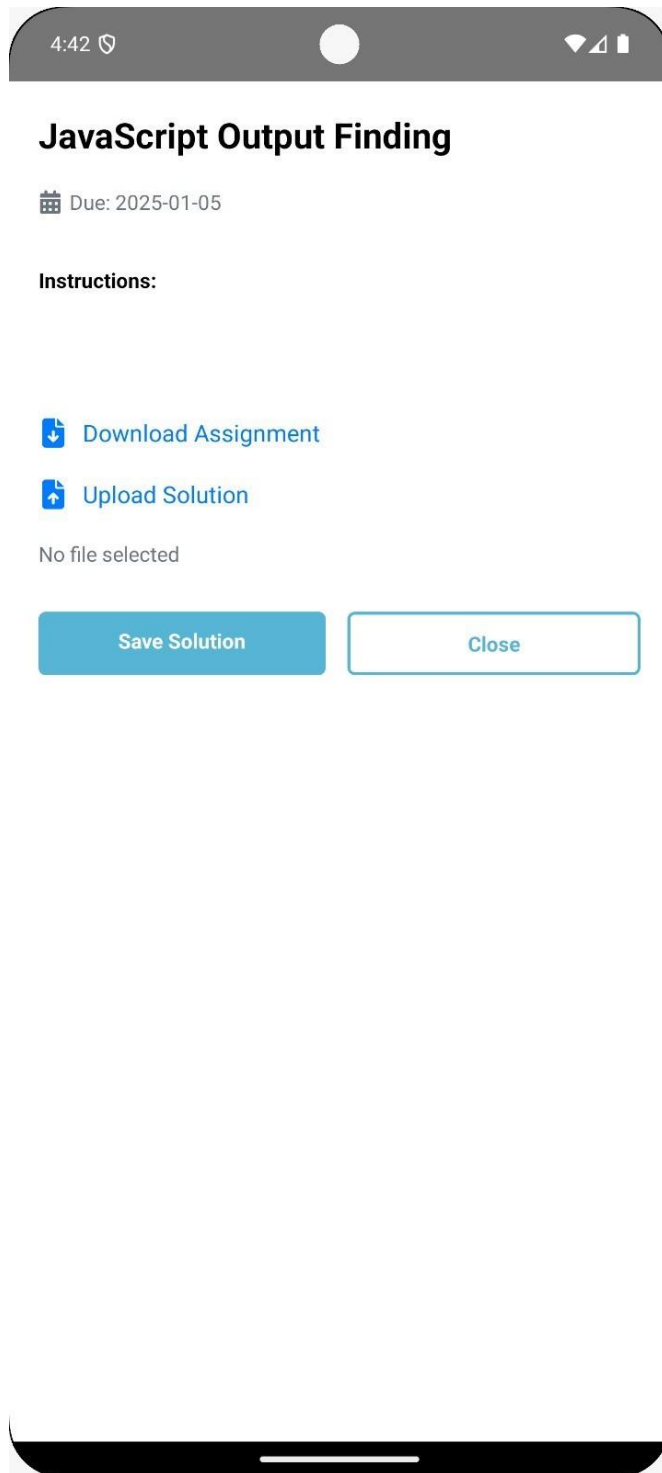


Figure 4.28: Assignment Details

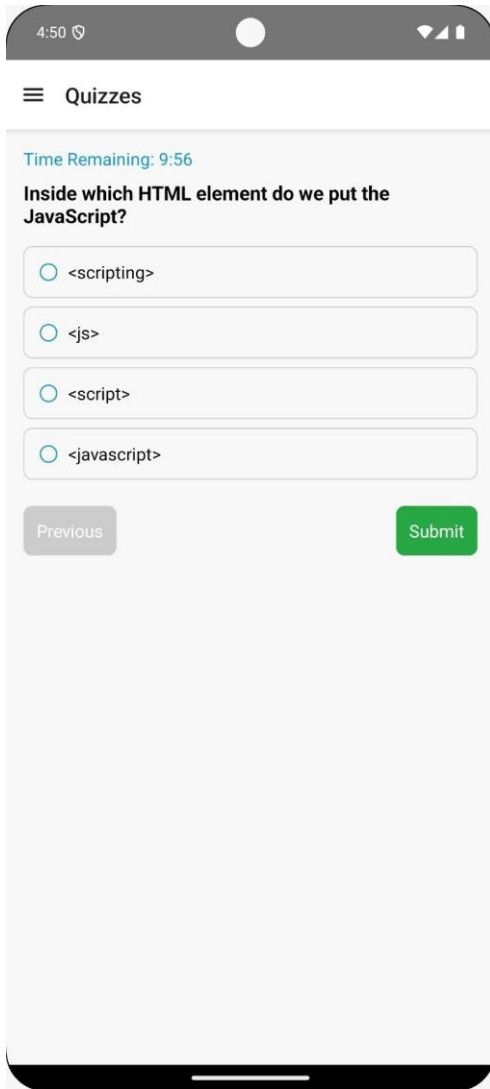


Figure 4.29: Specific Quiz

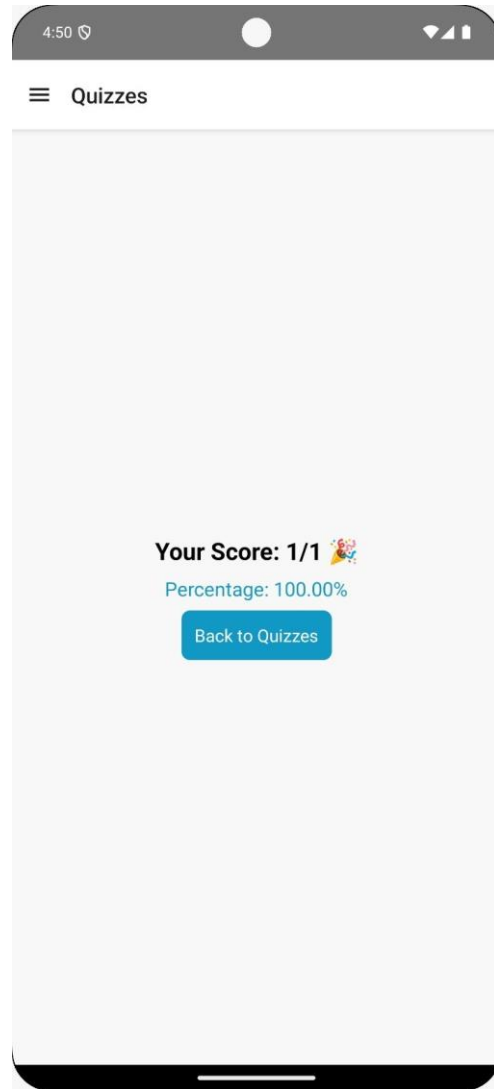
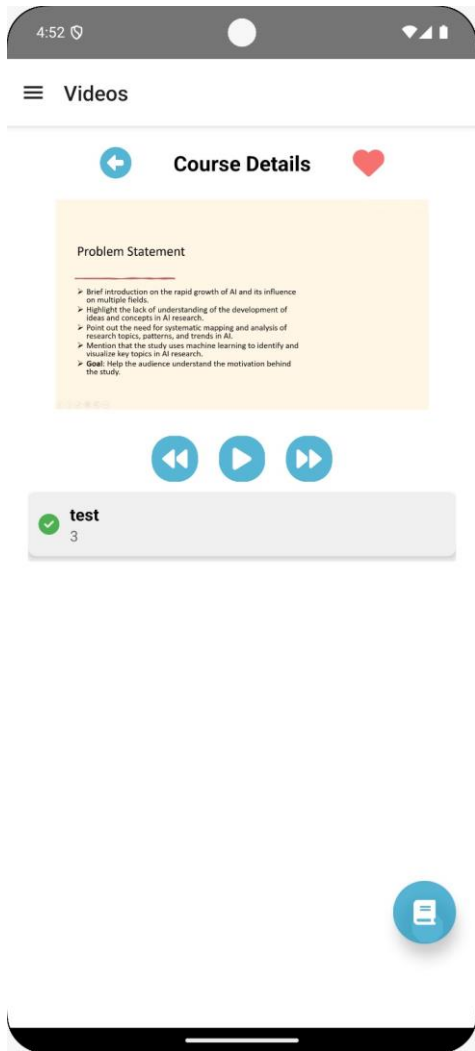


Figure 4.30: Grade Of Quiz

Video page: from this page student can watch records lecture.



Previously, we displayed exams, assignments, and subjects' pages if the user is a student. However, if he is a teacher, we will have different pages. Now we will display them.

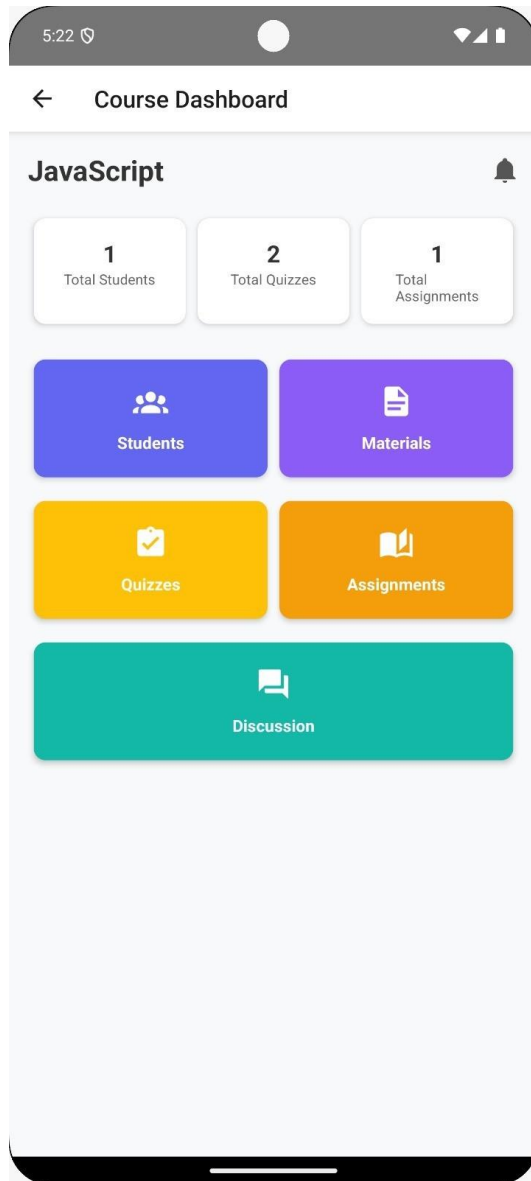
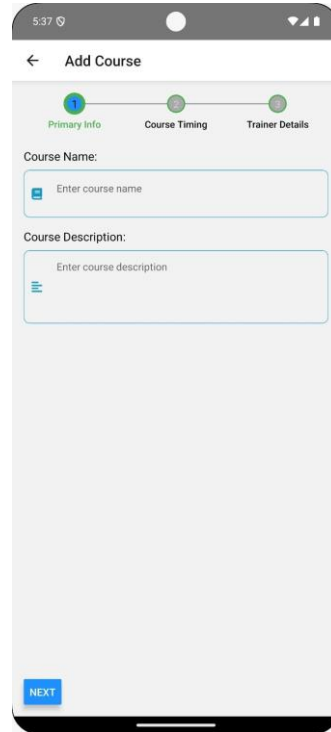
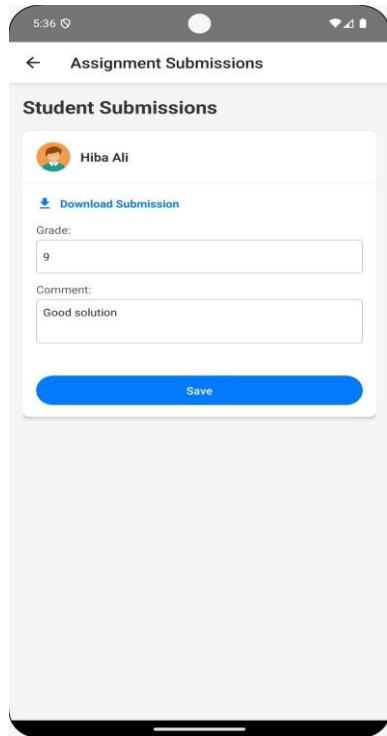
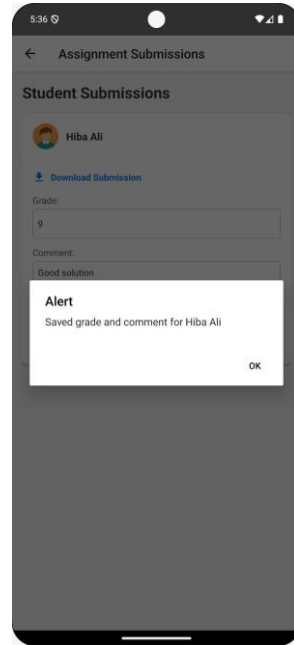
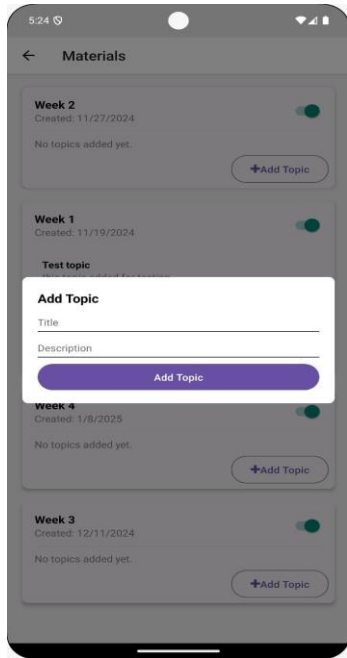


Figure 4.31: general instructor course

From this page we will see and display the powers that the teacher enjoys. At the beginning of the page, the number of students registered in this course is displayed, the number of exams that the teacher has set for this subject, in addition to the number of exams. Then each of button handle negative to different page.



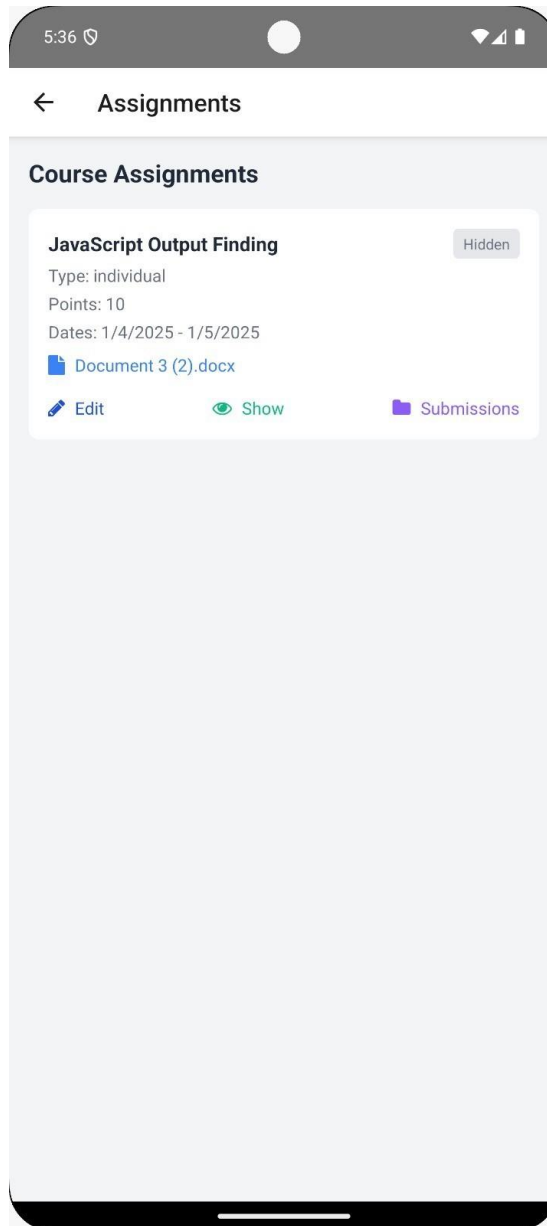


Figure 4.36: instructor assignments page

These pages dedicated to the teacher, that it shows more details about assignments, topics, etc.

Now we describe more details. For the assignments page, the instructors can edit any information and view the students' submissions in addition to correction and marking. In addition about course you can add new course and material each week separately under the week grid, which facilitates the process of accessing information more efficiently and quickly.

Discussion Page:

This page allows users to view posts, interact with them, and write their comments, in addition to a voting section. If there is a matter that requires the majority's opinion, a vote is created with options. Also, if the user is a teacher, an additional box will appear for him so that he can accept or reject unnecessary or inappropriate posts or votes. when user is student there are 3 tabs in page.

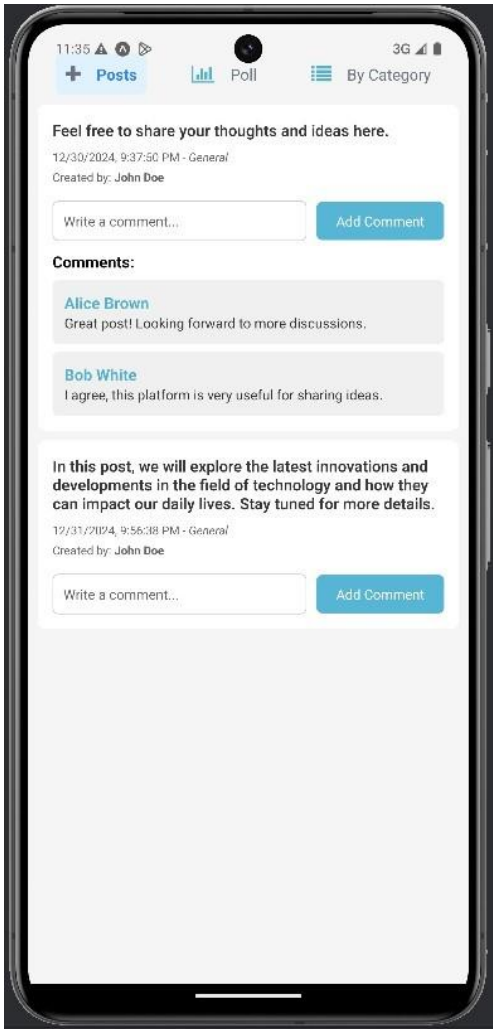


Figure 4.37: Discussion page

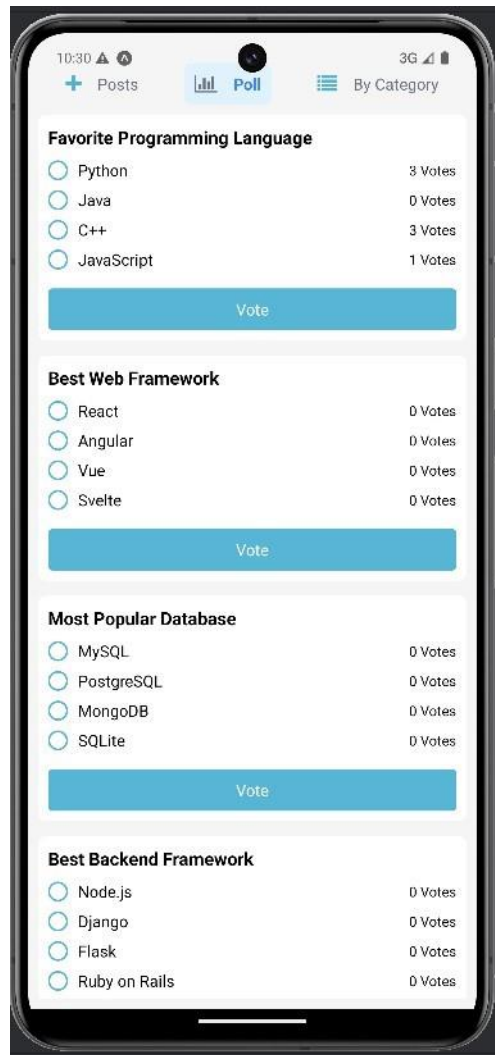


Figure 4.38: poll tab

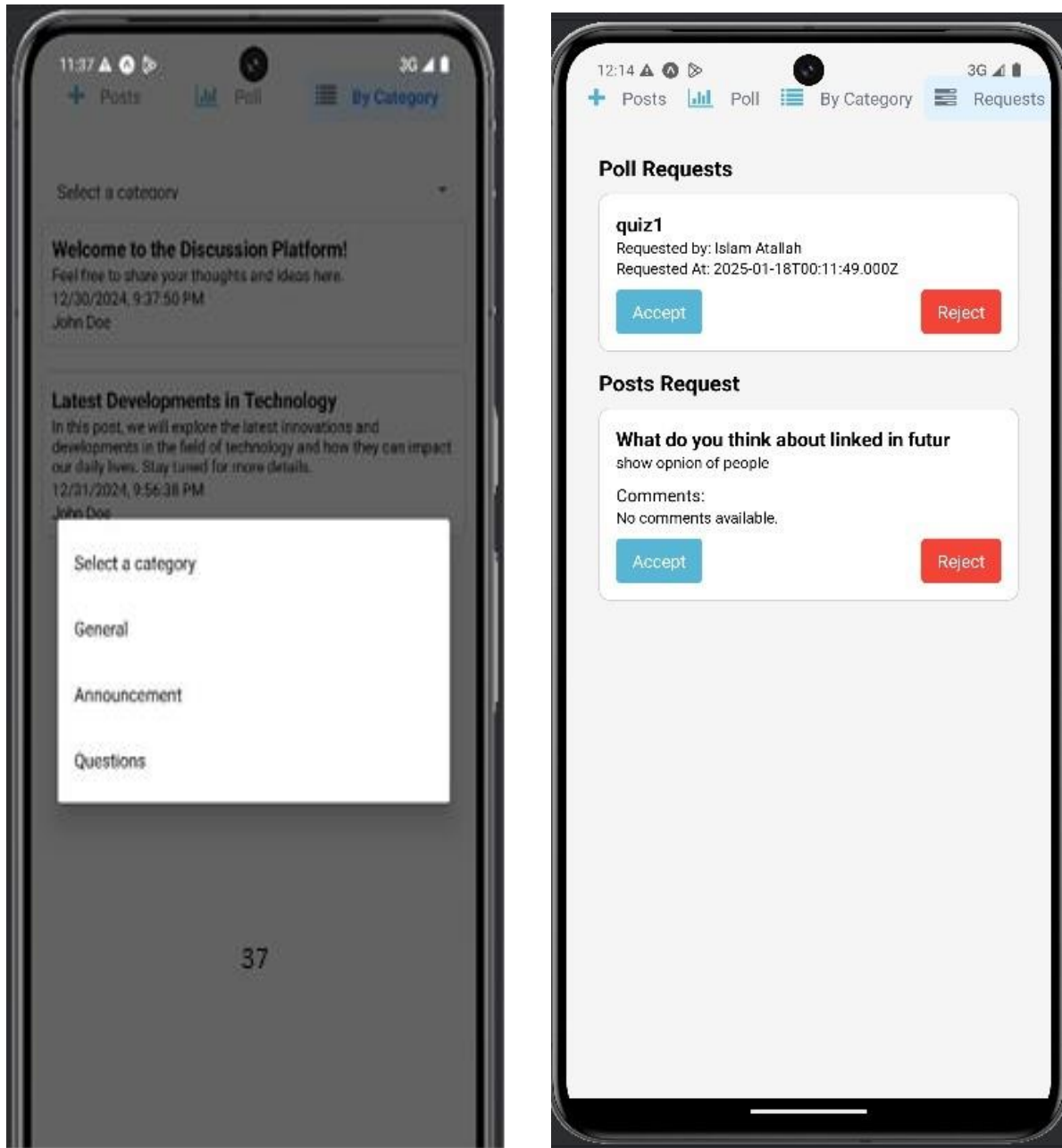


Figure 4.40: Request Tab

And if user login as instructor another tab are appears” request tab”, when click to accepted poll or post then appeared in their tab, else there are deleted.

From this navbar below when click to icon add behind post the subpage open to add new post and you can add to any category like general, question, announcements, but it not appears to people until the instructor accepted this post, also when click to icon behind poll you can add new poll with option to allow user to vote when poll accepted.

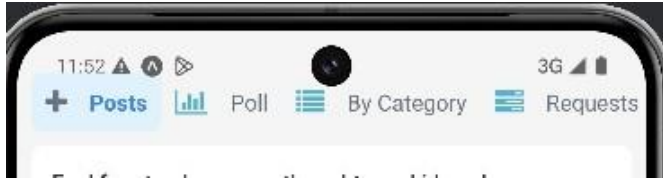


Figure 4.41: Navbar Discussion

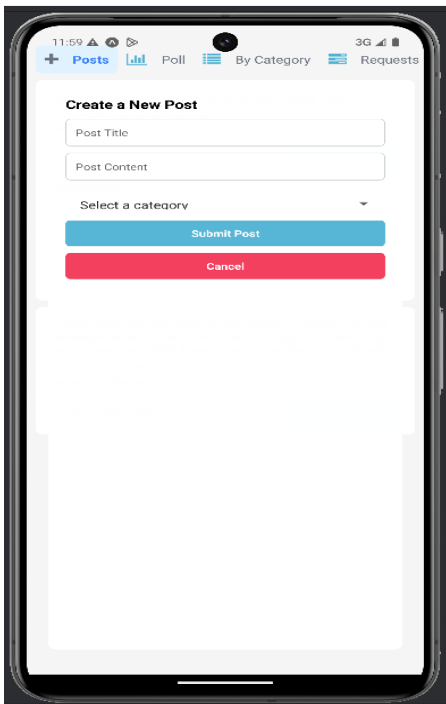


Figure 4.42: Add New Post

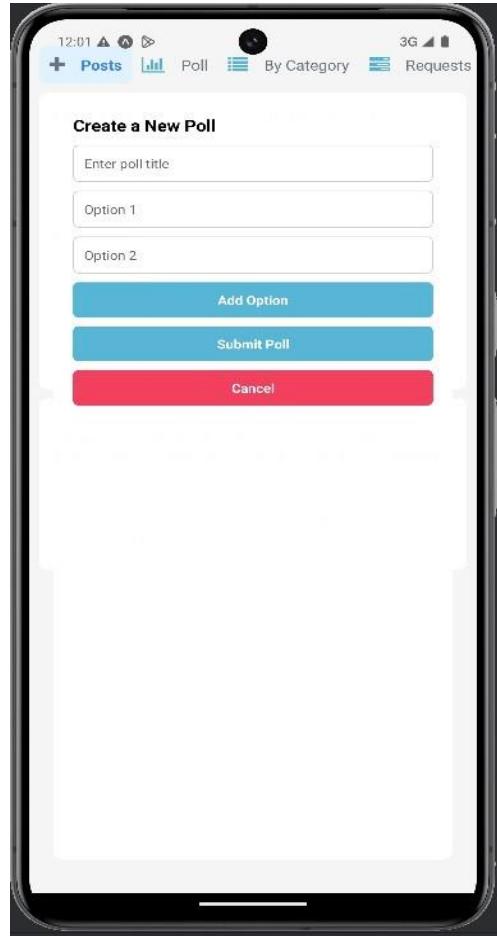
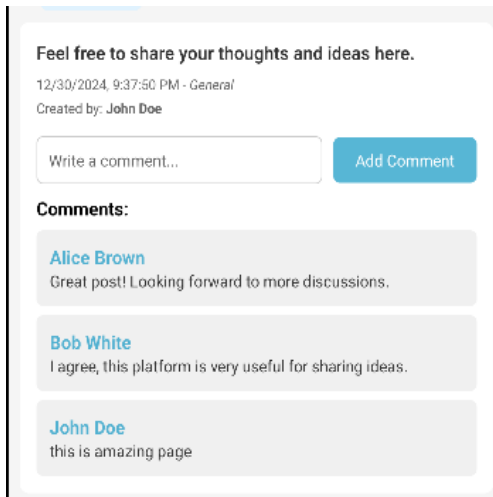
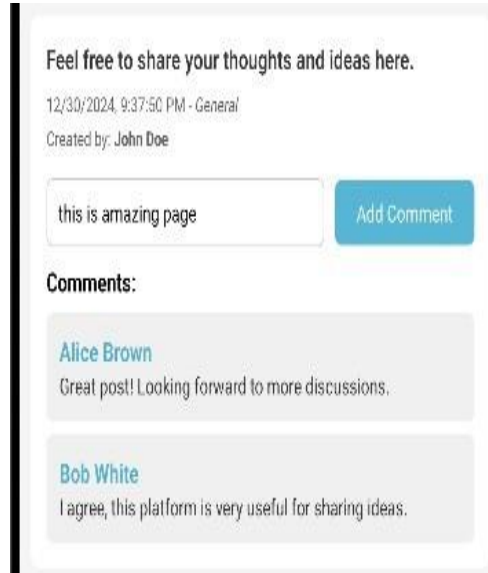
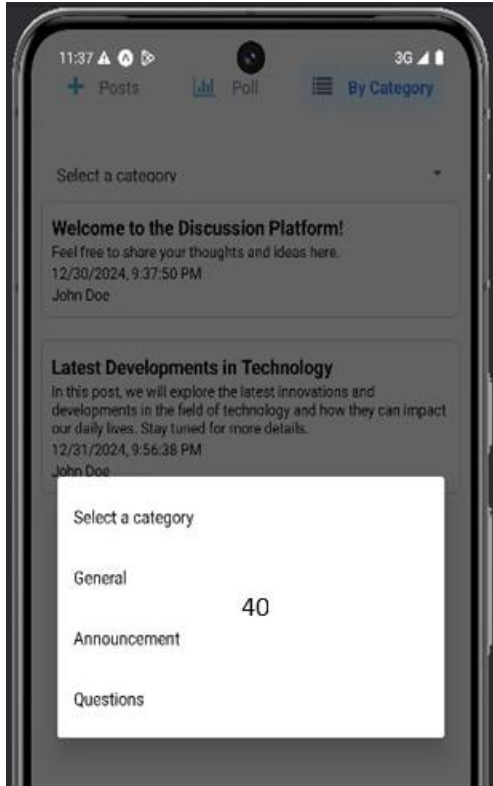


Figure 4.43: Add New Poll



NOW, we show that are happen when vote to poll. when click to vote number of votes of this option are increase.

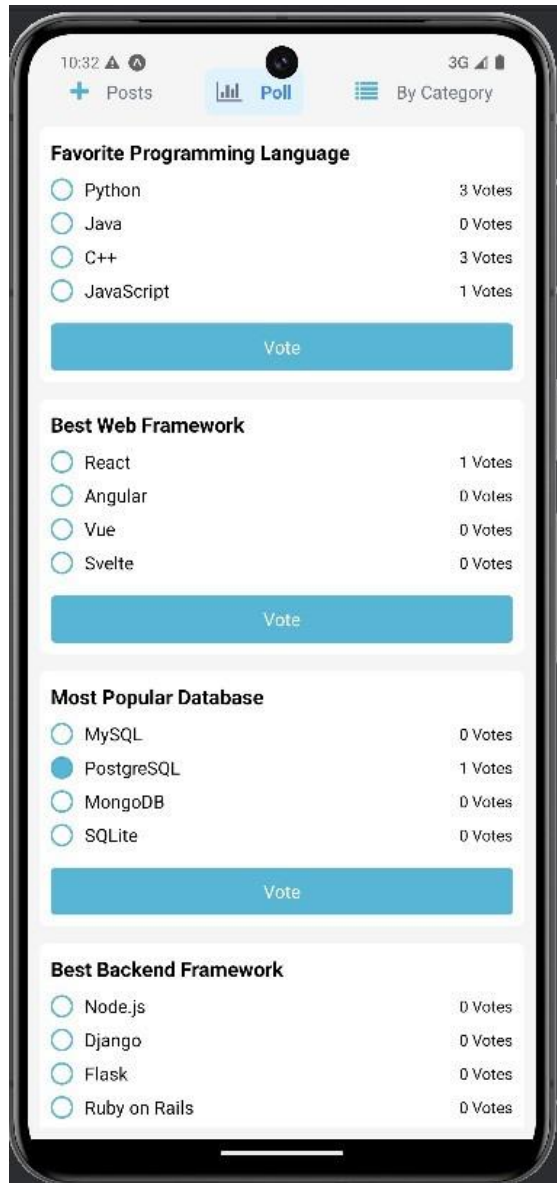



Figure 4.47: vote option

Bugs page:

The bugs page, like stack overflow, is an interactive forum where teachers and students may report, discuss, and fix coding problems, exchange solutions, and work together to efficiently troubleshoot bugs. When five people comment with the same comment, the answer is approved, as correct and interactive answer


10:31

Create a Question

 Title (e.g. How to fix a React issue?)


Description


Describe the issue

 Upload Image

Expectation

What did you expect to happen?



 Tags (e.g. React, JavaScript)

Save

10:30

Recent Question

Interesting Posts for you

How I fix the sdk path

sdk java

5 votes 3 answers Israa Mohammad

Test question

java

0 votes 0 answers Hiba Ali

test

python

0 votes 0 answers Hiba Ali

test


react

1 votes 0 answers Hiba Ali

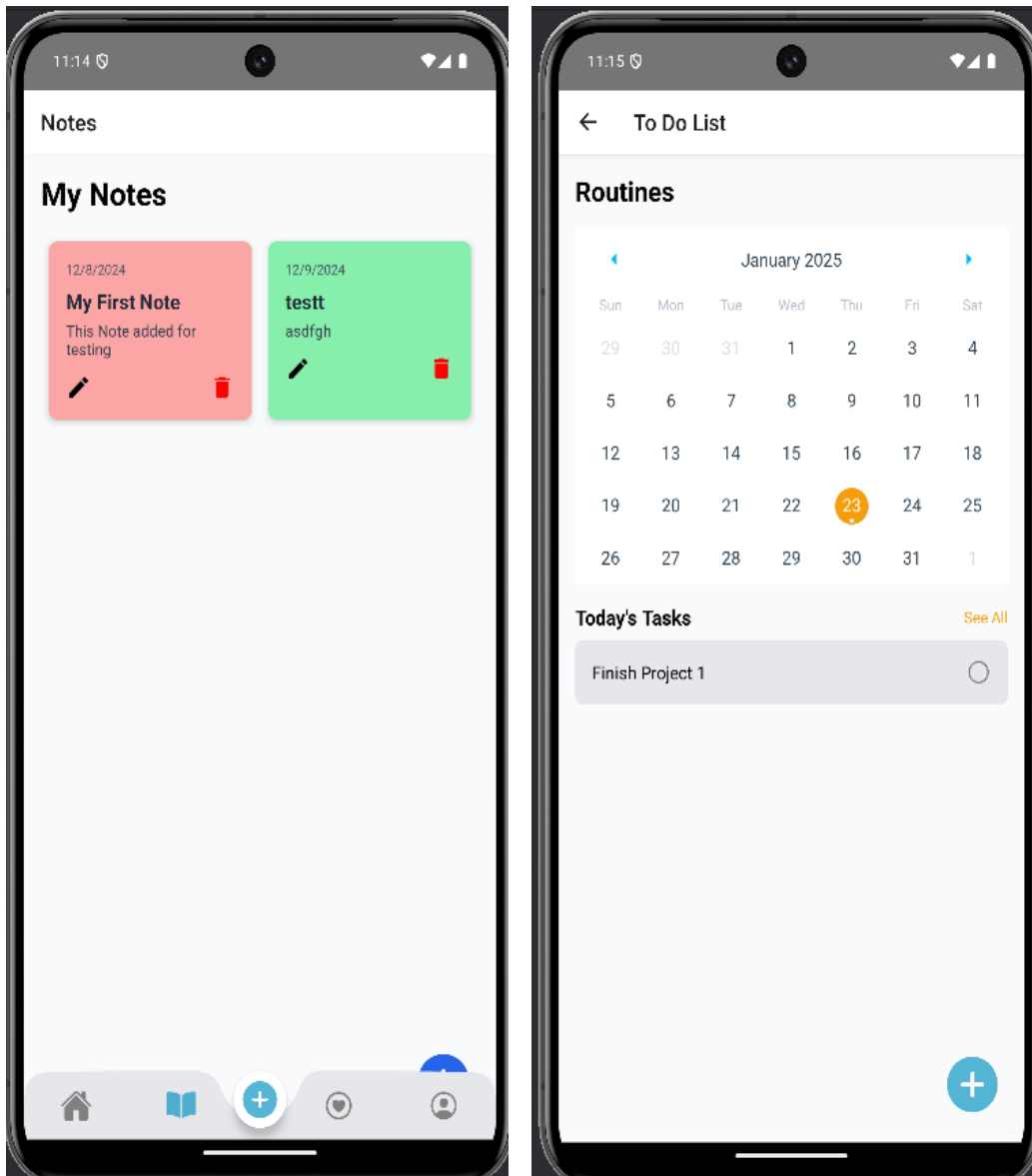
sdfgh

java javascript

0 votes 0 answers Hiba Ali

 Create Question

Notes page:



Grete Sketch page:

This page allows to user to draw or write anything's , and you can use shape like Square, circle and straight line, also you can use commander delete if you want.



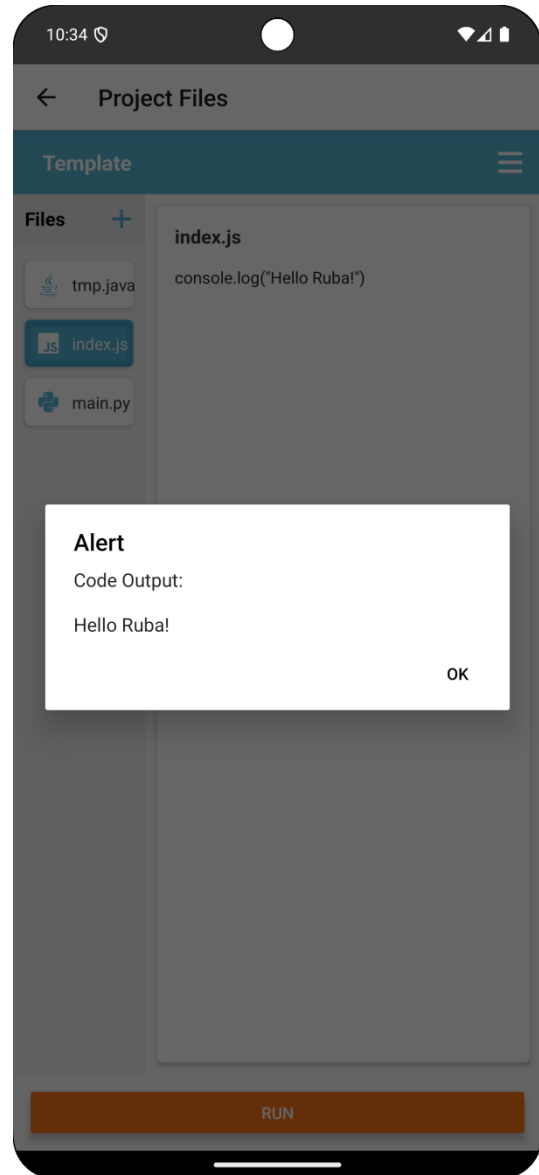
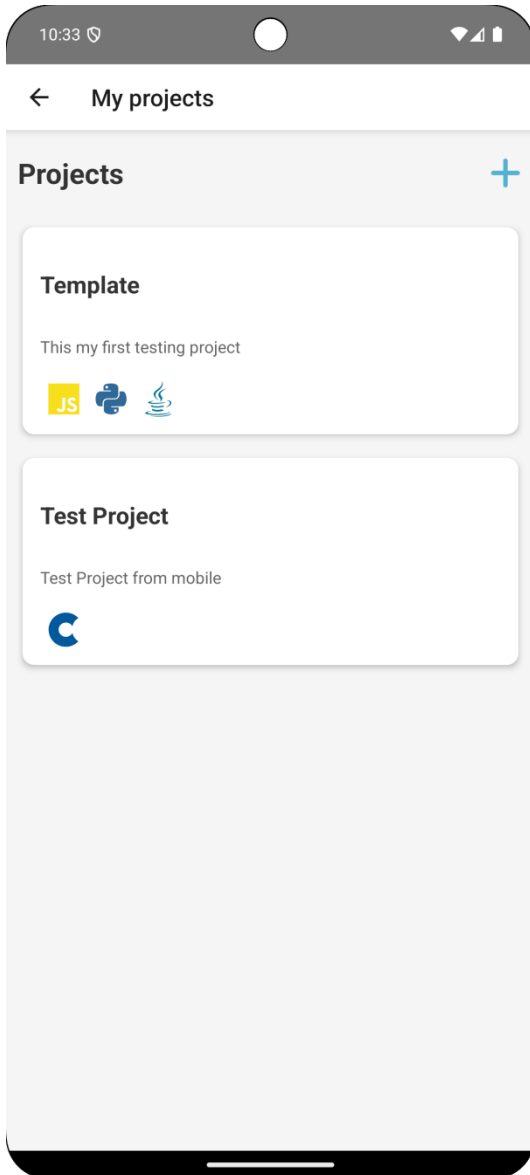
Figure 4.48: Category Page

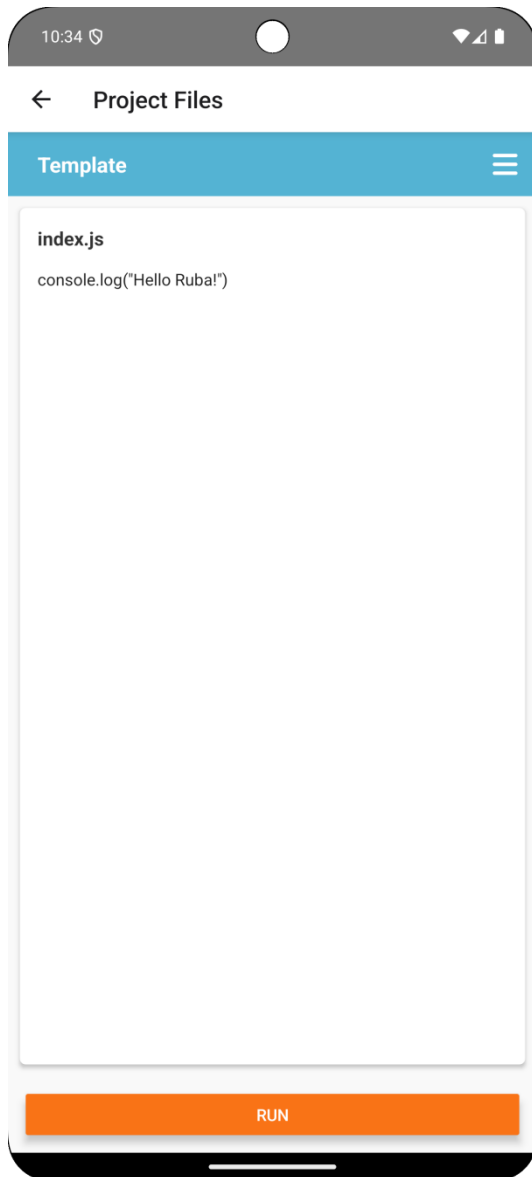


Figure 4.49: Software Course

Compiler Code:

The compiler code page promotes practical coding practice and skill development by enabling students to write, compile, and execute code in four major programming languages—Java, C++, Python, and JavaScript—directly on the platform without having to launch additional applications.





Team Work Page:

this page provides many different services that It makes it easy for students when work in project as team in the top of page we show icon of menu when click to it we show all project related to user and which you sharing to work.

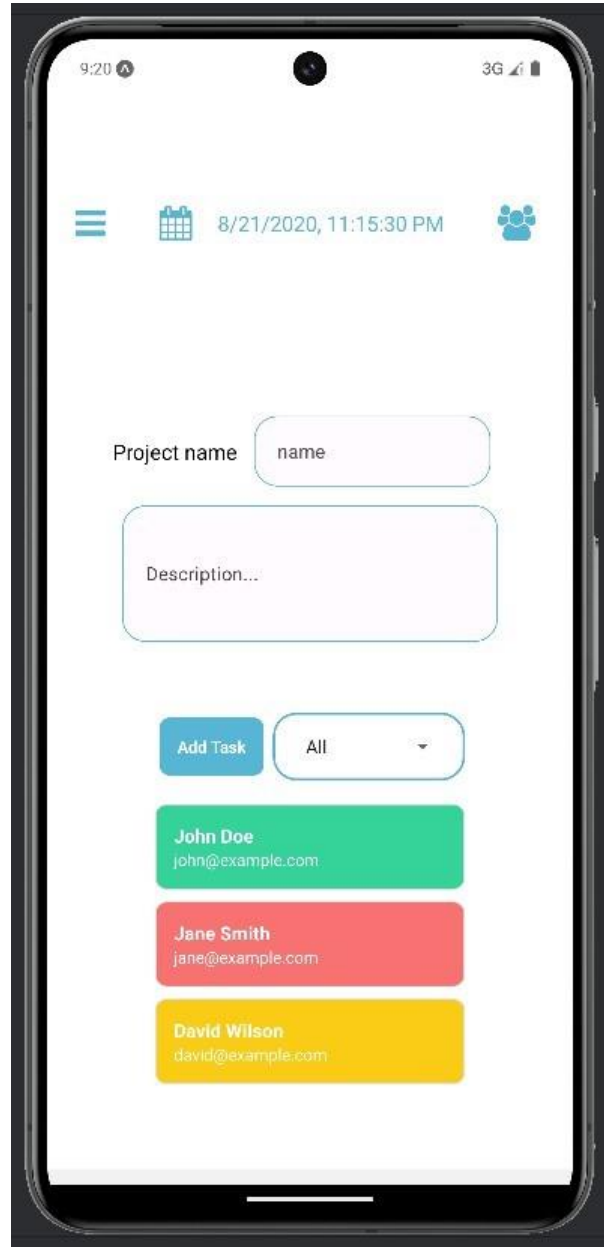
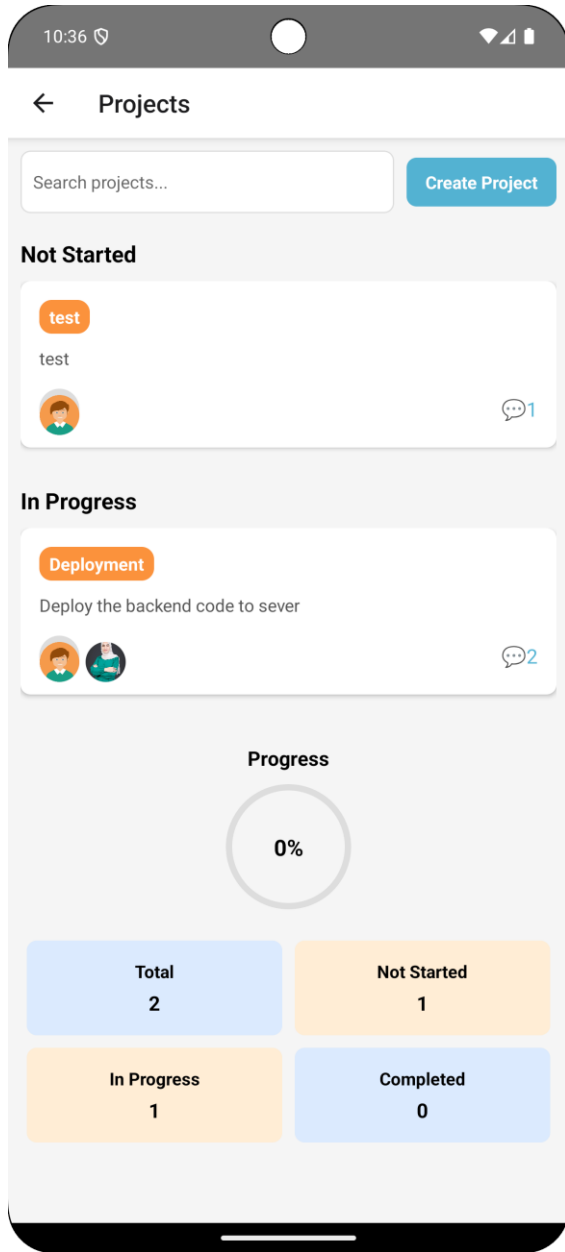


Figure 4.50: Team work

And also, you can show Celender



Figure 4.51: Set Celender of project

Also, at top right of page you can see icon team, when click to it you can add member to project by enter her email and project name then click to invite to send invitation

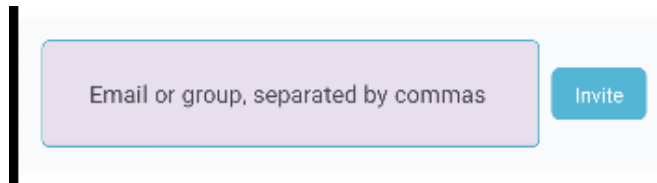


Figure 4.52: invitation project

After that you can see input text to enter name of project and description of details of this project to create it. Finally, you can add task of a specific member of project and set the status of this task.

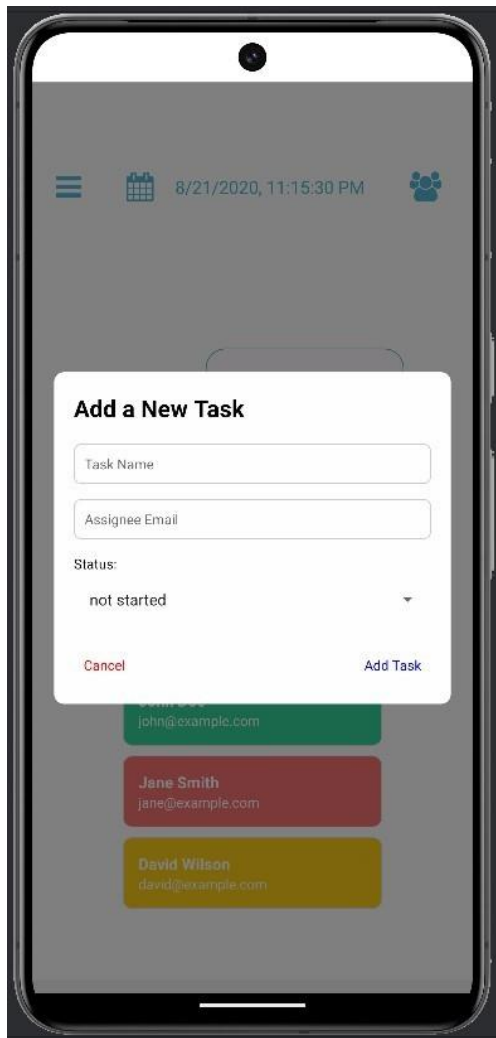


Figure 4.53: Add New Task

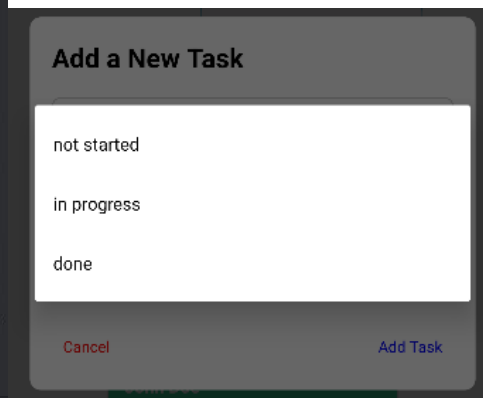


Figure 4.54: Select Status Of Task

After click to "add task" you can show task entered on list and you can select any status to show all task related. Furthermore, each task status has a specific color. — not start—red in process—orange done—green

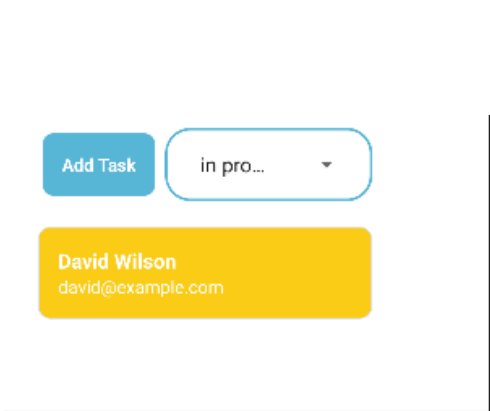


Figure 4.55: In Process List Task

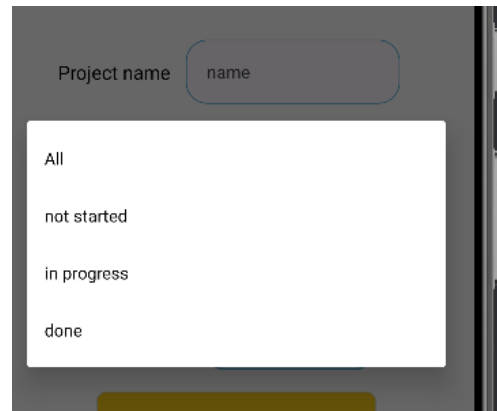


Figure 4.56: List Of Status

Edit task is available if you want modify , name, email, status of any task.

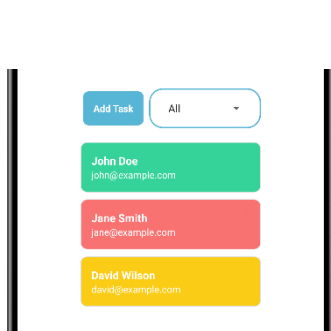


Figure 4.57: Show All Task

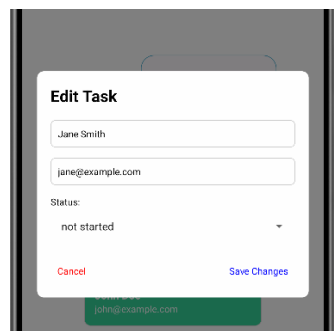


Figure 4.58: Edit Task

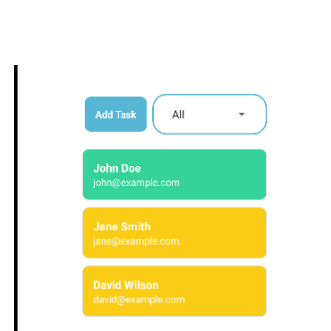


Figure 4.59: List After Edit

Study plan using ai :

in this part we use ai to do study plan depend on user information ,after what we show two button when of then to generate a static plan and anchor to regenerate first part by using three strategy include distribute time randomly,

increase time for hard subjects depend on percentage of specific material, last strategy is decrease time for less important subjects. Every time you press generate alternative, it gives you a different plan. This enables the user to choose the plan that suits him.

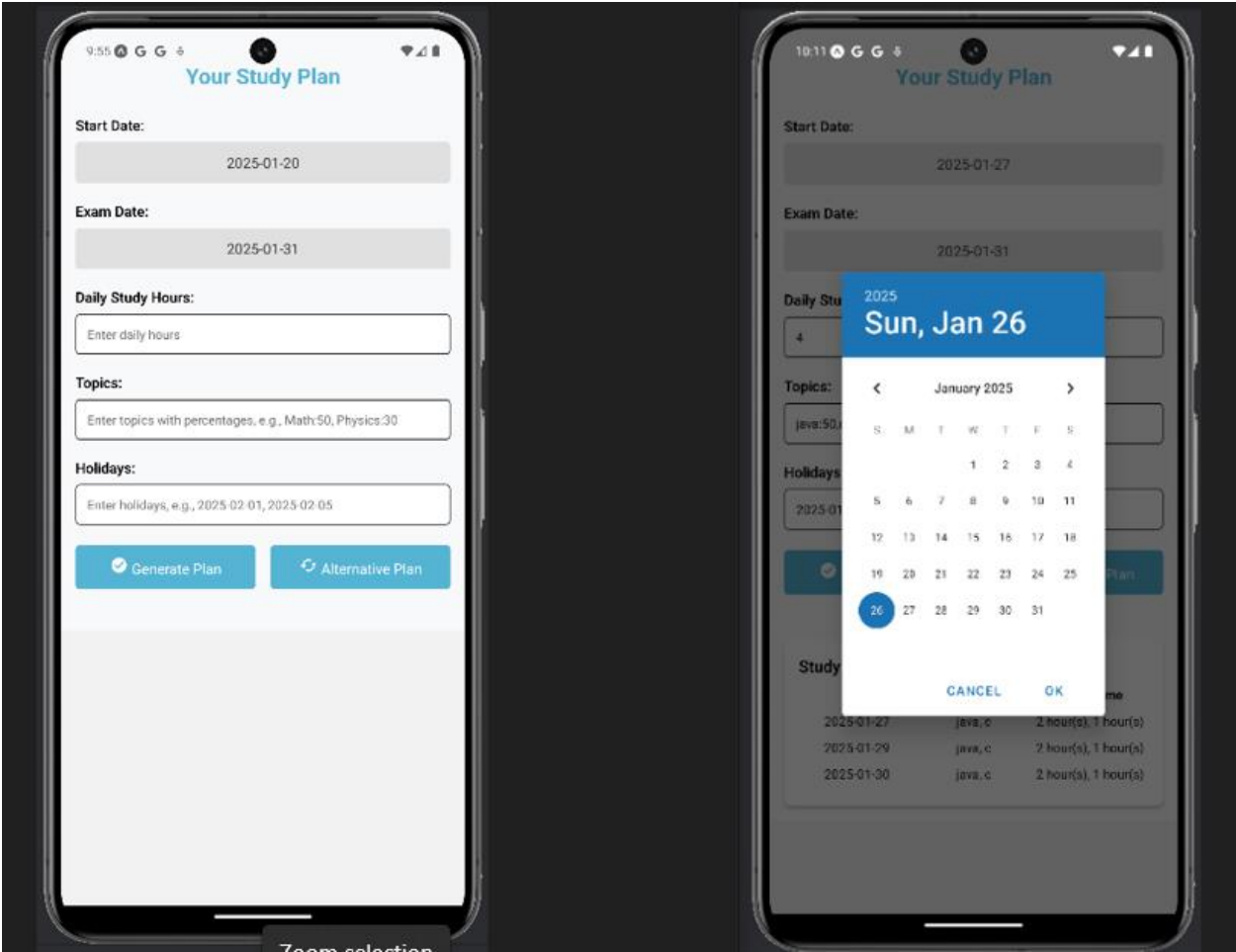


Figure 4.109: Study Plan

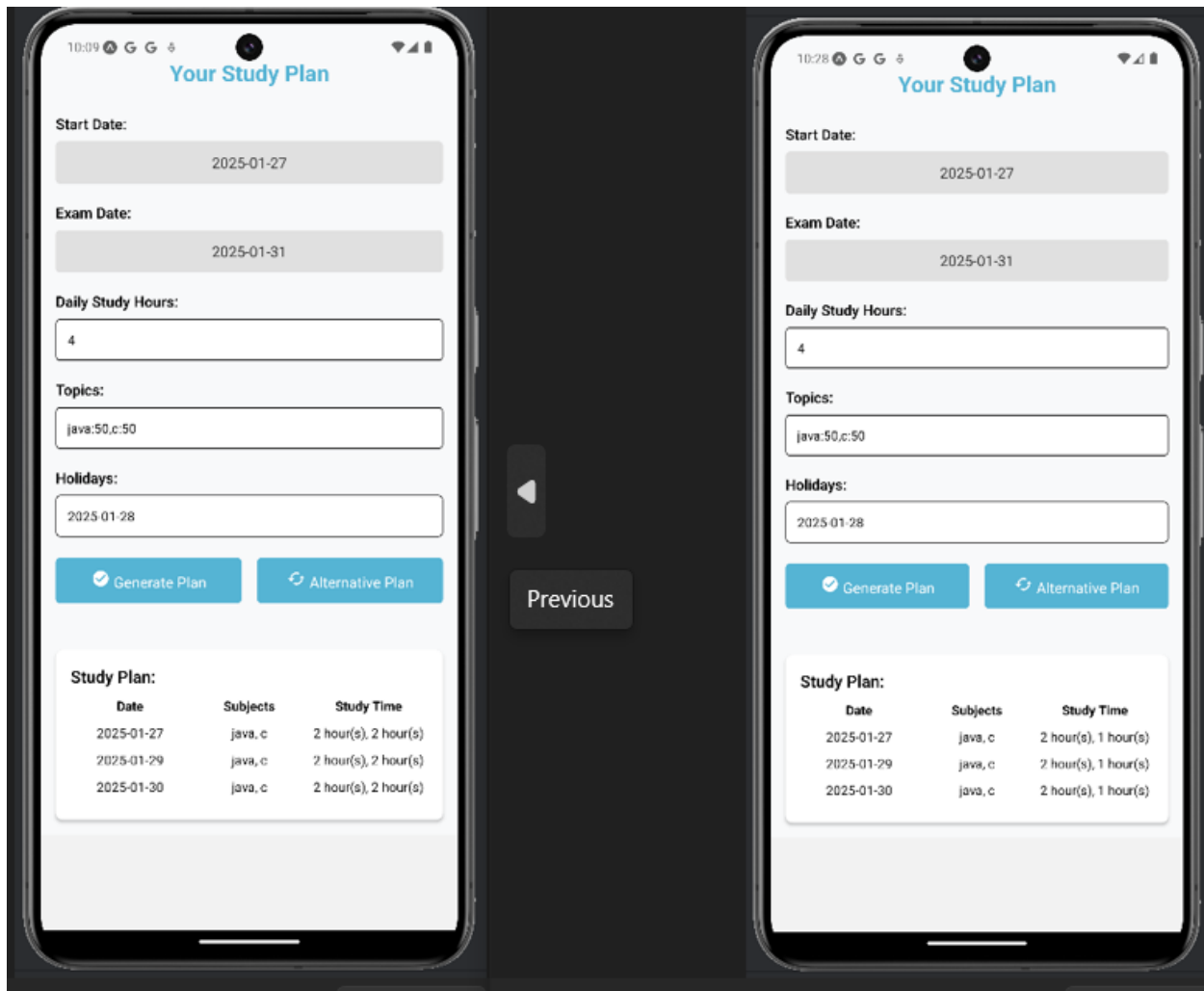
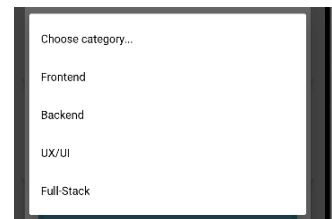
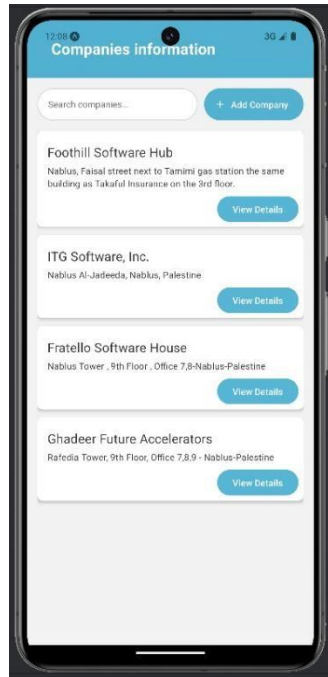
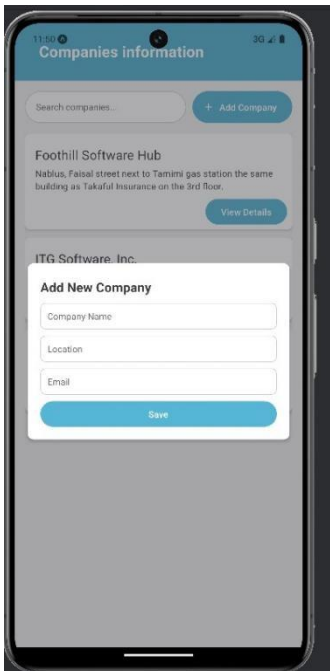
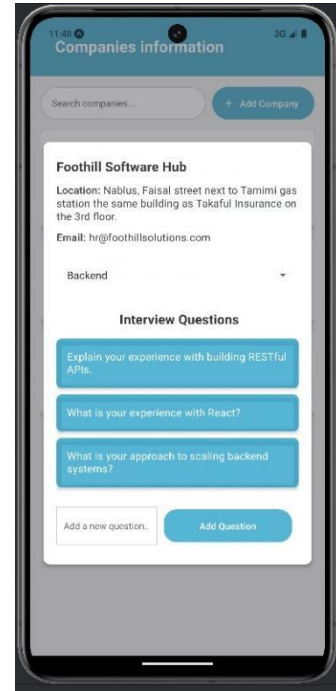
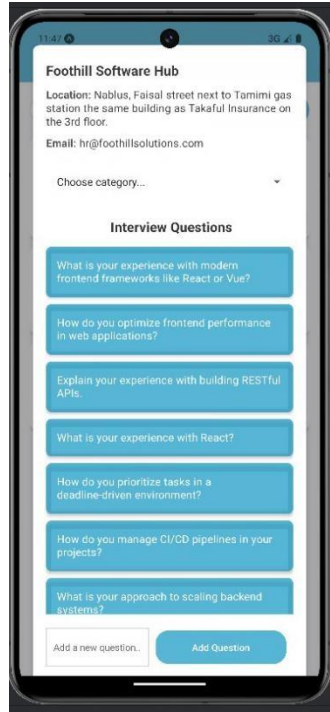
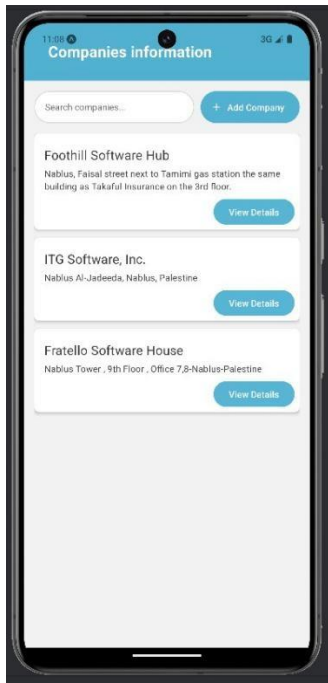


Figure 4.110: Generate Plan

Practical Training:

practical tanning page is helpful of students to prepare and improve skills when students are future to tanning or work. It provides different company, different question in different fields depend of which user prefer to show.

It allows students to cooperate and help each other, so that a new company can be added if it does not exist. It also allows users to add questions that the company asks that are not present. It also displays the company's location and email in case they want us to contact them or reach them privately. Finally, it contains search bar if you looking for a specific company.



Chat Page:

When click to icon chat at navbar, then chats page open, and see all user with name, photo, and

their status (active, inactive). When we click on any user to open the chat page to communicate with the user and exchange files, messages and pictures and at end of we show icon of group chat, when we click on it, it takes us to a new page so we can see the groups we are a member of. Last you can use search bar if you want to chat with specific user.

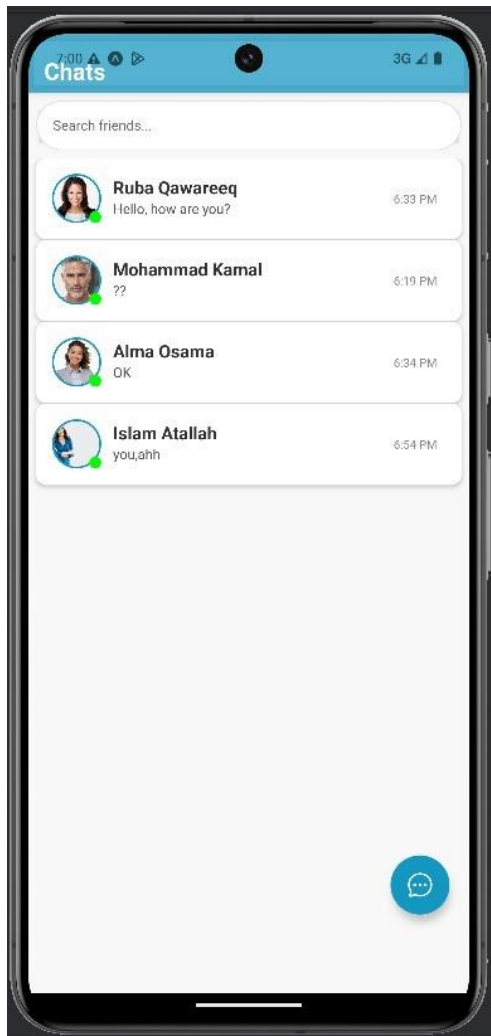


Figure 4.66: Chat Page



Figure 4.67: Search in Chat

Files, photos, and voice messages we use cloud nary storage so there are appeared as link when clicking to this link you go directly to file.



Figure 4.68: Personal Chat



Figure 4.69: received message with notification

In chat when you are received message you can show notification contains name and the content of messages, also after send file, photo, voice you received alert about message send successfully or not.

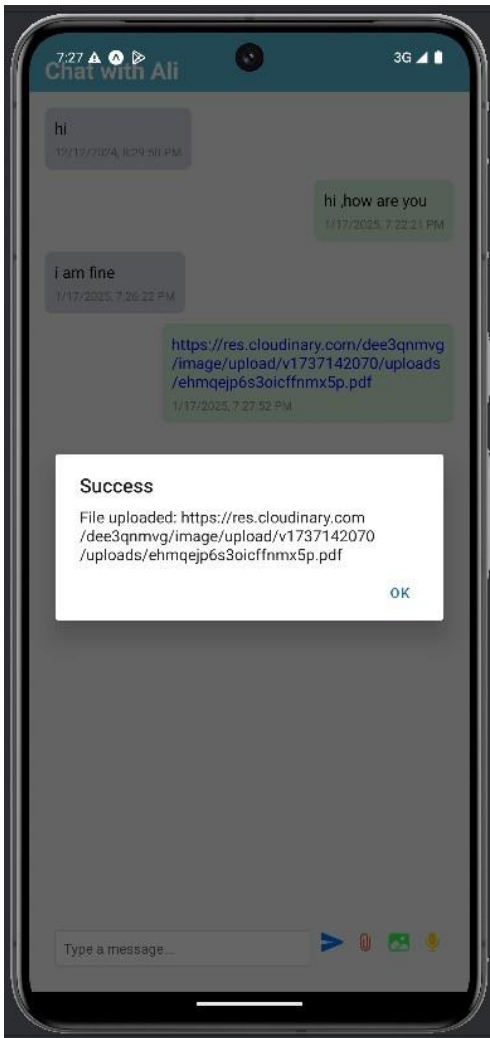


Figure 4.70: Alert After Send file

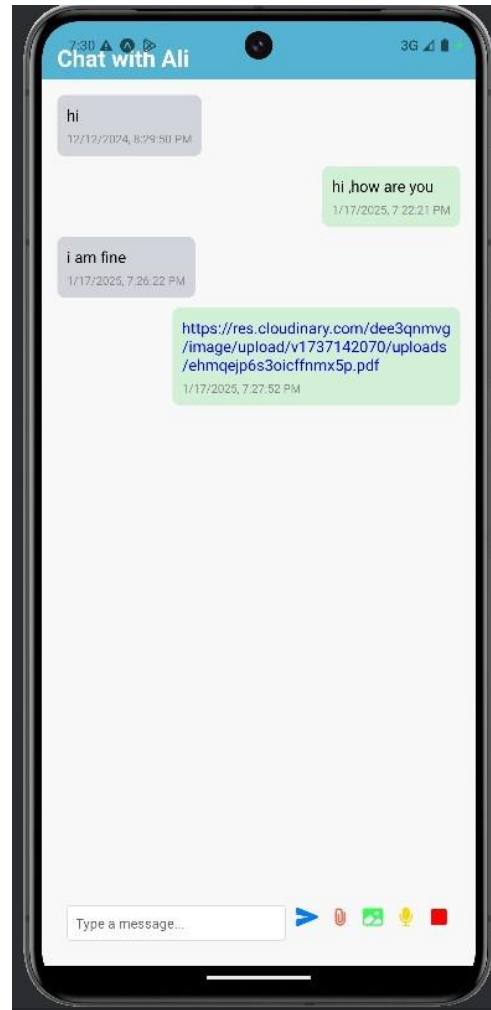


Figure 4.71: start record

At above page when click to icon voice the record voice start and new icon appears to click to her if you want to stop record. Image below shows how to send images, and to crop, and after send and how I can how show it after click to link.



Figure 4.72: Send Images



Figure 4.73: Image when send and open

This page show when click to link voice to hear it.

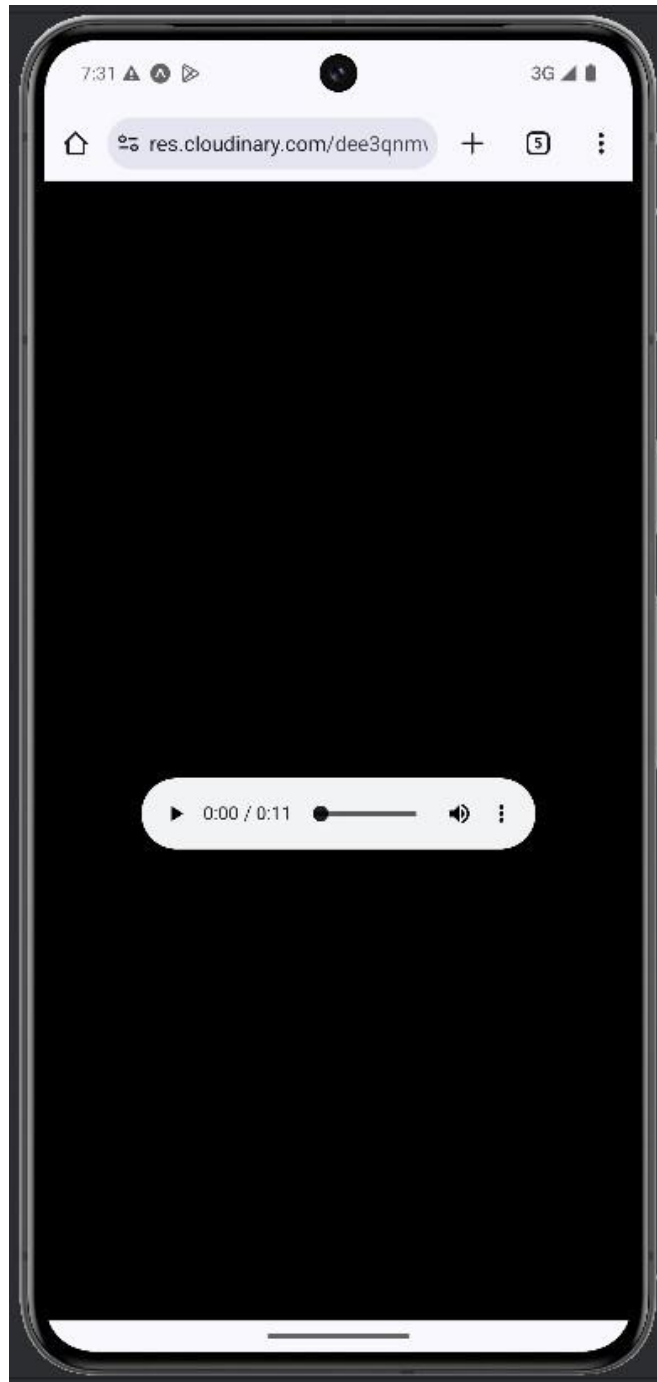


Figure 4.74: Voice Message

Group Chat:

When students are need to contact with other student with same quiz, course, or to contact with instructor you can use this page that allow to user to add new group, add new member invite it to group and it is contains all feature in personal chat like send text, file, voice, photos.

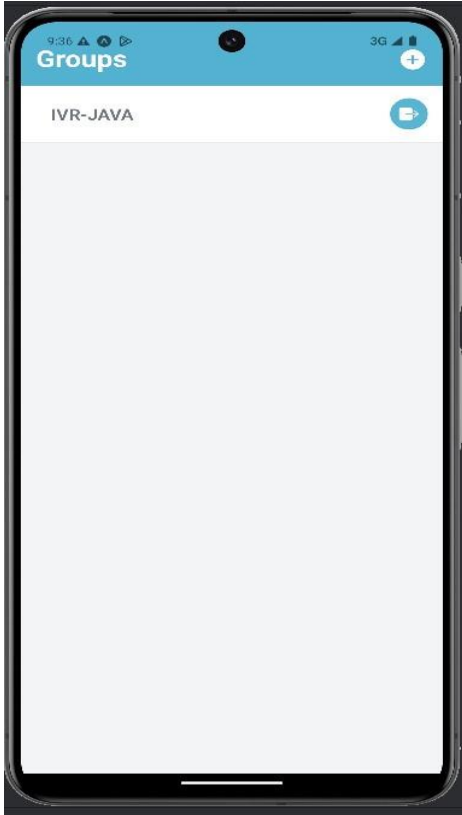


Figure 4.75: Group of specific users

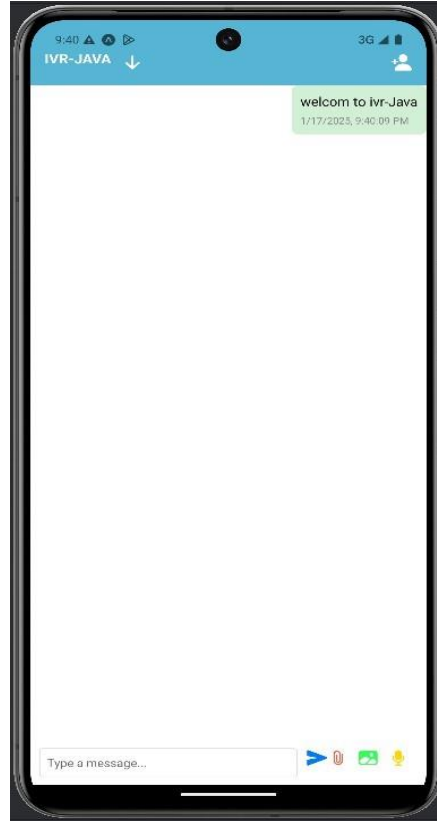


Figure 4.76: Group Chat

From this page you can also left group if you need when click to this icon and then you ask to check are you sure or not.



Figure 4.77: Left Group

After click to icon leave this message appears, after click to leave group will be removed.

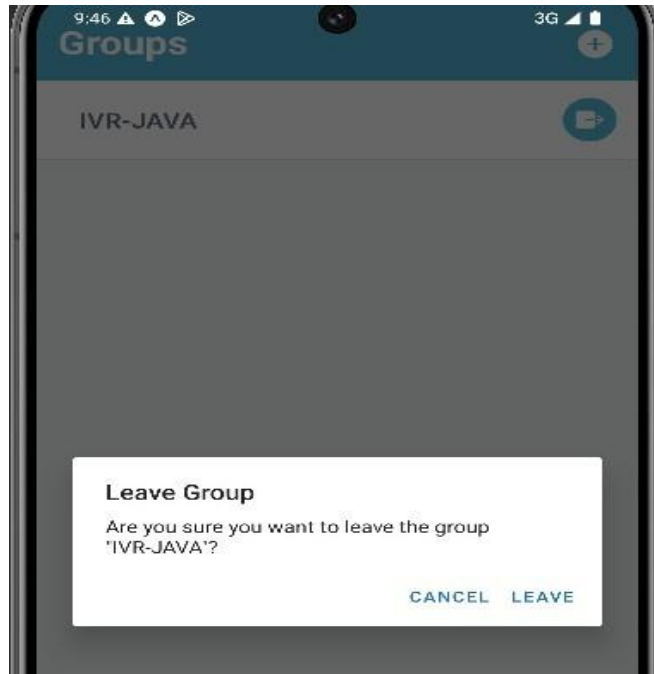


Figure 4.78: Leave Group

About icon add at the top of page group when click to it, you and enter information and then group added.



Figure 4.79: Icon Add

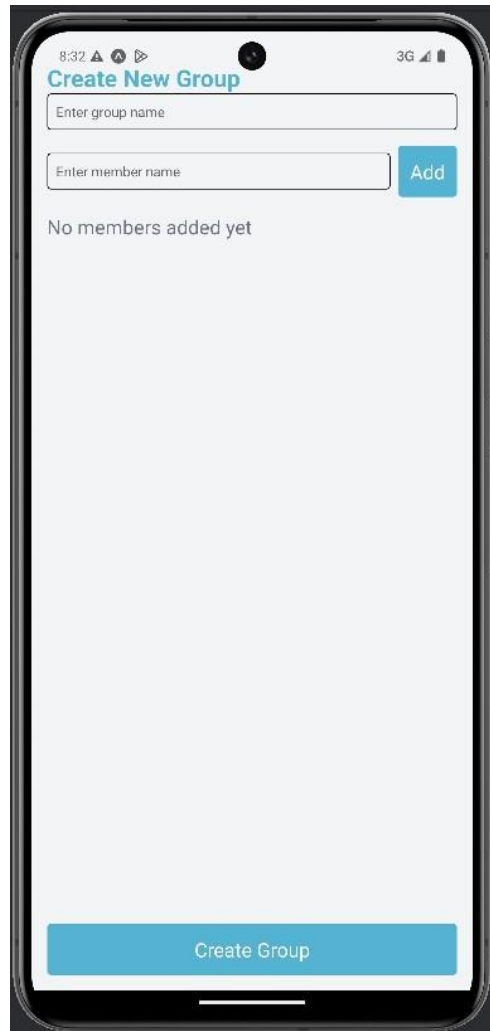


Figure 4.80: Page New Group

This page after enters information and create new page

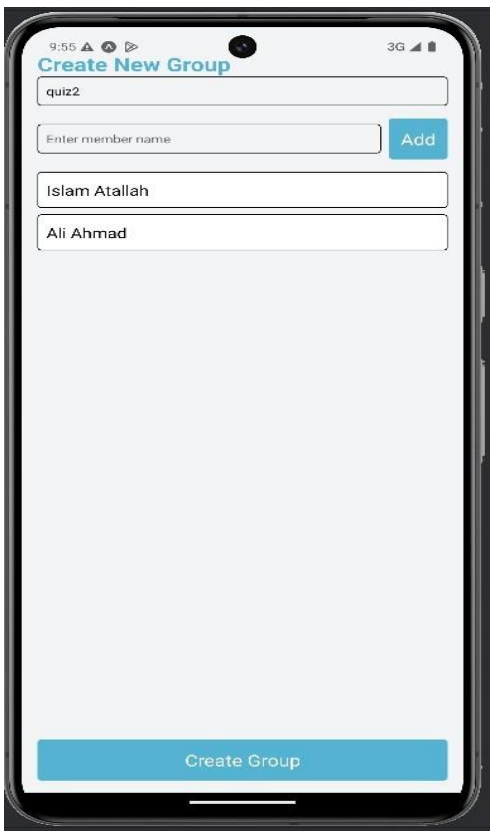


Figure 4.81: Group added information

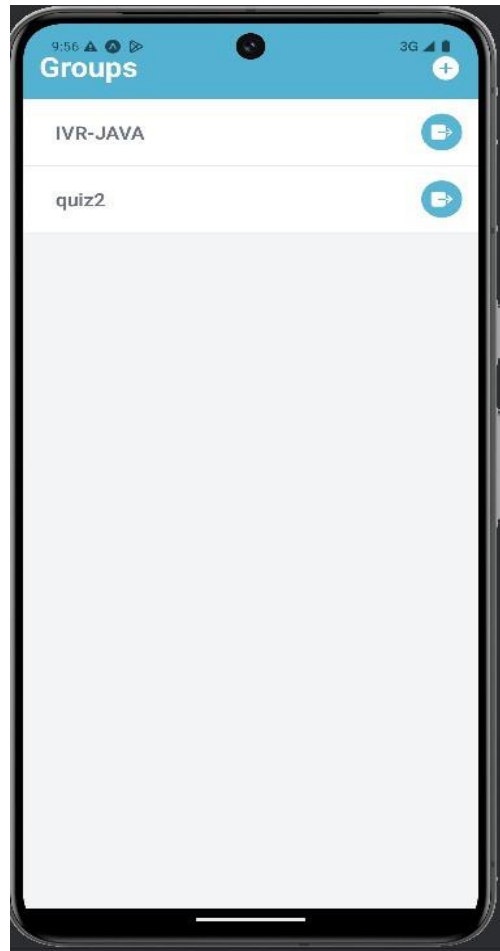


Figure 4.82: After Add Group

furthermore, at the top of page group chat you see two icons, either to show members and another icon to invite, add member to group. if click to dart behind group name you can show member, and when click to icon at right to can add new member.



Figure 4.83: member, invite member icon

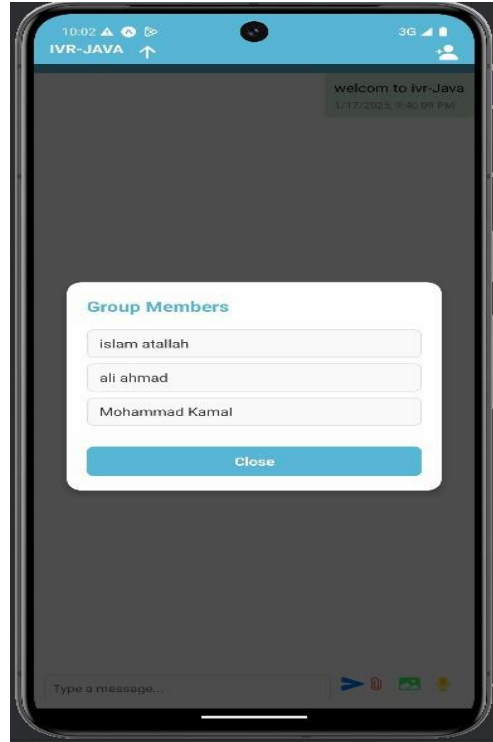


Figure 4.84: show members

From this picture below we added member to group, and show result after added.

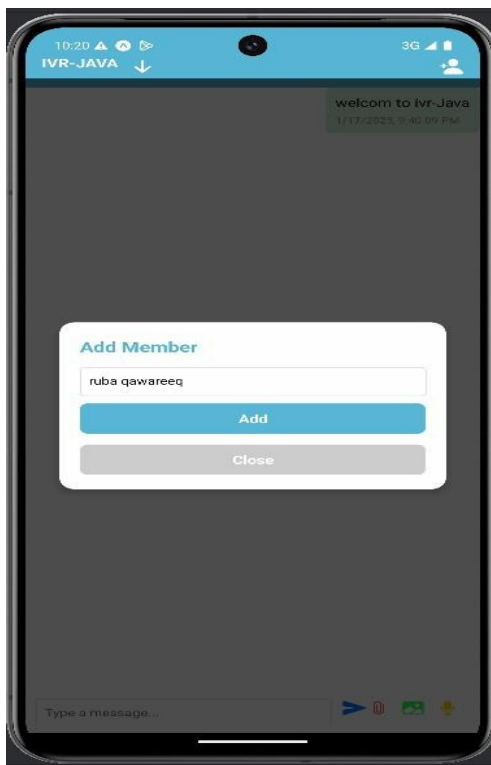


Figure 4.85: Add member to group

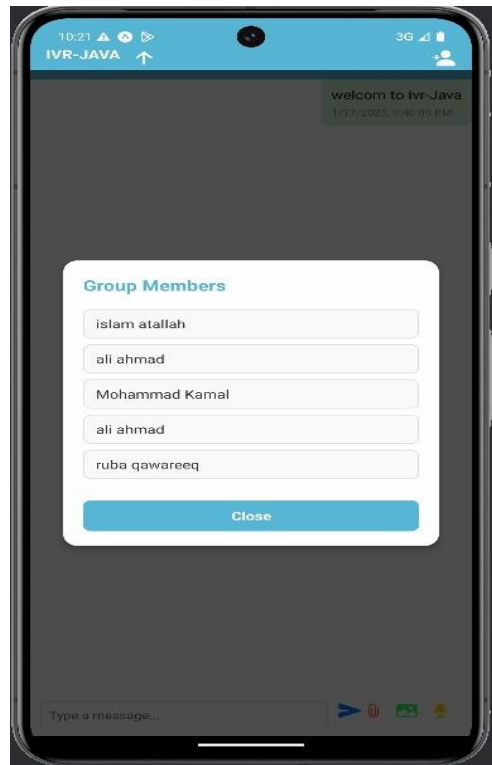


Figure 4.86: After Member Add

Event Page:

From this page we have a horizontal bar, drag it to the right and left to see all the events information and interactive with them you can register of any events prefer by click to button register if there are available seats, registration will be successful and the event will be displayed in the list of recently registered people. If there is no space and all seats are reserved, registration will not take place. The attached pictures show before and after registration for a specific event.

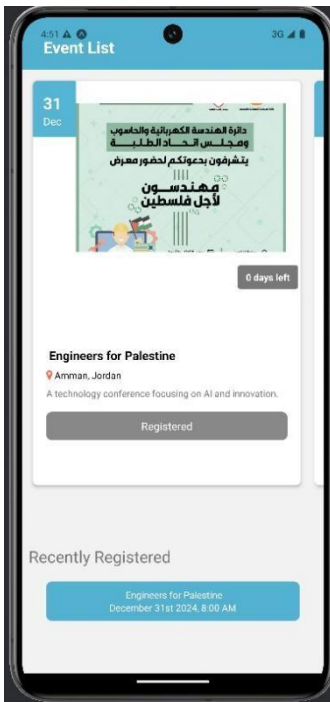


Figure 4.87: Event Page

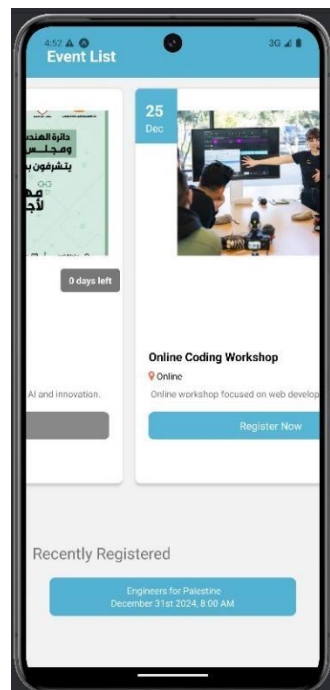


Figure 4.88: Event Details

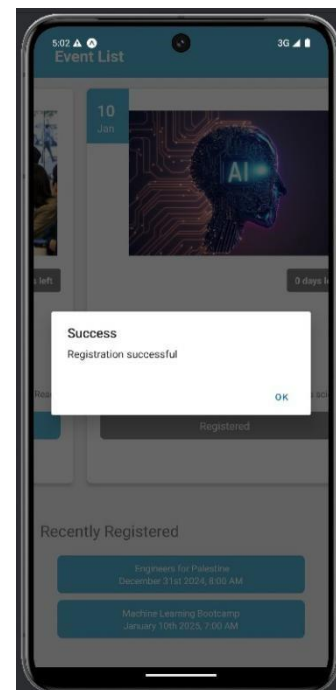


Figure 4.89: Register Event

Admin Page:

admin page contains all information about this platform, students, instructor, events, courses. It keeps the admin informed of the most important events, while giving him all the powers to add, delete and modify all the subjects for students and instructor.

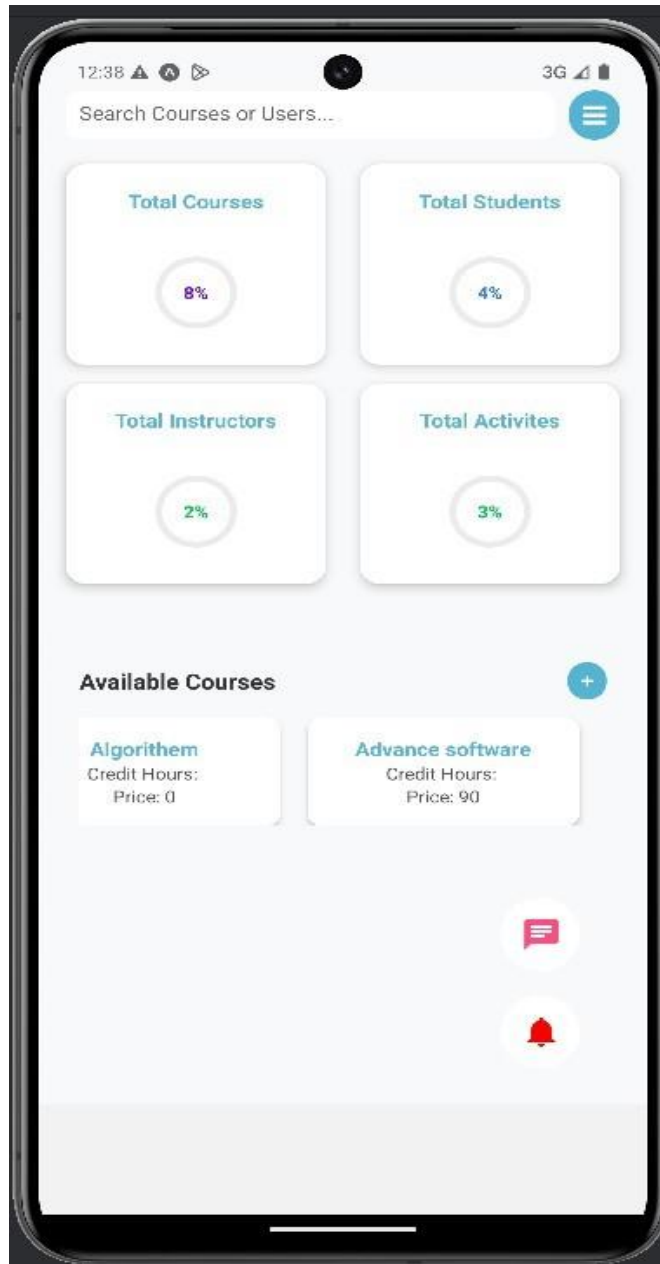


Figure 4.90: Admin Page

At the top you can search bar if you want to search about anything ,and at right you can see menu icon when click to it you can show different button when click to any of them you can go to negative page ,in center of page you see most popular ,available courses and ability to add new course by admin ,at end of page you can see to icon chat go to page chat to connect with other and notification icon to show last event.

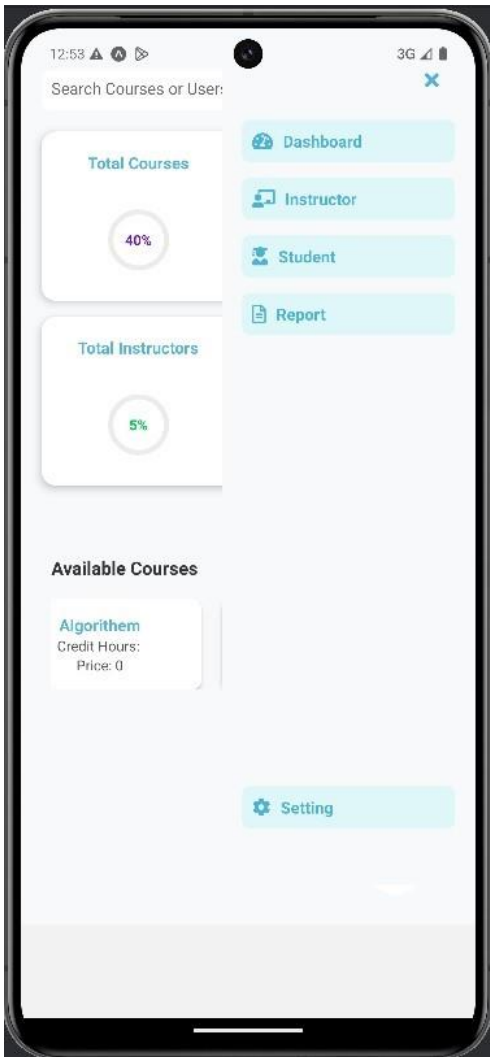


Figure 4.91: menu Admin



Figure 4.92: Available Course

From above page when click to show all you will go to negative page course and show all course with ability to delete to modify any of these. About icon add when click it form add course is open to enter information to add new course. When course page open then handle name and number of course, and admin click to icon delete, course will be deleted, another when click to icon modify you can modify any field.

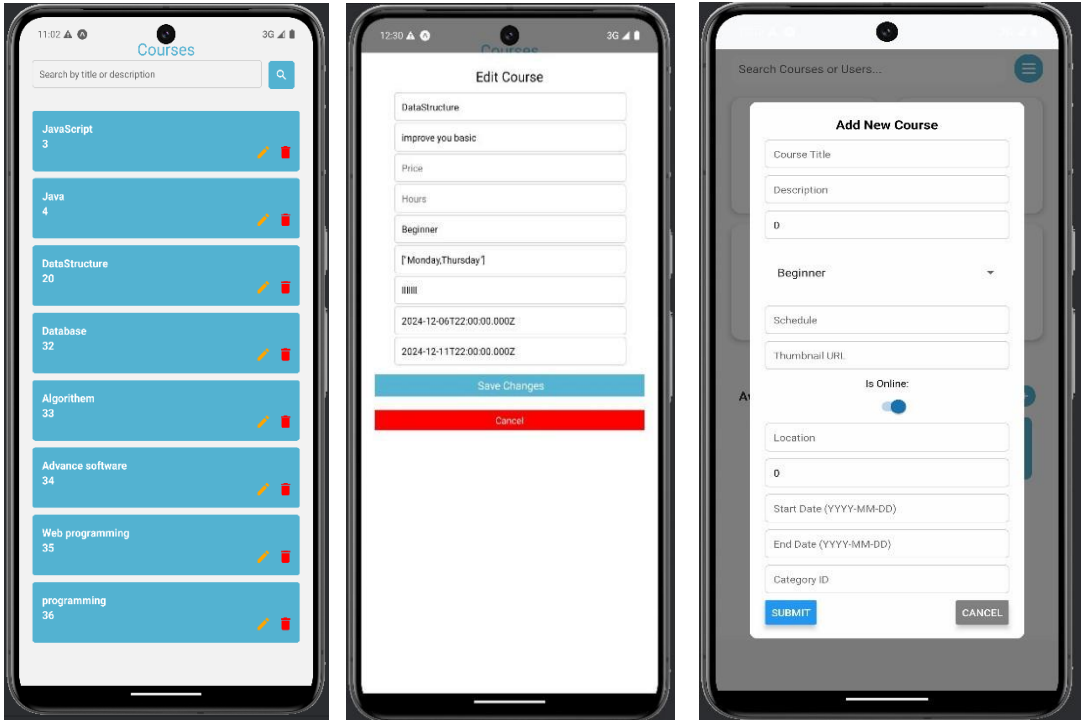


Figure 4.93 Admin Course Page Figure 4.94: Edit Course

Below image show when user search of specific course.

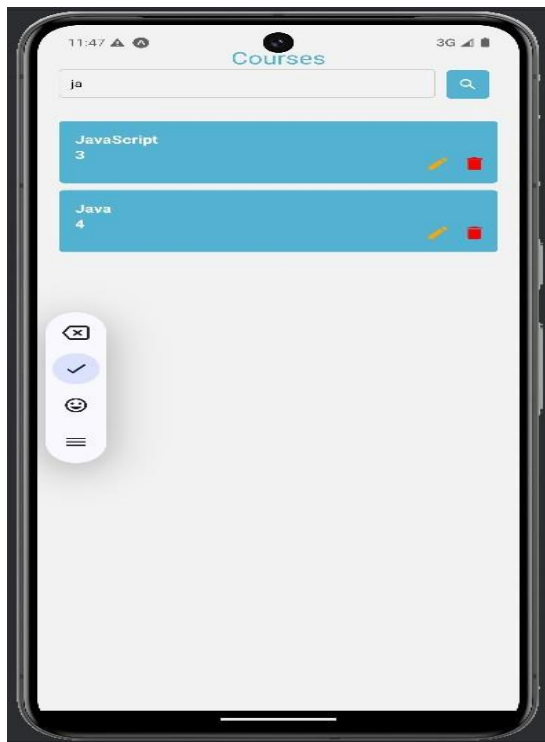


Figure 4.96: Search of course

From button menu when click to button instructor, the negative page open and handle instructor expertise and number, in addition you can, add, delete, update. When press to” Show all” admin see all instructor number and expertise with icon delete, modify if you want to use.

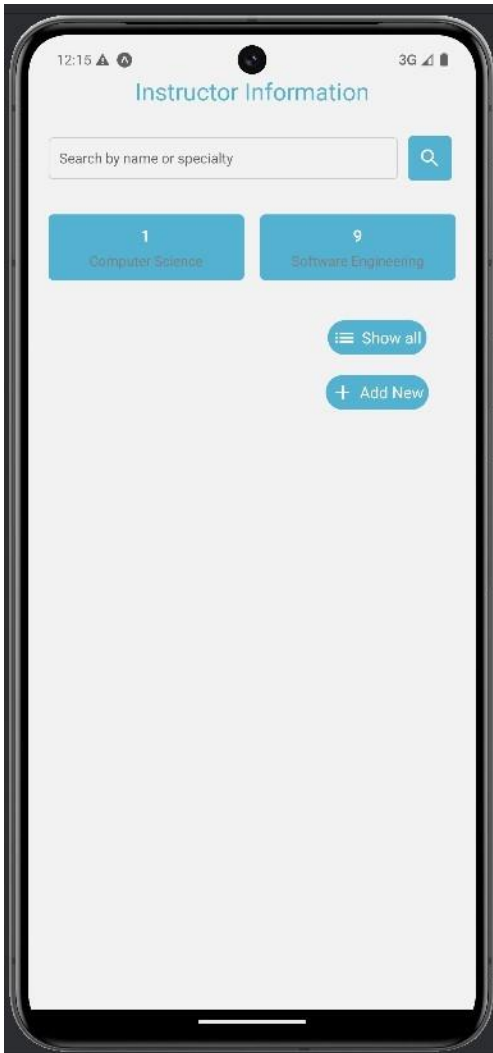


Figure 4.97: Instructor Admin page

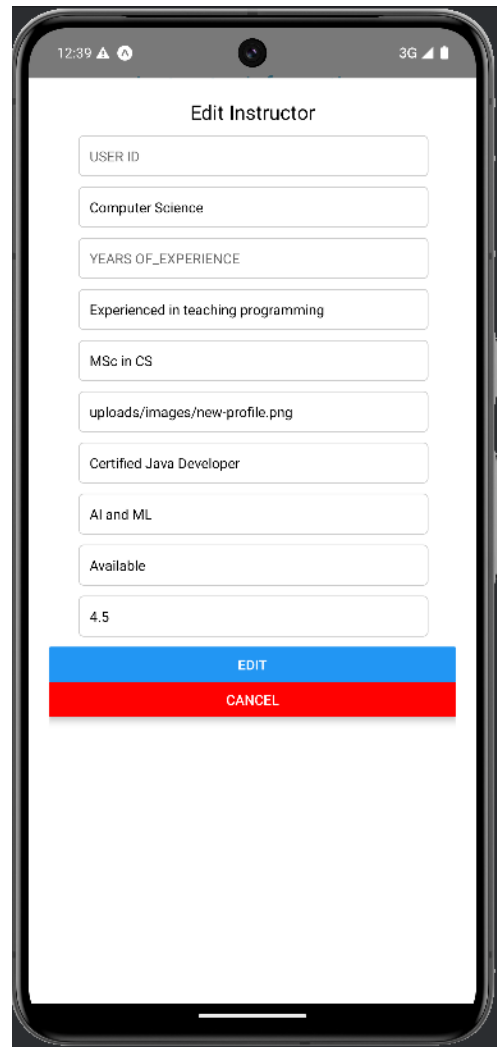


Figure 4.98: Edit Instructor

The image shows a mobile application interface for adding a new instructor. The screen is titled "Add New Instructor" and features a series of input fields for the following fields: USER ID, EXPERTISE, YEARS OF EXPERIENCE, BIO, EDUCATION, PROFILE IMAGE_URL, CERTIFICATIONS, SPECIALIZATION, AVAILABILITY, and RATING. At the bottom of the form, there are two buttons: a blue "ADD" button and a red "CANCEL" button. The status bar at the top of the phone shows the time as 12:42, signal strength, and 3G connectivity. The number "66" is displayed at the bottom center of the screen.

When click to students' button from menu, student information page will open, then you show all student, if you want to delete or update any information about student click to show all and if you want to add click to add new.

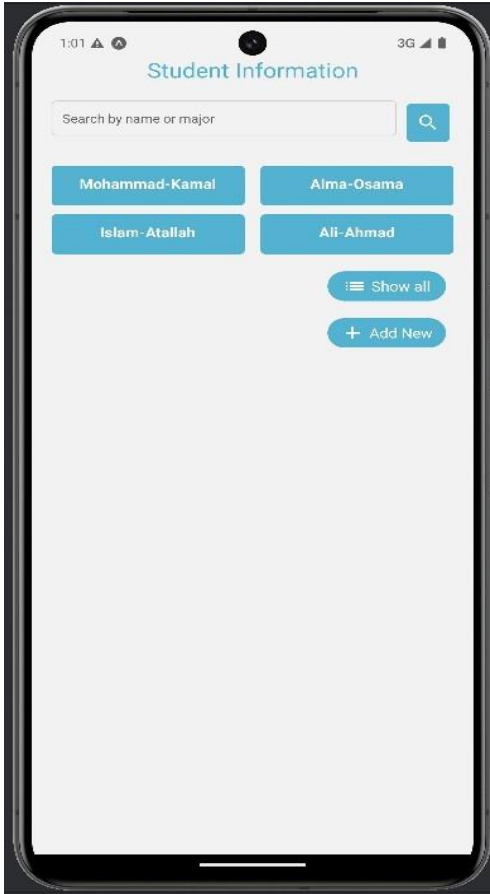


Figure 4.100: Student Information Page

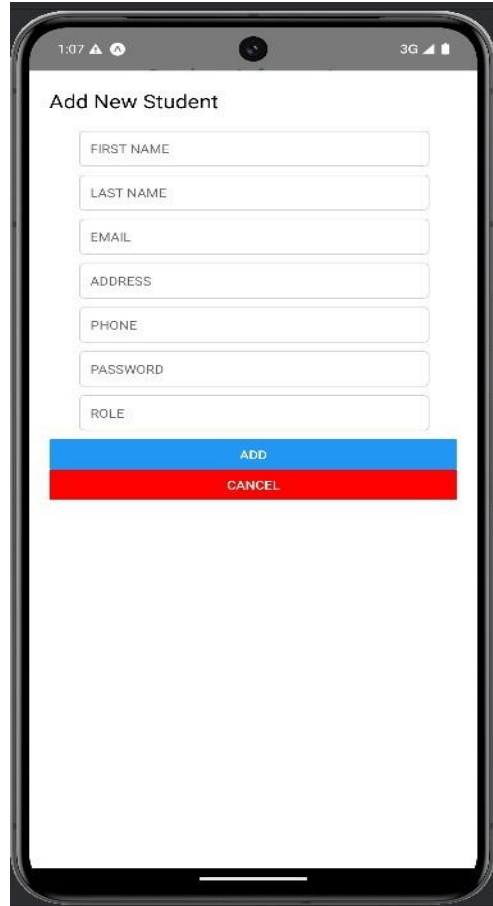


Figure 4.101: Add New Students

Website

The website contains all the features mentioned in the mobile application and is built separately.

Landing Page

This Land page for TechSync platform to provide general view about the platform and key features and services exist on it.



Figure 4.105: Land Page

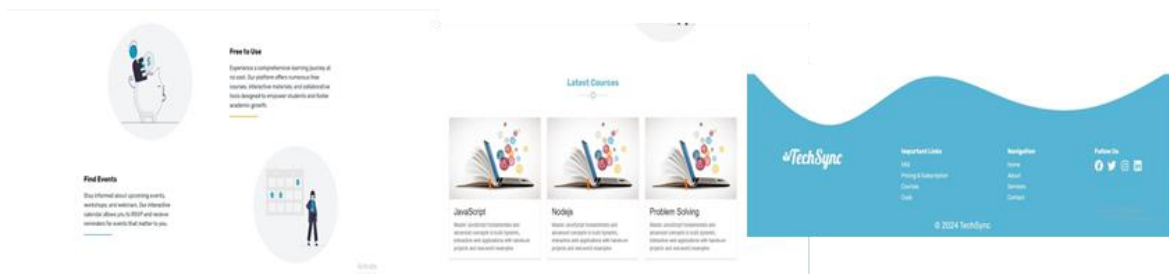


Figure 4.106: Land Page

SignUp/SignIn Page:

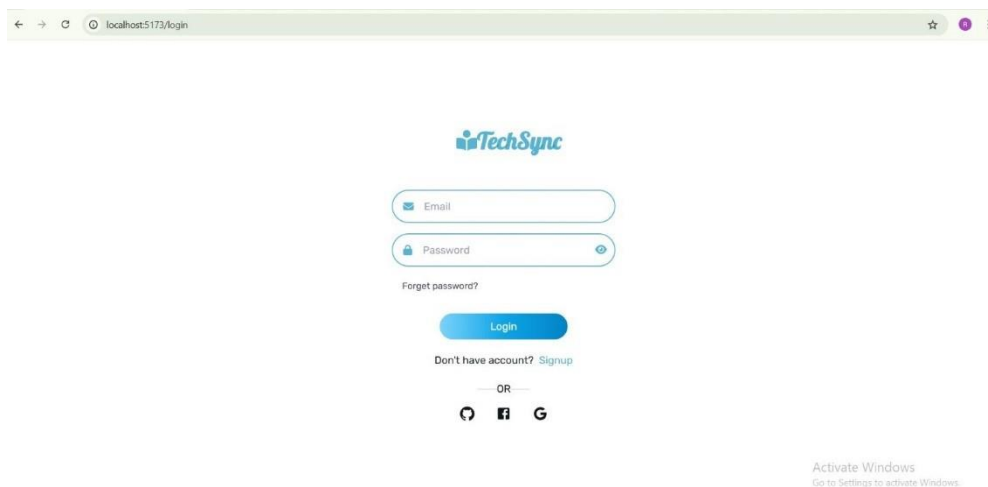


Figure 1.2: Sign In Page

These are the sign in & sign-up pages, where users can login or register as either an instructor or a student.

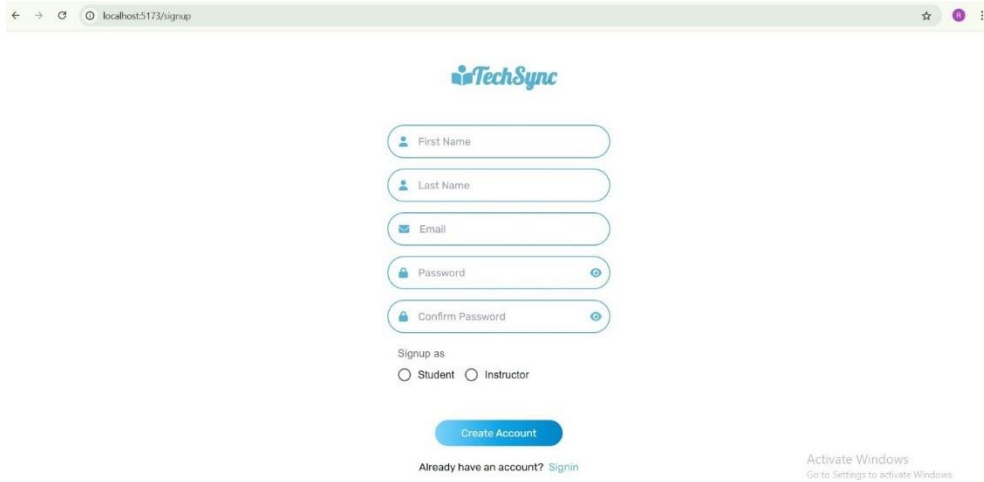


Figure 1.3: Signup Page

Forget Password Page:

In this page user enters his email, if the email is valid and exists on system, then the reset link sent to user email. When email is clicked, open the reset password page and enter the new password.

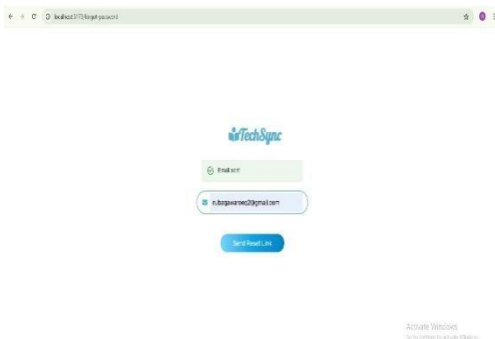


Figure 1.4: Forget Password Page

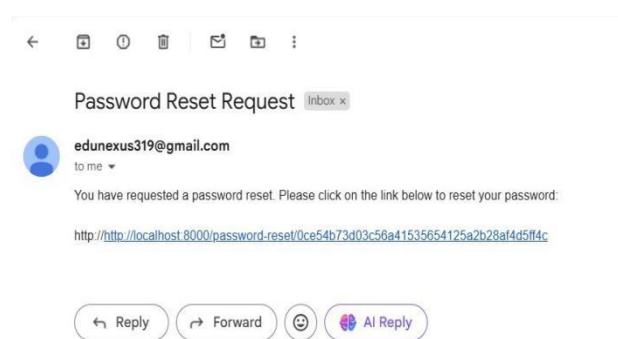


Figure 1.5: Email Verification Page



Figure 1.6: Reset Password Page



Figure 1.7: Password Reset Success

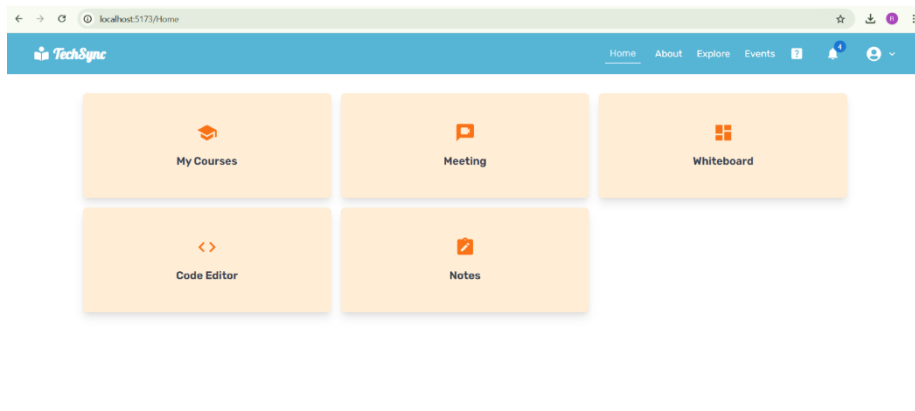


Figure 4.8: Instructor Home Page

- **Courses Page** In this page instructor see his published courses and ability to add new course

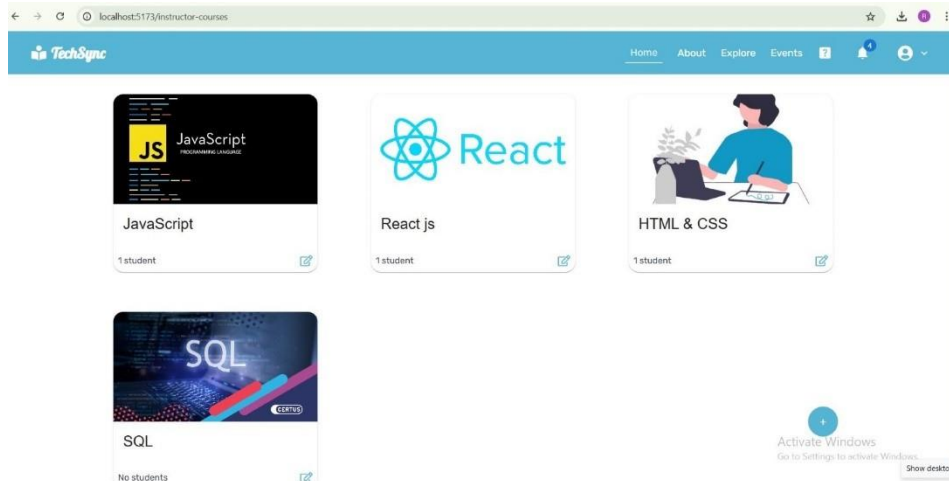


Figure 1.9: Instructor Courses Page

- **Add Course Component** Instructor adds a new course with complete course information and details.

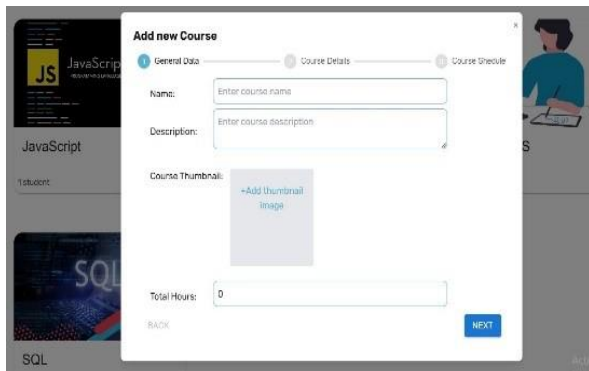


Figure 1.10: Add Course

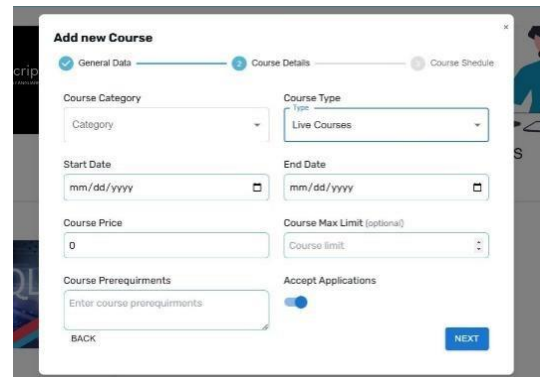


Figure 1.11: Add Course

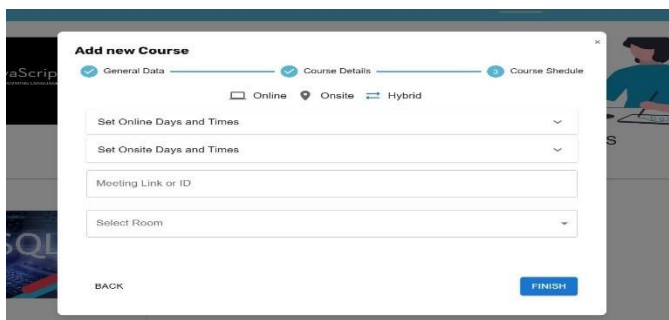


Figure 1.12: Add Course

instructor enter all course details and course could be online or onsite, so instructor select course schedule and time for each day and the location of the course.

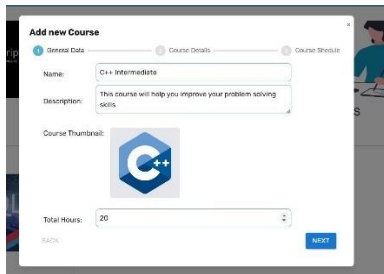


Figure 1.13: Add Course

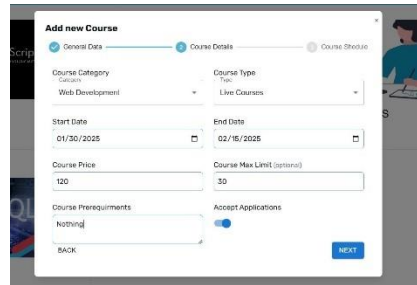


Figure 1.14: Add Course

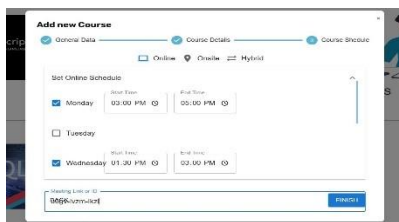


Figure 1.15: Add Course

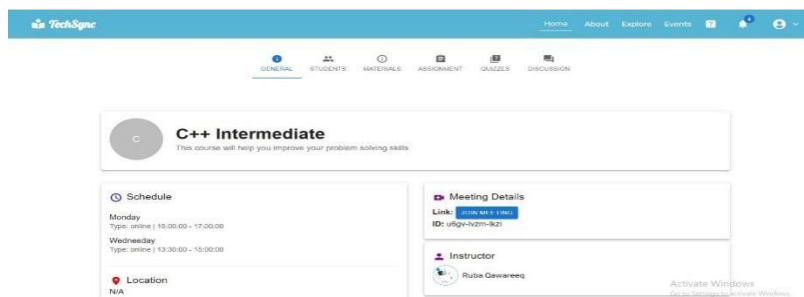


Figure 1.16: Course General Page

- **Course General Page** This page shows the general information related to course like: title, description, scheduled, and general statistics.

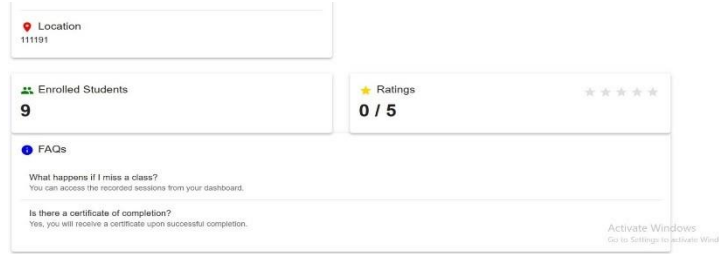


Figure 1.17: Course General Page

Course Students Page

This page shows table of student's details and wide range of filter options, such as, search by name or status or any other field. And instructor could make an action for each student, as chat with student, accept student request to join the course. or reject it.

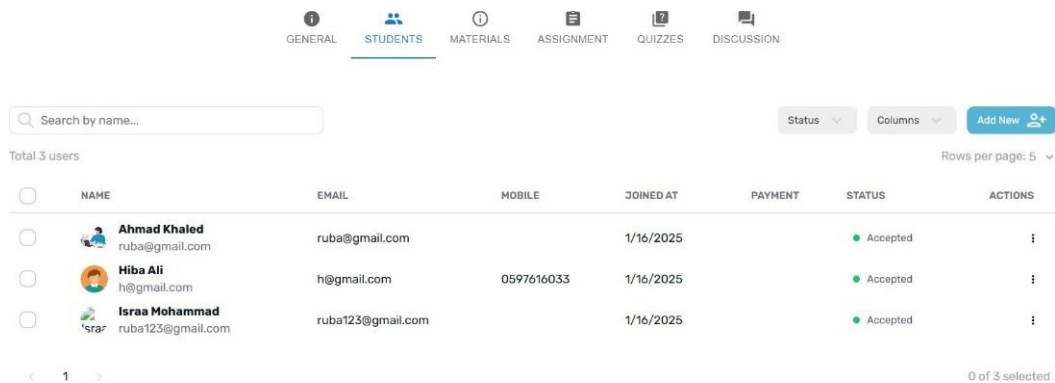


Figure 1.18: Students Page

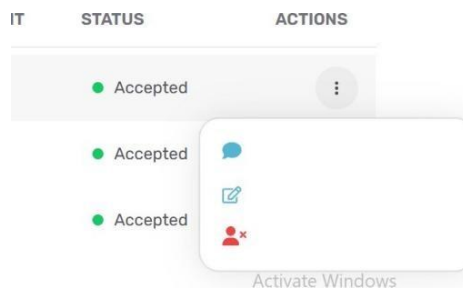


Figure 1.19: Students Action

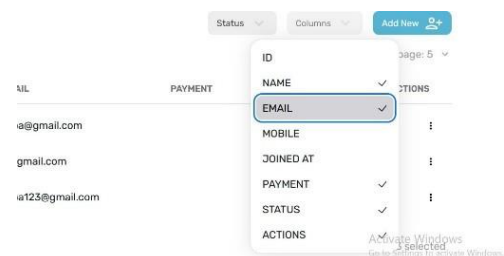
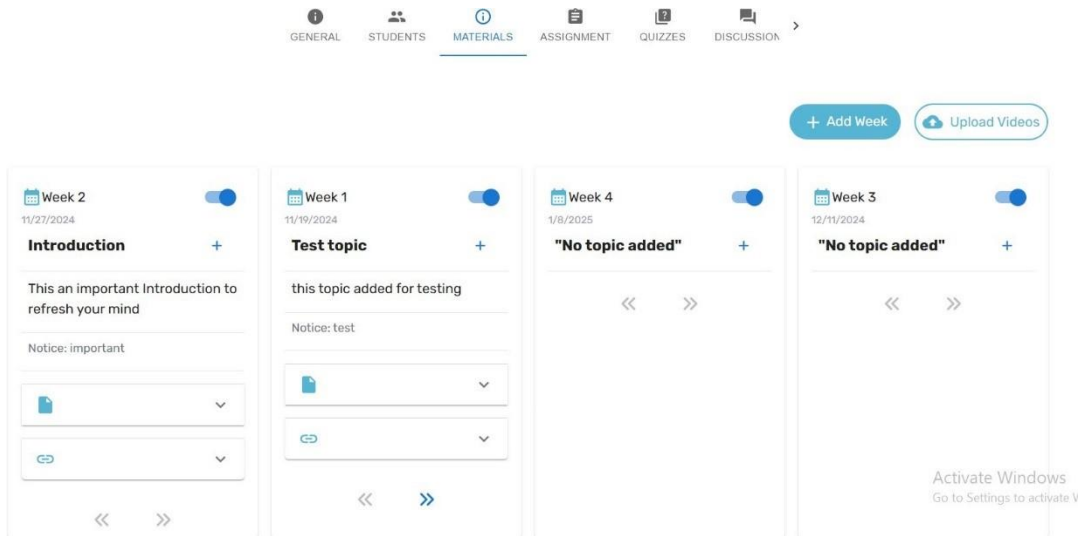


Figure 1.20: Students Filter

Course Materials Page This page shows the course content and materials instructor will add for students. So, instructor could add new week, each week contains number of topics, for each topic its own materials like: files, links, notice, etc...



]Figure 1.21: Materials Page

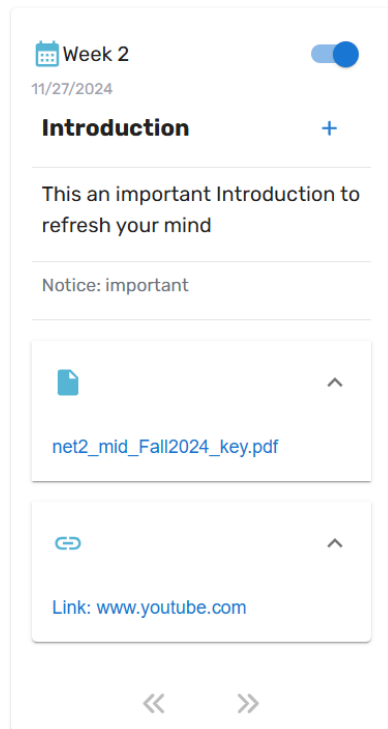


Figure 1.22: Week Card

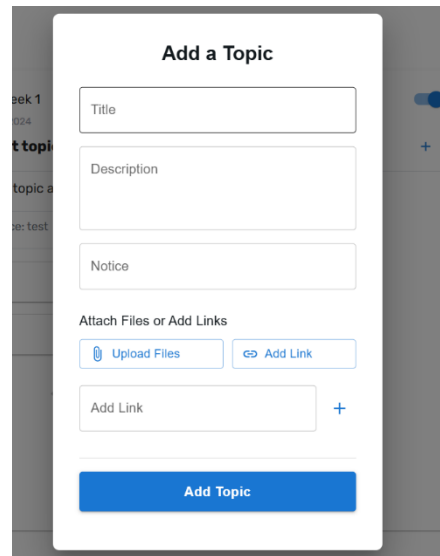


Figure 1.23: Add New Topic

Each week card shows the topic for this week with pagination to improve the Ui &

keep it organized.

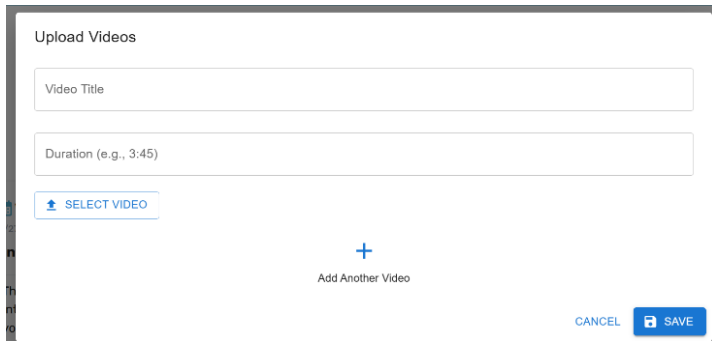


Figure 1.25: Add New Video

Upload Videos Some courses could contains videos so there is a button to upload video and upload one or more video for the course.



Figure 1.24: Upload Video Button

- **Course Assignments Page** Each course has its own assignments and instructor can add one or more assignment with all details, or edit exist assignment or cancel it.



Figure 1.26: Assignments Page


Add New Assignment


Assignment Title

Instructions:

Upload File (PDF, Doc):

[Choose file](#) No file chosen

Start date:  End date:

 Total points:


Assignment type:  Status

Figure 1.27: Add Assignment Page

- **Assignment Submissions Page** This page enable instructor to review students' submissions and set grade or add comments to students to keep track them.

Student Submissions

Avatar	Name	Submission	Grade	Comment	Actions
	Hiba Ali	DOWNLOAD	<input type="text" value="Grade"/>	<input type="text" value="Comment"/>	<input type="button" value="SAVE"/>

Figure 1.28: Assignment Submissions

- **Course Quizzes Page** Each course has its own quizzes, each quiz has several questions each question could has different type such as: MCQS, True/False, etc...

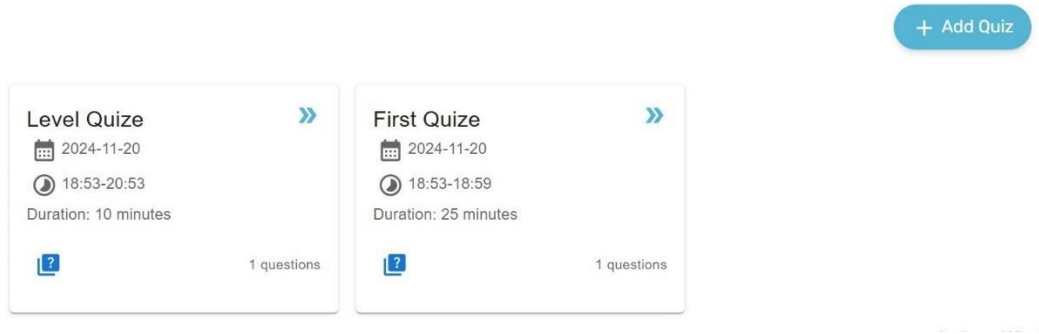


Figure 1.29: Quizzes Page

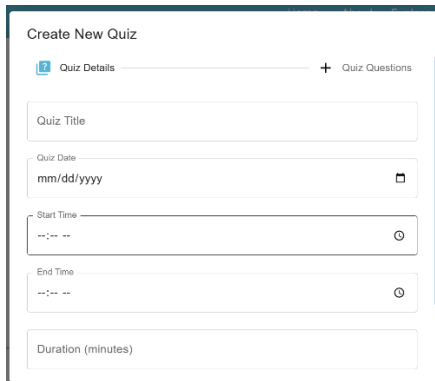


Figure 1.30: Add Quiz

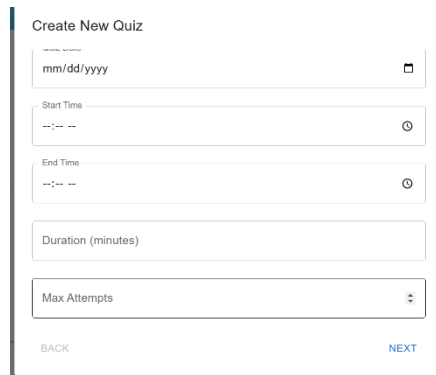


Figure 1.31: Add Quiz

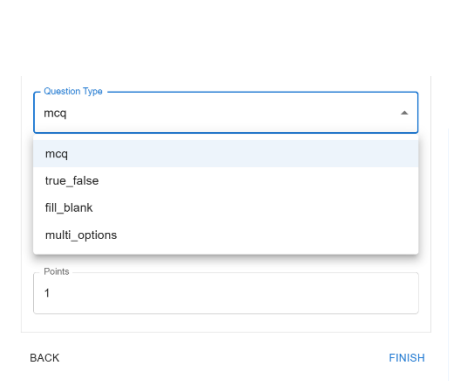


Figure 1.33: Add Quiz

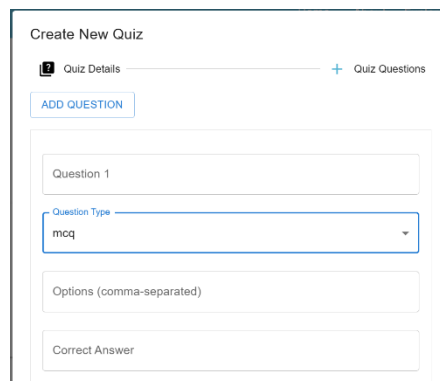


Figure 1.32: Add Quiz

Quiz Review And this component to enable instructor review the quiz and edit it

fields, showing questions and correct answers.

Level Quiz

Inside which HTML element do we put the JavaScript?

Options:

✗ <scripting>

✗ <js>

✔ <script>

✗ <javascript>

Correct Answer: "<script>"



Figure 1.34: Quiz Review

- **Meeting Page** This page for live meeting, so enable users to create or join meeting. help them meet, collaborate and watch courses.

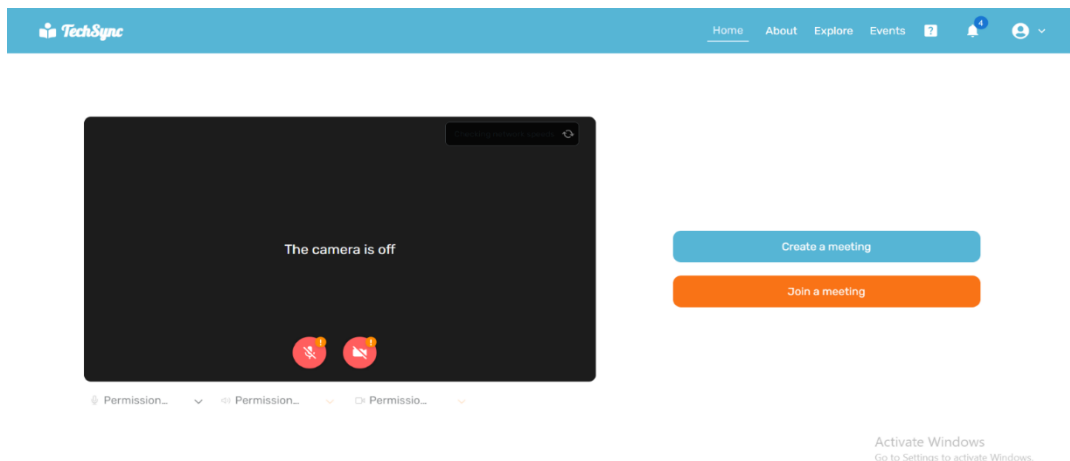


Figure 1.35: Meeting Page

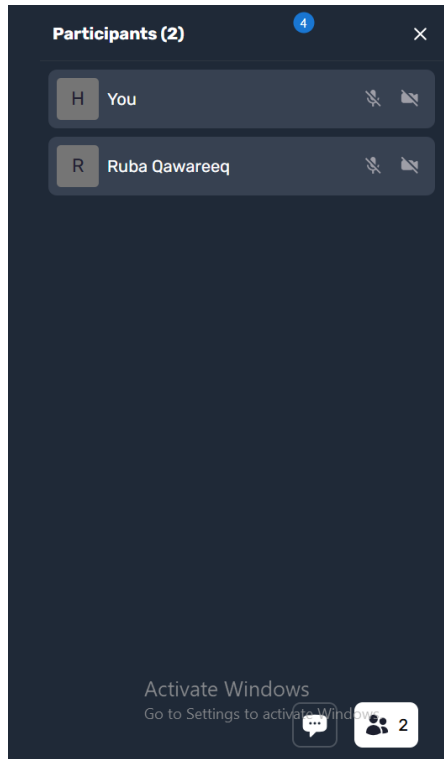


Figure 1.37: Meeting Participants

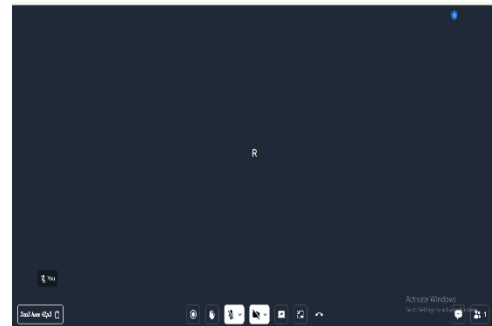


Figure 1.36: Meeting Page

Meeting contains all important features as, chat, share screen, record meeting, etc...

- **Whiteboard Page** This page provides a whiteboard or sketch tool, so user can design a sketch, explain ideas, draw shapes, and more.

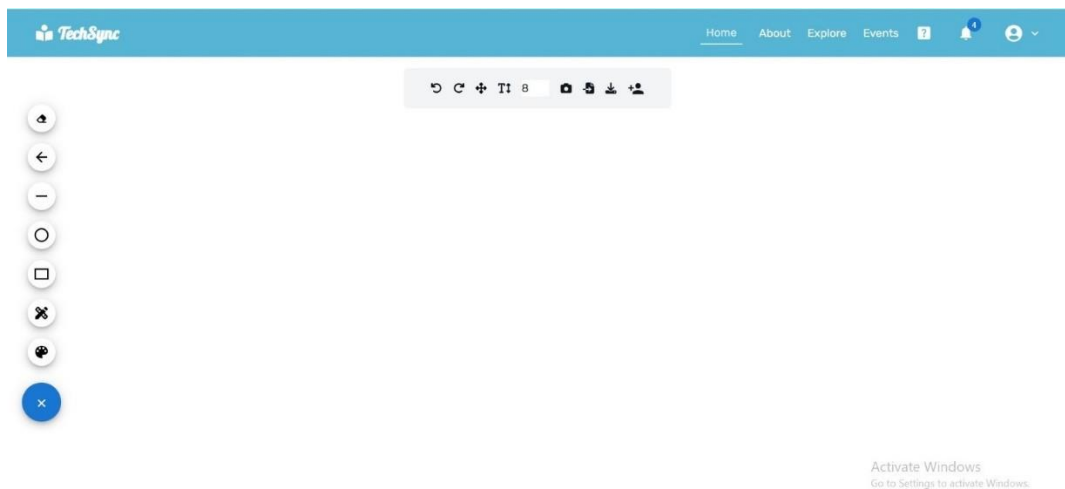


Figure 1.38: Whiteboard Page

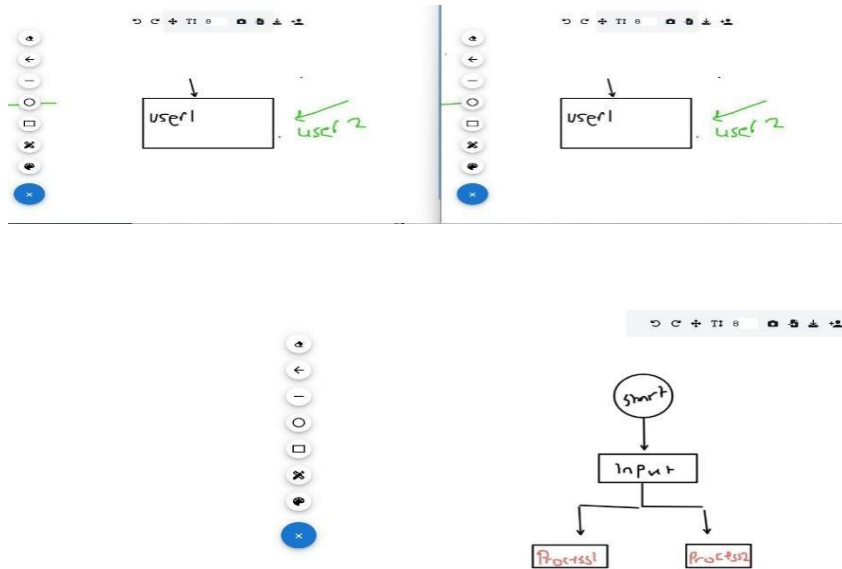


Figure 1.39: Whiteboard Page

This collaborative whiteboard enables real-time sharing, allowing multiple users to collaborate simultaneously. Users can exchange ideas, brainstorm, and contribute in real time, making it an ideal tool for teamwork and creative projects.

Code Editor

For compiler user create project each project contains number of files, to organize project and test code easily.

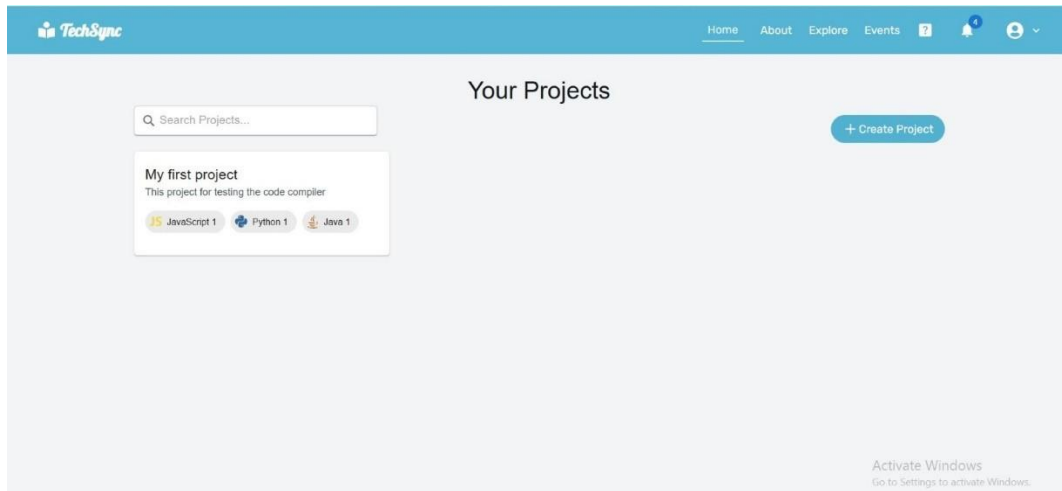


Figure 1.41: Code Projects Page

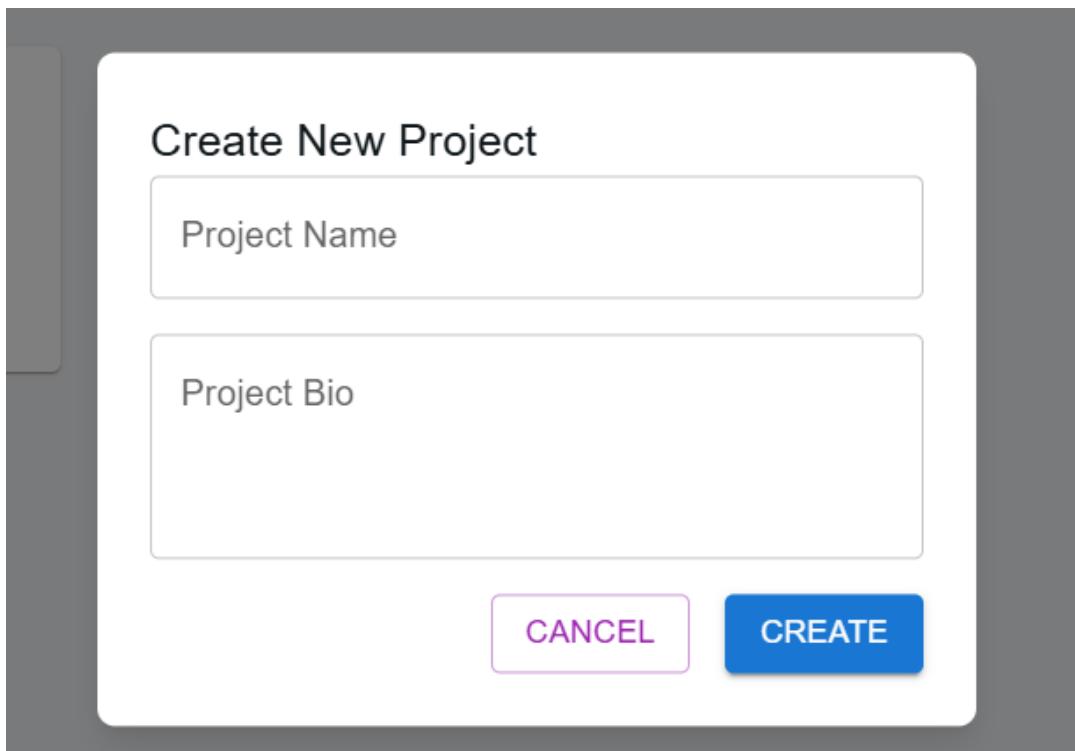


Figure 1.42: Add Project

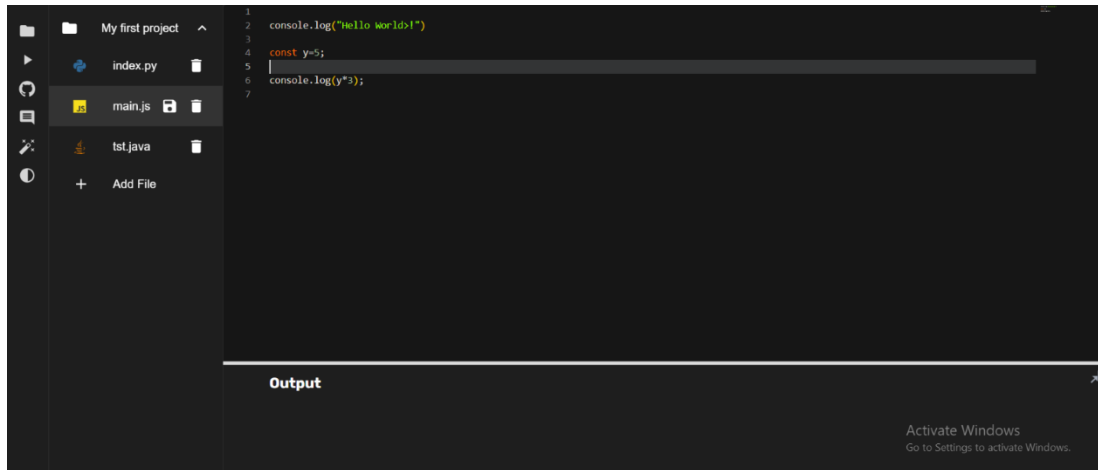


Figure 1.43: Code Editor Page

This page enable user add files, and test code, when click on run icon code sent to server to compile it, then return the output.

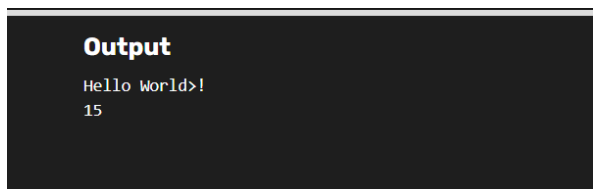


Figure 1.44: Code Output

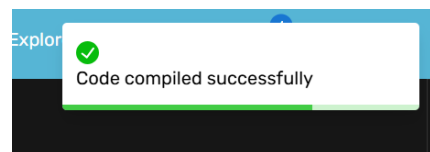


Figure 1.45: Compiled Success


- Code Comments For each line user can add comment related to this line to keep it organized and clear.

```
1 const y=5;
2
3
4 console.log(y*);
5
```

ADD COMMENT

Figure 1.46: Add Comment

Add Comment to Line 4

 **Ruba Qawareeq**

Write your comment here...



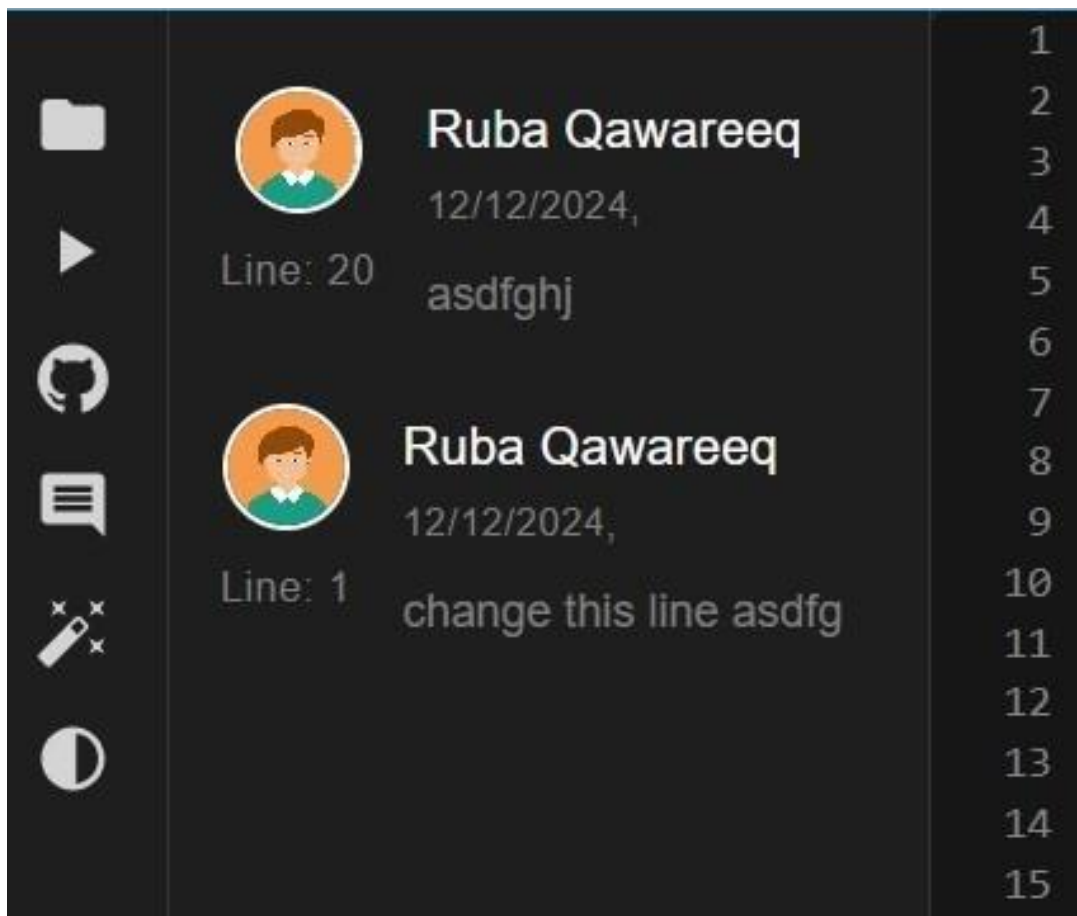

 MENTION  SEND

Figure 1.47: Add comment



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

 **Ruba Qawareeq**
12/12/2024,
Line: 20
asdfghj


 **Ruba Qawareeq**
12/12/2024,
Line: 1
change this line asdfg

Figure 1.48: Code Comments Page

GitHub Sharing

User able to save the code locally on the platform, and save it to GitHub. first time user should authenticate and logged using his GitHub account, then select repository, and files wants to

push them to GitHub repository.

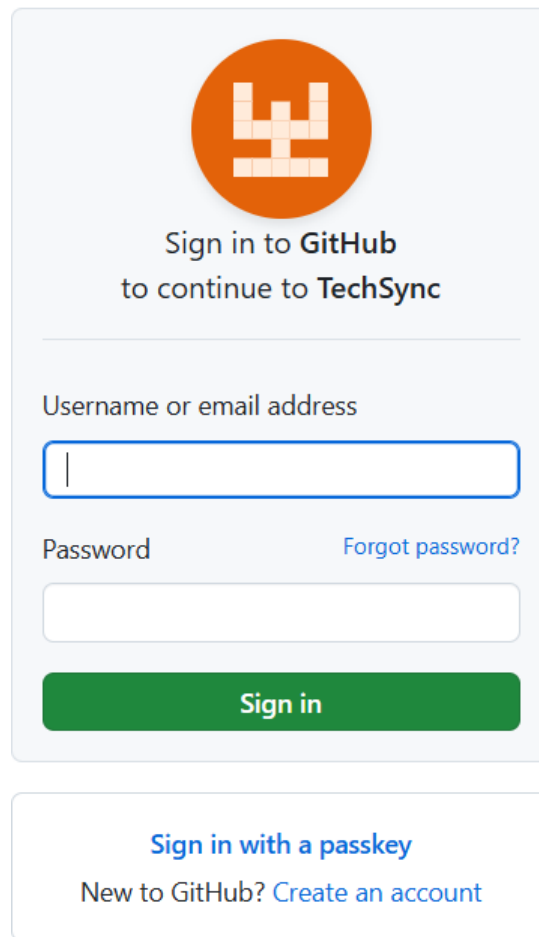
A screenshot of the GitHub authentication interface. At the top is the GitHub Octocat logo. Below it is a large orange circle containing a white grid pattern. The text "Sign in to GitHub to continue to TechSync" is centered below the circle. A horizontal line separates the header from the input fields. The first field is labeled "Username or email address" and contains a single vertical bar. The second field is labeled "Password" and is empty. To the right of the password field is a blue link "Forgot password?". Below the password field is a green "Sign in" button. At the bottom of the form is a rounded rectangle containing the text "Sign in with a passkey" in blue, and "New to GitHub? Create an account" in blue.

Figure 1.49: GitHub Authentication

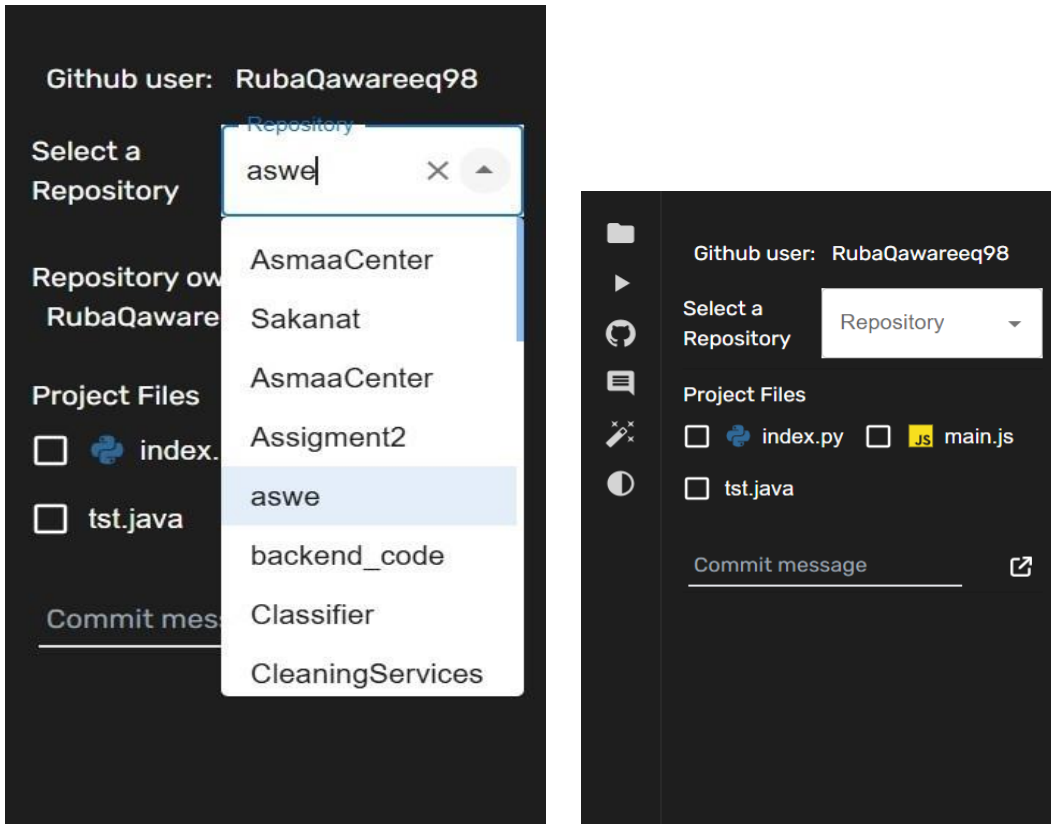


Figure 1.51: Push Code

Ask AI Page

This page aims to help user during developing code to ask ai for assessment or fix problems with code.

So, user enter his question and there is " Add Code" button, this button when clicked code on editor added to question content to ask help with this code.



Figure 1.52: Ask AI

Response:

Your code is functional, but it's not efficient due to the repeated lines. Here are some tips to improve it: 1. **Use a Loop**: Instead of repeating the `print` statement, you can use a loop to print "Hiii" multiple times. 2. **Function**: You could encapsulate the print statement within a function if you need to call it in different contexts. 3. **Parameterization**: If you want to customize the number of prints, you can parameterize your function. Here's an example incorporating these suggestions:

```
python def
print_message(message, times): for
_ in range(times): print(message)
print_message("Hiii", 4) ```
```

With this code: - If you want to change the message or the number of times it prints, you only need to change the function arguments. - The code is cleaner and easier to maintain.

Figure 1.54: Ask AI

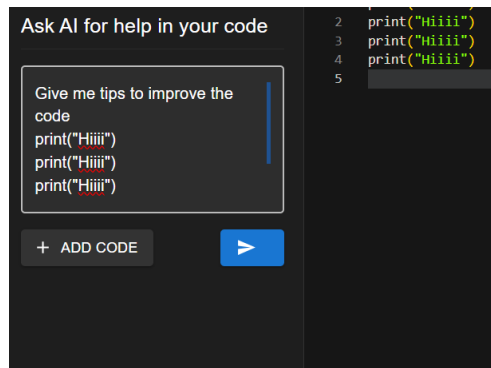


Figure 1.55: Ask AI

- **Notes & Calendar** Our application provides three distinct yet interconnected pages designed to enhance productivity and organization:
- **Notes Page:** A dedicated space for users to jot down important ideas, reminders, and information. With a user-friendly interface, the Notes page ensures that users can easily create, edit, and save notes. Whether it's a quick thought or detailed planning, this feature helps users stay organized and never lose track of critical details.

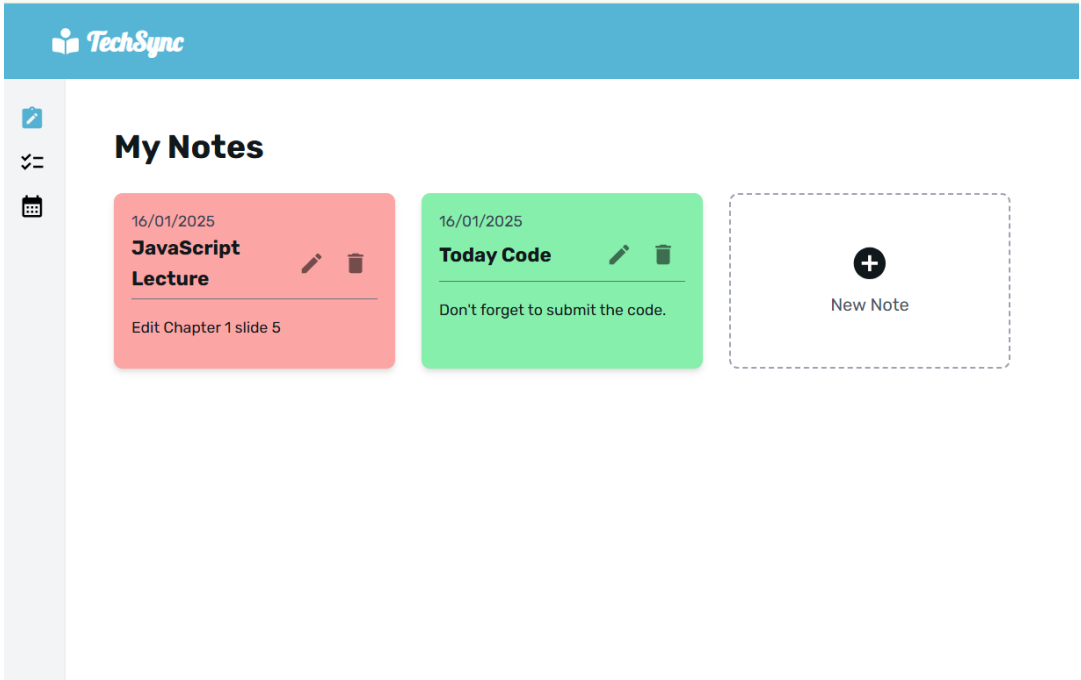


Figure 1.56: Notes Page

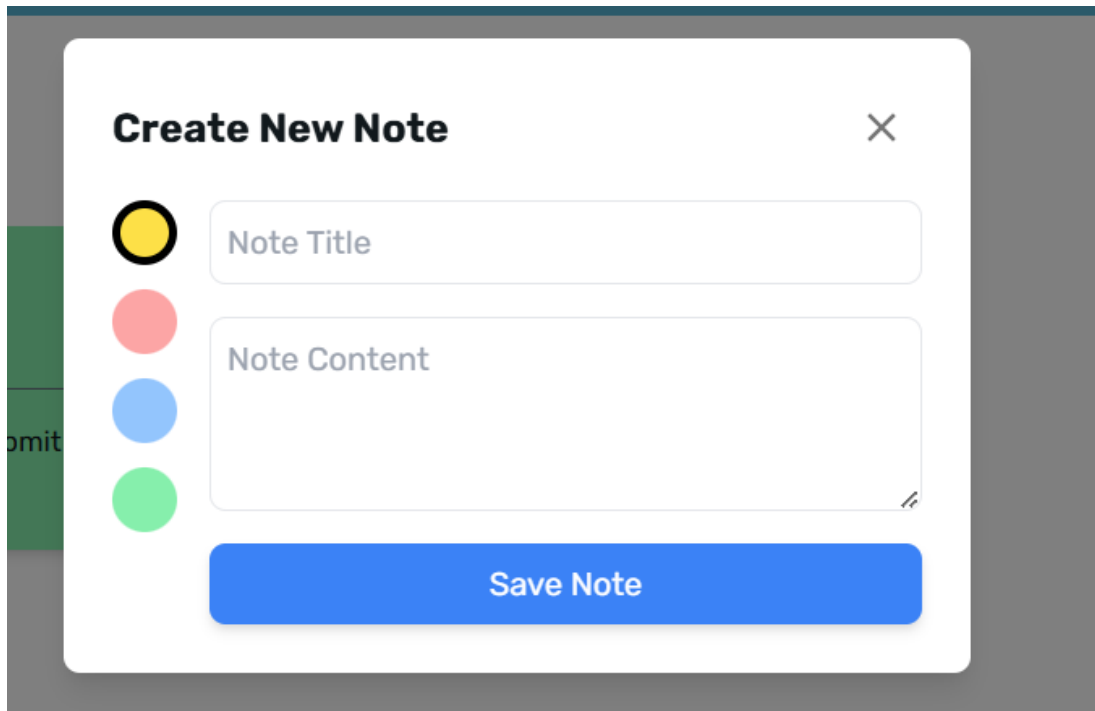


Figure 1.57: Notes Page

- **To-Do List Page:** A well-structured To-Do List helps users track their tasks efficiently, ensuring that no deadlines are missed. Users can add, prioritize, and check off tasks as they are completed. With daily reminders and a visually clear layout, this page empowers users to manage their day-to-day activities and long-term goals seamlessly.

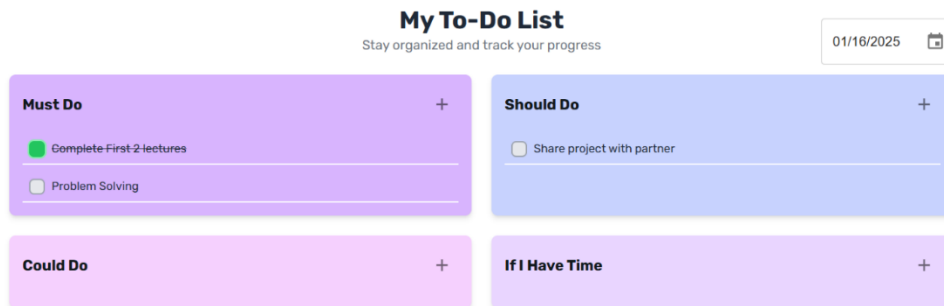


Figure 1.58: To-Do List Page

Calendar

The Calendar page gives insight to the user into his or her schedule comprehensively. All the key activities that range from courses, quizzes, assignments, and deadlines integrated into one timeline let the events be marked according to date and time for a view of what is around the corner. And there is lot of view options, even by month, day, or week.

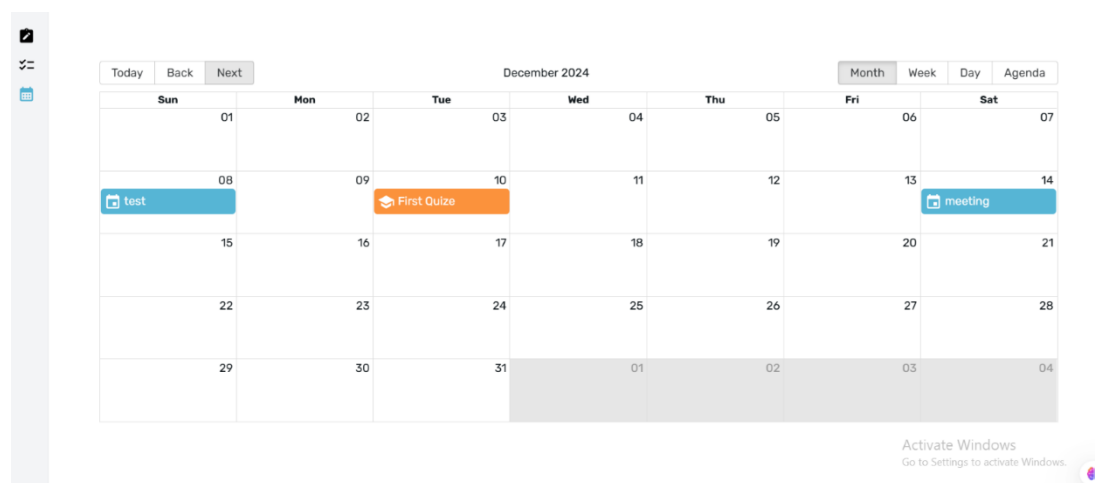
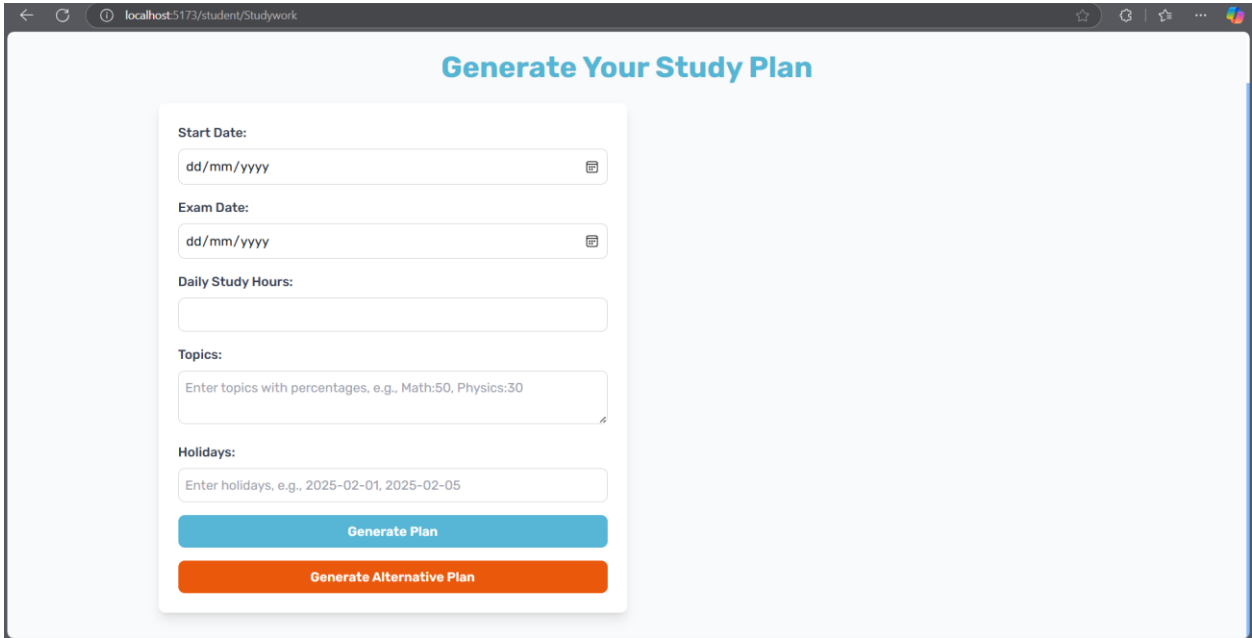


Figure 1.59: Calendar

Study Plan Page

We used AI to create a study plan based on the inputs entered by the user, in addition to the possibility of choosing the most appropriate plan by using more than one strategy.



The screenshot shows a web browser window with the URL `localhost:5173/student/Studywork`. The page title is "Generate Your Study Plan". The form contains the following fields and buttons:

- Start Date:** A date input field with the placeholder text "dd/mm/yyyy" and a calendar icon.
- Exam Date:** A date input field with the placeholder text "dd/mm/yyyy" and a calendar icon.
- Daily Study Hours:** A text input field.
- Topics:** A text input field with the placeholder text "Enter topics with percentages. e.g., Math:50, Physics:30".
- Holidays:** A text input field with the placeholder text "Enter holidays. e.g., 2025-02-01, 2025-02-05".
- Buttons:** Two buttons are located at the bottom of the form: a blue "Generate Plan" button and an orange "Generate Alternative Plan" button.

Figure 4.111: Study Plan website

Generate Your Study Plan

Start Date:
27/01/2025

Exam Date:
04/02/2025

Daily Study Hours:
5

Topics:
c++:30,java:40

Holidays:
2025-02-01, 2025-01-29

Generate Plan

Generate Alternative Plan

Study Plan:

Date	Subject	Study Time
2025-01-27	c++	1 hour(s) and 30 minute(s)
	java	2 hour(s)
2025-01-28	c++	1 hour(s) and 30 minute(s)
	java	2 hour(s)
2025-01-30	c++	1 hour(s) and 30 minute(s)
	java	2 hour(s)
2025-01-31	c++	1 hour(s) and 30 minute(s)
	java	2 hour(s)
2025-02-02	c++	1 hour(s) and 30 minute(s)
	java	2 hour(s)
2025-02-03	c++	1 hour(s) and 30 minute(s)
	java	2 hour(s)

Figure 4.112: Generate Alternative Plan

Generate Your Study Plan

Start Date:
27/01/2025

Exam Date:
04/02/2025

Daily Study Hours:
5

Topics:
c++:30,java:40

Holidays:
2025-02-01, 2025-01-29

Generate Plan

Generate Alternative Plan

Study Plan:

Date	Subject	Study Time
2025-01-27	c++	1 hour(s) and 27 minute(s)
	java	3 hour(s) and 33 minute(s)
2025-01-28	c++	1 hour(s) and 21 minute(s)
	java	3 hour(s) and 39 minute(s)
2025-01-30	c++	2 hour(s) and 20 minute(s)
	java	2 hour(s) and 40 minute(s)
2025-01-31	c++	37 minute(s)
	java	4 hour(s) and 23 minute(s)
2025-02-02	c++	56 minute(s)
	java	4 hour(s) and 4 minute(s)
2025-02-03	c++	42 minute(s)
	java	4 hour(s) and 18 minute(s)

Figure 4.113: Generate Alternative Plan2

Portfolio Page

every user can showcase their personal and professional journey through a well-organized Portfolio Page. This page is designed to highlight essential details and achievements, making it easier for others to understand the user's background and capabilities.

We've built this page with five key sections:

- **Personal Information:** Displays general details such as the user's name, profile picture, bio, and contact information, ensuring seamless communication.
- **Education:** Provides an overview of the user's academic background, including degrees, certifications, and specialized training.
- **Work Experience:** Highlights the user's professional history, including roles, responsibilities, and achievements across various jobs or projects.
- **Certificates and Achievements:** A dedicated space to showcase

certifications, awards, and notable accomplishments that demonstrate the user's expertise and commitment


To make the Portfolio Page more engaging, we've included options for users such as: Add social media links (LinkedIn, GitHub, etc.) for better networking.

Upload multimedia content, such as images, to visually represent their work.
Customize the layout and design for a personalized touch.


TechSync

Home About Explore Events ? 4

h@gmail.com
0597616033




Hiba Ali
Engineer
An Najah National University | Nablus




My Work

Take a look at my latest work.

Add Work


Portfolio Website
Personal description


test
asdfgh

My Certifications

Add Certification

Full Stack development - Academy

My Education

Add Education

Bachelor's in Computer Engineering
An Najah National University | 2025-05

About Me

Edit About



 I am a passionate frontend developer with expertise in building modern web applications. I love solving problems and collaborating with teams to deliver outstanding user experiences.sdf

Figure 1.60: Portfolio Page

Choose File No file chosen




Current Role

Company/School

Location

Phone

 LinkedIn


 GitHub

Figure 1.61: Portfolio

Add New Project

Upload Thumbnail

Figure 1.61: Portfolio

Add Education

Figure 1.63: Portfolio

Add Certification

Figure 1.64: Portfolio

This page not only helps users present their profiles professionally, but also serves as a platform to network and showcase your skills to potential collaborators, other students, or employers.

For student role, can access above features as courses, whiteboard, code editor, in addition to these pages:

- **Bugs & Issues Page** In this page students share problems with codes or other technical problems and seek the help of others.

TechSync Home About Explore Events

Questions Tags My Questions

Interesting Posts for You

Search Questions [+ ASK A QUESTION](#)

How I fix the sdk path?
 Posted by Israa Mohammad on 30/11/2024
 I try to add path of sdk to the enviornment variables but it not working at all
 sdk java
 5 Votes 3 Answers

Test question
 Posted by Hiba Ali on 06/12/2024
 I have problem with my code
 java
 0 Votes 0 Answers

Activate Wi-Fi [Go to Settings](#)

Figure 1.65: Bugs & Issues

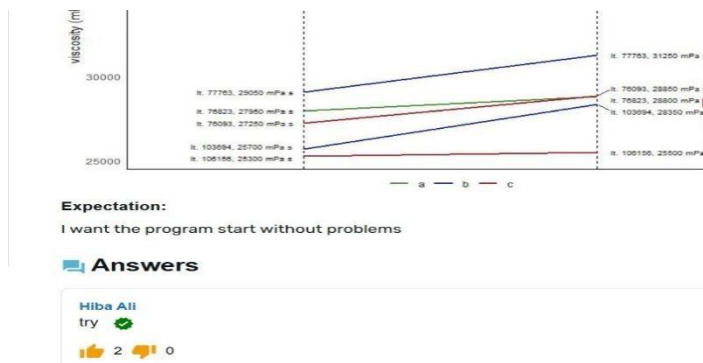


Figure 1.66: Bugs & Issues

- **Practical Training Page** In this page students help each other's by sharing them inter- views questions to help them prepare for it.

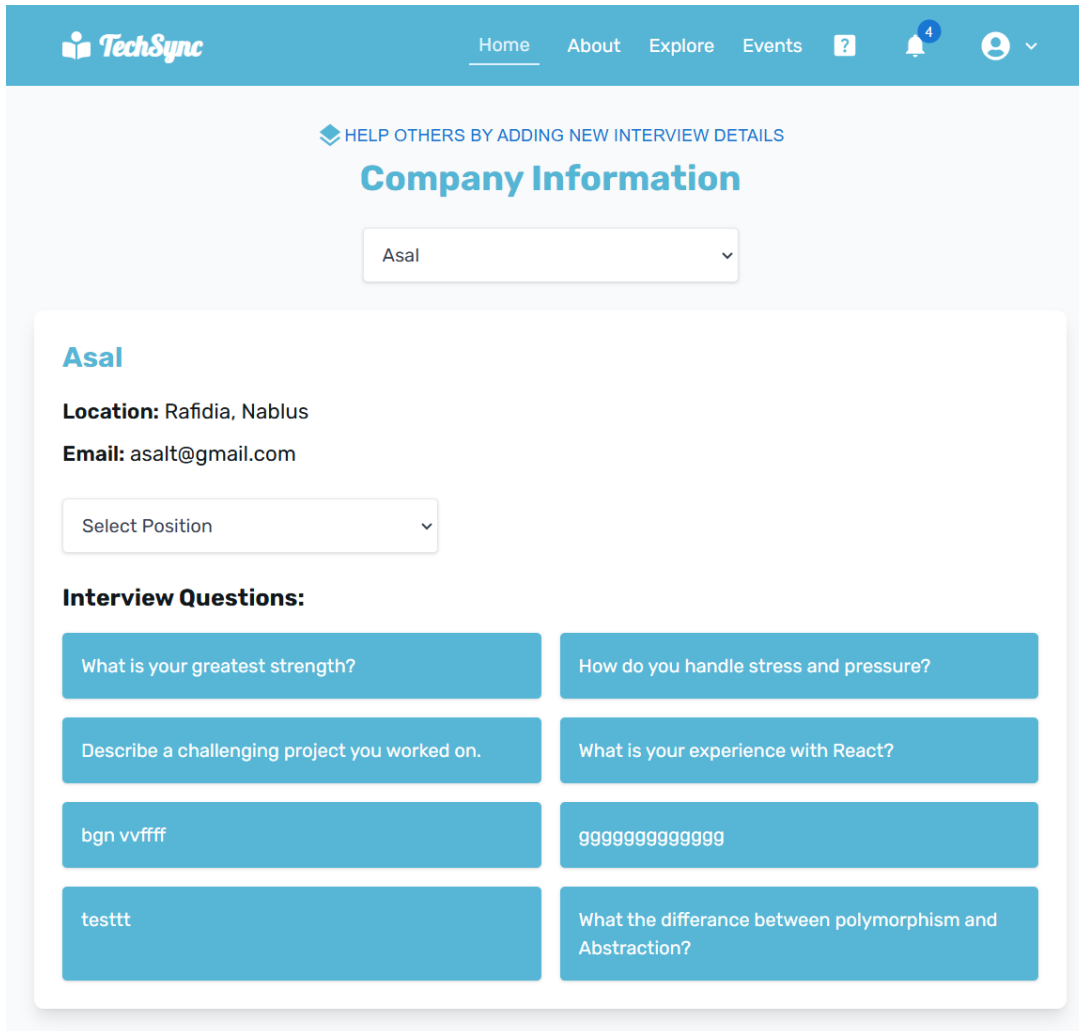


Figure 1.67: Practical Training Page

- **Tasks Manager Page** This page is to help students collaborate on projects. so, student creates new project or works on shared project, for each project student adds number of tasks assign tasks to members, with real-time notifications.

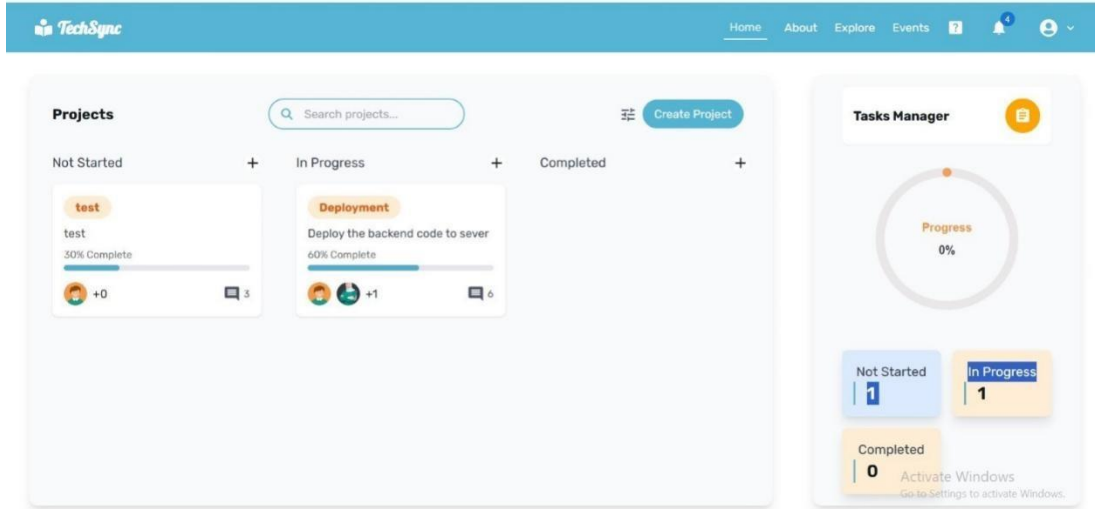


Figure 1.68: Tasks Manager Page

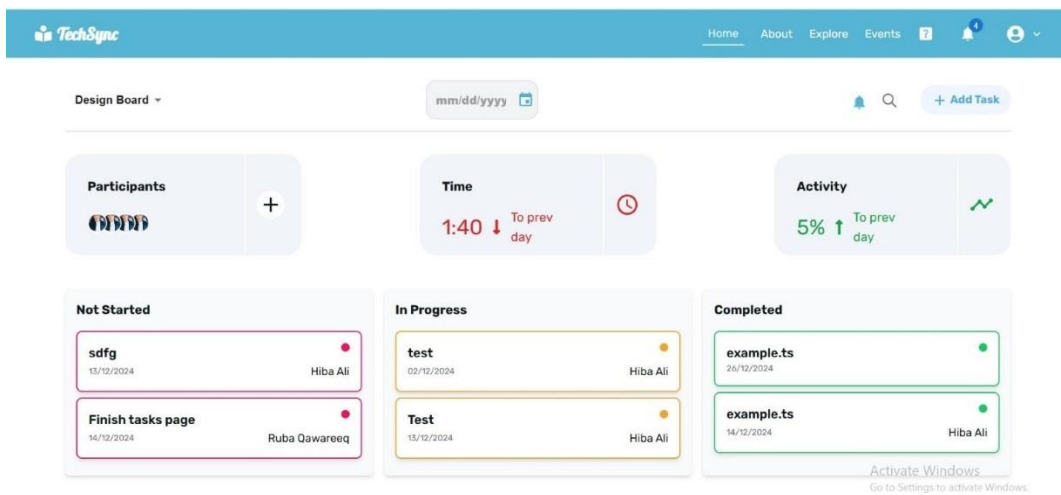


Figure 1.69: Tasks Manager Page

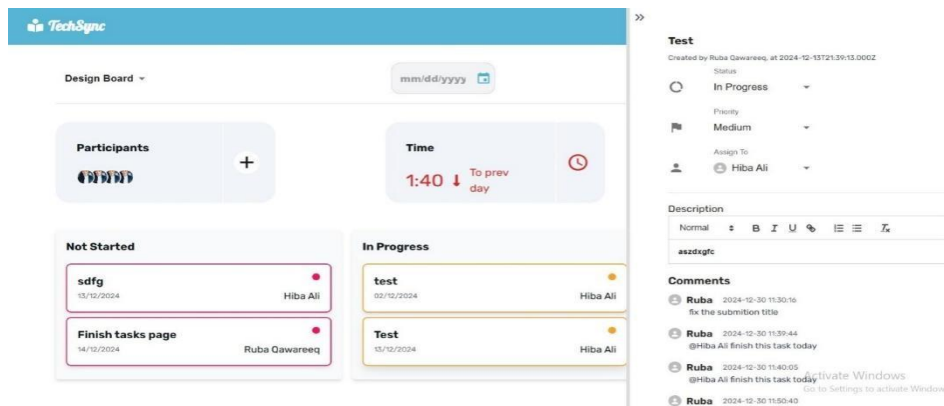


Figure 1.70: Task Details

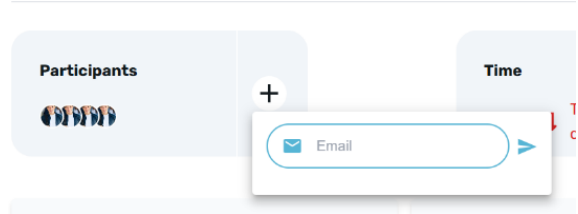


Figure 1.71: Add member

Report Problems:

To improve the platform and resolve issues could face users, this page enable users to report a problem he faces and this will be sent to admin to review it.

Report a Problem

Name:

Email:

Problem:

Problem Description:

Figure 1.72: Practical Training Page

Events Page:

This page help students find latest events around and participate on it, helping them to discover upcoming events.

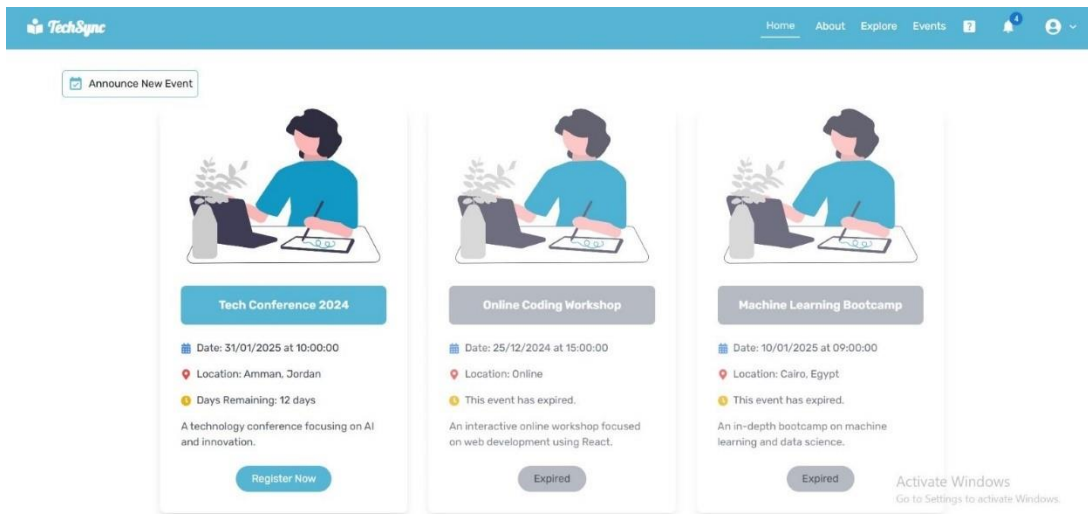


Figure 1.73: Events Page

Admin Dashboard For the admin, this dashboard to help him manage the website features and show the added courses, students, and other events, and show analysis of each.

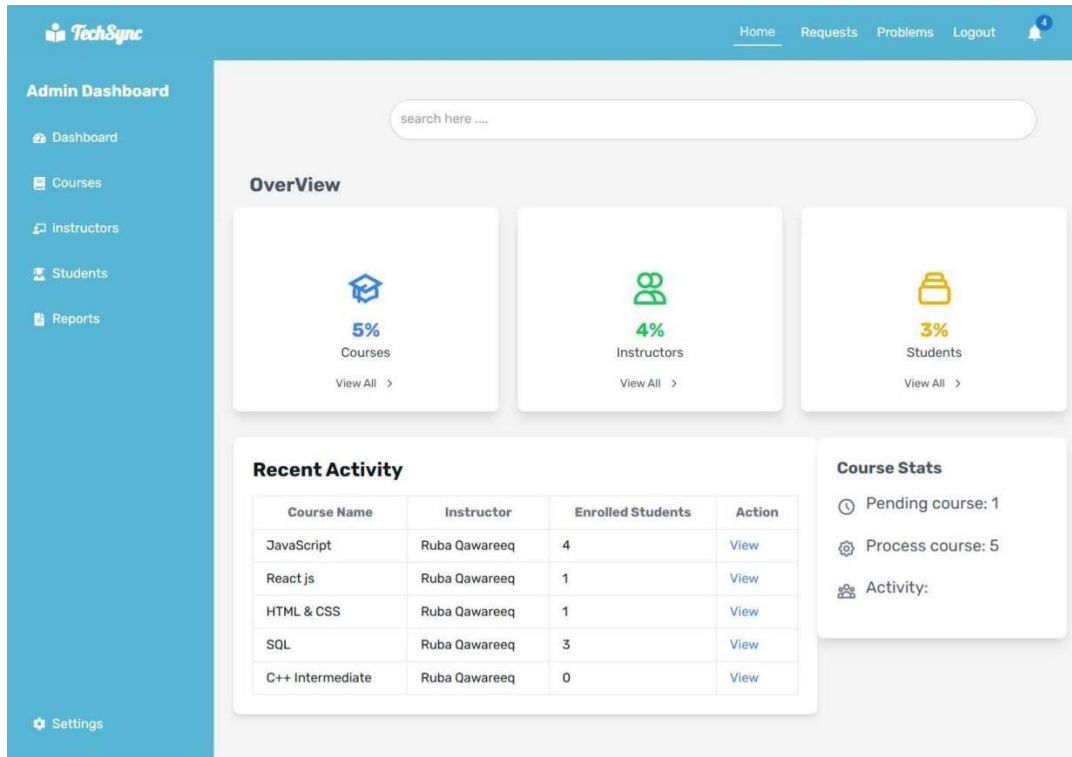


Figure 1.74: Admin Dashboard

Chat Page: This page shows communication and conversation with others and the exchange of files, audio recordings and messages.

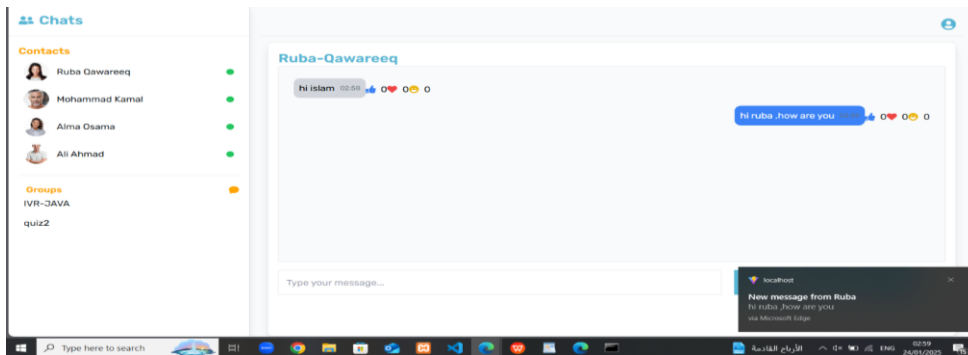


Figure 1.75: Chat Page

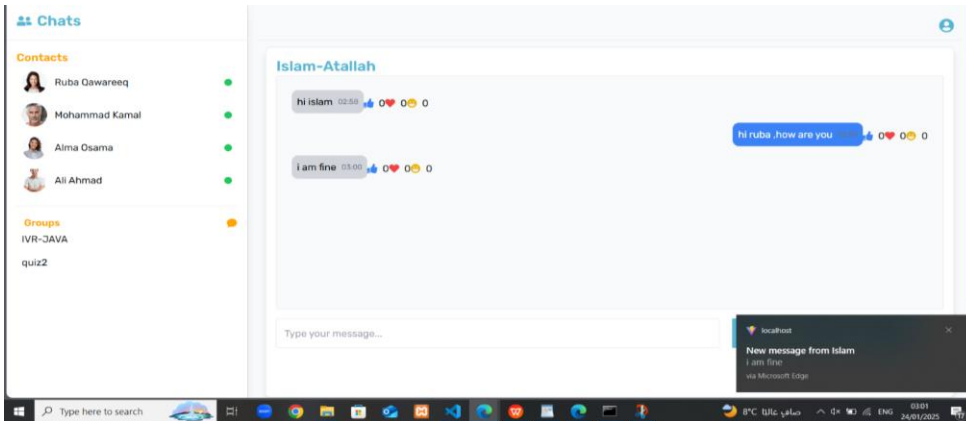


Figure 1.76: Chat2 Page

And also, appears notification when received message.

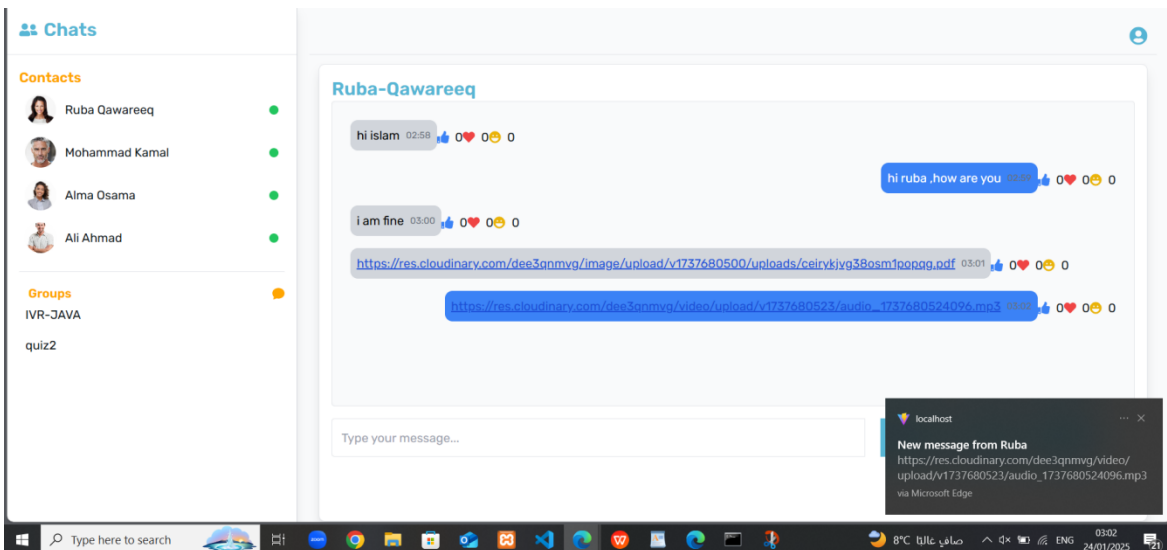


Figure 1.77: File & Voice Message

These picture show when you want to add member of show member of group chat

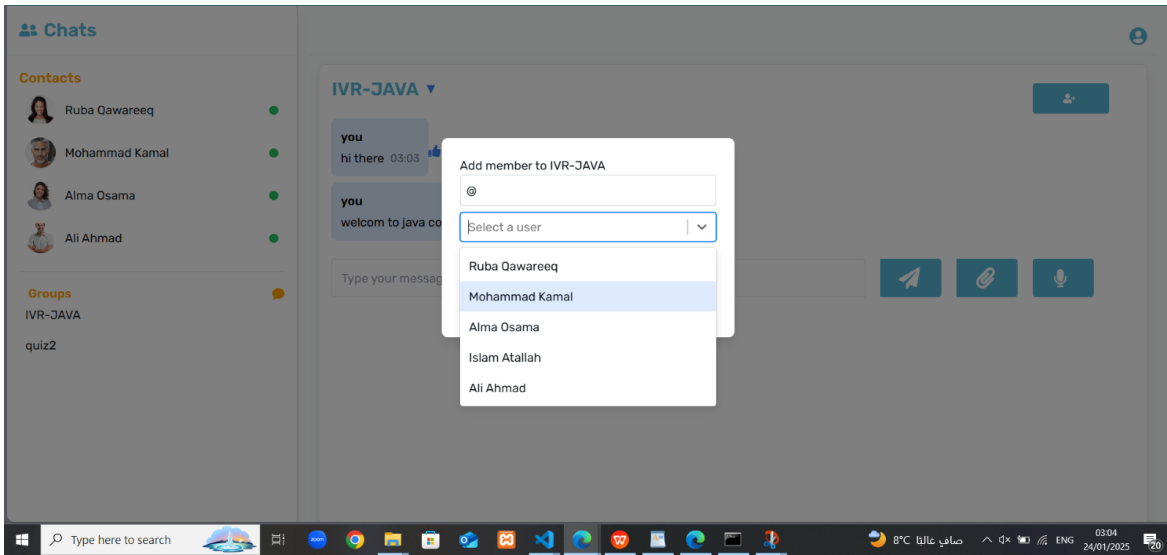


Figure 1.78: Add Member to Group

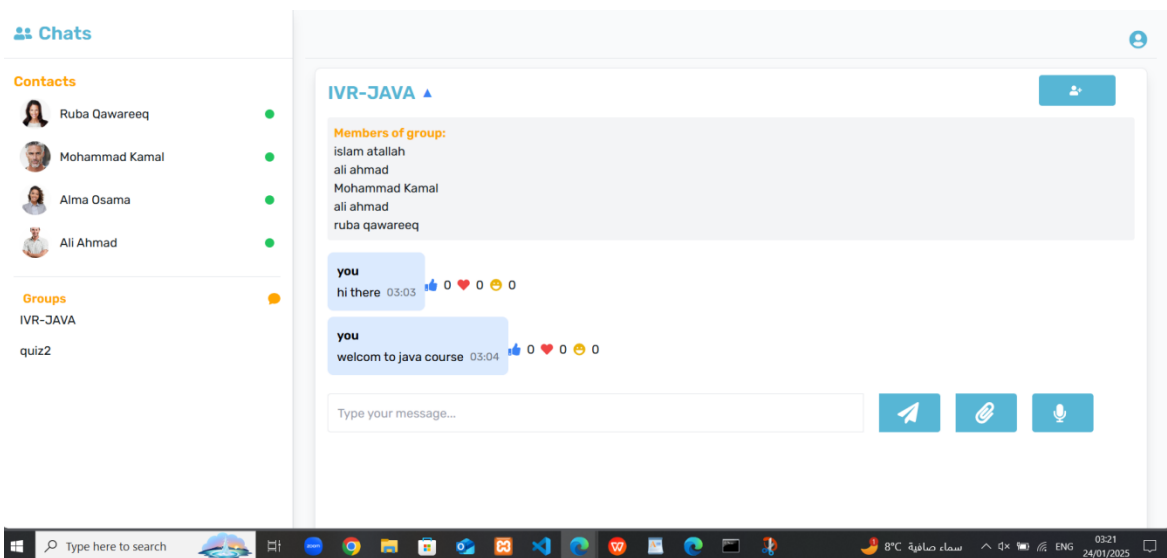


Figure 1.79: Show Member

And this picture show notification received in my personal laptop

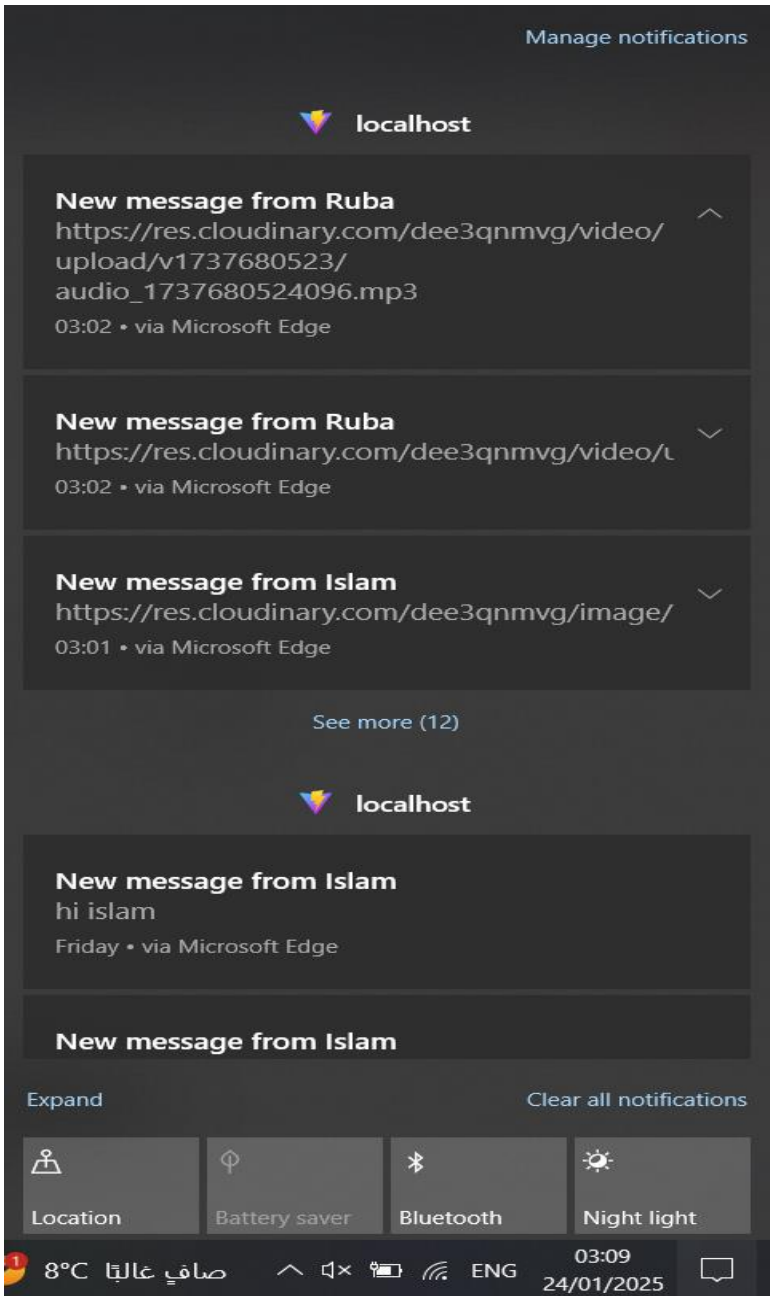


Figure 1.80: Notification

Chapter 5 Results & Discussion

5.1 Results

In this section, we present the results of our graduation project, "TechSync". The TechSync platform offers a seamless experience across mobile and web platforms, ensuring users can access all features regardless of the device. Key functionalities include:

Authentication: Secure sign-up, login, and password recovery. **Material Management:** Teachers can upload, edit, and manage educational materials, including lecture notes, assignments, exams, and project files.

Interactive Features: Quizzes, Assignments and Projects: Students can participate in quizzes, assignments, her projects. While teachers can create any or all of these to engage students interactively.

Discussion Forum: A space for collaborative learning where users can ask questions, share knowledge, and hold academic discussions between students and instructors by deploy posts or create polls.

Real-Time Chat: A chat system with individual, group, and file-sharing capabilities to facilitate communication.

Stack Sync: Collaborative Problem-Solving Space One of the standout features of TechSync is its StackSync, a collaborative problem-solving space inspired by platforms like Stack Overflow.

This feature is designed to provide students and teachers with a centralized hub for sharing knowledge, solving programming issues, and collaborating effectively on academic and project related challenges.

5.2 Discussion

At the end we are managed to build a cross-platform application that helps programmers to improve their skills and reach an important tool they need.

And we are success to build the website using react js and mobile application using react native. So, it was challenging to working on two separate projects and learning multiple technologies

Chapter 6 Conclusion

The TechSync project is an innovative step towards improving the educational process, along with improving the interaction between students and teachers. TechSync enhances the learning experience and provides an integrated educational environment, having a comprehensive platform that combines all educational elements: submitting assignments, exams, projects, and various educational resources.

Adding features such as the compiler and platform like stack overflow to solve software and technical problems, and many other tools contribute to developing students' skills in programming and technique effectively and practically. It also highly contributes to the communication between all entities of the educational process, which places it as a basic tool that enhances the quality of education and guarantees the achievement of academic success.

TechSync is an advance level learning platform satisfying all the requisites of a new digital epoch that can comprehensively support teachers and students within this journey towards better education.

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