Timetably

Final report

COMP1020 - Term Project

Theme: Digital Scheduling

Team name: Alibu
Nguyen Tiet Nguyen Khoi - V202000277
Nguyen Dai Nghia - V202000124
Le Hoang Vinh - V202000144

Table of content

I. Project Description

A mobile application provides an easy-to-use interface to schedule a meeting for the team.

User can:

- Schedule and share meeting for team members
- Preview meeting:
  - Home page: upcoming meetings
  - Calendar page: all meetings
- Join meetings from other platforms

II. Team description

A. Team introduction

1. Nguyen Tiet Nguyen Khoi - V202000277 - Team Leader
   a. Bio: major in Computer Science at VinUniversity
   b. Programming experience: some experience in Python, Java, HTML.
2. Nguyen Dai Nghia - V202000124
   a. Bio: major in Computer Science at VinUniversity
   b. Programming experience: some experience in C, Python, and Java.
3. Le Hoang Vinh - V202000144
   a. Bio: major in Computer Science at VinUniversity
   b. Programming experience: some experience in Python, Java, JavaScript.

B. Task division

This task division is for reference, the actual work could be overlapped and members could also support others in developing one's part.

1. Nguyen Tiet Nguyen Khoi:
    a. Develop log in/signup features
    b. Handle communicating with Firebase
        i. Push event
        ii. Pull event
    c. Develop account page
2. Nguyen Dai Nghia:
    a. Implement calendar view
    b. Develop home page (meeting cards)
    c. Merge and manage team code
    d. Refactor and reorganize team's codebase
3. Le Hoang Vinh
    a. Implement creating new event feature and validate user input
    b. Test application with use cases
    c. Troubleshoot and fix problems with use cases
    d. Write report

III. Problem resolution

A. Problem definition

Meeting scheduling is one of the major task interference within the academic environment specifically. Due to the difference in class schedules and response speed, the time taken to arrange a meeting is enormous and causes much latency for the workflow. Therefore, it is necessary to come up with a method to facilitate this process.

B. Idea

A mobile application

- To provide users with a user-friendly, convenient, and sustainable platform to schedule meetings.
- To provide a centralized hub for meeting schedules from multiple platforms.

C. Target users

VinUni students, staff, and faculties who need an easier and more convenient way to schedule a meeting.

IV. Project development

A. Functional Specification

Features:

- Calendar view: Allows users to view the year calendar in months.
- Create account feature (Login/Sign Up): Allow users to create accounts and personalized settings.
- Scheduling table: Allow users to manually select their available time and display the commonly available time for every member.
- Meeting hub: Provide a centralized hub for gathering meeting information from multiple online platforms such as Zoom, Microsoft Teams, Google Meet, etc. Meeting type (online or offline) and meeting links will be specified/manually inputted by users.
- Automatic reminder: Remind the user of the meeting information.

Development platform:

- Mobile application programming language: Java using Android Studio for native application development.
- Application database: Firebase to optimize the syncing between devices. Firebase will save information about the users' available time and the meetings' detailed information.

B. Project Timelines

Phase	Name	Description	Start Date	End Date	Progress
1	Planning	Define problem Brainstorm for ideas	March 21st	March 26th	Done

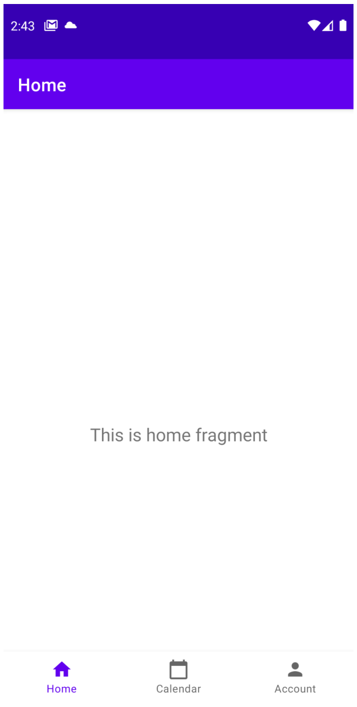
		Writing proposal			
2	Define requirements	Identify core functions Elaborate specific details	March 26th	March 27th	**Done**
3	Design and prototyping	Design wireframe Implement UI	March 27th	April 15th	**Done**
4	Implementation	Develop backend Integrate components	April 15th	May 14th	**Done**
5	Testing	UI test Logic test Functional test	May 14th	May 17th	**Done**
6	User evaluation	Taking feedback from users	May 17th	May 20th	**Done**
7	Report	Perform changes based on feedback and prototype’s performance Summarize the project Write report Make presentation	May 20th	May 23rd	**Done**

C. Interim Progress

Features implemented:

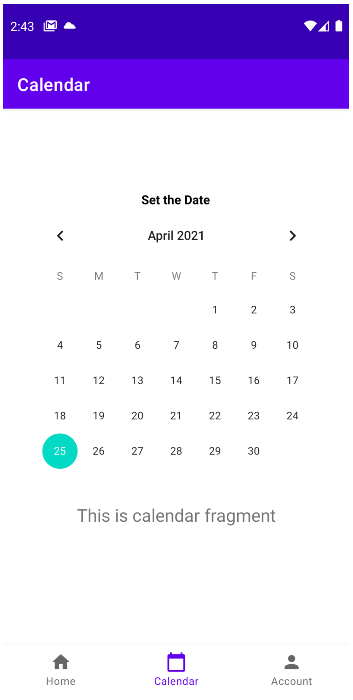
- Basic UI:

Home screen



This is home fragment

Calendar screen



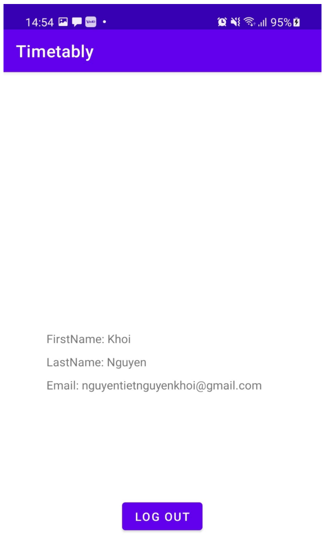
Set the Date

April 2021

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

This is calendar fragment

Account screen



FirstName: Khoi

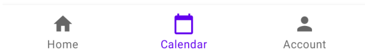
LastName: Nguyen

Email: nguyentietnguyenkhoi@gmail.com

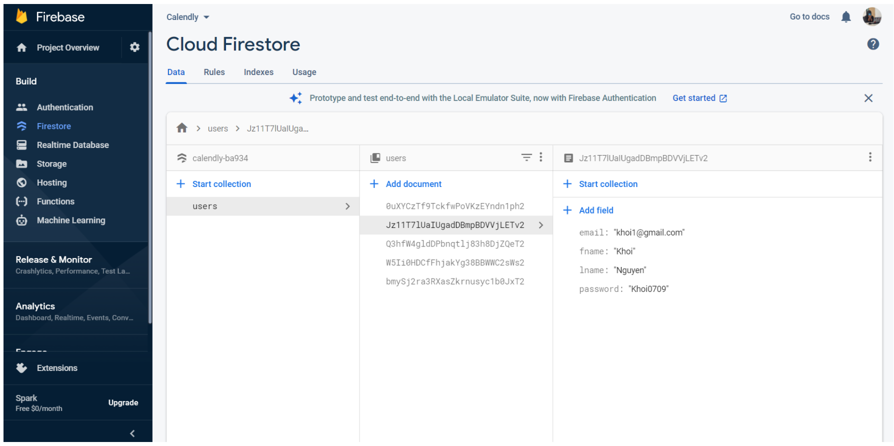
Navigation

3 main tabs

- Home (meeting hub)
- Calendar (create events and meeting time selection)
- Account (user information)



- Login/Sign up using Firebase
  - Firebase database:



Cloud Firestore

Prototype and test end-to-end with the Local Emulator Suite, now with Firebase Authentication

users > Jz11T7lUalUga...

calendly-ba934

users

```
users
```

users

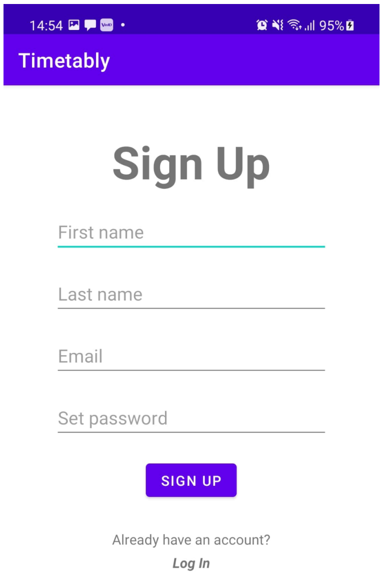
```
0uXYCzTf9TckfwPoVKzEYndn1ph2
Jz11T7lUaIUgadDBmpBDVVjLETv2
Q3hfW4gldDPbnqtlj83h8DjZQeT2
W5Ii0HDCfFhjakYg38BBWWC2sWs2
bmySj2ra3RXasZkrnusyc1b0JxT2
```

Jz11T7lUalUgadDBmpBDVVjLETv2

```
email: "khoi1@gmail.com"
fname: "Khoi"
lname: "Nguyen"
password: "Khoi0709"
```

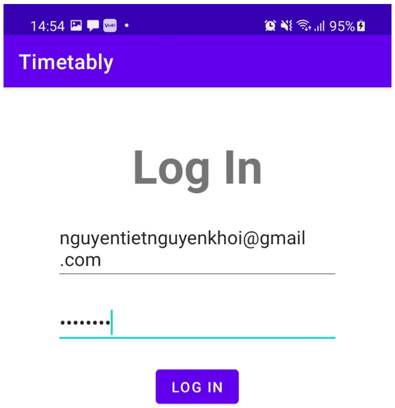
- Sign Up/Login screen:

Sign up screen



Already have an account?

Login screen



nguyentietnguyenkhoi@gmail.com

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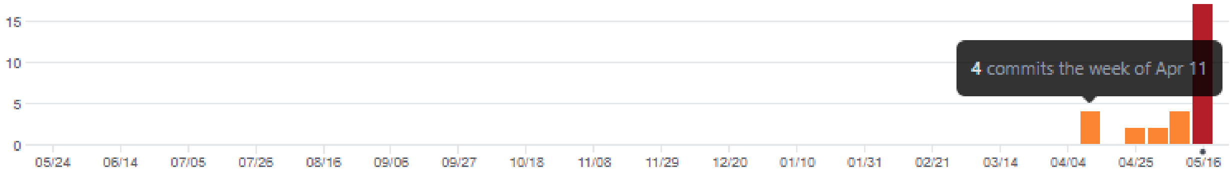
V. Final product

A. Project's Github

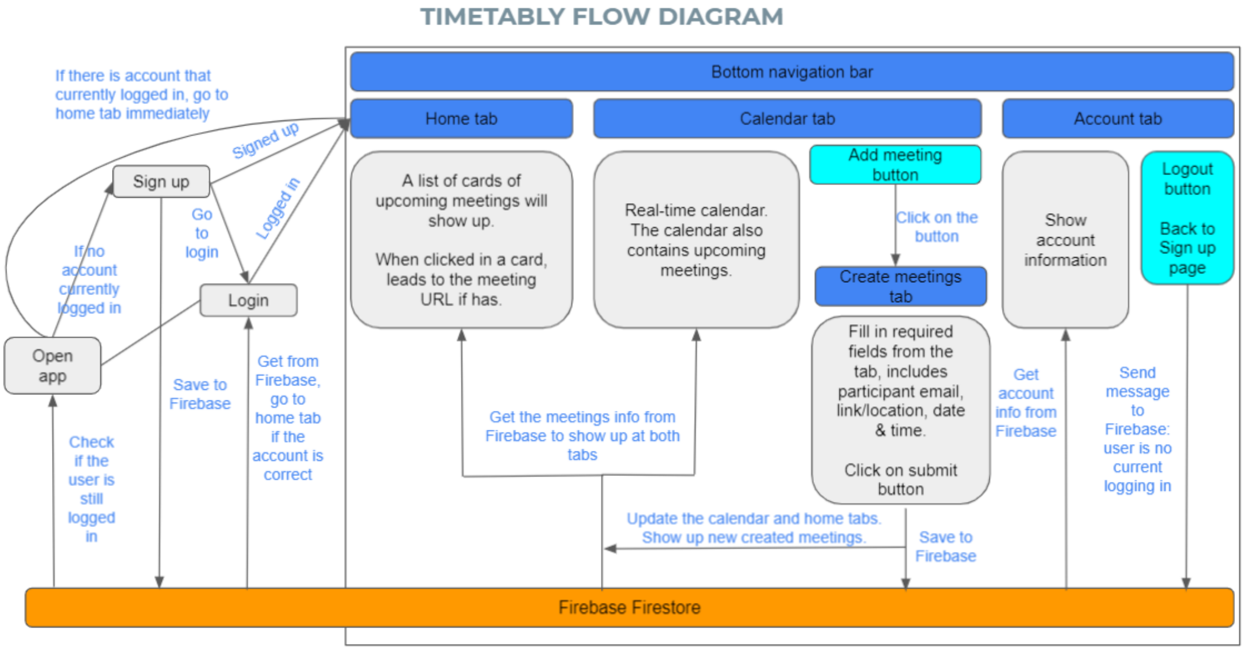
Github Link: https://github.com/nghia-nd/comp1020-term-project
Statistics (from Github):

> Excluding merges, 3 authors have pushed 20 commits to main and 21 commits to all branches. On main, 86 files have changed and there have been 1,838 additions and 884 deletions.



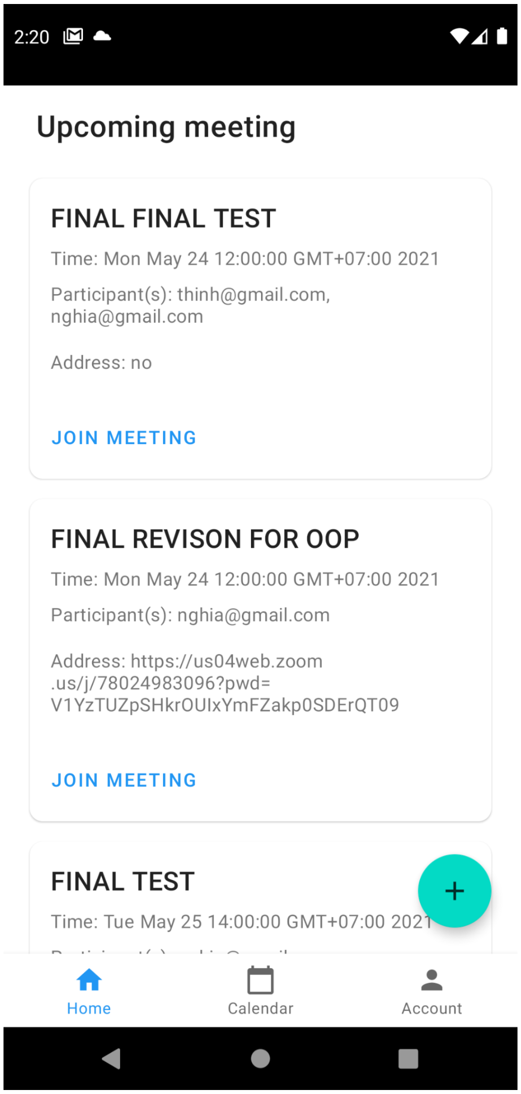
This project was actively developed since the start of April 2021.

B. Timetably's activity diagram


TIMETABLY FLOW DIAGRAM
If there is account that currently logged in, go to home tab immediately
Signed up
Sign up
Go to login
Logged in
If no account currently logged in
Login
Open app
Save to Firebase
Get from Firebase, go to home tab if the account is correct
Check if the user is still logged in
Bottom navigation bar
Home tab
Calendar tab
Account tab
A list of cards of upcoming meetings will show up.
When clicked in a card, leads to the meeting URL if has.
Real-time calendar. The calendar also contains upcoming meetings.
Add meeting button
Click on the button
Create meetings tab
Fill in required fields from the tab, includes participant email, link/location, date & time.
Click on submit button
Show account information
Logout button
Back to Sign up page
Get the meetings info from Firebase to show up at both tabs
Update the calendar and home tabs. Show up new created meetings.
Save to Firebase
Get account info from Firebase
Send message to Firebase: user is no current logging in
Firebase Firestore

C. User interface

Home screen



Upcoming meeting

FINAL FINAL TEST

Time: Mon May 24 12:00:00 GMT+07:00 2021

Participant(s): thinh@gmail.com, nghia@gmail.com

Address: no

JOIN MEETING

FINAL REVISON FOR OOP

Time: Mon May 24 12:00:00 GMT+07:00 2021

Participant(s): nghia@gmail.com

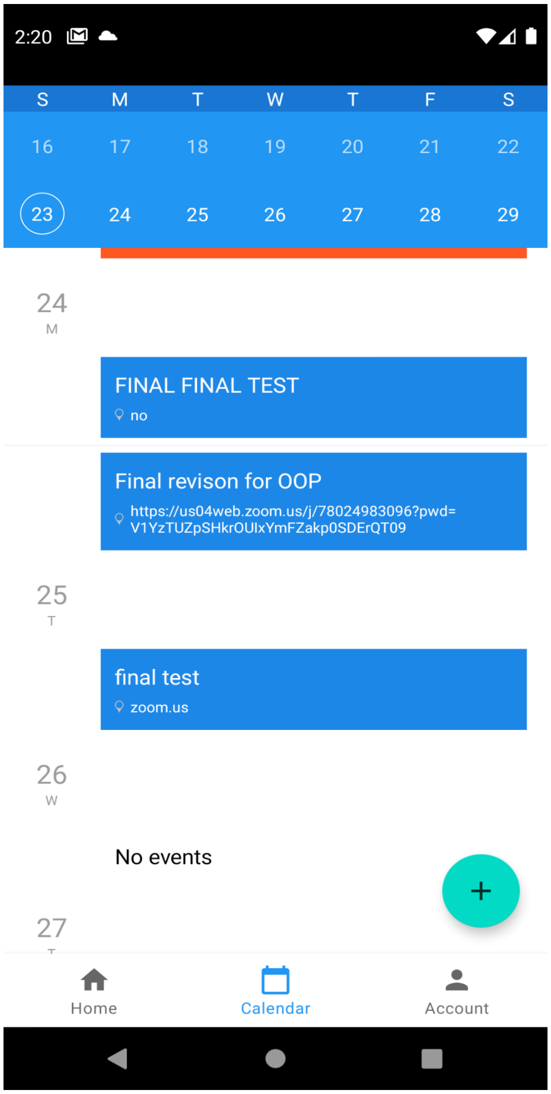
Address: https://us04web.zoom.us/j/78024983096?pwd=V1YzTUZpSHkrOUlxYmFZakp0SDErQT09

JOIN MEETING

FINAL TEST

Time: Tue May 25 14:00:00 GMT+07:00 2021

Calendar screen



S	M	T	W	T	F	S
16	17	18	19	20	21	22
23	24	25	26	27	28	29

24
M

FINAL FINAL TEST
no

Final revison for OOP
https://us04web.zoom.us/j/78024983096?pwd=V1YzTUZpSHkrOUlxYmFZakp0SDErQT09

25
T

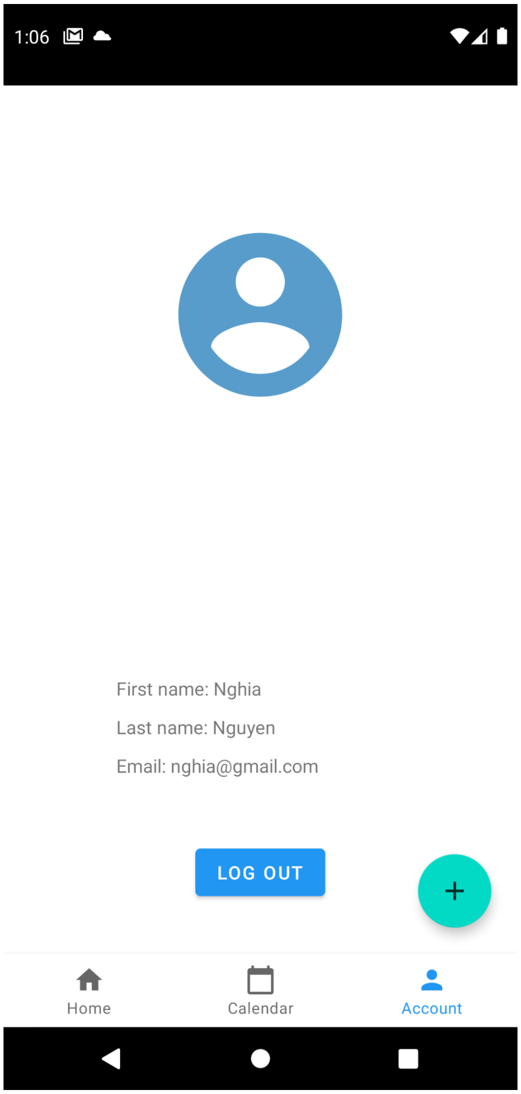
final test
zoom.us

26
W

No events

27

Account screen



First name: Nghia

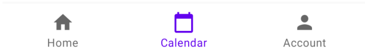
Last name: Nguyen

Email: nghia@gmail.com

Navigation

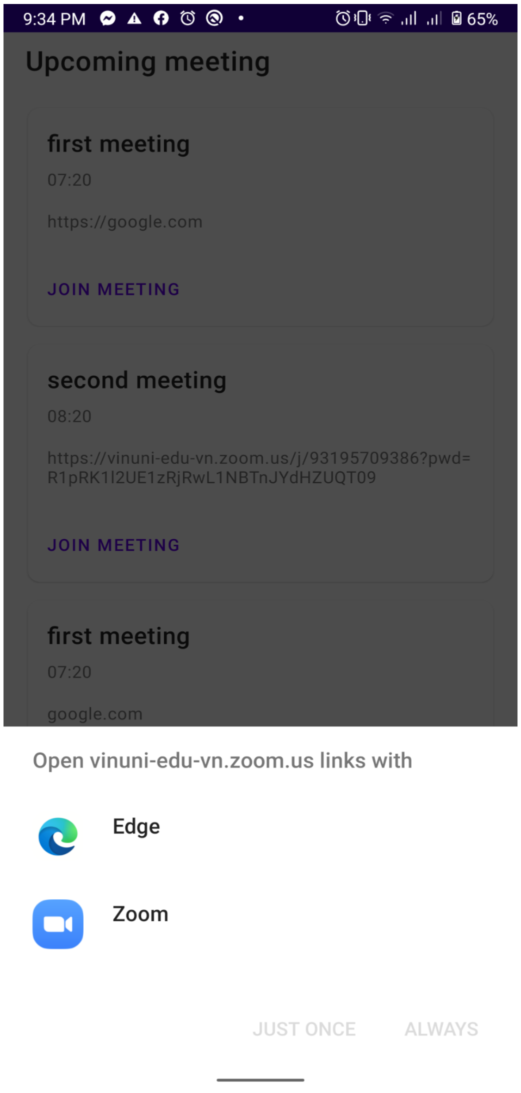
3 main tabs on the bottom bar:

- Home (meeting hub)
- Calendar (create events and meeting time selection)
- Account (user information)



The “+” button to create a new event

Join meeting



Upcoming meeting

first meeting

07:20

https://google.com

second meeting

08:20

https://vinuni-edu-vn.zoom.us/j/93195709386?pwd=R1pRK1l2UE1zRjRwL1NBTnJYdHZUQT09

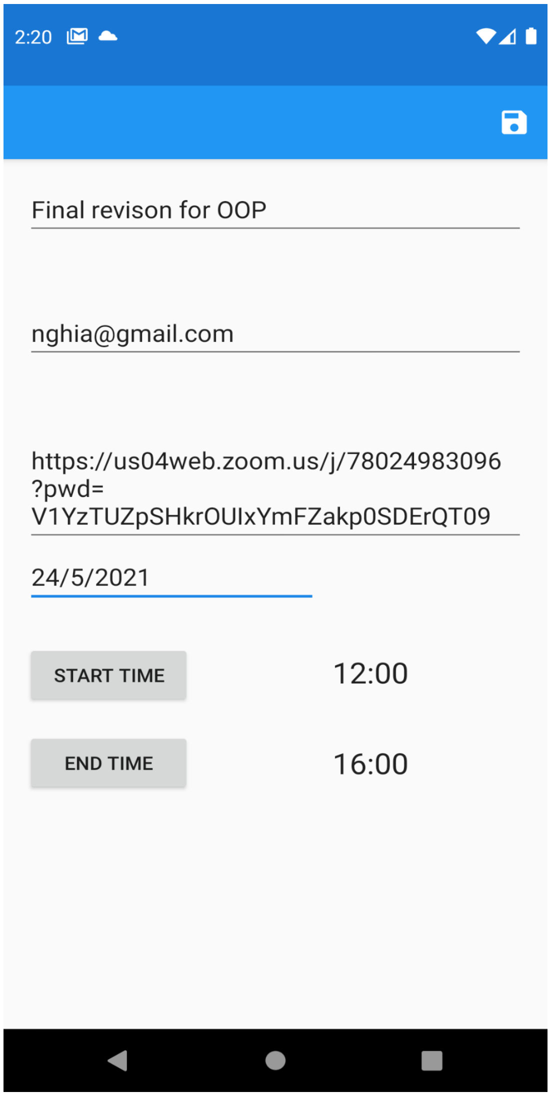
first meeting

07:20

google.com

Open vinuni-edu-vn.zoom.us links with

Create event form



Final revison for OOP

nghia@gmail.com

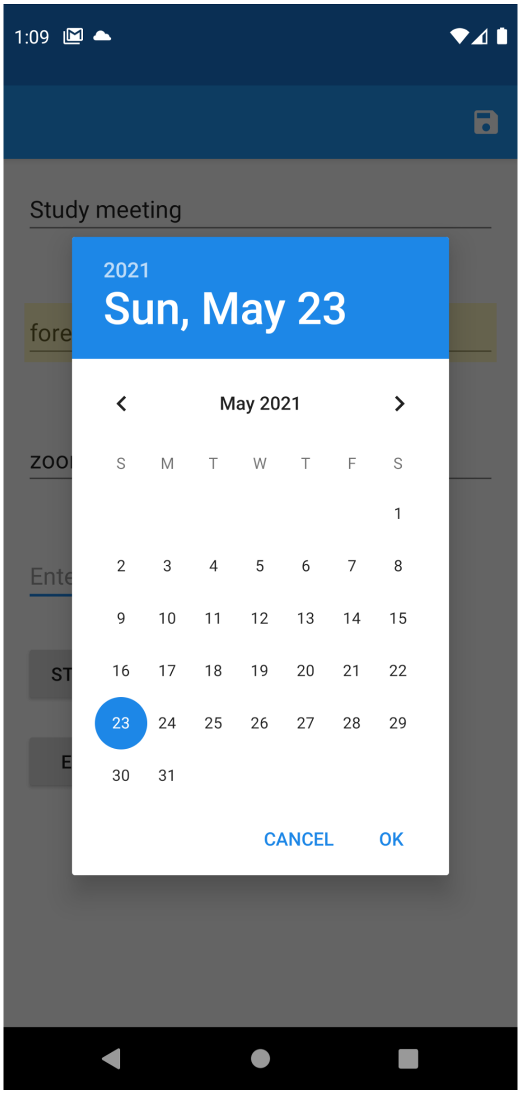
https://us04web.zoom.us/j/78024983096?pwd=V1YzTUZpSHkrOUlxYmFZakp0SDErQT09

24/5/2021

START TIME 12:00

END TIME 16:00

Date choosing



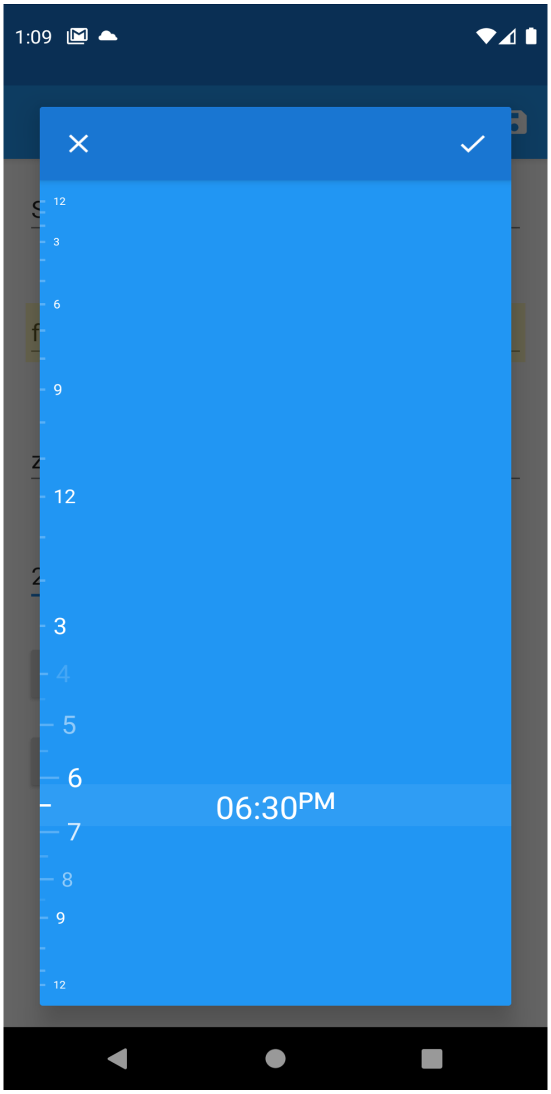
2021

Sun, May 23

May 2021

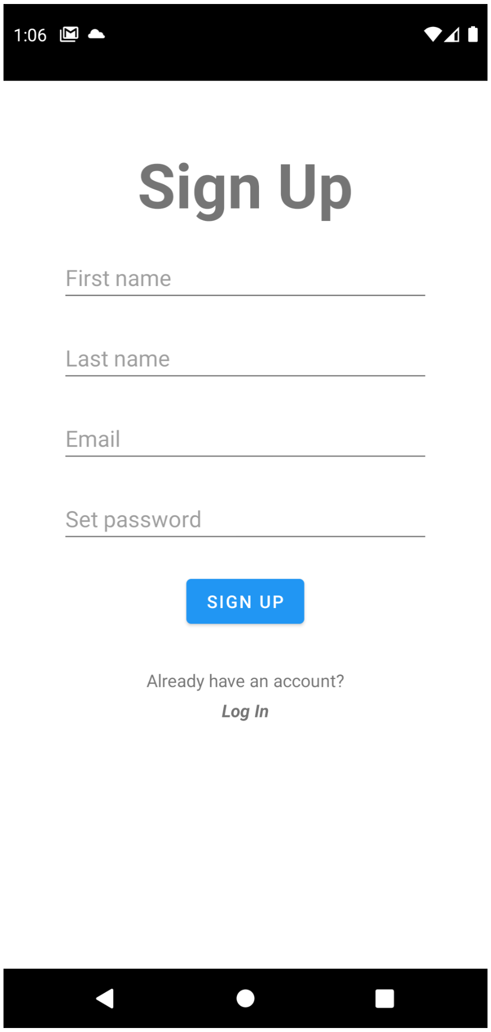
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Time choosing



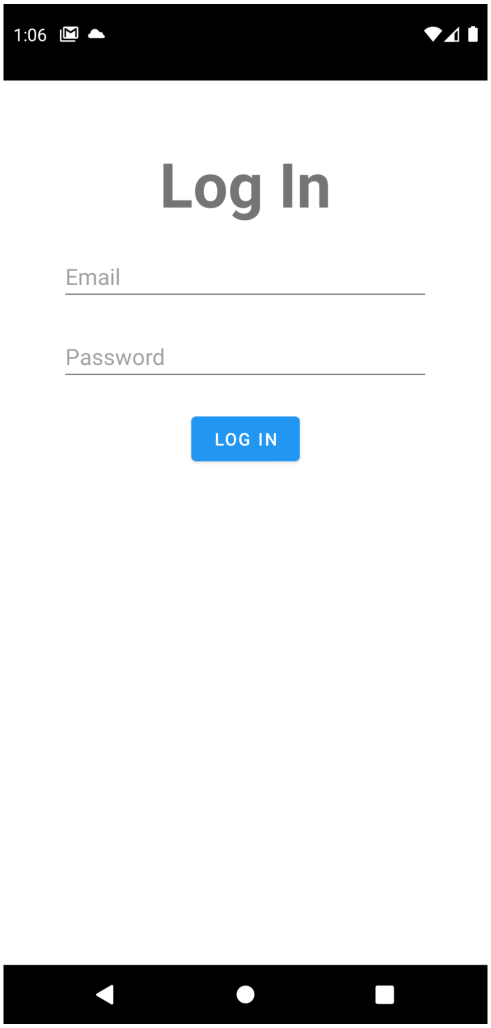
06:30PM

Sign up screen



Already have an account?
Log In

Login screen



D. Difficulties and resolution

Feature failed to implement:

- **Finding common time for all participants**: The create-meeting form is supposed to have a check-box for all participants to choose their available time in a list of times given by the host. However, we decided not to implement this function due to time constraints and Firebase communication problems. Due to troubleshooting and handling async tasks, it would take much more time to implement this feature.

Difficulty:

- **Asynchronous task:**
    - **Problem:** We encountered this problem as we tried to retrieve data from Firestore in Firebase. As the retrieval requires time meanwhile the processes continue without waiting for the data, the list and the calendar usually result in NullPointerException or blank home and calendar tab.
    - **Solution:** We added a splash screen to allow Firebase to retrieve all the data before the start of the application.
- **IDE usage:**
    - **Problem:** Getting used to Android Studio is a daunting task as this platform frequently updates and some features usually provide hard-to-debug errors.
    - **Solution:** We spent lots of time getting used to the features provided by Android Studio. Online tutorials did help a lot in this process.
- **Not synced libraries (Version conflict):**

    - **Problem:** Some libraries of Android and Java have been updated many times and tutorials sometimes use old libraries which conflict with the present version, causing the code unable to run.
    - **Solution:** Checking for documentation thoroughly and looking for similar problems in online platforms such as StackOverflow.
- **Code merging:**
    - **Problem:** The parts of work of each member after one completes the task needs to be merged with the rest. This process is challenging for us as each person has a different coding style, also at each merging, many files are edited and new packages and libraries are implemented/imported, which require meticulous code handling.
    - **Solution:** Our team has lots of discussion sections for each other to clarify the implementation details of the others. Problems will be fixed at code merging and will be handled in these sections.
- **Exception handling:**
    - **Problem:** In the process of developing the app, we are constantly faced with numerous errors of many types, which mainly arise when we build a new feature or merge code. While many common errors are easy to fix immediately and require low effort, others are hard to debug as they are fatal, complicated, and demand more effort.
- **Implement concept or template (activity, fragment, layout, etc.):** This activity is the most demanding task as we have to learn through the tutorial of implementing the concept and after successful implementation, try to customize it according to our preference. It takes a long amount of time to research and test before it could work properly.

Resolution and comment: All the problems above that we faced in the process of developing the app are of many kinds. Although we have been learning Java for nearly a semester, coding an Android app in a team is pretty much a novel experience compared to the materials that we learned in class. We have to design an app with only a simple base in coding. Therefore, we really struggled a lot with the difficulties that came up throughout the process. We had to get used to and learn to find the problems on our own. The learning not only occurs in lectures or watching tutorials, but also through hours searching through coding sites and forums like Geeksforgeeks or StackOverflow. Though it is difficult, it helps us to improve our problem solving and researching skills, aside from the new technical knowledge.

E. Limitation

- The password is only set at registration and could not be changed
- Event after creation is fixed and uneditable (Even for the host)
- Lack of user validation (Checking if the data user input in is in the right format)
- Event data is retrieved only at the initialization of the application.

F. What we learned

From the project, we have learned:

Skill Sets:

- Self-study skill
- Teamwork and task division
- Problem analyzing and solving
- Critical thinking
- Pattern finding

Technical knowledge:

- Android studio usage
- Firebase communication

- Improve java coding proficiency
- Create User Interface on XML
- Combining components to create a full-fledged application

G. Resources and work analysis

Estimated time spent on project:

- Nguyen Tiet Nguyen Khoi: 40 hours
- Nguyen Dai Nghia: 44.5 hours
- Le Hoang Vinh: 39 hours
- **Total: 123.5 hours**

In this project, we adopted 2 main sources from Github

- Scheduleh: We reused the create NewEventActivity class with the form layout, modified and adapted it to the CalendarEvent interface. To store the data, we create a new class called FormEvent to receive data after the save button is clicked.
- Agenda Calendar View: This is a deprecated project but it has lots of useful features; therefore, we still decided to implement this view. However, since its deprecation, we need to manually fix a lot of bugs and errors, including old libraries' implementation, conflict with new versions, etc. The result was satisfying and served the purpose of the app well.
- Since the two sources implemented different event systems, we have to adapt it by creating an EventManager class, which will handle the event type conversion, old event filtering, Firebase data retrieval, Firebase pushing, etc.

Our team implemented most of the UI and logic of this application, apart from the calendar view and some part of the adapted form.

H. Future work & potential features

- Allow more actions regarding event modification (edit, delete event, etc.).
- Implement the feature where users could vote on meeting time together - referring to the when2meet.com website
- Allow users to set up a time when they are unavailable for meetings.
- Implement user input validation.

- User reminder when there is an incoming meeting.
- Refresh and retrieve data frequently.
- Change password & update profile pictures. Be able to display the personal meeting link on the account page. The users can also automatically choose which platform is the default platform when creating new meetings.

VI. References

[1] “Android | Creating a Calendar View app - GeeksforGeeks,” GeeksforGeeks. https://www.geeksforgeeks.org/android-creating-a-calendar-view-app/

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[3]W. Kok-Seng, “COMP1020, Object-Oriented Programming, Algorithms and Data Structures, VinUniversity.” https://vinuni.instructure.com/courses/219

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