

Final Project Report
On
“CLASS TO DO”



Daffodil International University
Dhaka, Bangladesh
October 2020

DESIGN AND DEVELOPMENT OF AN ANDROID APPLICATION NAMED

“CLASS TO DO”

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In partial fulfillment of the requirements for the degree of Bachelor of
Science in Computer Science and Engineering (CSE)

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October 2020

APPROVAL

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We hereby declare that, the project report entitled “CLASS TO DO” has been done by us under the supervision of Nadira Anjum Nipa, Lecturer, Department of Computer Science & Engineering Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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ABSTRACT

We have created an app to keep pace with the current era. We hope that “**Class-to-do**” will be a very useful element in our digitalized society. We've developed our app for all students who can't get good results for inconsistent reasons. Most students forget their exams, assignments, projects, presentations and quizzes, which has a big impact on their results. After thinking about these problems of the students, we decided to make an app. We've developed our apps on Flatter platform, so our apps will be used by both Android and iOS users. Our application is very user friendly so that, we hope that users will feel comfortable using our application. We have tried to add many features together in our app so that students can enjoy all the benefits through one app and we hope to add more features in the future. We have many more plans to improve and enhance our application day. We develop our applications with students' thoughts and social applications in mind so that they find it interesting and comfortable.

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CHAPTER 1

Introduction

1.1 Introduction

In our digitalized society, all students are using smart phone. We have built our app using flutter, so that every students (**IOS** and **Android**) user can both use it. These apps have navigation buttons. Navigation buttons include homepage, timeline page, routine page, post page, notification page, search option and my profile options. Users will be able to follow each other and the posts of those who will follow will show on their homepage. In this app students can add their class routine with specific day and also delete it. In the Activity Feed the user will see notifications from other users, such as if someone follows him or if someone likes his post or if someone comments on his post, they will display everything he has in the Activity Feed. Student can also set reminder for their class routine and post any kind of information about their class work.

As a result, our motive was to simplify out students life and more interesting for their study and make them active for it.

1.2 Motivation

For the best outcome, students should do their study properly. Maximum time we (students) were forgetting our classes, class time, assignment, presentation and many other important things, as a result, our (students) results are badly affected.

With these problems in mind, we decided to create an app for our friends and junior brother and sister, so that we do our class work properly and our results can do better. Nowadays almost every students have an android mobile, someone also have iOS mobile phone. So every students will be able to use our app, we created. We tried to make our app more dynamic where every students can access from anywhere anytime.

1.3 Objectives

Here, we have included our objectives. We are hoping to fulfill our goal after completing our project. Those are followed by:

- Analysis the applications and try to modify it according to Student purpose.
- We want to build a perfect app for all levels, from high school to university.
- Try to develop an efficient application that will be helpful for students.
- Students who will use it have definitely noticed a difference.

1.4 Methodology

Our project is android and iOS based app. You have to run it via an **Android** or **IOS** operated system mobile. If you want to use our app in your mobile, you must have an internet connection. We have used firebase as our database. Google's security is very high so we do not need any additional security in our apps. It can provide real-time data. In the search feature of our app user can quickly find the other user list according to their profile details. Our database is secure and only the registered user can access the app data. For the user attraction we will develop user-interface and increase security of our app.

1.5 Organization of the Report

The report has six chapters. The first chapter describes the introduction, method and purpose of the project. In the second chapter we describe the background of the system. We have described how the whole system actually went through this chapter. Chapter three contains the requirements and details. It also includes the features of Firebase. The chapter four contains the entire project structure and final output. Chapter five includes system tests and project results. The chapter six contains resources for decision making and implementation of future projects.

1.6 Expected Justification

Our project aim is to active the students to their studies. Using this app students can do their class, classwork and attend their exam in proper time. This app will make a student active. We just want to share our idea and we build our app in initial stage. We should have to much more development in our app.

CHAPTER 2

Background

2.1 Introduction

We design our app in flutter platform and we used dart language. Our app UI has some functionality. We have used a bottom navigation with six buttons. All are add in a page named Homepage. We also added other activities in different pages and different dart file. Some features are listed below:

- Online Login/Registration
- Posting
- Searching User
- View post of the user and liking and comment the post
- Set class routine and add reminder
- Get notification for post, like and comment
- Update and delete post

2.2 System Development Life Cycle

Systems development is the process of defining, designing, testing, and implementing a new software application or program. It could include the internal development of customized systems, the creation of database systems, or the acquisition of third party developed software. An effective System Development Life Cycle should result in a high quality system that meets client expectations.

The system development life cycle is a project management model that defines the stages involved in bringing a project from inception to completion. System development life cycle is a combination of various activities. In other words, we can say that various activities put together to develop a system are referred to as system development life cycle. In the System Analysis and Design terminology, the system development life cycle means Software Development.

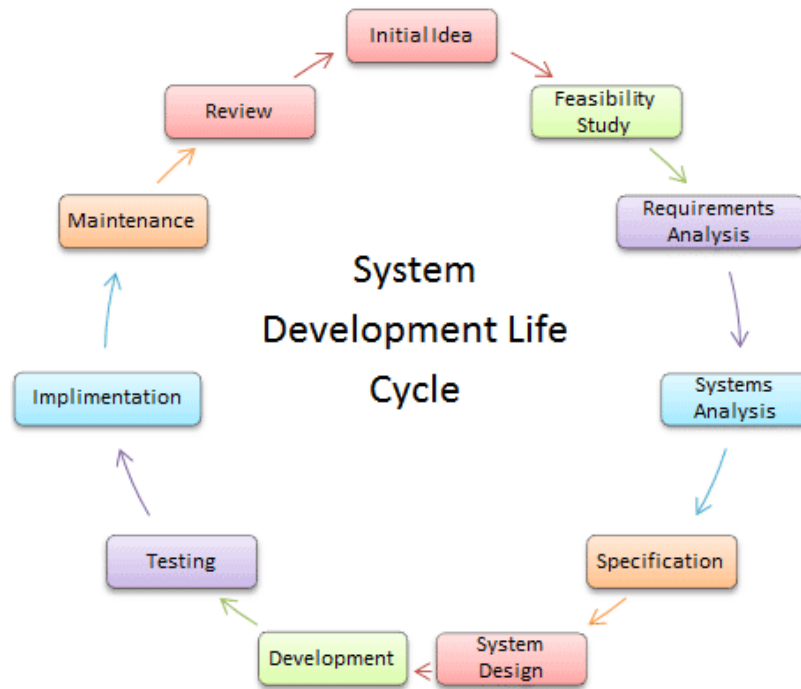


Figure 2.1: Process of system development life cycle

The different phase of software development cycle are given below:

- Initial Idea
- Feasibility study
- Detailed system study
- System analysis
- System design
- Coding
- Testing
- Implementation
- Maintenance
- Review

2.3 Phase of Software Development Life Cycle

Software Development life cycle describes the different phases and related activities of system development life cycle in details. Here the figure 2.2 that will show the system development life cycle process.

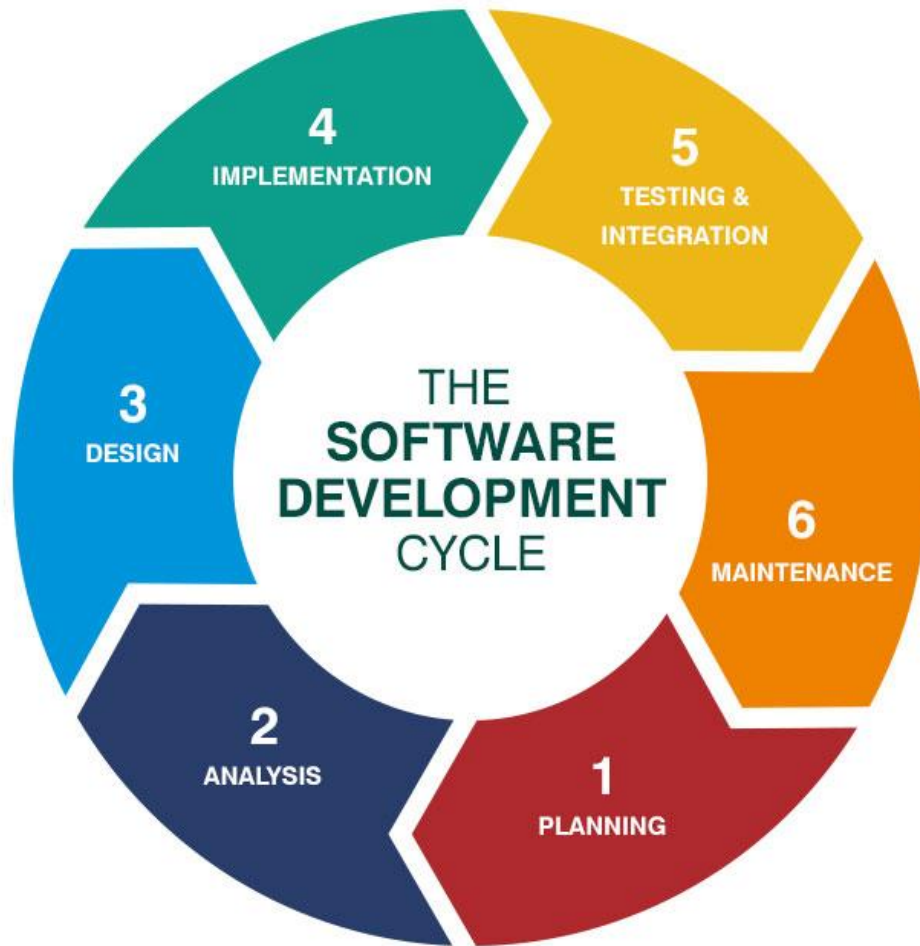


Figure 2.2: Different phase of Software Development Life Cycle process

2.4 Initial Idea

Initial idea is the first stage of System Development Life Cycle. In this stage we get a clean picture what exactly the physical system is. After completing the initial idea the system analyst (who studies the system) prepared a proposal and placed before the user. Every project must start with an initial idea. Generally, this consists of a brief definition on what

is the project all about, what is project purpose and what the project aims to accomplish. How the success of the project will be measured.

To describe the system study phases more analytically, we would say that system study phases through the following steps:

- Problem identification & project initiation
- Background analysis
- Interface of findings

2.5 Feasibility Study

When the system proposal is acceptable to the management, the next phase is to examine the feasibility of the system. The main goal of feasibility study is achieve the scope. In that phase we know how long a project should take and how the results should be presented. Usually the senior management drawn up the terms of reference. The feasibility study must be through with if the development of the project is uphold in terms of economic and organizational terms.

The central role of the analyst in the feasibility study is to analyze the current system at a high level. Data Flow Diagrams (DFD) are used to describe how the current system performs and to illustrate known problems.

The system we were trying to build a lot of potentiality for students. The platforms I have chosen are Android Studio (Flutter), Dart programming language and Firebase to stored data.

CHAPTER 3

Requirement Specification

3.1 Introduction

Each software system must need some requirements. Our app has also some requirement specification. We developed our app by using flutter so that both android and iPhone user can use our app. We used firebase in our app for storing user information. We need permission to use firebase database. At first firebase is providing 1 GB storage and 30 GB of data transfer limit free. If the limitation cross then it will be paid. But as testing phase it is enough but later if user increases then the paid version can be used.

3.2 Permission Requirement

For using any android application, user must need provide some permission. Android has launched total 17 versions, Android (A-10). The lower version from android M (Marshmallow) permission option was not available. From android M (Marshmallow) there a new option added which is called android runtime permission. When any user install an app the all permission was automatically granted. But from android mobile user must provide all permission individually. And all the state has followed perfectly in our app 'Class-To-Do'. Our app has only one permission needed and that is 'Internet Permission'. If any user reject the permission then app will not working.

3.3 Security of Database

In our app online database has been used. Firebase Real time database has used in our app. For using database there are an issue of giving security of these database. While using Firebase we don't have any headaches. Because this is Google's service and Google will provide the security. So there are no need extra security. There are also another option in firebase to protect data. We may turn off all write and read data from firebase.

```

1 rules_version = '2';
2 service cloud.firestore {
3   match /databases/{database}/documents {
4     match /{document=**} {
5       allow read, write;
6     }
7   }
8 }

```

Figure: 3.1 Firebase Real time Database Rules

3.4 Threats to System Security

Security the most important things for a system. Our app has authentication system. User also need to sign in first using valid email address and provide their email password to open an account. User will provide their username for identity. User can update their profile with display name and bio. User can't use same user name twice by using one email account. Our database is strongly secured as it is maintained by Google.

3.5 Conclusion

After finishing the full requirement specification 'Class-To-Do' will work properly. In our apps we are trying to increasing student attention. At present almost all students are using smartphone. So if they use our apps then they will get good rewards. If any students does not want to miss his class attendance and take the exams at the right time, we think he/she will get a good reward if he/she uses this app.

CHAPTER 4

Design Specification

4.1 Design & Prototyping

An important part of designing and prototyping in each application is the concept of phase. Design can be more efficient and reliable for users who are important as the most user friendly interface. A Good designing can have a good response and user experience can provide in addition to prototyping. The developer will benefit from how much improvement and designing is actually needed.



Figure: 4.1: Class Diagram

4.2 User Interface Prototyping

The prototype is the initial model of an application. The prototype is actually considered in the early stages of an application. Prototyping developers allow users to understand the desired further distances and requirements. So prototyping is really very important for creating successful applications. Also used for prototyping testing purposes. The test output is how effective and usable an application actually is.

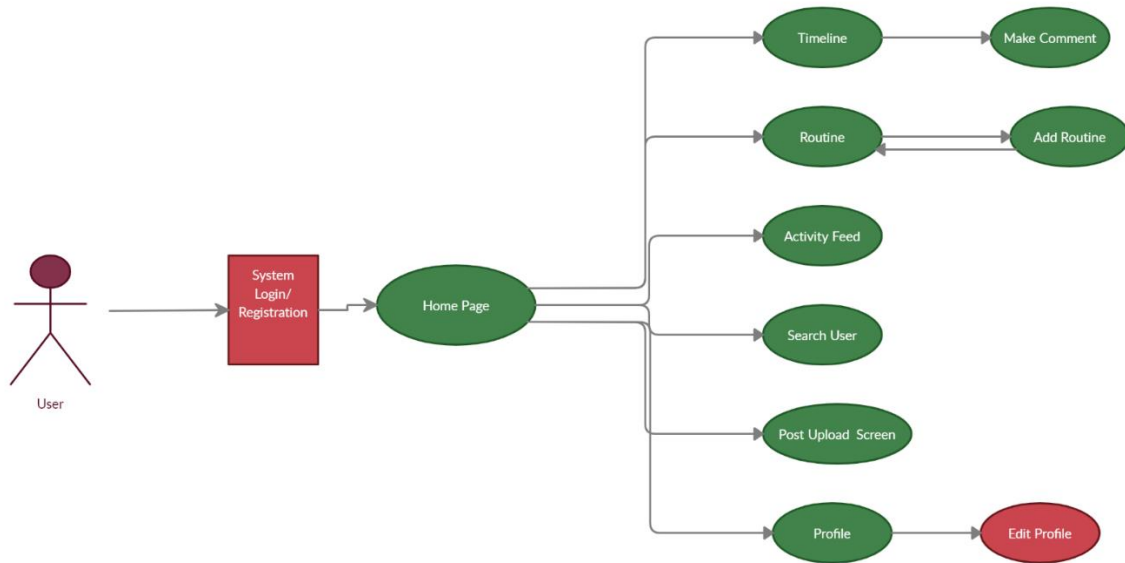


Figure 4.2: User Interface Prototyping

4.3 ER Diagram

Here is the ER diagram of our database. The user must provide the email and password in the database to verify authentication.

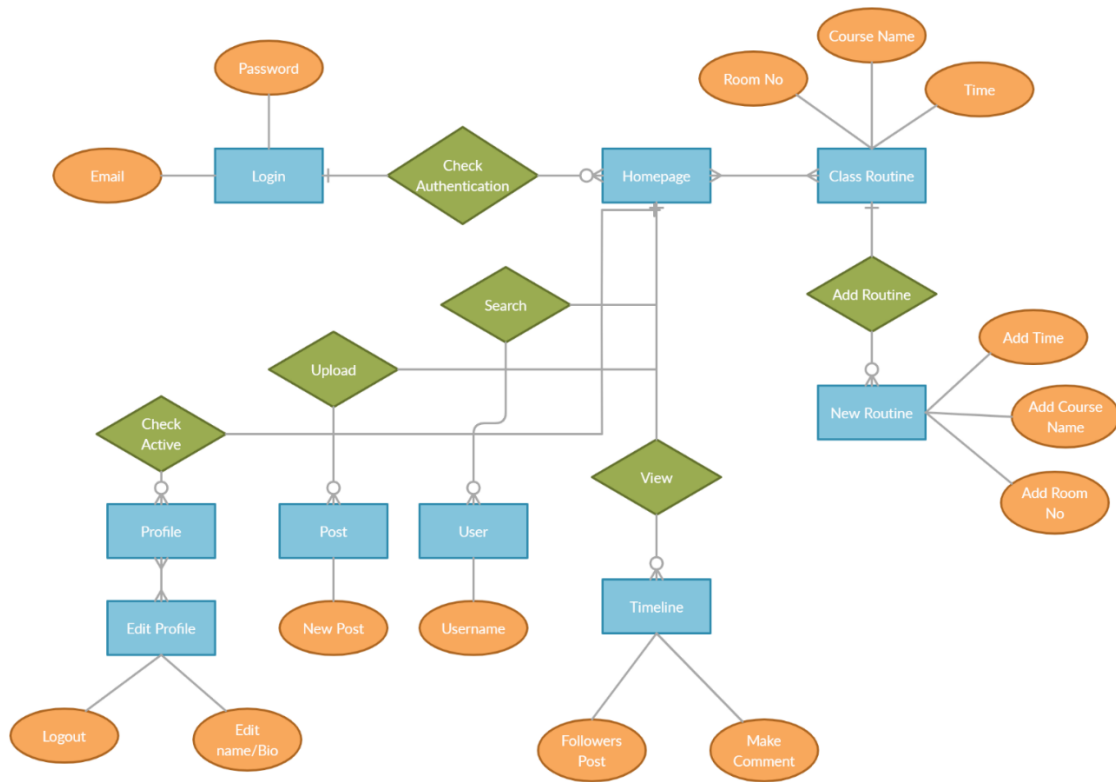


Figure 4.3: ER Diagram

4.4 DFD Diagram

Here is the DFD diagram of our project. Our system initially requests authentication. After authentication, users can access posts, searches and other data. Responsible for posting post data. Profile data is used to provide user information.

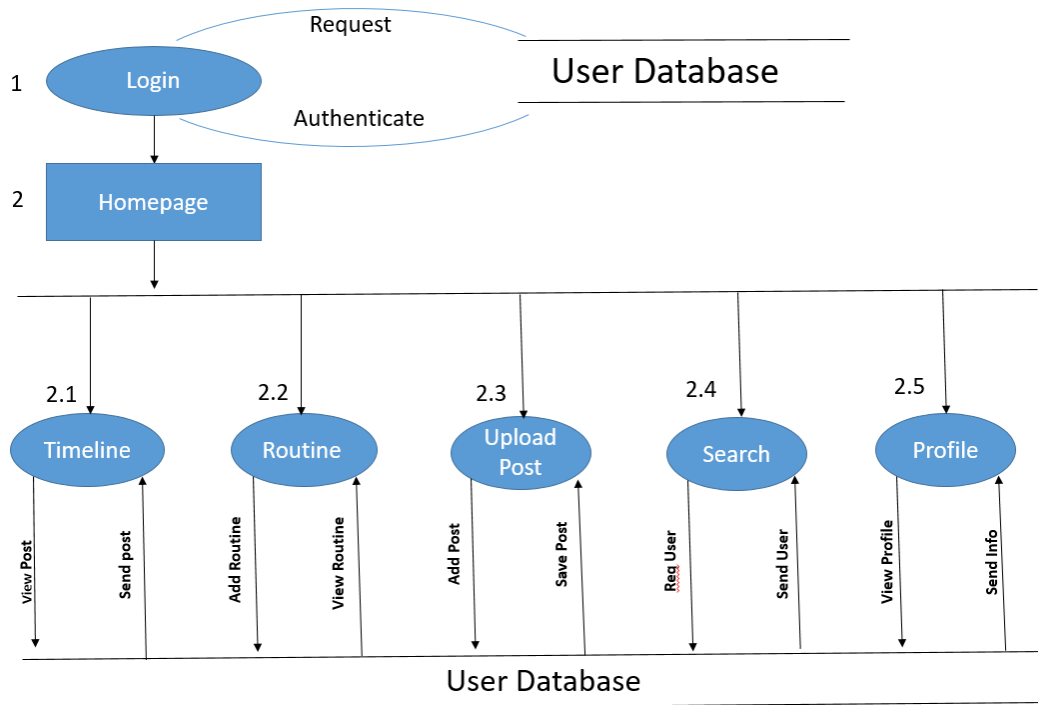


Figure 4.4: DFD Diagram

4.5 Technology Used

In these apps we have used Android Studio, android virtual device and worked on Flutter platform using dart language.

Android Studio: Android Studio is an IDE for developing Android applications. This is a product of Google. It has some features like debugging and testing. All these benefits are free. Android Studio has design tools including previews. We can preview our designs or run them on virtual devices. It can also use different libraries for UI updates and changes. We can create a signed APC by clicking and uploading applications in the Play Store. Android Studio has SDK tools. This platform is independent. SDK provides build tools, debugging tools and much more. Android Studio has Android SDK Director. It provides the necessary components, tools, resources and platforms for developing a complete Android application.

AVD Manager: AVD Manager is an experimental device that runs on the Android emulator. Here we can install an APK file for testing. It runs on an emulator and provides a virtual environment. The virtual device can be configured with user-specific details.

Dart: The whole project is developed in DART programming language. Dart is a client-optimized programming language for applications across multiple platforms. It was developed by Google and used to create mobile, desktop, server and web applications. Dart is an object-based, class-based, garbage-collecting language with C-style syntax. DART can compile both local code or JavaScript.

Firebase: Firebase is an online database system. This is a product of Google. It provides real time data management system which is very important. This makes the app management system easy and efficient. We can integrate multiple projects into our Firebase console. Initially it is free to use for a certain range. It provides features for database, analysis, storage, authentication, hosting, crash reporting and ad prefixes.

Post Database

In Post Fragment, our posts will be available to anyone who is a login user and those who are following users will be able to see the posts and they will be able to like, comment and share the post. Below is a picture of a part of the post database:

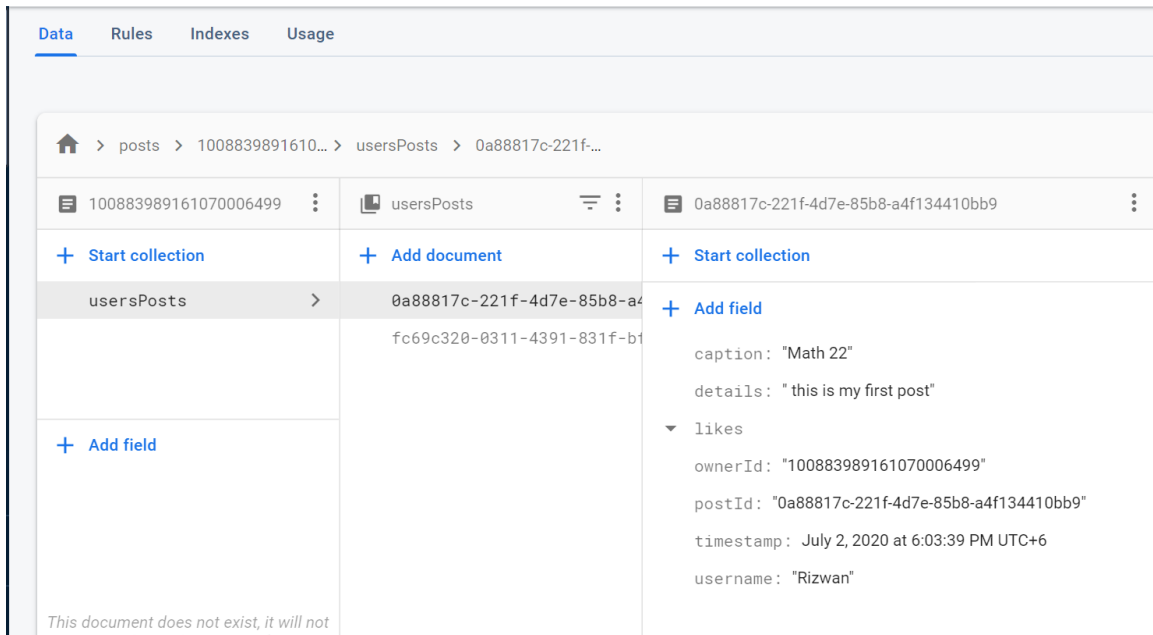


Figure: 4.5: Post Database

Comments Database

To comment on a post you must be a following user and login user then he can comment on the post. Below is a picture of a part of the comment database:

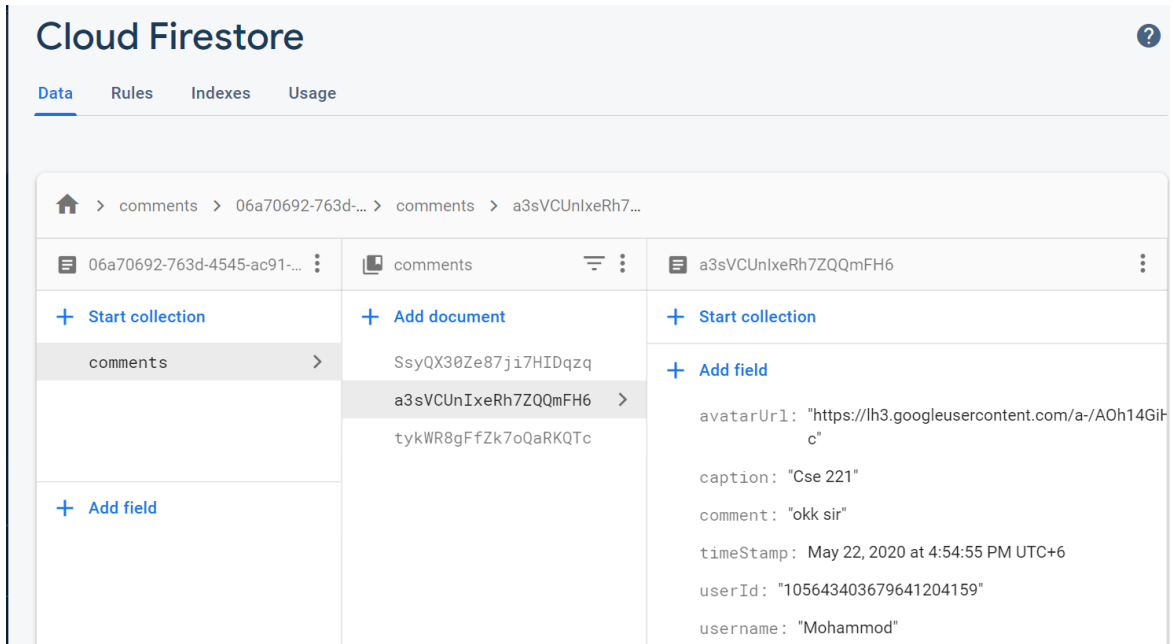


Figure: 4.6: Comments Database

Timeline Database

Any login user will be able to see the post of the person following in his timeline. If anyone follows him, he will see it too. If someone likes and comments on his post, they will see the notifications. Below is a picture of a part of the timeline database:

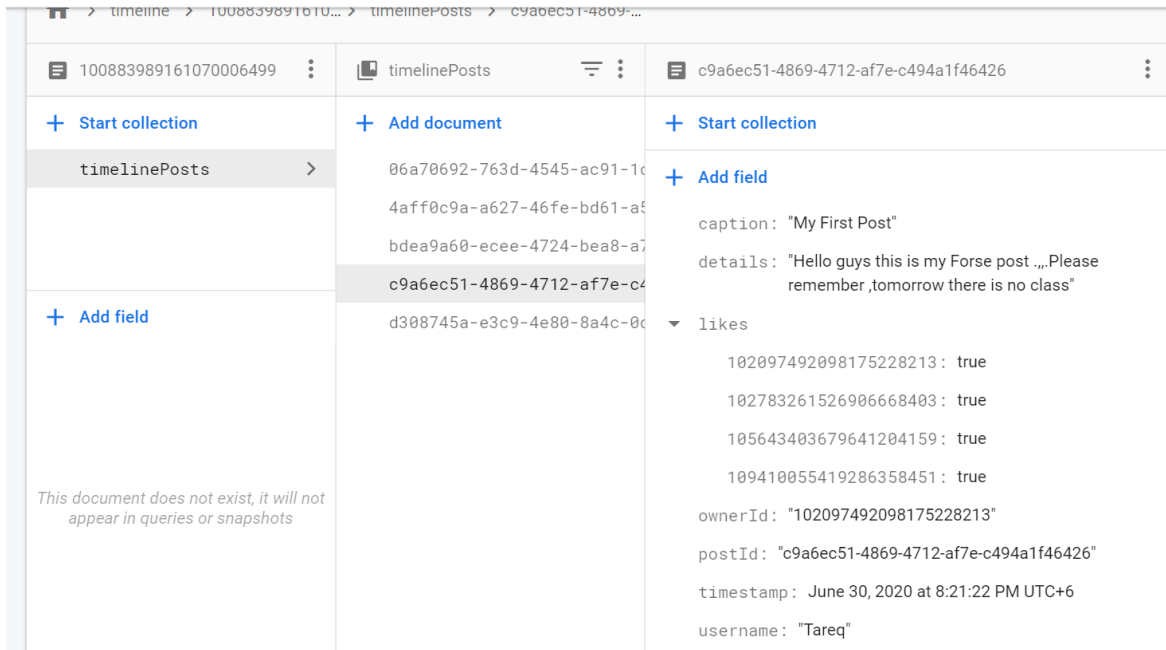


Figure: 4.7: Timeline Database

Routine Database

In the Routines section, any login user can see the routines, add routines if they want and delete routines if they want. Routine segment routines can be determined by day and routine class times and classrooms can be checked. Below is a picture of a part of the routine database:

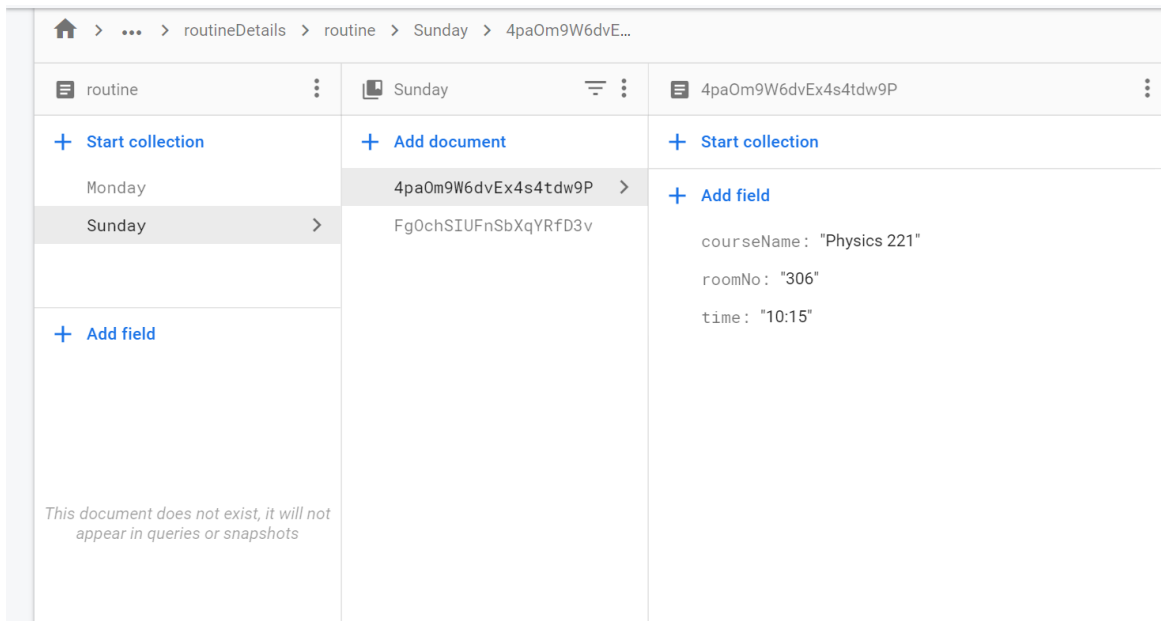


Figure: 4.8: Routine Database

User Profile

The user can see the details in the profile section. The segment also includes my posts, logout and edit profile options. In Profile Activity the user can find all his posts according to his category and the user can delete his posts. Edit profile options to edit user details. The logout option will take the user out of the app system. Below is a picture of a part of the profile database:

neww-c669b	users	105643403679641204159
+ Start collection	+ Add document	+ Start collection
comments	100883989161070006499	+ Add field
feed	102097492098175228213	bio: "Daffodil Internation University"
follower	102783261526906668403	displayName: "Mohammad pranto"
following	104682547341365712465	email: "shirajpranto89@gmail.com"
posts	105643403679641204159 >	id: "105643403679641204159"
routineList	105979462649524953369	photoUrl: "https://lh3.googleusercontent.com/a-/AOh14GiHl c"
timeline	109410055419286358451	timestamp: May 22, 2020 at 4:50:49 PM UTC+6
users >	110493771657314165164	username: "Mohammad"
	115889814931935173008	

Figure: 4.9: Profile Database

Final Output

Here are all the activity pages of our apps is given below:



Figure: 4.10: Sign in page

Figure 4.10 is Login page. This page is for user authentication. We will only allow registered users to access the app. The login system is based on the Firebase email and password authentication system.

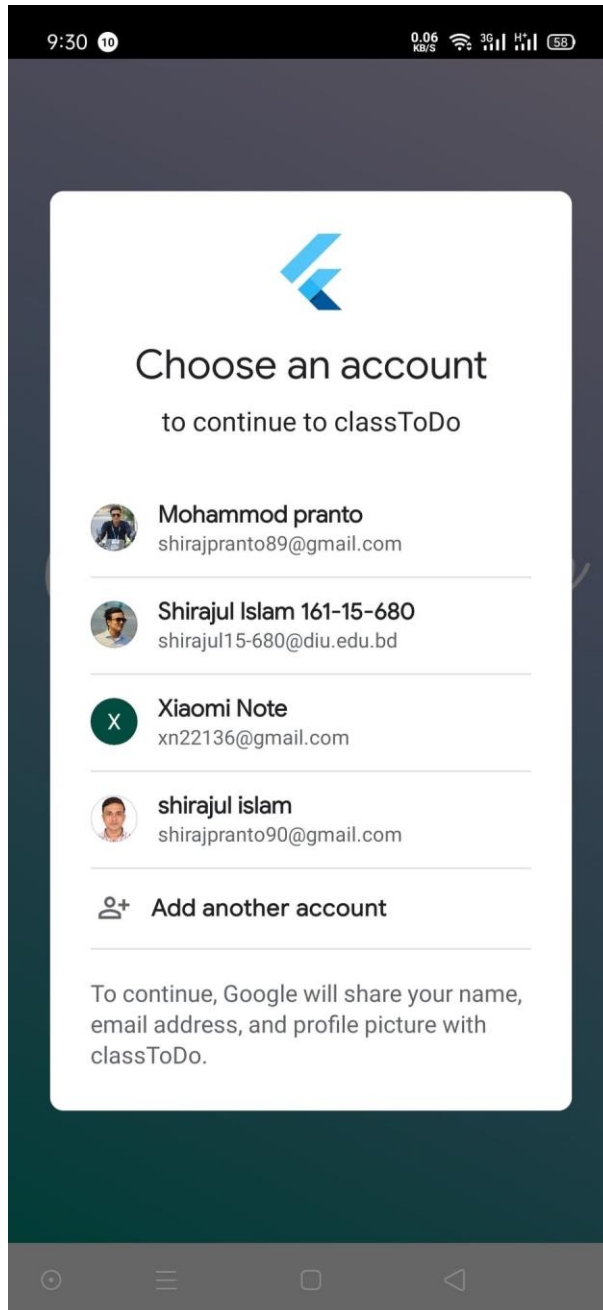


Figure: 4.10.1: Choose account

Figure 4.10.1 is Sign Up page. This page is for user authentication and from here any user can choose his used email or add new account.

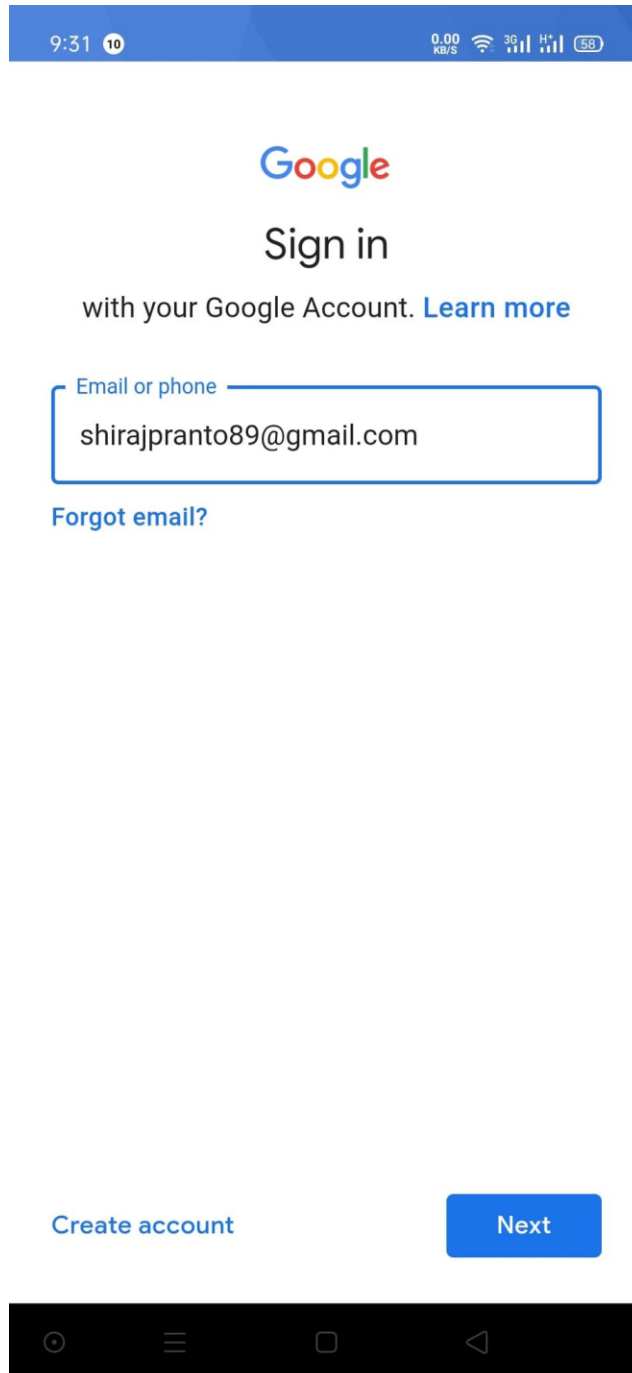


Figure: 4.10.2: Add Account

Figure 4.10.2 is Sign Up page for new user. New emails need to be added here for new users.

9:36 8 0.85 KB/s 3G 57

Google

Welcome

01632-488506

Enter your password

pfaisnbd

More ways to sign in

Next

Figure: 4.10.3: Add password

Figure 4.10.3 is Sign Up page for new user. And for new emails, you must log in with a password. After each account is logged in, you must log in here with a password.

9:32 10 0.01 KB/s 3G 58

Setup Your Profile

Create Your Username

Username

Pranto

Submit

Welcome to Pranto

Figure: 4.10.4: Setup Username

Figure 4.10.4 is Create Username page for only new user. Username should be unique. Exist username will not be accepted.

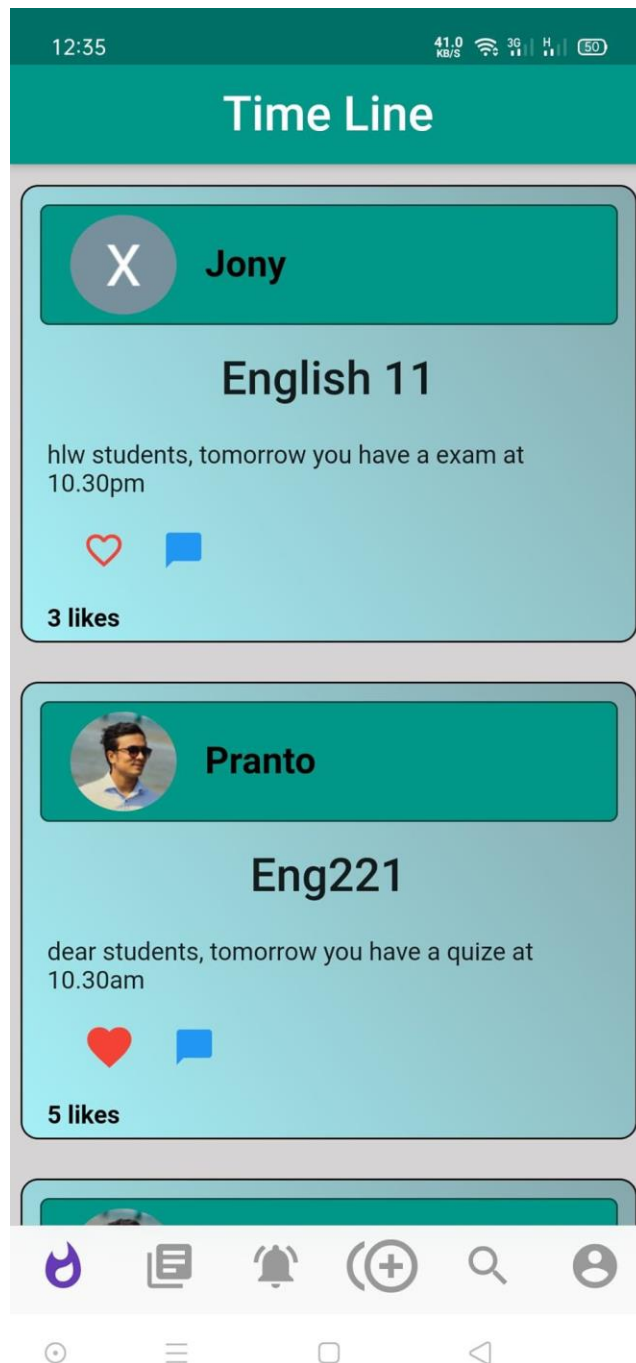


Figure: 4.10.5: Homepage

Figure 4.10.5 is Homepage. This fragment contains all the works list posted by the users. Here the login user can see the post of the follower on the timeline page and can comment like if he wants.

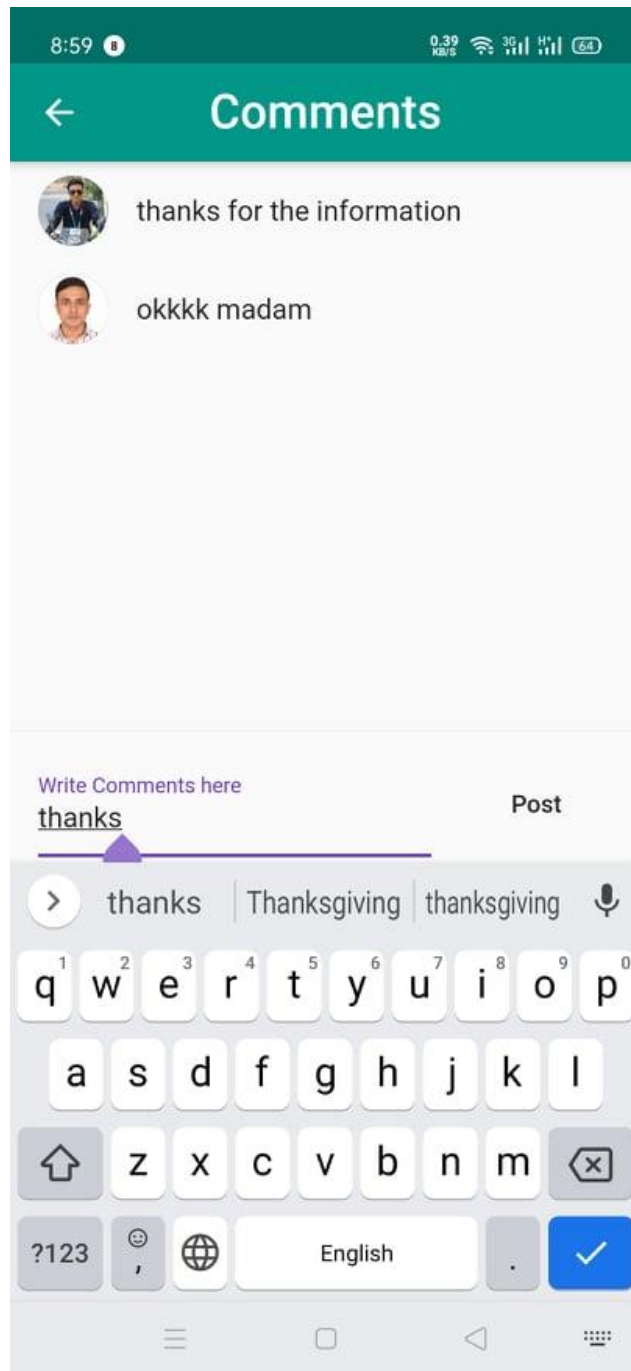


Figure: 4.10.6: Comments

Figure 4.10.6 is Comment page. Here the user can comment and reply to someone else's comment.



Figure: 4.10.7: Class Routine

Figure 4.10.7 is Routine page. Here users can set their routines day by day. Users can add or delete routines here if they want and they will reach all users and be seen by everyone.

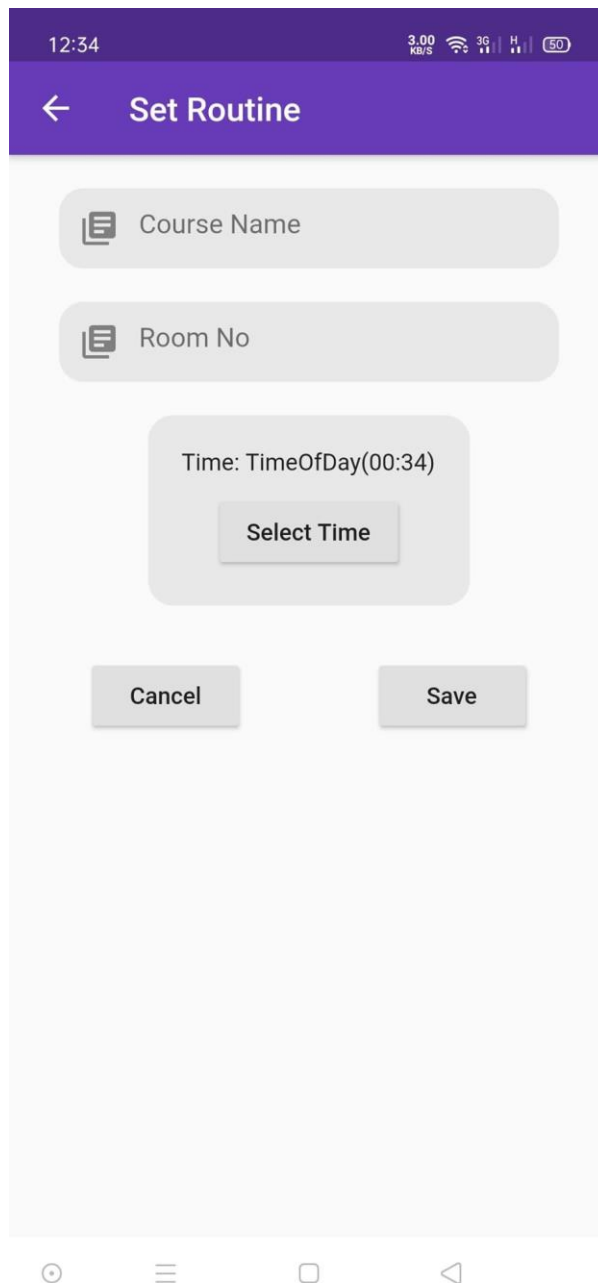


Figure: 4.10.8: Set Routine

Figure 4.10.8 is Set Routine page. Here the user can set the course name, room number and class time.

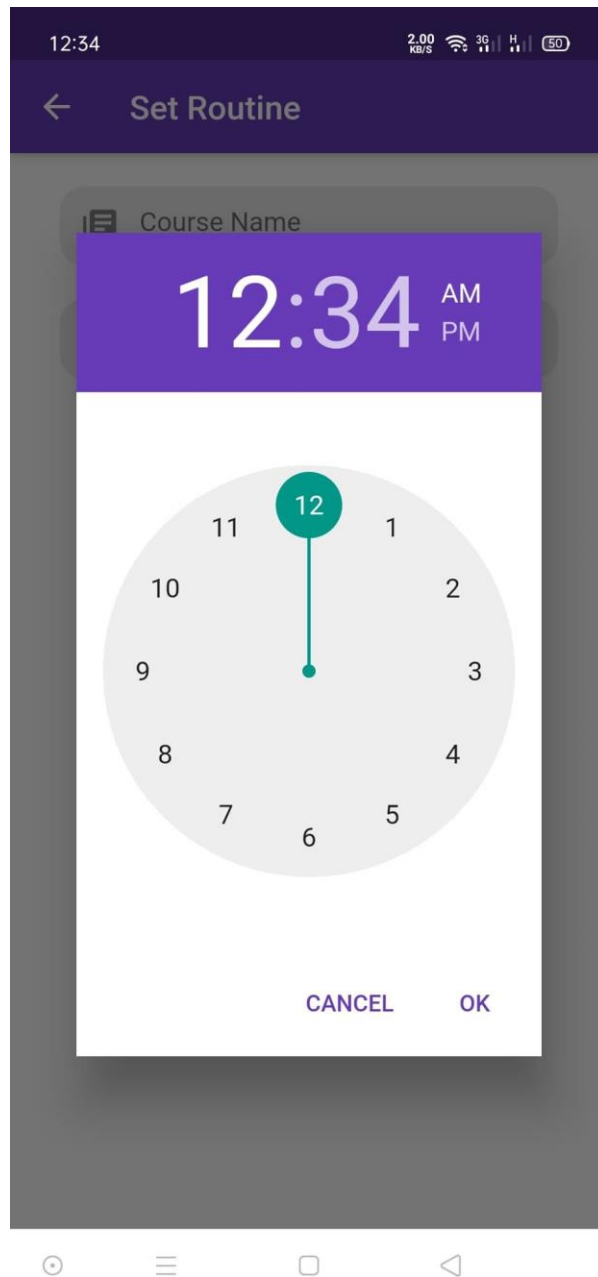


Figure: 4.10.9: Set Routine Time

Figure 4.10.9 is Set Routine Time page. After clicking on select time, there will be an option to set the time. From here, you can set the class time.

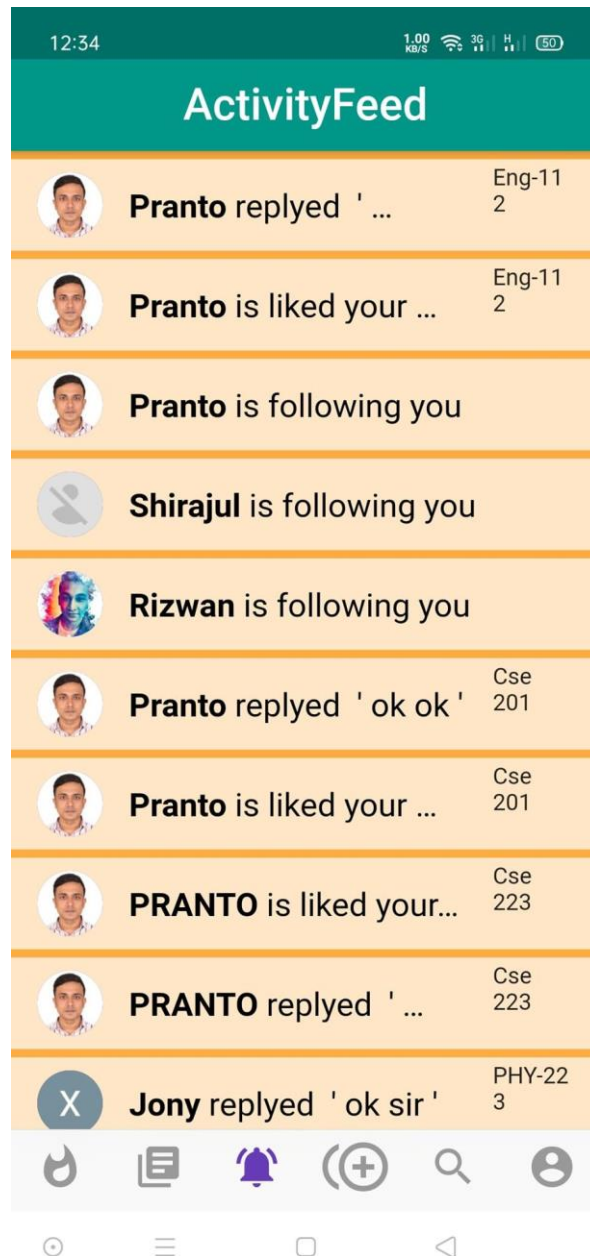


Figure: 4.10.10: Activity Feeds

Figure 4.10.10 is Activity Feed page. On the activity page, the user can see the activities of other users, comment, like, replay their posts, and if someone follows him, he can see them.

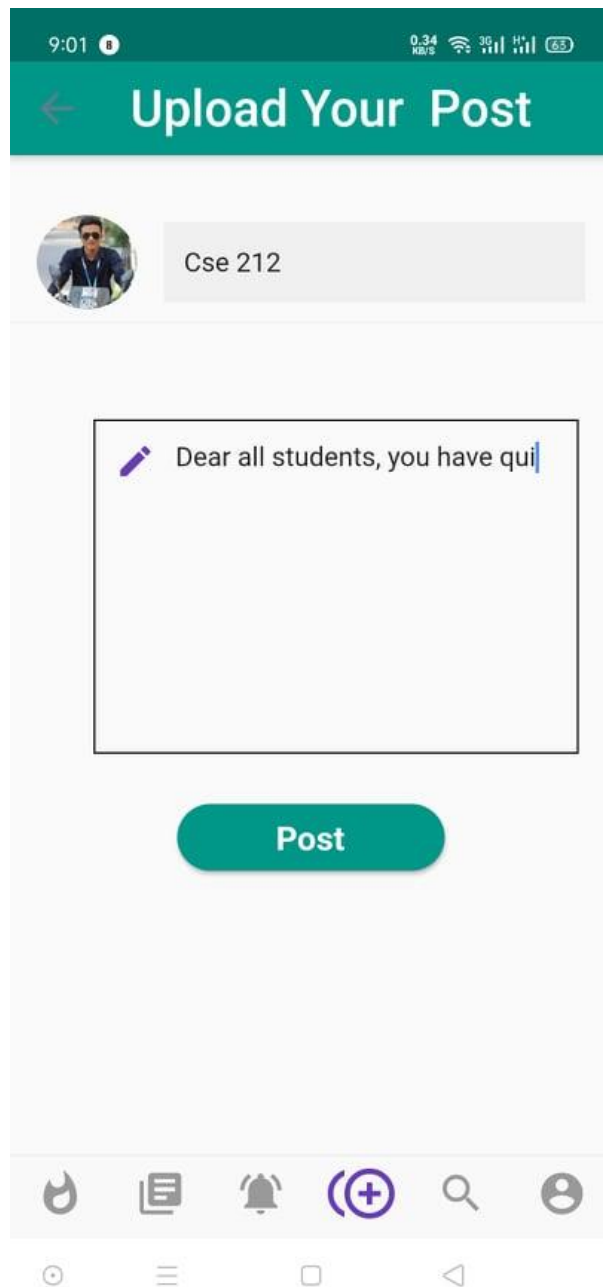


Figure: 4.10.11: Create Post

Figure 4.10.11 is Post page. The user can post any course here along with the course code and details.

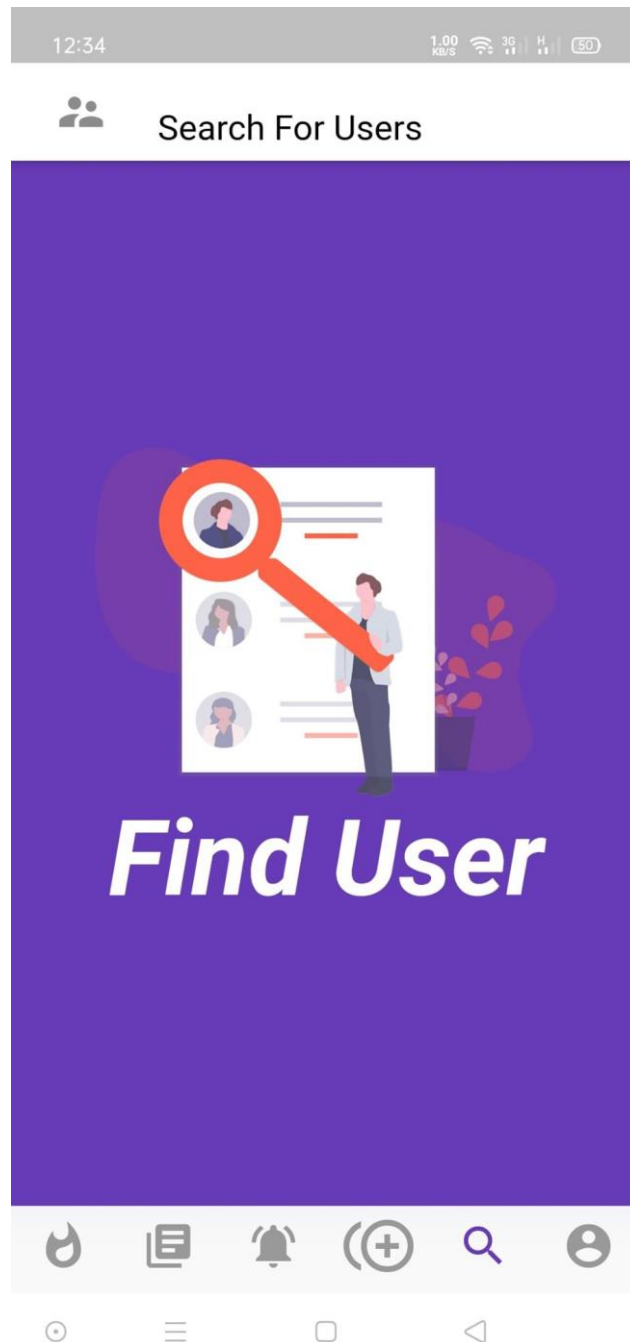


Figure: 4.10.12: Search for user

Figure 4.10.12 is Searching page. Users will be able to search for new users here and follow them.

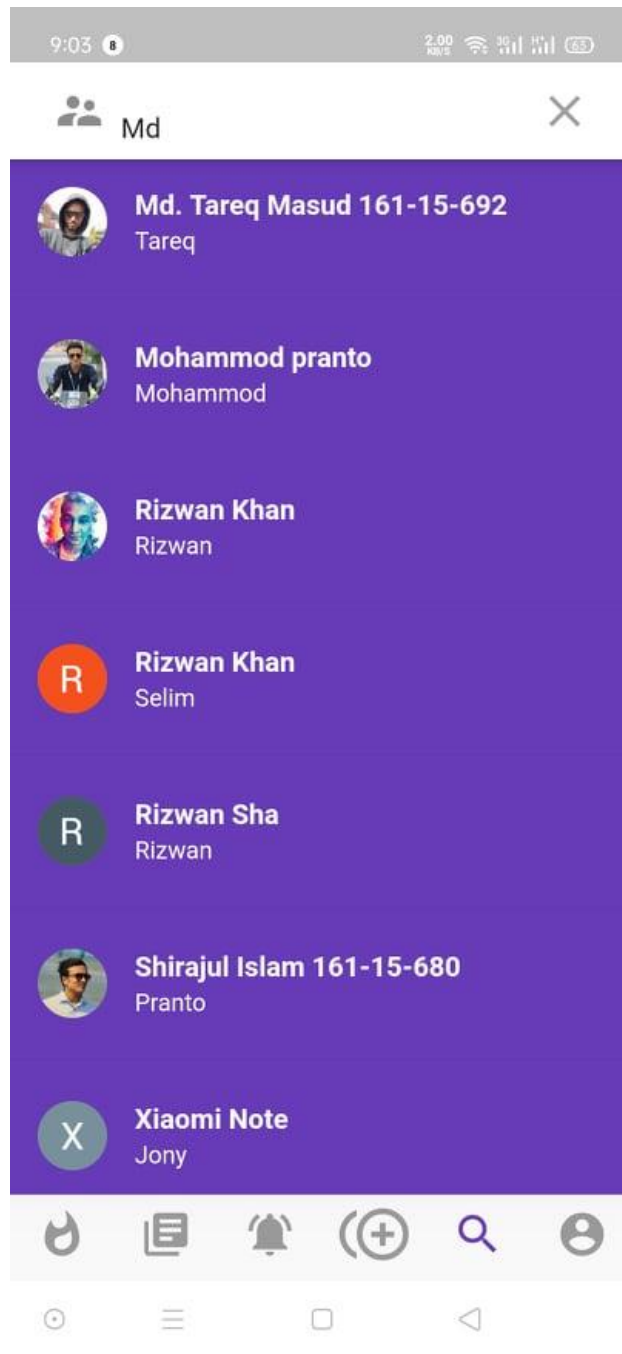


Figure: 4.10.13: Searching Result

Figure 4.10.13 is Searching result page. Our apps here automatically suggest usernames as soon as you enter a username to search for users on the search page.

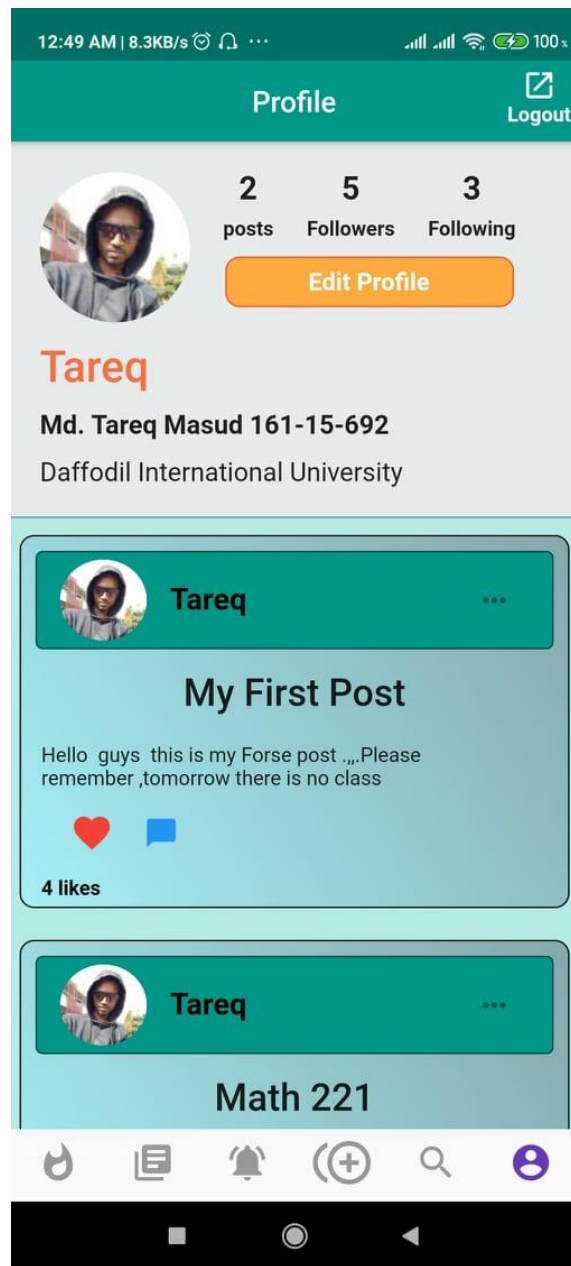


Figure: 4.10.14: My Profile

Figure 4.10.14 is Profile page. On the profile page the user can see the number of his posts, the number of his followers and the number of people he is following and his posts. Here you will see your name and your username and your details. Here is the logout button which you can click to exit from this apps.

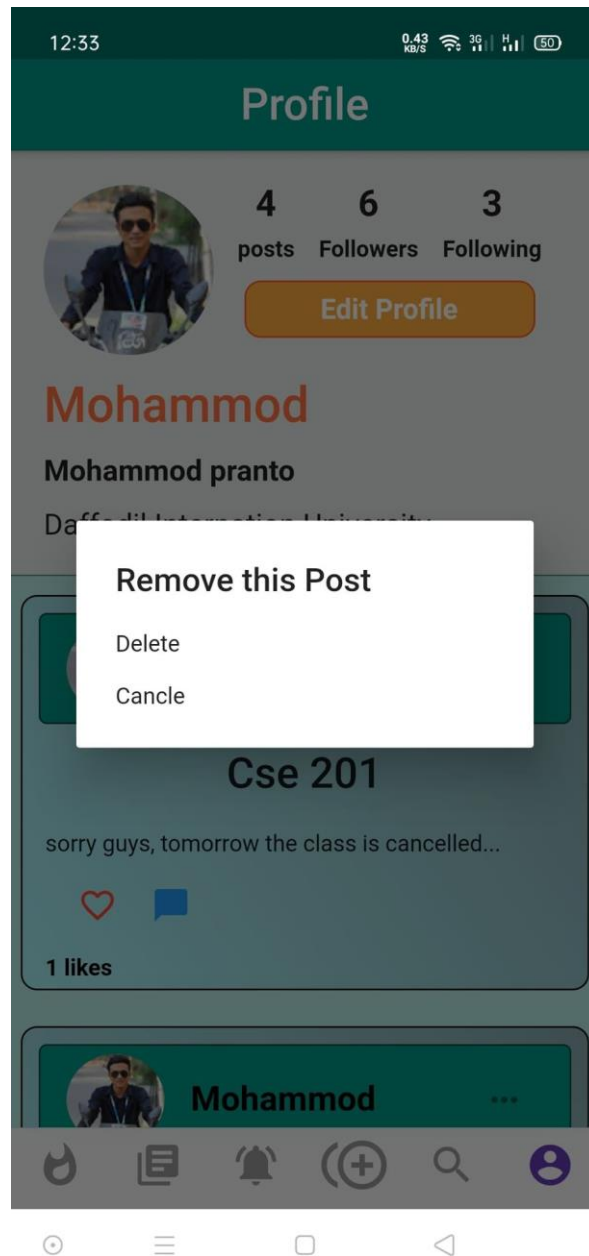


Figure: 4.10.15: Delete Post

Figure 4.10.15 is Profile page. If you want, you can delete your post here and you will be shown this option through a pop-up page.

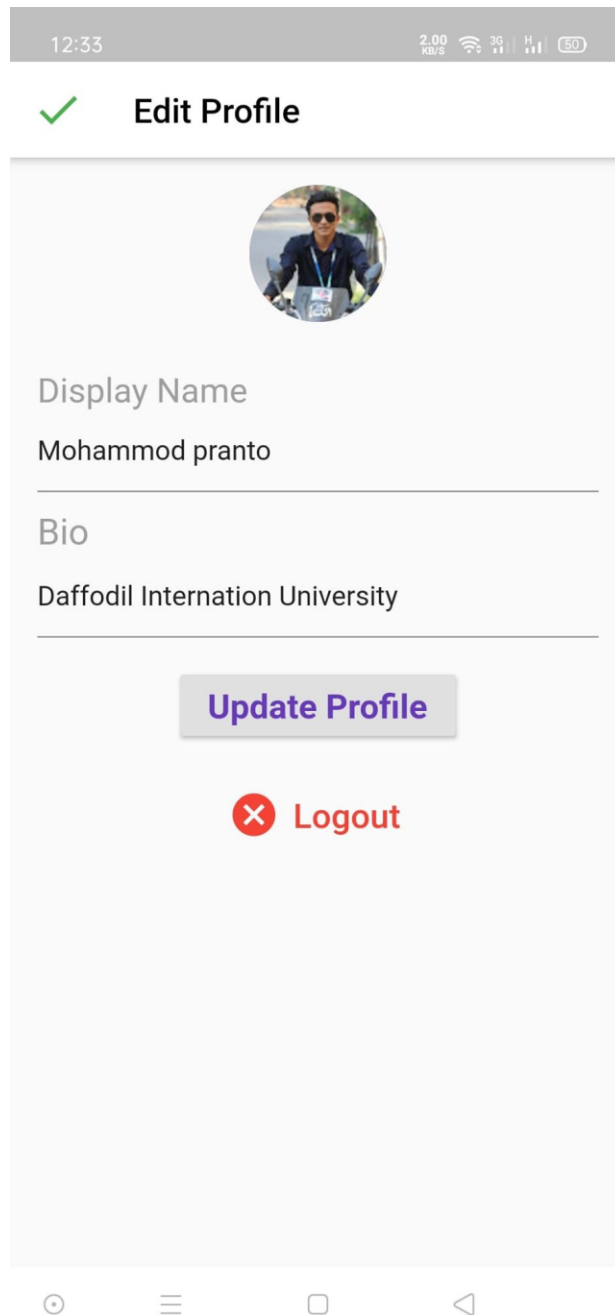


Figure: 4.10.16: Edit Profile

Figure 4.10.16 is Edit Profile page. On this edit profile page you can change your display name and change your bio and upload to your profile by clicking update profile button and here is also the logout button which you can click to exit apps.

CHAPTER 5

Implementation and Testing

5.1 Introduction

The most important part of the Android application is implementation and testing. Another important part of the Android application is developing but not as important as developing is as important as testing. After developing any application, its implementation and testing is required. After implementation and testing, we will be able to publish our application. When a project is completed it must have a purpose for its future implementation. We also plan to implement our apps (Class-To-Do) in the future. At present it's all about narrow features. However, many features will be added in the future. On the other hand implementation never mean that all time include new feature. In the future we will fix the weak ones and then promote the quality of android application. So in the future there will be some options to implement. Otherwise if a user says while using our apps that we need to add something new or we need to change something or change something for their convenience then we may add new features or change our apps for their convenience. At last user really found a proper and better android application for android device.

5.2 How it works

The testing period will begin after the implementation is complete. Many system tests are required during developing. For “Class-To-Do” when we came to develop any feature we have tested the feature in the initial phase. We usually continue testing until satisfactory output comes. Although it took a lot of time from us but finally we were able to develop the system. Usually testing and implementation are opposite to each other. If any case the testing period is failed then further implementation is started. Many times we did not get our expected results then we collected information on that subject and doing research on that subject and after recharging all the reasons why it did not happen and why it did not work and how it happened then try to solve this from own. But when we can't solve a problem on our own, we are getting help from our older brothers and our experts on the subject and that's why we have been able to complete our project 100%.

5.3 Goals of “Class-To-Do”

The main reason behind creating these apps is that we want students to get good results. Nowadays most of the students cannot remember these during their exams during their classes, due to which they cannot attend their classes at the right time, cannot take their exam preparations, cannot join their classes properly, due to which their exam results are bad maximum time. But if a student uses our apps then he will be able to do his classes at the right time and he will be able to prepare his exam at the right time and give the exams at the right time so that his result will be much better than before. Also using our apps they will be able to share any information with each other in these apps and anyone will be able to collect that information and accordingly they will be able to prepare for class work. So after completing our project we are sure that it can fulfil our goals.

5.4 Testing

Testing is a very important part of any Android application. Before publishing any Android application must be tested. First we must have checked all the feature is working or not, all data are has been checked so that user may not deliver any unnecessary data. Then we have to check whether our expected result is coming or not. If the expected output has come than ok, but otherwise we need to detect bug and start testing again. Another important part of the Android application is verification and validation. Any user logging in to our apps will have their valid e-mail will be accepted and their valid password will be accepted.

5.5 Automate user interface test

The user interface ensures that our Android application meets its functional requirements and achieves a high quality standard. Then the user can use our application in a very friendly way. We know that many people in the world use different versions of Android and there are many people who use iOS, which is why we are developing our apps in Flutter so that iOS users and Android users can use our apps.

5.6 Test UI Performance

The user interface of any application is more important than any other component. The user interface is more important than the backend. The first time a user notices the user interface when viewing an application, they check the backend of the app if they like the user

interface. That's why we are using the most updated version of our “Class to Do” apps and we have tried to make the user interface user friendly so that users can use our apps. We hope it will be a very good application for students.

5.7 Security Testing

Security is one of the biggest issues in any Android application. Because of the lack of security, people are losing their own data and personal information due to using many Android applications and are being harassed. So before creating any Android application, we should keep the security issue in mind. In “Class-To-Do” we used firebase database. All our data is saved in Firebase's database. Firebase database is a product of Google. Google will be responsible if any data is lost or stolen from Firebase. We now know that Firebase is more secure than other databases, so we did nothing for extra security.

5.8 System Testing

Our app may not install in every device and it may found some bug. So testing methods can solve all these problems. The system testing of our project gone through 3 steps .UI testing, Integration testing and the Unit testing.

CHAPTER 6

Conclusion and Future Work

6.1 Conclusion

'Class-To-Do' is such kind of app which actually makes students daily study problem easier by alert. With our apps, students can keep in touch with themselves and share with each other any kind of class information that other students can see and benefit from and do their class work in a timely manner. Now that students are all dependent on technology, we think that these apps will play a significant role in improving their learning. One of the biggest problems today is Covid-19 which is why most of the students are now sitting at home and now a big solution to this problem is that many students today and many universities are able to continue their studies at the right pace through technology so I think our apps are important in the current situation will play a role. Our application is easy to use. The UI of our application is designed in such a way that the user can easily control the app.

6.2 Future Implementation and Limitation

Our app is still in its infancy. A lot of work needs to be done here if we want to upload it to the Google Play Store for business purposes. Some future plans are given below:

- Reminders will be added and we will be notified via notification
- We will bring some new features and upgrade gradually.
- The application will be valid for all school college varsity students.
- Tasks can be added specifically

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APPENDIX

We have embarked on this journey to create an online mobile application for all students for a true experience. We followed some models to complete our project with the help of Google, researching our application and getting help from our respective teachers. Undoubtedly it will be a very helpful process in terms of communication between students. We have all tried to build good relationships with our classmates. Here students will be able to follow and un-follow each other if they want, which will help them to get important updates.

In the end, we make sure that our "**Class-To-Do**" becomes an effective and helpful application for all students. We will come up with new features and upgrade the whole system day by day.

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