

DIU Routine Manager: An Android Application

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

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APPROVAL

This Project titled “**DIU Routine Manager: An Android Application**”, submitted by ALI ASHRAF MUNNA, Tofayel Ahmed and Shakib Hasan Rial to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 02-06-2021.

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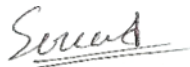
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We hereby declare that, this project has been done by us under the supervision of **Ms. Afsara Tasneem Misha, Lecturer, Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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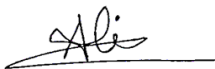
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ABSTRACT

DIU Routine Manager is an Android application. This application can be used to view, modify and control the both class routine and exam routine. Also This application can be used to view, modify and control the class and room information. Users can see the empty room easily through this application. There are mainly three types of user can be used this application. First user is teacher who can view the class routine and exam routine of the running semester. A teacher is able to create a profile and update profile if needed. Second user which is student who can view the class and exam routine of the running semester. A student is able to create a profile and update profile if needed. Teachers and Students able to view empty rooms in a specific time. All teachers and students can view their all-class routine by clicking the custom search option. Last and most important user admin who will control the whole routine and room information. We make an another application for Admin. Admin can input all the class and exam routine information. Admin can see all the class room information. Admin can send a notification message which both students and teachers can see. Tight security is applied so other can't interfere with the functionalities. Everything is customizable and controllable from mobile. We believe that this application will make our teachers and students life more easier.

TABLE OF CONTENTS

CONTENTS	PAGE
Board of Examiners	ii
Declaration	iv
Acknowledgement	vi
Abstract	vii
CHAPTER 1: Introduction	1-2
1.1 Introduction	1
1.2 Motivation	1
1.3 Objective	1
1.4 Expected Outcome	2
1.6 Methodology	2
1.6 Organization of the Report	2
CHAPTER 2: Background	3-4
2.1 Preliminaries.....	3
2.2 Related Work.....	3
2.3 Comparative Studies	3
2.4 Scope of the problem.....	4
2.5 Challenges	4
CHAPTER 3: Requirement Specification	5-8
3.1 Business Processing Modeling.....	5
3.2 Use Case Modeling	7
3.3 Data Flow Diagram Model.....	8
3.4 Flow Chart.....	8
CHAPTER 4: Design Specification	10-10
4.1 Front-end Design.....	10
4.2 Back-end Design	10
	viii

4.3 Requirements Implementation	10
CHAPTER 5: Implementation and Testing	11-27
5.1 Implementation of Database.....	11
5.2 Implementation of Authentication System.....	15
5.3 Implementation of Front-End Design	16
5.3 Testing of the Implementation	27
CHAPTER 6: Impact on Society, Environment and Sustainability	28-29
6.1 Impact on Society.....	28
6.2 Impact on Environment.....	28
6.3 Ethical Aspects.....	29
6.4 Sustainability Plan.....	29
CHAPTER 7: Conclusion	30-30
7.1 Discussion and Conclusion	30
7.2 Scope for Further Developments.....	30
APPENDIX: PROJECT REFLECTION:	32
REFERENCE	33
ORIGINALITY REPORT	34
FIGURE LIST	
FIGURES:	
Figure 3.1.1: Business Processing Model for Admin.	5
Figure 3.1.1: Business Processing Model for Users.	6
Figure 3.2.1: Use case modeling of this application.	7
Figure 3.3.1: Data Flow Diagram for this application.	8
Figure 3.4.1: User’s Flow chat.	9
Figure 3.4.2: Admin Flow Chart.	9
Figure 5.1.1 Realtime Database	11
Figure 5.1.2: Realtime database for user of a student	12
	ix

Figure 5.1.3: Realtime database for another user of a teacher.	12
Figure 5.1.4: Realtime database for Teacher Exam Routine	13
Figure 5.1.5: Realtime database for Notification	13
Figure 5.1.6: Realtime database for Empty Rooms.	14
Figure 5.1.7: Realtime database for Classes.	14
Figure 5.1.8: Realtime database for Student Exam Routine	15
Figure 5.2.1: Firebase Authentication.	15
Figure 5.3.1: Login and email verify	16
Figure 5.3.2: User's information for registration	17
Figure 5.3.3: Class Routine of both student and teacher respectively.	18
Figure 5.3.4: Navigation Bar for users.	19
Figure: 5.3.5 exam routine for student.	20
Figure 5.3.6 exam routine for teachers.	21
Figure 5.3.7 profile of both teacher and student respectively.	22
Figure: 5.3.8 profile update both for teacher and student respectively.	23
Figure 5.3.9: Empty rooms.	24
Figure 5.3.11: Notification	25
Figure 5.3.12: About Page.	26
Figure 5.3.1: Unit Testing.	27

CHAPTER 1

INTRODUCTION

1.1 Introduction

'DIU Routine Manager' is the Android application that can also help student and teacher both. There are many application. But In one app both exam routine and class routine in still not. So In Daffodil International University have class routine manager application but exam seat plan and class routine both in one application still not. That's why we develop this 'DIU Routine Manager' android application. This app really help student and teacher both. In our university if students wants their exam seat plan or exam routine they have to download pdf in our university website and find their exam seat plan in pdf with their course code and exam routine also .So this is difficult for students and wastes a lot of time. And on the other hand teachers can also easily see their examination guard in which room and the specific time through this application. All of those cases our app is very helpful for students and teachers. This app in not only display the exam seat plan for students and teachers but also class routine for both students and teachers. So we can believe that this application easily help the life of students and teachers of our university.

1.2 Motivation

There is a no android application system managing both exam seat plan or exam routine and class routine for Daffodil International University where the students and teachers both can access easily. We integrated our application highly secured ERP and only the registered users can access the data.

1.3 Objective

Our application main objective is the students can view their exam seat plan and their class routine and the teachers can view their exam guard room and see their class in which room with the specific time. So we want to help the students and teachers for this application. Our 'DIU Routine Manager' app will help the students to find their examination seat plan and classroom and it also will help the teachers to find their examination guard room and class schedule.

1.4 Expected Outcome

The predictable outcome of our project is conservative and forward. It will help the students to find their exam seat plan and classroom schedule in the right time. For teachers it will helps them to find their exam guard room and class schedule. This app is in the primary period so much more development is really required to ensure the security.

1.6 Methodology

Our '**DIU Routine Manager**' project is android based application. Users must need to download this application. You have run this android application an android operated system mobile. In this project we have used firebase as our database. We can make sure that our database is secure and only the registered users can access the data while registration users has to provide their right information for registration or sign up. When successfully registration or sign up is complete then users can access the data. In this application we developed the interface for the users is a very simple and the UI can be more user friendly and easy to use for all types of user.

1.6 Organization of the Report

The report contains 7 chapters. In chapter 1 the intro, methodology and project objective has described. In chapter 2 we have described about the background of the system. How the whole system is actually gone through in this chapter we have described. Chapter 3 & 4 contains the requirement and design specification of this application. It also contains the feature of firebase and the admin panel information. In chapter 5 the whole project structure and the final output has been described. It also contains the system test and the result of the project. Chapter 6 & 7 we have described the impact of this application and conclusion of the application. Also we have described the future work of the application.

CHAPTER 2

BACKGROUND

2.1 Preliminaries

Our university publishes the examination seat plan and class routine manually. So that students have many problems to find their examination seat plan and class schedule. Because students are download pdf file in university website and search through a large list in a pdf file to find their exam seat plan and same way they can find their class routine. Then they can write this routine somewhere if it loses then students again download pdf and rewrite it. On the other side the teachers can have same problem and various other issues to find their examination hall and classes schedule. We will be preparation for solving both students and teachers problems and make a study related works and make sure that we can deliver the best service by our project.

2.2 Related Work

On the internet, there are numerous routine related projects. However the issue is that they are not qualified to address the problems at our university. If one feature is present another is absent. So this types of application is not for our university. And there was only one project created especially for our university students. However there is a problem and that it is lack of a large number of features.

However, in our project they can see both the classes schedule and the examination seating plan in one android program. AS a result, our mission is to develop a new application to assist students and teachers.

2.3 Comparative Studies

The other related project, which was created for our university students is lacking in functionality, as it only supports showing the routine. It has not related to showing the exam seating schedule. Also teachers the same problem they can only see their own class routines. There is no option for examination routine. As a result our application will address all of the problems that other projects miss. Occasionally an application will not accept all the users. As a result we built our project on the android platform. Android is now the most

widely used operating system on the planet. So our application is easily access students and teachers. Our application is user friendly and very helpful for all. As a result everyone can easily use our application.

2.4 Scope of the problem

Our main goal is to improve the system. For our university students and teachers, our application will solve the issue of class routine and exam seat plan schedule routine. The project is initially aimed at the Computer Science and Engineering department. On the other hand, the database would be structured in such way that It can be easily update and it should be made available for other departments.

2.5 Challenges

- Any challenge in developing the DIU Routine Manager application was to provide users with a safe and user-friendly environment.
- The admin must decide that a user will be granted access or not.
- Admin is responsible for maintaining the entire database and preventing unauthorized access.
- Then each post is shown to everyone individually.

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Business Processing Modeling

Business processing model is a model that helps to improvement of an organizations business process. The following figure 3.1.1 & 3.1.2 shows the Business Processing Model of our application.

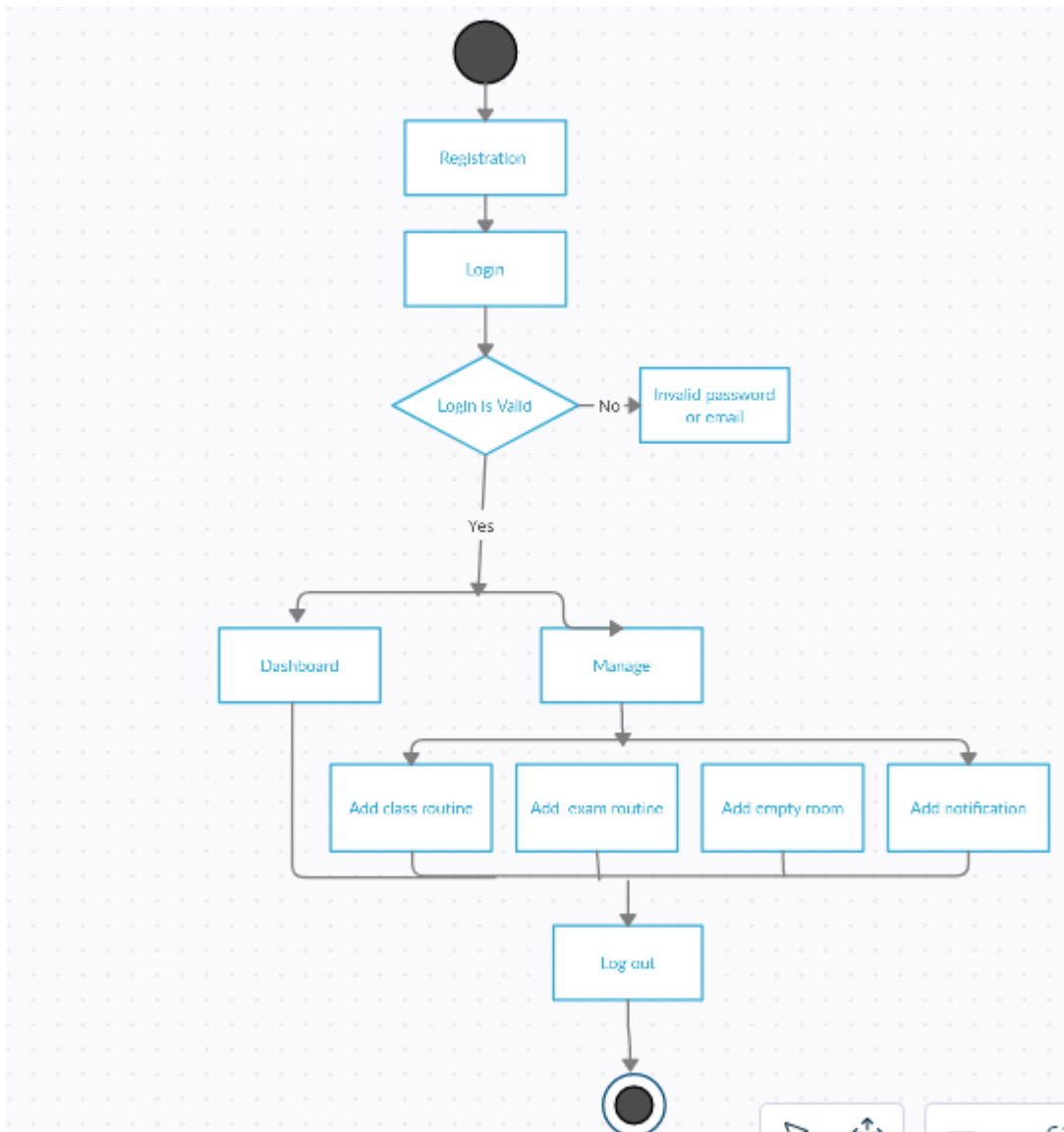


Figure 3.1.1: Business Processing Model for Admin.

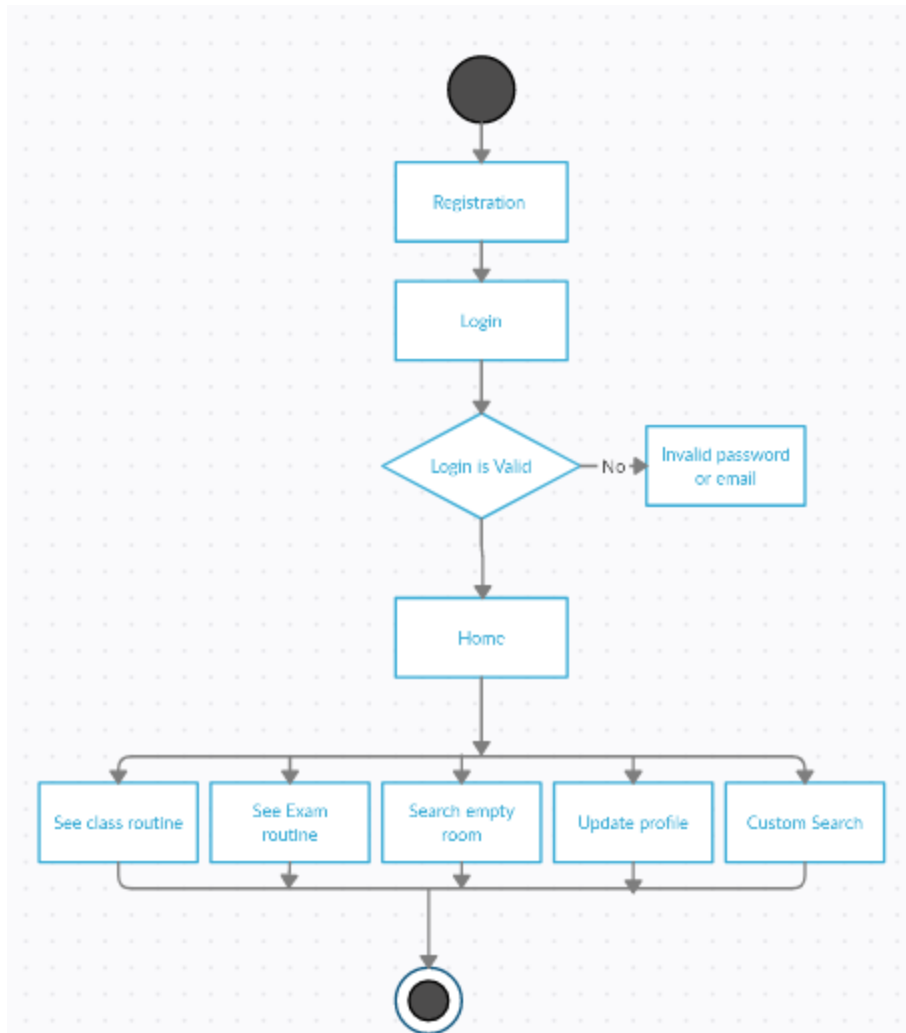


Figure 3.1.1: Business Processing Model for Users.

3.2 Use Case Modeling

Use Case Modeling provides a graphical representation of the software system's requirements [1]. Different types of users are identified of a system by using use case modeling. Figure 3.2.1 shows the Use case modeling of our application.

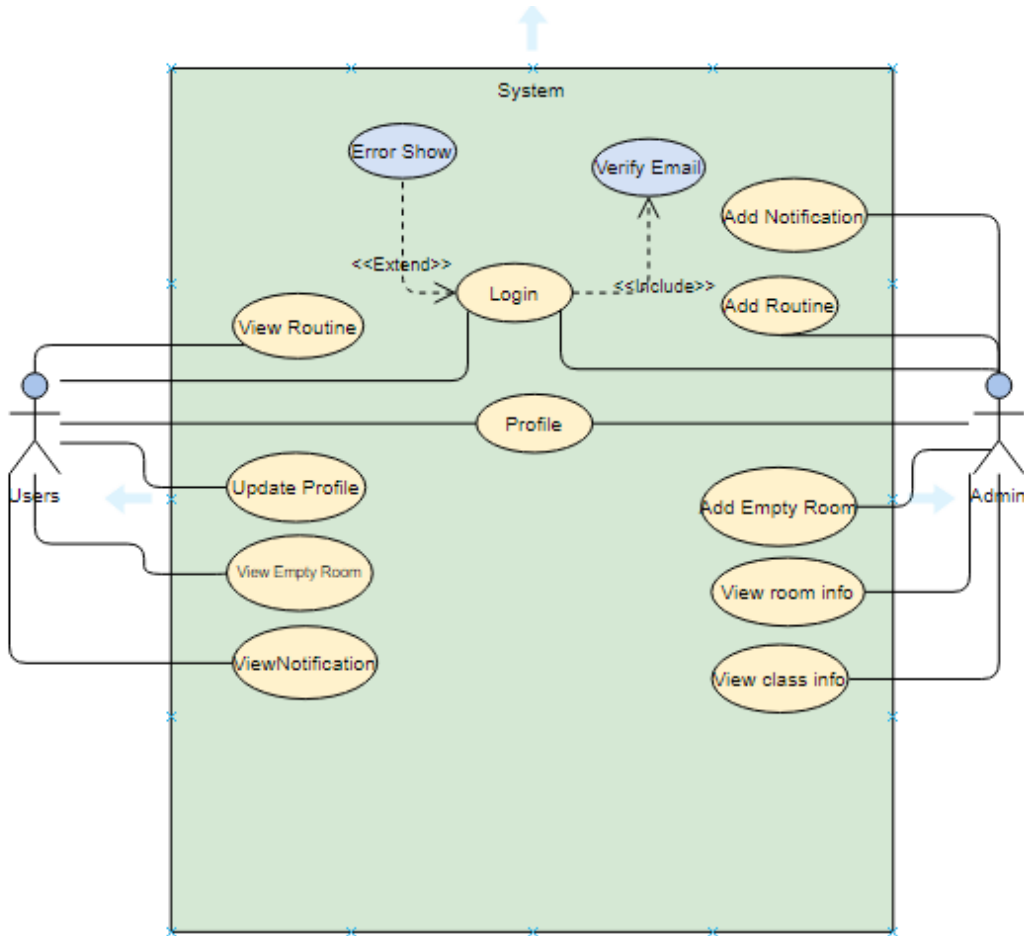


Figure 3.2.1: Use case modeling of this application.

3.3 Data Flow Diagram Model

A data-flow diagram is a way of representing a flow of data through a process or a system [2]. In our application DFD shows what kinds of data input in our system and what kind of data output from our system and also where the system data will be stored. The following figure 3.3.1 shows DFD of our application.

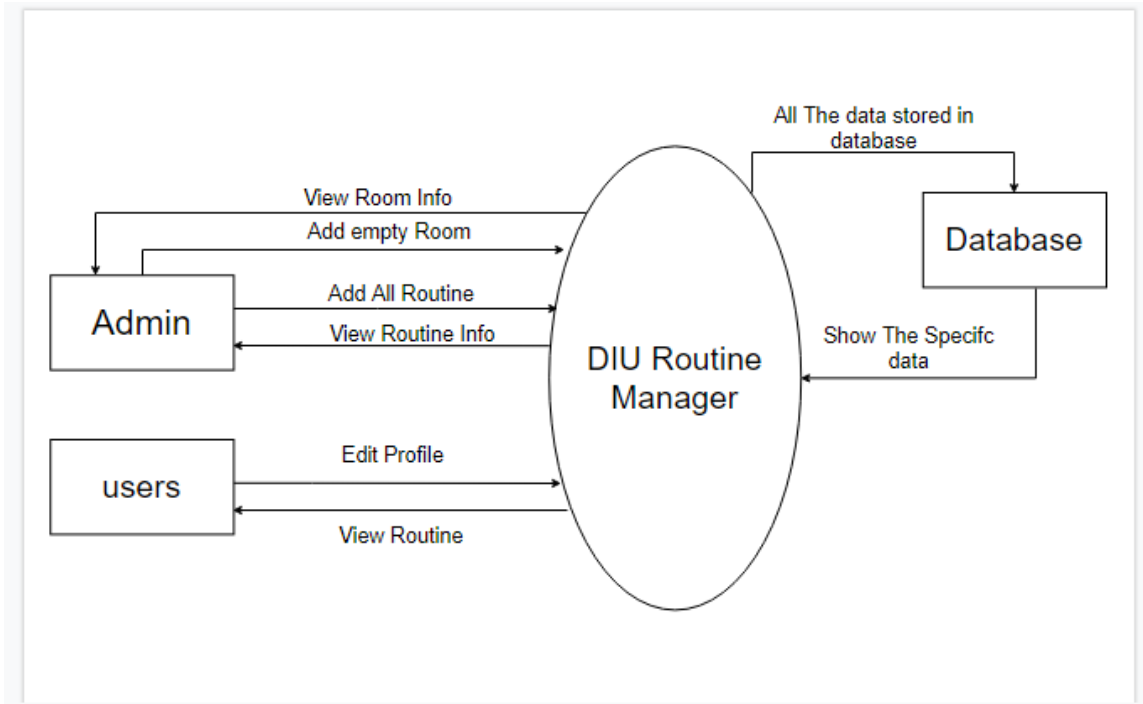


Figure 3.3.1: Data Flow Diagram for this application.

3.4 Flow Chart

The flow chart of our application are described by figure 3.4.1 & 3.4.2.

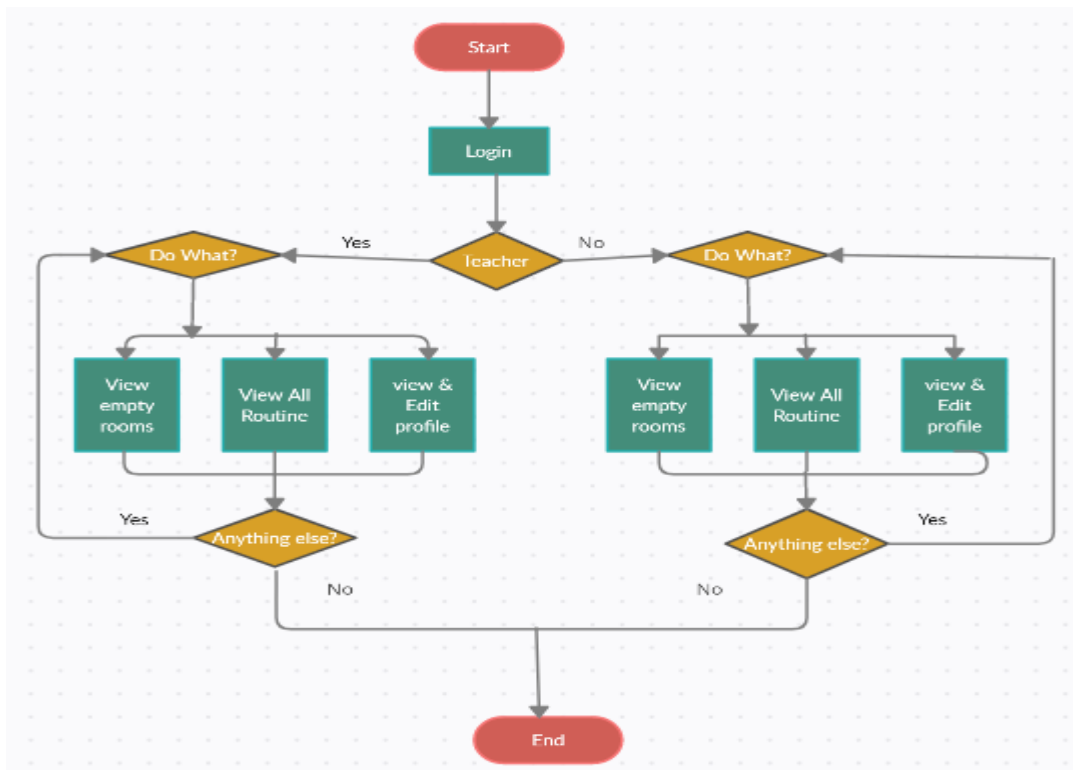


Figure 3.4.1: User's Flow chat.

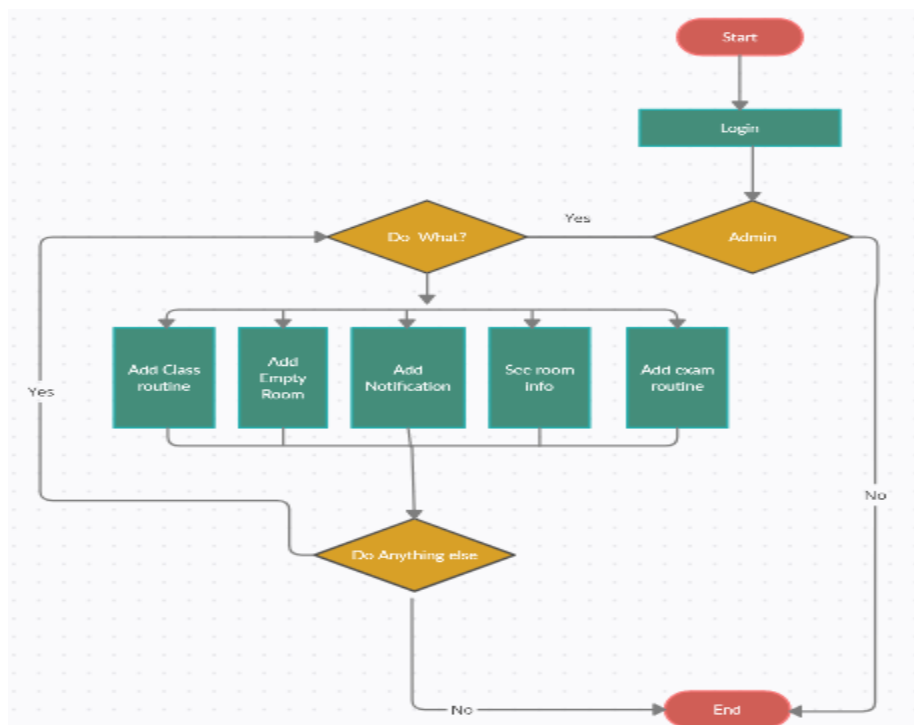


Figure 3.4.2: Admin Flow Chart.

CHAPTER 4

DESIGN SPECIFICATION

4.1 Front-end Design

For front-end design, we have used XML design of our application. We have created a simple interface for our users. That's why our users can easily use this application. We have created different option our users. We have created class routine, exam routine, notification, empty room option. We are try to make a simple and beautiful interface that's why our users and admin can easily use this and beneficial from this application.

4.2 Back-end Design

For back-end design we are using Java language. Java is one of the top programming language in the world. Using java language, we have created different packages of our background design. We also use real time firebase database, firebase authentication use for verification of email when user's registration of our application. We are using firebase real time database that's why admin can change data the anytime from database. This project has lots of feature. Users and admin can easily use this application.

4.3 Requirements Implementation

- Realtime firebase
- Firebase Authentication
- Android Studio

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation of Database

Our database is implemented in a very efficient way that is able to handle multiple requests simultaneously. We have used Realtime Firebase database which is most popular and secure database management system. We can easily modified our database if we need because it is open source. Firebase database is google mobile application development platform that's why administration of our database can be securely handled by using this database. All the information of our application will be stored here including all class information and user's details.

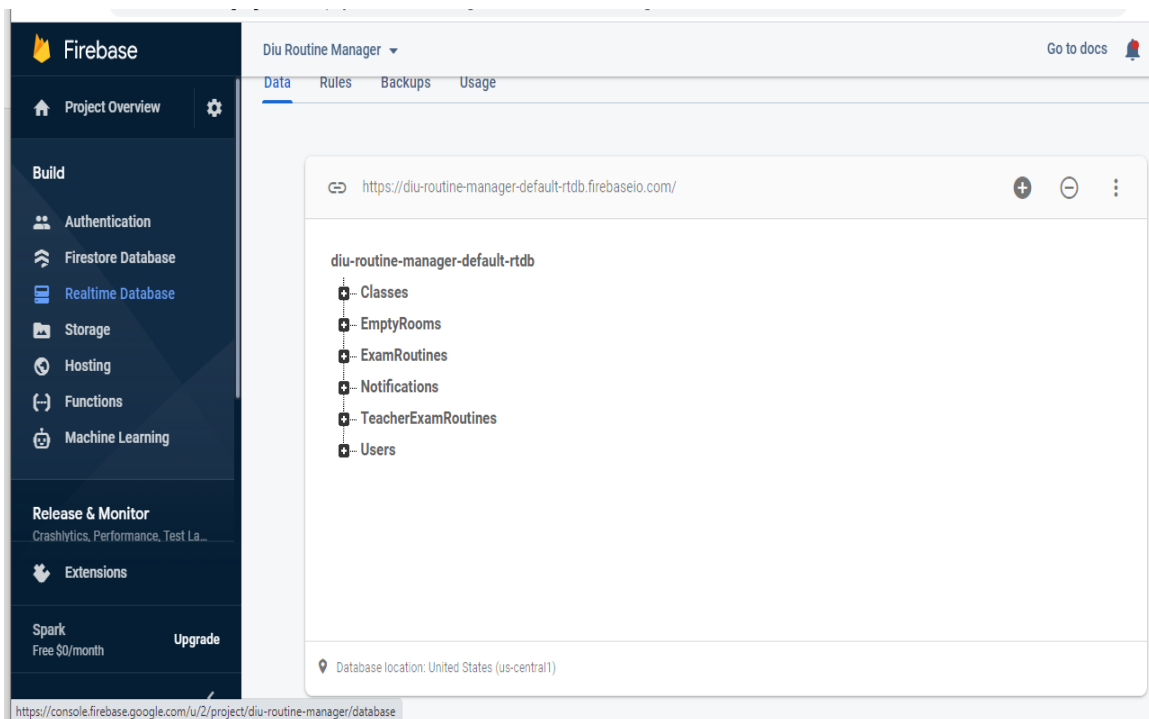


Figure 5.1.1 Realtime Database

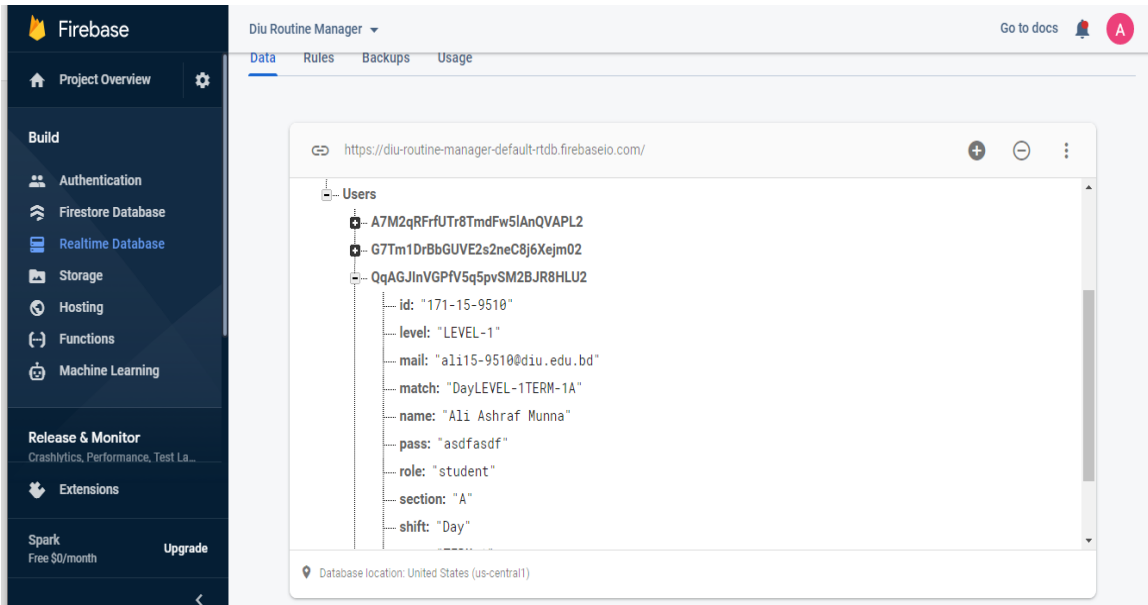


Figure 5.1.2: Realtime database for user of a student

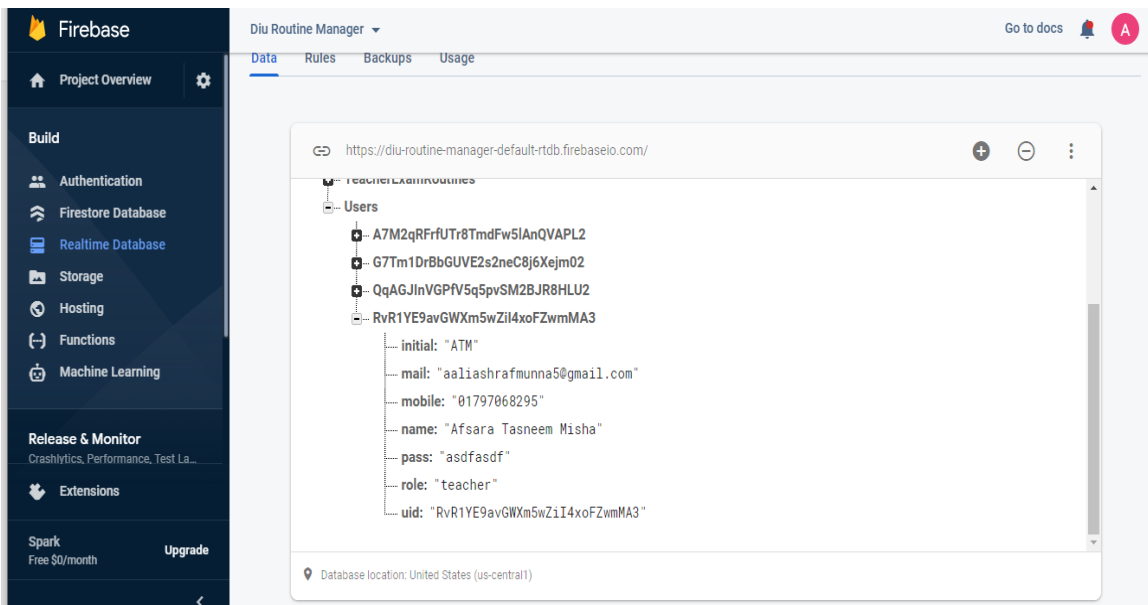


Figure 5.1.3: Realtime database for another user of a teacher.

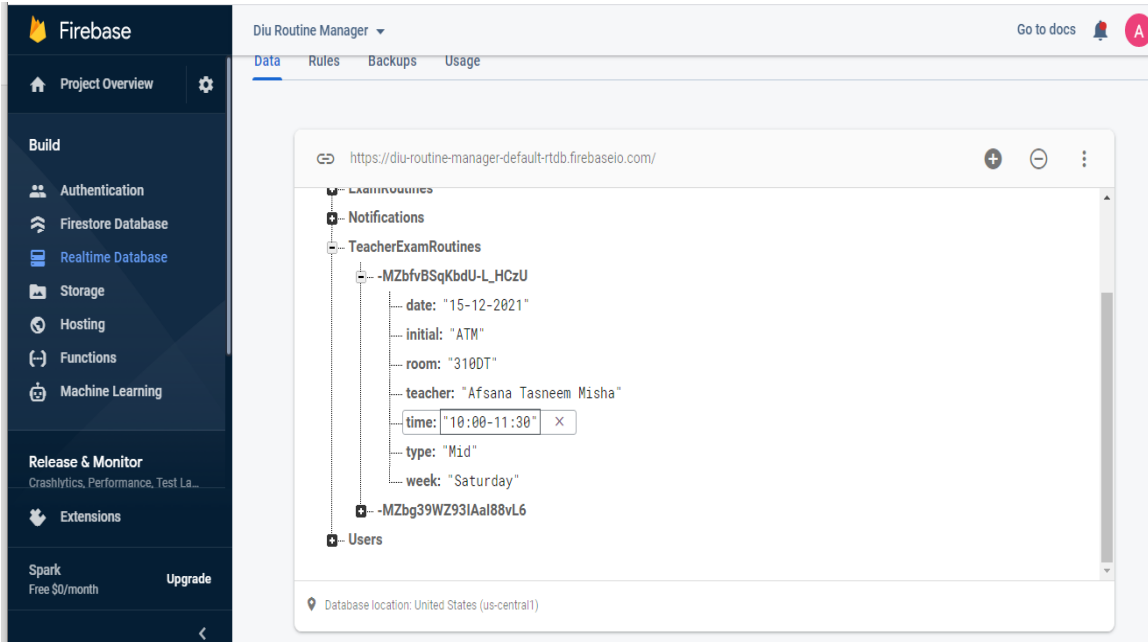


Figure 5.1.4: Realtime database for Teacher Exam Routine

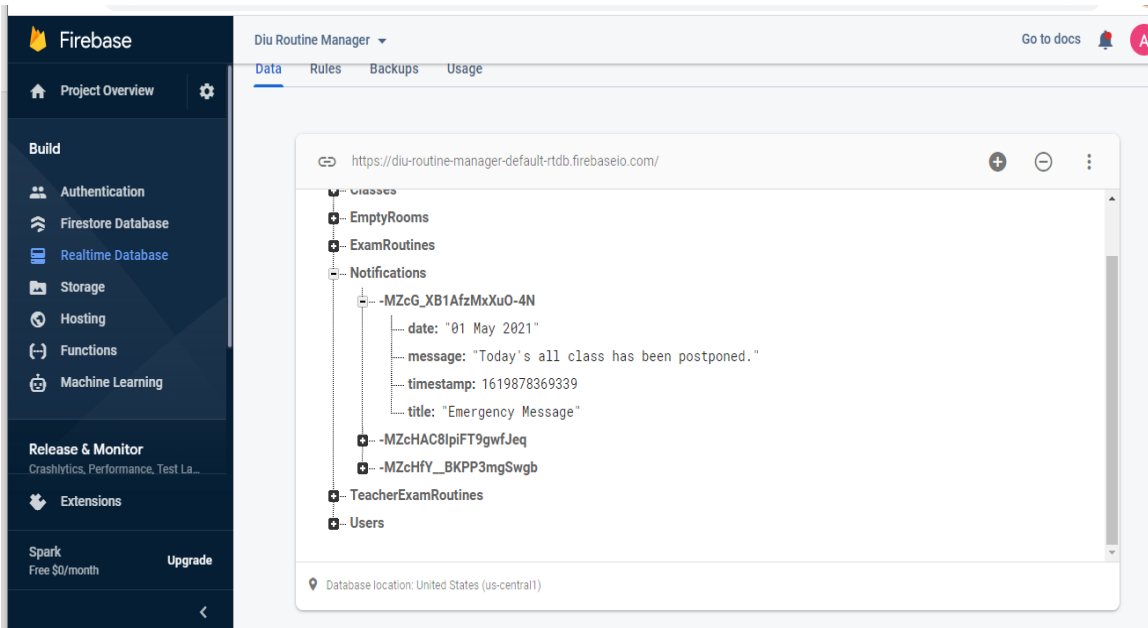


Figure 5.1.5: Realtime database for Notification

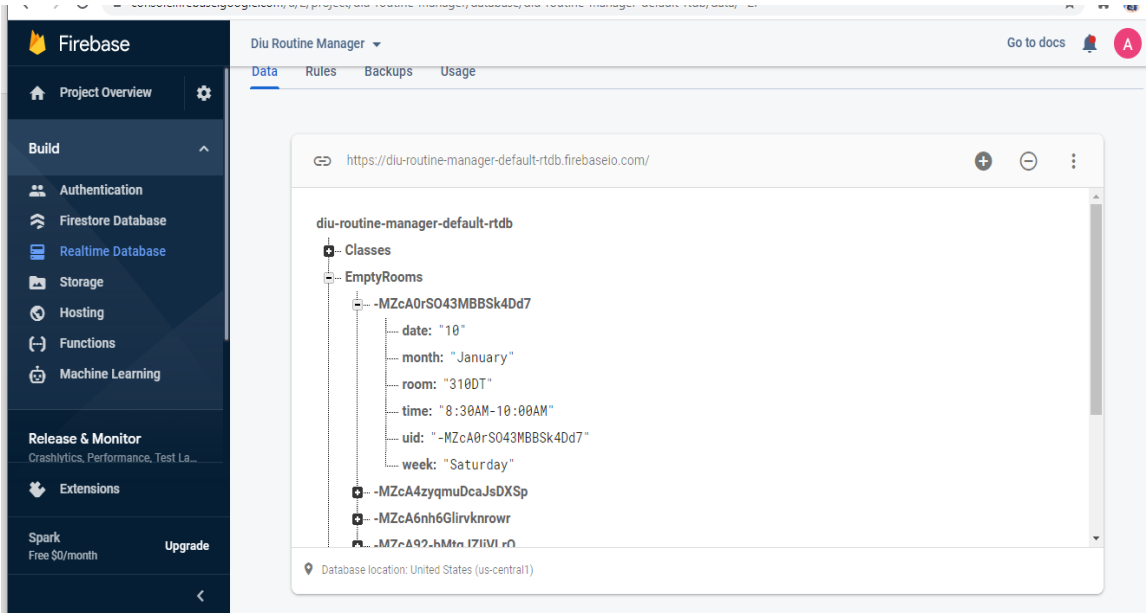


Figure 5.1.6: Realtime database for Empty Rooms.

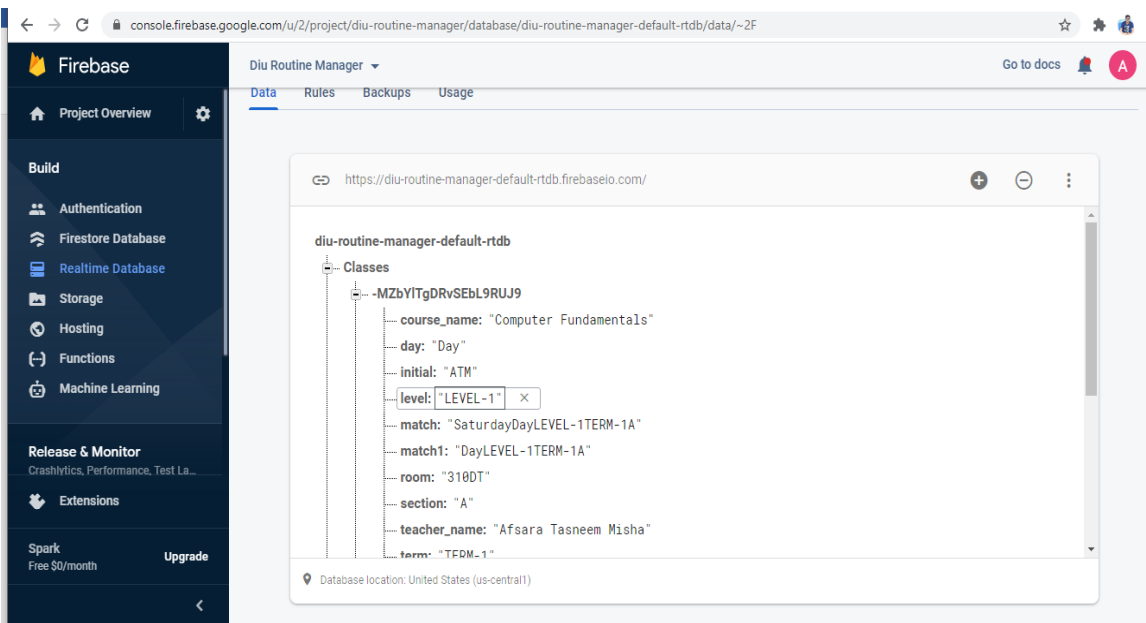


Figure 5.1.7: Realtime database for Classes.

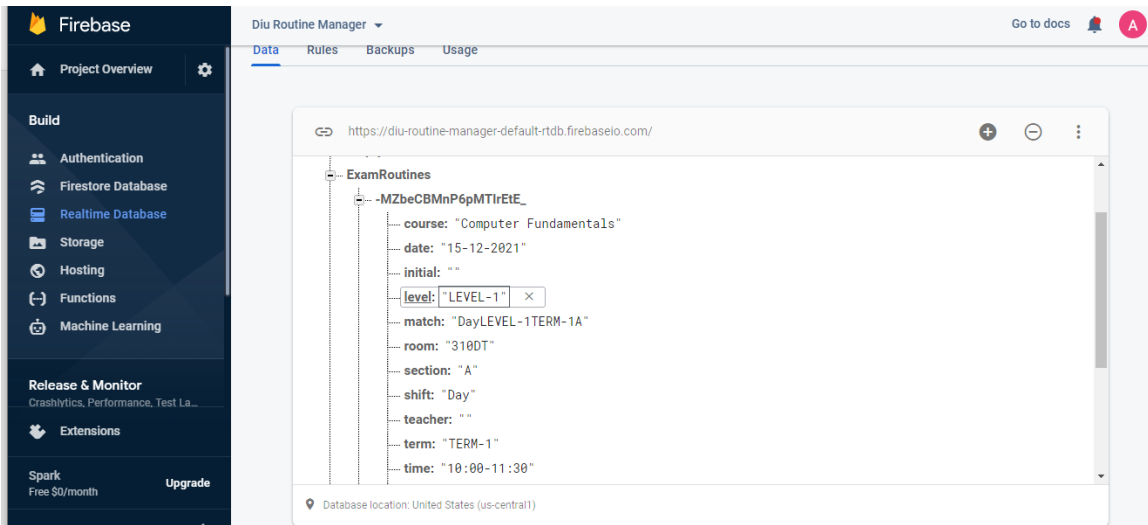


Figure 5.1.8: Realtime database for Student Exam Routine

5.2 Implementation of Authentication System

For authentication, we have used Firebase authentication system. Because it is also a real-time authentication system. We have used email sign in authentication through the firebase authentication system in this application. That's why user need to verify their email.

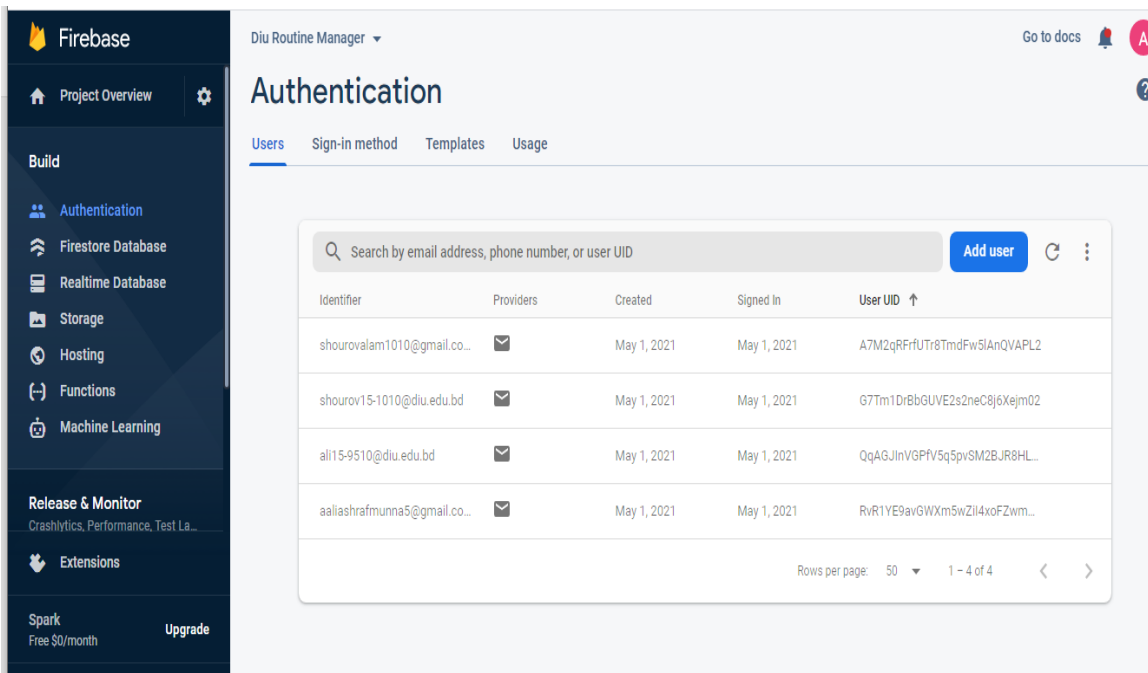


Figure 5.2.1: Firebase Authentication.

5.3 Implementation of Front-End Design

UI of our android application includes routine, user information, admin panel, search activity etc. are explained below:

Login: This is the first screen that will be show when an user open the application. Teachers and Students must create an account if they want to access this application. After completing their registration they need to verify their email. After verification the email they can login into this application. If anyone registration one time they do not need to registration again. Someone has inserted all the information then they will be redirected to the home screen of the app. Figure 5.3.1 shows Login page and verify email.

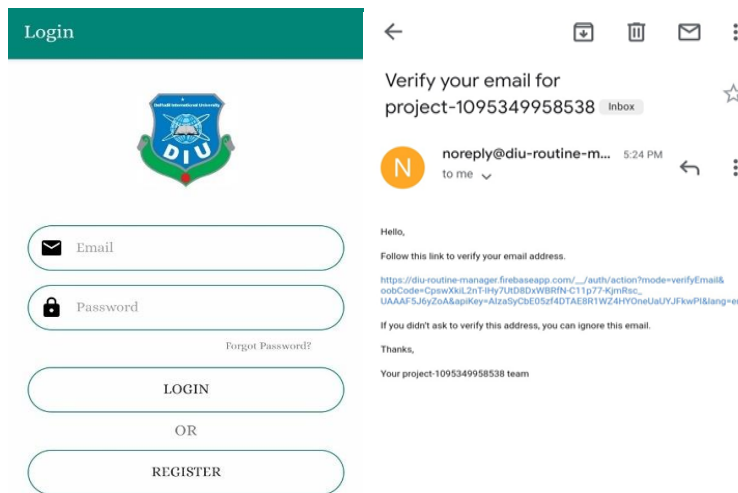


Figure 5.3.1: Login and email verify

Complete Registration Information: Here users must be submitted their all information when they login first time in this application. Because no information of user can't be retrieved from the university server. That's why user must be inserted data manually. 5.3.2 shows page for completing information by a user.

Registration (Teacher)	Registration (Student)
Enter Mail	Enter Mail
Enter password	Enter password
Enter name	Enter name
Enter initial name	Enter ID
Enter Mobile No.	LEVEL-1 TERM-1
	Day A
SAVE	SAVE

Figure 5.3.2: User's information for registration

Class Routine: After login, user can see the main screen of this application. Here users can see their class routine that is designed in day-by-day basis. User can see the class routine in which day and schedule of the class. 5.3.3 shows class routine both students and teachers.

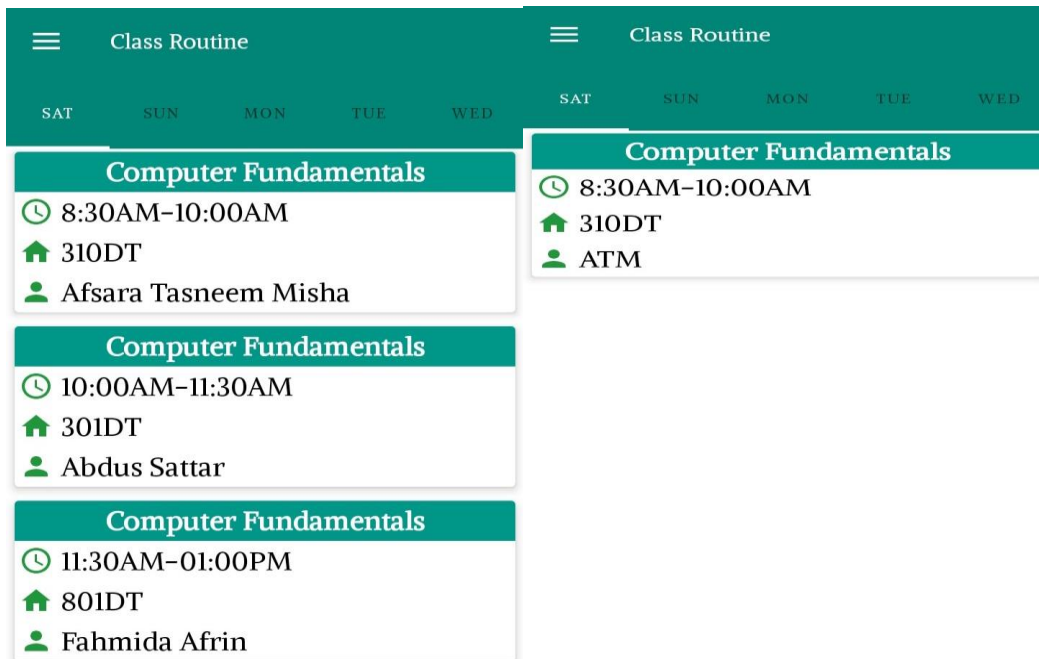


Figure 5.3.3: Class Routine of both student and teacher respectively.

Navigation Drawer: On the left top corner of the application we can able to see a navigation bar. Click on the navigation bar then open a drawer which will show the different types of feature of the application. In this application all users will see the same features. 5.3.4 shows navigation drawer for all users.

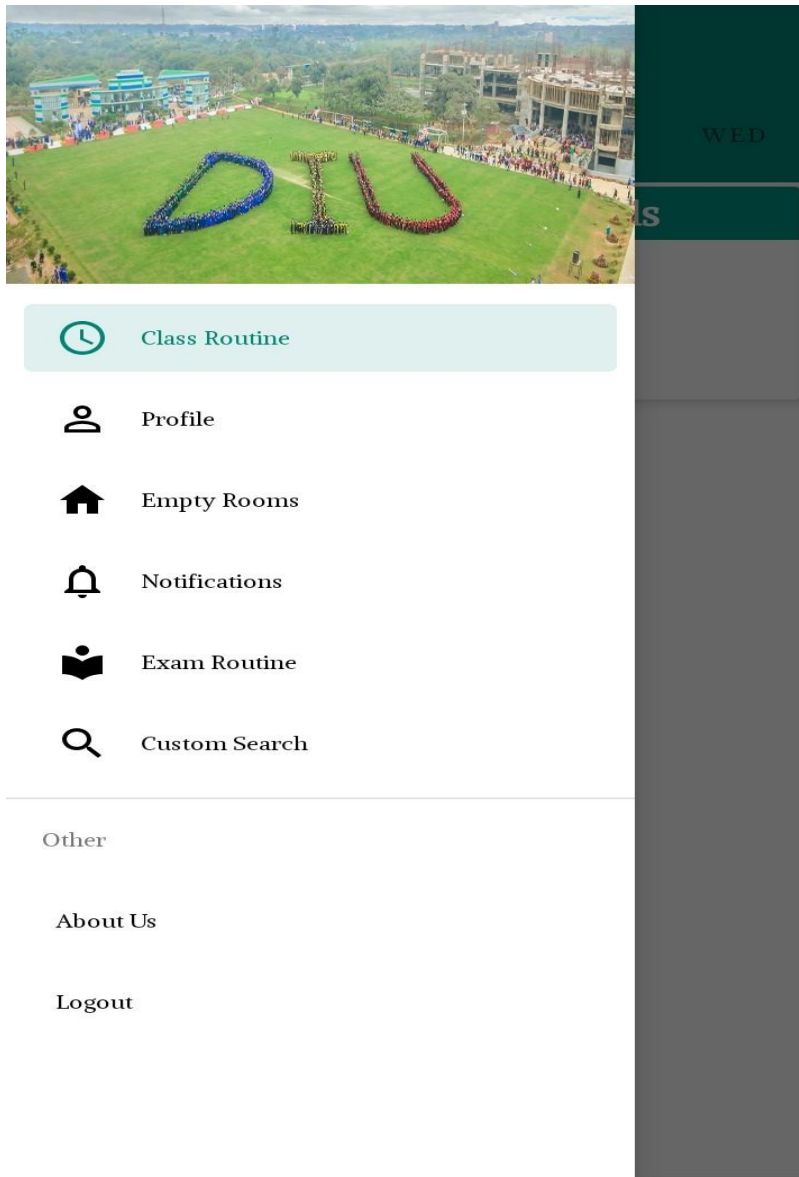


Figure 5.3.4: Navigation Bar for users.

Exam Routine: After clicking the navigation drawer students and teachers can see the exam routine option. Here student can easily find their room number where their exam seat are given. And also can see the exam time and date. 5.2.5 shows the exam routine for student.

Exam Routine

● LEVEL-1 ● TERM-1
 ☀ Day 📌 A

Computer Fundamentals

📅 15-12-2021 📌 Mid
 🕒 10:00-11:30 📅 Saturday
 🏠 310DT

Mathematics-I: Differential and Integral Calculus

📅 17-12-2021 📌 Mid
 🕒 2:30-4:00 📅 Sunday
 🏠 310DT

Mathematics-I: Differential and Integral Calculus

📅 17-01-2022 📌 Final
 🕒 11:30-1:00 📅 Sunday
 🏠 801DT

Basic Functional English and English Spoken

📅 19-01-2022 📌 Final
 🕒 11:30-1:00 📅 Wednesday
 🏠 810DT

Figure: 5.3.5 exam routine for student.

And in the teacher exam routine, teacher can easily see which room and when they have exam duty.



Figure 5.3.6 exam routine for teachers.

Profile: In this application there are mainly three users. Every user have a profile and they will able to see their personal information. Here Teachers have Name, Mobile and Initial while students have Name, ID, Shift, Section, Level and Term. According their profile information's they can see their both class and exam routine. Figure 5.2.7 shows both teacher and student profile.

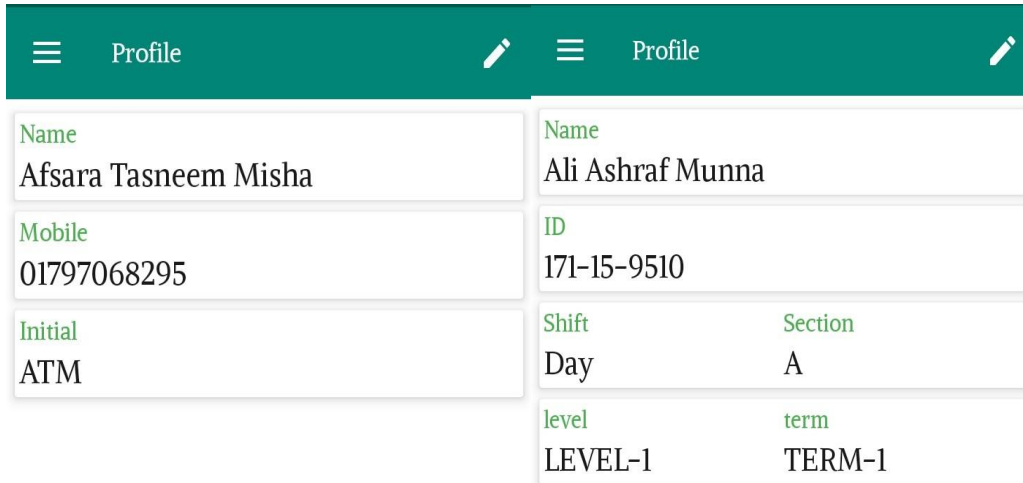


Figure 5.3.7 profile of both teacher and student respectively.

Editing Profile: If any users need to update their profile then they click on the top right pencil icon and they update their profile easily. Teacher can be updated their name, contact and initial. And student can be updated their name, id, section, level and term. Remember that all the routine will be shown according to provided information. Figure 5.2.8 shows update profile UI for teachers and students respectively.

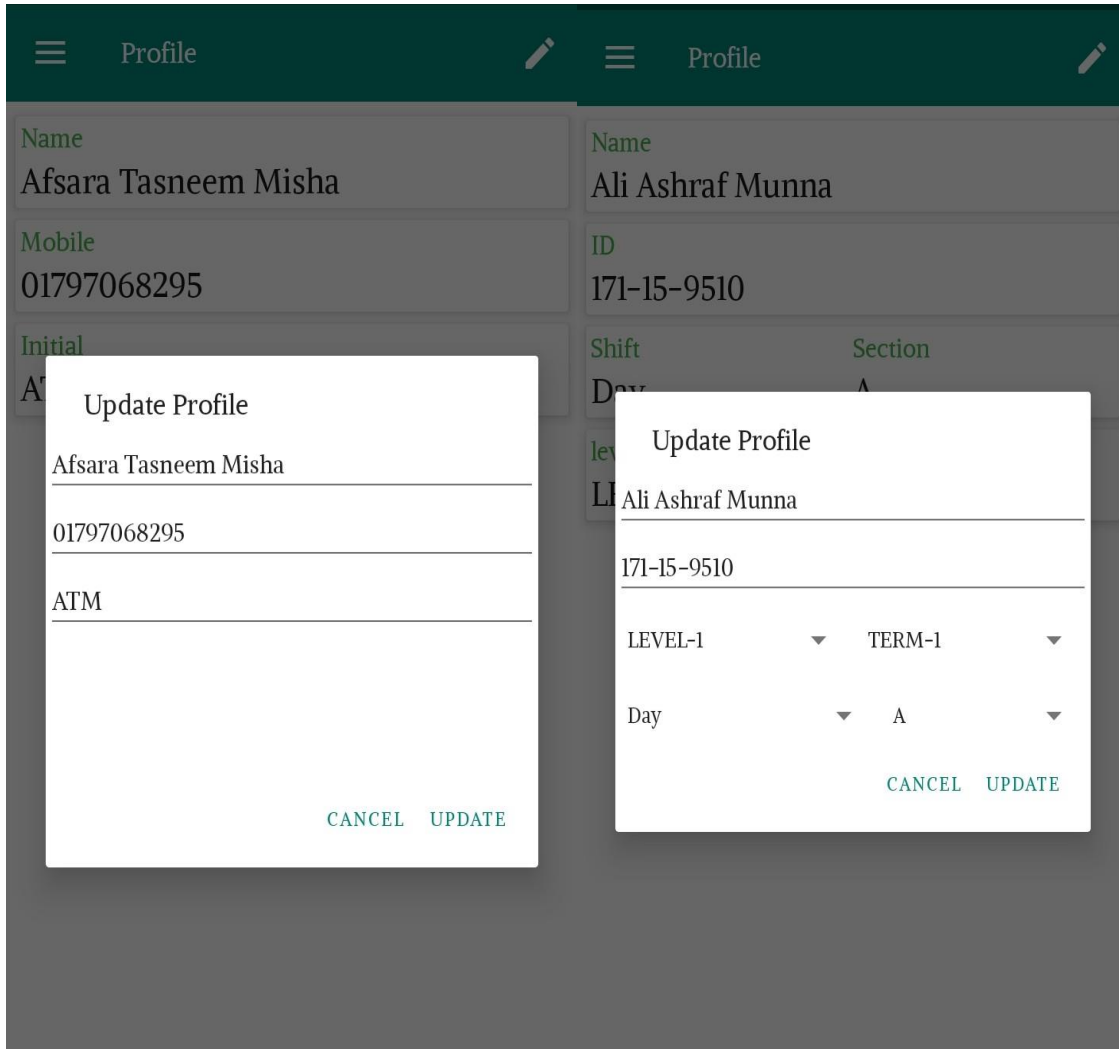


Figure: 5.3.8 profile update both for teacher and student respectively.

Search Empty Room: When we click the navigation bar of this application we can see the “Empty Room” option. If any teacher and student want to see which room is available in a specific time then they need to click the empty room option and choose the day of the week and time then click the search button. Then the empty rooms list will be shown. Figure 5.2.9 shows UI for Empty rooms.

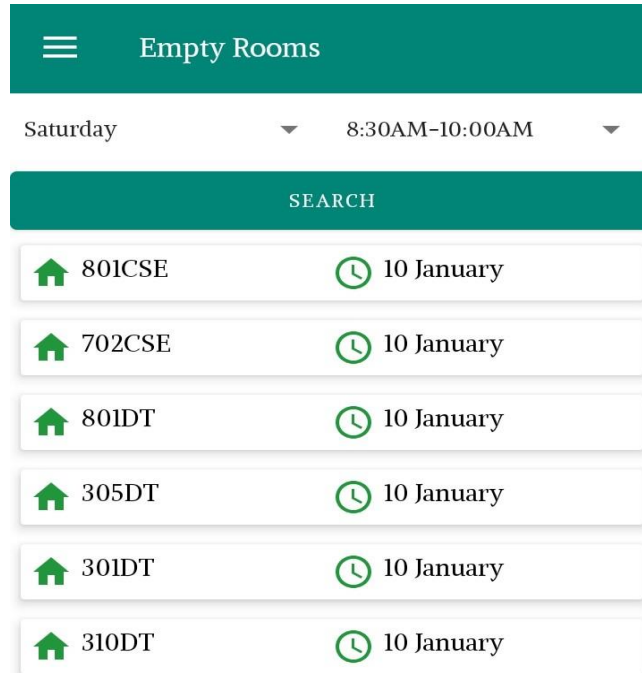


Figure 5.3.9: Empty rooms.

Notification: When we click the navigation bar of this application we can see the “Notification” option. When we click notification option then teachers and students can see the important notice from the admin. If any problem happened then admin add a notification then teachers and students will get the notification immediately. Figure 5.3.11 shows the notification UI both teacher and student.

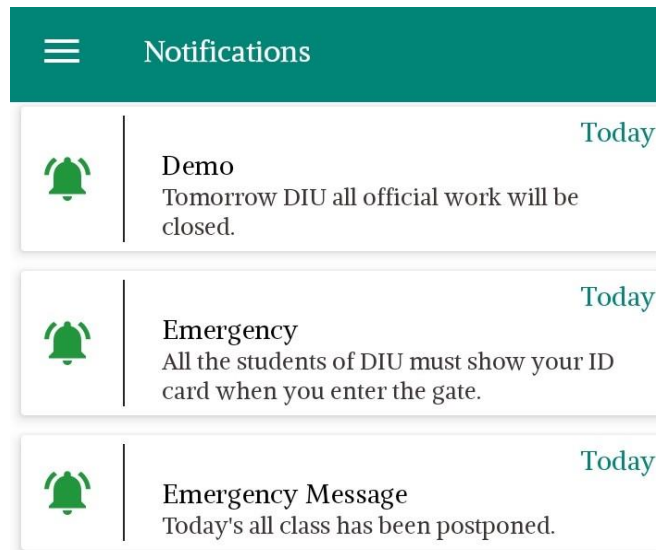


Figure 5.3.11: Notification

About: From the navigation drawer if we click on the about option then we will see the people who worked for this application. Figure 5.3.12 shows for About page UI.

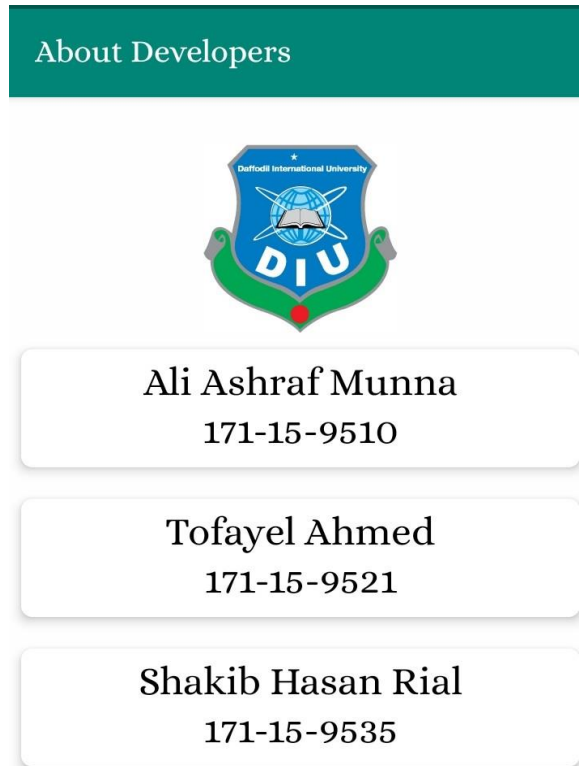


Figure 5.3.12: About Page.

Logout: Select the logout option from the navigation drawer users will sign out from this application

5.3 Testing of the Implementation

Testing is a very important part of an android application. Before publishing an android application we need to test carefully. If we want to ensure that our software is bug-free or stable, we must perform the software testing because testing is the only method that makes our application bug-free [3]. Different types of software testing. Unit testing is most popular software testing. Unit testing involves the testing of each unit or an individual component of the software application. It is the first level of functional testing. The aim behind unit testing is to validate unit components with its performance. A unit is a single testable part of a software system and tested during the development phase of the application software. The purpose of unit testing is to test the correctness of isolated code.

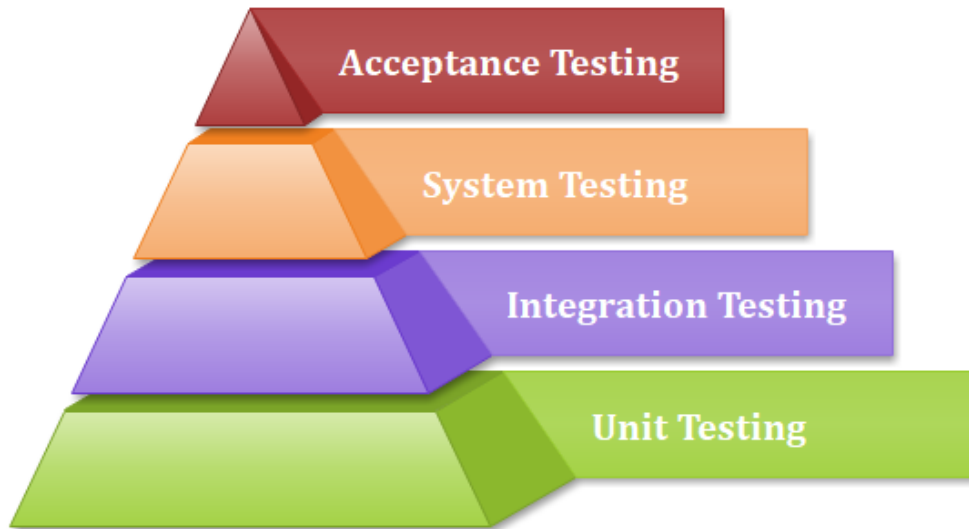


Figure 5.3.1: Unit Testing.

CHAPTER 6

IMPACT ON SOCIETY, ENVIRONMENT AND SUSTAINABILITY

6.1 Impact on Society

We have seen our test and class routines written by hand or on paper since we were admitted to the school at a very young age, i.e., since we were admitted to the school. We had to look at the notice board to see this. However, as technology advances, smartphones have become more affordable. As a result, nearly everyone has a smartphone. We've arrived. Routine is beneficial. Students can download the software on their tablets, which eliminates the need for them to keep track of their test and class schedules on paper. In today's culture, People on the other hand are more technologically advanced. Using the Internet is one way to alleviate this problem. For example, in certain locations, using the application may necessitate the use of the internet. Students must use the internet from time to time to keep their schedule up to date. As a result, to put it another way, you'll need to learn how to purchase data sets, system settings, and so on. People can quickly overcome the initial issues that they can encounter.

6.2 Impact on Environment

I think that, our application is totally environment friendly. It may, however, have a negative effect on the climate. For example, an Android device is required to use our application, and a mobile phone will pollute the environment if it is not recycled properly. As a result, if anyone brings a phone to use our app and does not recycle it, it will have an environmental effect. Furthermore, by using our application, we are assisting the environment. When it results in It is not required that people use it to handle exam routine and class routines people must use paper and pen for noting them. Trees are needed to make paper. So, here's ours. One day, the app will assist in the preservation of thousands of trees, making the earth a more beautiful place.

6.3 Ethical Aspects

If we consider the moral aspect, I think there is nothing to fear. Since we're using it for personal work for a business, there won't be any immoral work associated with our application. Our application is open source, so I think there is no way to do unethical that people may be harmed.

6.4 Sustainability Plan

Every year, Android launches a new version. As a result, if the platform's updated API changes, applications written for Android OS must be updated. Fortunately, our program follows the MVVM (Model View View Model) design pattern. Model (View Model). This architecture has a lot of scalability. As a result, making improvements to the app would not pose a significant challenge. Furthermore, since our app will be open source, students from our university who work in the Android sector will be able to contribute and demonstrate their valuable skills by contributing to the app. In the case of a back-end server, our implementation is cost-effective. It's designed to keep the application's reliance on the back-end server to a bare minimum. The application backend server will be provided free of charge by Daffodil International University. As a result, we can be certain that our application will last a long time.

CHAPTER 7

CONCLUSION AND FUTURE SCOP

7.1 Discussion and Conclusion

We have almost all types of applications in the university. But there is no routine application for the exam. Due to which teachers and students have to download and find their pdf to see the routine. Due to which teachers and students waste a lot of time. This application is the exam routine for teachers and students Made for this so that it is easy to find out. We think that this DIU exam routine application will be beneficial for both teachers and students. This application has not only exam routine, but also class routine, room booking and some other benefits. Before this application, a lot of time was wasted for teachers and students to find exam routines, find class bread, book rooms and it was also difficult. On the internet, it was also difficult to find details about certain teachers. As a result, we've taken into account and added features for obtaining any teacher information. In these cases, we assume our app will save time and effort for teachers and students. Furthermore, we chose to keep it free of charge and to avoid using any forms of advertisements so that students and teachers would have a positive experience with our application. It's all open source, so everyone can upgrade or develop it in the future if they choose. This will aid in a number of function enhancements and bug fixes.

7.2 Scope for Further Developments

The system was created with the intention of displaying class routines, exam routines, reviewing routines, and booking classrooms in mind. We've gradually added more features to the app, such as the ability to display teacher details. Despite the fact that we already have a lot of functionality, there is still space for more. Students would be able to set a reminder for their class test and homework using the "Class Test" and "To-do" options. One of our team members is also working on a web version of this application to reach a wider audience. It will ensure that any form of user can easily access our application from any place. Our framework, as previously mentioned, is reliant on a REST API. As a result,

this REST API is accessible from any platform. As a result, we can build an iOS version of our app. The benefit of developing an iOS app is that the developer will not have to work on the server backend again because it is already prepared. We couldn't help but think about it. However, we can see how various people can come up with unique and interesting ideas. As a result, in order to solicit feedback and new functionality from other students at our university, we made our application open source and freely accessible to everyone. Since the framework would be open source, anyone who has any other useful ideas about how to improve its features is welcome to contribute. This application was created using the most up-to-date and cutting-edge technology available. It can be a great opportunity for new learners who want to learn about the most up-to-date architecture and design trends in the Android sector.

APPENDIX: PROJECT REFLECTION:

DIU Routine Manager is an android based mobile application. We have created this application for DIU teachers, students and admin. This application will make their life easier. Using the DIU Routine Manager application students can easily see their class routine and exam routine. They can also see the empty rooms of the university. They can see the notification message that's provide from university. And using this application teachers can see their class and exam routine. A teacher can see which room and when he/she has exam duty. Teachers can also see the empty room that's helps them to booking an empty room. Using this application admin can easily maintain the whole routine system. As there is no system for managing exam routine and exam routine our main aim is to make a scalable and dynamic system for the Computer Science and Engineering department so that students and teachers can easily view their exam routine and admin can manage the routine system. So i think this application will help a lot to our teachers and students. This application will save our time.

We have used java programming language for making this application. We have been able to enhance our programming knowledge by creating this application.

Hopefully, our university students and teachers use this application. It will helps to save our time and make our life easier.

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