

# **A Midterm Progress Report**

## **On**

# **Student Stay Hub**

**Submitted in partial fulfillment of the requirements for the award of the degree of**

**BACHELOR OF TECHNOLOGY**  
**Computer Science and Engineering**

SUBMITTED BY

NAME : HARSH RATHI

URN: 2104115

NAME : JASKARAN SINGH

URN: 2104125

NAME: HARSHARAN SINGH

URN: 2104116

UNDER THE GUIDANCE OF  
MRS. LAKHVIR KAUR GREWAL

October, 2024



**Department of Computer Science and Engineering**

**GURU NANAK DEV ENGINEERING COLLEGE,**

**LUDHIANA**

# INDEX

<b>Sr. No.</b>	<b>Topics</b>	<b>Page No.</b>
<b>1.</b>	<b>Chapter-1 Introduction of Project</b>	<b>2</b>
	<b>1.1 Objectives</b>	<b>3</b>
<b>2.</b>	<b>Chapter-2 System Requirements</b>	<b>4</b>
	<b>2.1 Software Requirements</b>	<b>4</b>
	<b>2.2 Hardware Requirements</b>	<b>5</b>
<b>3.</b>	<b>Chapter-3 Software Requirement</b>	<b>6</b>
	<b>3.1 Problems</b>	<b>6</b>
	<b>3.2 Modules</b>	<b>7</b>
	<b>3.3 Introduction to Language</b>	<b>8</b>
<b>4.</b>	<b>Chapter - 4 Software Design</b>	<b>12</b>
	<b>4.1 DFD</b>	<b>12</b>
<b>5.</b>	<b>Chapter -5 Testing Module</b>	<b>15</b>
<b>6.</b>	<b>Chapter - 6 Performance of project developed</b>	<b>17</b>
<b>7.</b>	<b>Chapter -7 Output Screens</b>	<b>18</b>
<b>8.</b>	<b>Chapter - 8 References</b>	<b>23</b>

## **Chapter - 1 Introduction**

The Student Stay Hub is a comprehensive application designed to streamline and automate various aspects of hostel administration. It includes features such as student registration, room allocation, fee management, attendance tracking, and communication tools. This system enhances efficiency, reduces manual work, and provides real-time data for better decision-making in hostel management. It would provide better maintenance for the hostellers. Students can post complaints on the application itself. The students can register themselves and their data would be saved in the backend database. In our current era of automated systems with it being either software or hardware, it's not advisable to be using manual systems. Hostels without a management system are usually done manually. Registration forms verification Other data saving processes are done manually and most at times, they are written on paper. Thus a lot of repetitions can be avoided with an automated system. The drawbacks of existing systems lead to the design of a computerized system that will help reduce a lot of manual inputs. With this system in place, we can improve the efficiency of the system, thus overcoming the drawbacks of the existing manual system. This system is designed in favor of the hostel management which helps them to save the records of the students about their rooms and other things. Mess is also an integral part of the hostel system. Nowadays, everything is becoming digital. So, we had added a new module in this application as "Mess Master". In this we had various modules or sections like adding customers and their specific plans. The plan is added in accordance with the time of the day like for Breakfast - B, Lunch - L and Dinner - D. The user can even update or delete the specific plan.

## **1.1 Objectives**

1. To create an attendance system for effective management of the mess system.
2. To design a Polling system for mess menu modification and daily feedback.
3. To generate reports forecasting attendance records and menu provided on a monthly basis.

## **Chapter - 2 System Requirements**

### **2.1 Software Requirements**

#### **1. Front end:**

##### **Kotlin:**

Kotlin is a statically typed, general-purpose programming language developed by JetBrains has built world-class IDEs like IntelliJ IDEA, PhpStorm, Appcode, etc. It was first introduced by JetBrains in 2011 and a new language for the JVM. Kotlin is object-oriented language, and a “better language” than Java, but still be fully interoperable with Java code. Kotlin is sponsored by Google, announced as one of the official languages for Android Development in 2017

#### **2. Database: Firebase**

Kotlin is preferred by many developers for its conciseness, safety features, and interoperability with Java. Coupling it with Firebase, a comprehensive suite of mobile development tools, allows developers to achieve more with less code. To use Firebase with Kotlin, first, ensure that you have Android Studio installed (version 3.0 or later recommended). Start a new project and choose Kotlin as the programming language. Next, integrate Firebase into your project. Here are the steps:

1. In Android Studio, click on Tools -> Firebase.
2. You'll see the assistant panel on the right. Select the Firebase service you want to add (e.g., Authentication, Firestore, Analytics, etc.).

## **2.2 Hardware Requirements**

Hardware interfaces exist in computing systems between many of the components such as the various storage devices, other I/O devices, etc. these are following for this project.

Processor :intel core 2 duo processor or higher

RAM: 4GB RAM

Monitor:15" Color Monitor

Keyboard & Mouse

## **Chapter - 3 Software Requirements Analysis**

### **3.1 Problems**

1. The attendance will be taken digitally. It will save time and pages.
2. Through this system we can check the number of students who were present or absent on particular days.
3. The students can set a plan which can be validated for 15 or 30 days.

### **3.2 Modules / Functionalities**

#### **3.2.1 Customer Add Module**

**Functionality:** In this module, students can add themselves.

**Implementation:** The students can see themselves as registered in the application.

#### **3.2.1 Plan Management Module**

**Functionality:** This module will help students to add plans according to their needs.

**Implementation:** Users can add likes for Breakfast - B, Lunch - L, Dinner - D.

#### **3.2.1 Update/Delete Module**

**Functionality:** In this module, users can update or delete plans and their entry.

**Implementation:** Like the users had added themselves and their plans, in the same way he/she can delete or update them.

### **3.2.1 Login Module**

**Functionality:** Facilitates user authentication and access to personalized features or account-related information.

**Implementation:** Utilizes secure protocols to transmit and verify user credentials, ensuring data privacy and protection.

### **3.2.1 Registration Module**

**Functionality:** Enables users to create new accounts or register for the service.

**Implementation:** Validates user input and stores registration details.



## 3.3 Introduction to Language

### 3.3.1 Kotlin

Kotlin is a statically typed, general-purpose programming language developed by JetBrains, that has built world-class IDEs like IntelliJ IDEA, PhpStorm, Appcode, etc. It was first introduced by JetBrains in 2011 and a new language for the JVM. Kotlin is object-oriented language, and a “better language” than Java, but still be fully interoperable with Java code. Kotlin is sponsored by Google, announced as one of the official languages for Android Development in 2017.

#### Key Features of Kotlin:

1. **Statically typed** – Statically typed is a programming language characteristic that means the type of every variable and expression is known at compile time. Although it is statically typed language, it does not require you to explicitly specify the type of every variable you declare.
2. **Data Classes**– In Kotlin, there are Data Classes which lead to auto-generation of boilerplate like equals, hashCode, toString, getters/setters and much more.
3. **Concise** – It drastically reduces the extra code written in other object-oriented programming languages.
4. **Safe** – It provides the safety from most annoying and irritating NullPointerExceptions by supporting nullability as part of its system. Every variable in Kotlin is non-null by default.
5. If we try to assign a null value then it gives a compile time error.
6. To assign null value to any string string it should be declared as nullable.  
`String nullableStr? = null // compiles successfully`
7. length() function also disabled on the nullable strings.
8. **Interoperable with Java** – Kotlin runs on Java Virtual Machine(JVM) so it is totally

interoperable with java. We can easily access java code from kotlin and kotlin code from java.

9. **Functional and Object Oriented Capabilities** – Kotlin has a rich set of many useful methods which includes higher-order functions, lambda expressions, operator overloading, lazy evaluation, operator overloading and much more. Higher order function is a function which accepts a function as a parameter or returns a function or can do both.
10. **Compilation time** – It has higher performance and fast compilation time.
11. **Tool- Friendly** – It has excellent tooling support. Any of the Java IDEs – IntelliJ IDEA, Eclipse and Android Studio can be used for Kotlin. We can also run Kotlin programs from the command line.

#### **Advantages of Kotlin language:**

1. Easy to learn – Basic is almost similar to java. If anybody worked in java then easily understand in no time. Kotlin is multi-platform – Kotlin is supported by all IDEs of java so you can write your program and execute them on any machine which supports JVM. It's much safer than Java.
2. It allows using the Java frameworks and libraries in your new Kotlin projects by using advanced frameworks without any need to change the whole project in Java. Kotlin programming language, including the compiler, libraries and all the tooling is completely free and open source and available on github. Here is the link for Github <https://github.com/JetBrains/kotlin>

### **Applications of Kotlin language:**

1. You can use Kotlin to build Android applications.
2. Kotlin can also compile to JavaScript, making it available for the frontend.
3. It is also designed to work well for web development and server-side development.

### **3.3.2 Firebase**

Kotlin is preferred by many developers for its conciseness, safety features, and interoperability with Java. Coupling it with Firebase, a comprehensive suite of mobile development tools, allows developers to achieve more with less code. To use Firebase with Kotlin, first, ensure that you have Android Studio installed (version 3.0 or later recommended). Start a new project and choose Kotlin as the programming language. Next, integrate Firebase into your project. Here are the steps:

1. In Android Studio, click on Tools -> Firebase.
2. You'll see the assistant panel on the right. Select the Firebase service you want to add (e.g., Authentication, Firestore, Analytics, etc.).
3. Click on the provided link to connect your app to Firebase, then click "Add Firebase SDK" to finish the setup.

## **Firestore Authentication with Kotlin**

Firestore Authentication is a crucial service that provides backend services, ready-made UI libraries, and easy-to-use SDKs to authenticate users to your app. With Firestore's powerful features and Kotlin's robustness, Android app development becomes a more streamlined and enjoyable process. This guide covers only the basics of using Kotlin with Firestore, but the possibilities are endless. Whether it's implementing push notifications with Firestore Cloud Messaging or analyzing user behavior with Google Analytics, Kotlin and Firestore provide all the tools you need to build high-quality Android apps. Remember, as with any tool or technology, the key to mastery lies in consistent practice and exploration. Keep building, keep iterating, and soon, you'll be adept at using Kotlin and Firestore for your Android app development journey.

## Chapter - 4 Software Design

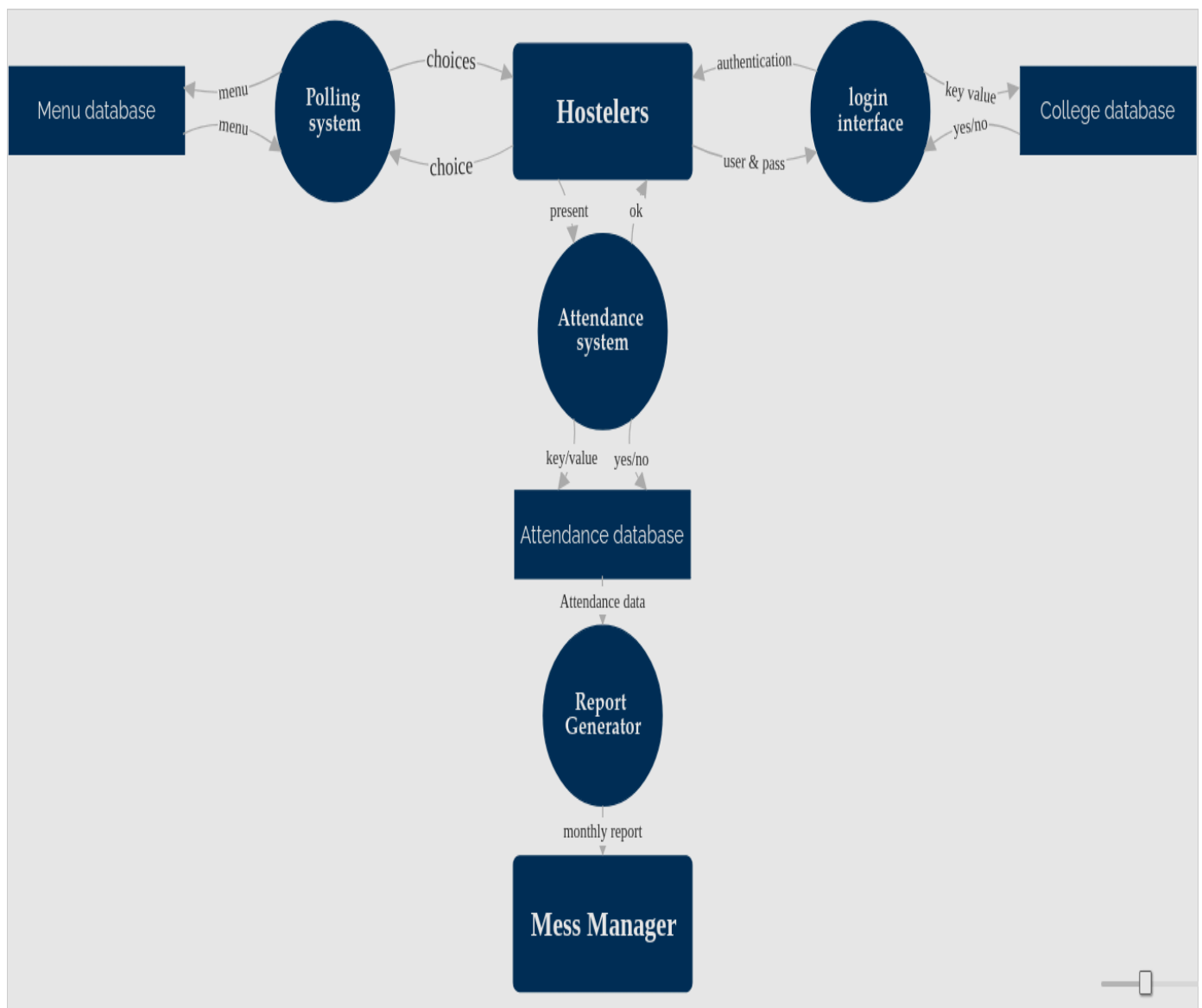
### 4.1 DFD

A Data Flow Diagram for Hostel Management System is a visual representation that illustrates the flow of information within the system. It identifies processes, data sources, and destinations, highlighting how data moves between them. In the context of hostel management, a DFD would showcase actions like student check-ins, room assignments, fee payments, and record-keeping. Each of these activities is depicted as a process node, with arrows indicating the direction of data flow. This graphical tool provides a clear, intuitive overview, aiding in the analysis, design, and optimization of the system's operations for enhanced efficiency and effectiveness.

1. **Clarity and Understanding:** DFDs provide a visual representation, making complex systems easier to comprehend for stakeholders at all levels.
2. **Process Optimization:** By mapping out data flow, inefficiencies and bottlenecks can be identified and addressed, leading to streamlined operations.
3. **Effective Communication:** DFDs serve as a universal language for technical and non-technical stakeholders, facilitating better communication and collaboration.  
  
Error Detection and Prevention: They enable early identification of potential issues in the system, allowing for preemptive measures to be taken.
4. **Scalability Planning:** DFDs help in envisioning future expansions or modifications, ensuring the system can accommodate growth seamlessly.
5. **Resource Allocation:** They aid in understanding where resources are allocated within the system, enabling better resource management.
6. **Documentation and Training:** DFDs serve as valuable documentation for training purposes, helping in onboarding new staff and ensuring consistent operations.
7. **Risk Management:** By visualizing the entire data flow, potential security vulnerabilities

and risks can be identified and mitigated proactively.

8. **Decision Support:** DFDs provide valuable insights for making informed decisions about system enhancements, upgrades, or redesigns



**Figure 4.1 DFD of project**

Crafting a Data Flow Diagram for Hostel Management System is a fundamental step toward optimizing operations and enhancing efficiency. EdrawMax emerges as an invaluable platform, offering an intuitive platform that simplifies the otherwise intricate process. Its user-friendly interface, extensive symbol library, collaborative features, and export options empower both novices and experts in system design. By utilizing EdrawMax, you can seamlessly map out data flow, identify bottlenecks, and streamline processes. This visual representation not only aids in comprehension but also serves as a blueprint for future enhancements. With EdrawMax, the path to a well-structured and the efficient Hostel Management System becomes clearer than ever.

## Chapter - 5 Testing Module

Testing is a crucial process in software development that involves evaluating a system or application to identify defects, errors, or discrepancies between expected and actual behavior. Testing ensures that the software meets quality standards, functions correctly, and satisfies user requirements. For testing, black-box testing is done. Black-box testing means examining the functionality of the system without peering into its internal structures or workings. This method of test can be applied virtually to every level of software testing: unit testing, integration system and acceptance. The black box is a powerful technique to check the system under test from the user's perspective. The testing team does not cover the inside details such as code, server logic, and development method. So, the testing involves the following steps:

**Unit testing:** The individual UI of each screen was separately tested.

**Integration Testing:** Two or more screens were then combined and examined to find out whether they are working functionally correct when combined with each other.

**System Testing:** Different modules together combined and checked to find out if there is any bug in its working. After this, the whole software was tested as a whole.

**Acceptance Testing:** Software was then given to the third party for testing.



**Test Cases:****Valid Plan Added:**

**Test Case:** Users will add their plan.

**Expected Result:** The system will add the plan and give an alert “plan added”. Breakfast as B, for Lunch - L and for Dinner - D. The plan will be added as: BL - Paratha, D - Dessert etc.

**Invalid Plan Added:**

**Test Case:** We will check if they had added the plan in the correct way or not.

**Expected Result:** The system would check if the students had added the plan in the right way.

**Valid Login:**

**Test Case:** The user can login with their credentials.

**Expected Result:** The system would check for the account. If the student had used the correct credentials to log in then they can successfully access their account.

**Invalid Login:**

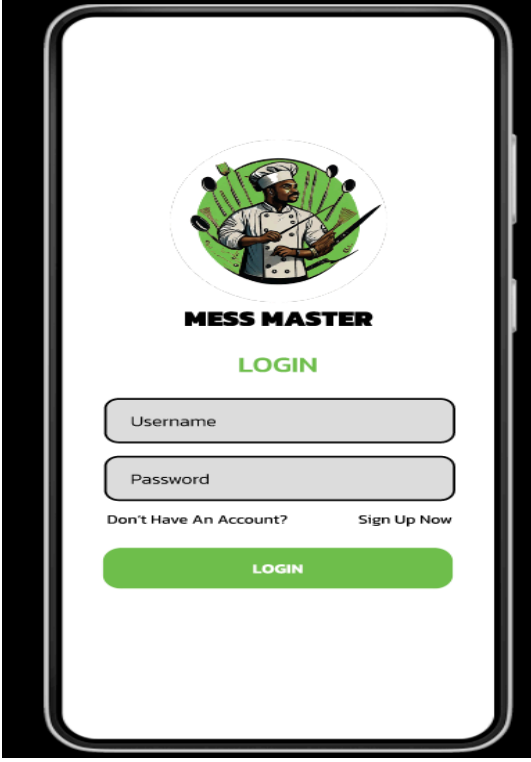
**Test Case:** The student had tried to login with another account.

**Expected Result:** The system would check for the account. If the student had used another account to log in then it would come up with the message “Invalid login”.

## **Chapter - 6 Performance of project developed**

The application developed so far enables one to sign up or login themselves in the application. A particular user can add themselves in the application. Their name against their phone number is shown there. Anyone who is logged in the application can see others as registered in the application. If they are new to the application, he/she can sign up as a new user. The login and sign up functionality works well. The data is stored in the database(Firebase). Next comes, adding a particular plan. In the plan management module, one can add a plan according to the time(Breakfast, Lunch, Dinner). The system will add the plan and give an alert “plan added”. Breakfast as B, for Lunch - L and for Dinner - D. The plan will be added as: BL - Paratha, D - Dessert etc. Up To here, the project is working well. You can even update or delete a specific plan or their number and contact. In customer management, you can see options like “Add customer”, “Remove Customer”, “Edit Customer”. In plan management, you can see options like “Add plan”, “Remove plan”, “Edit plan”. In the settings section, you can set “on” notifications and data saver options. You can also change the password using your email used to login into your application account.

## Chapter - 7 Output Screens



The login page for the 'MESS MASTER' application. It features a circular logo at the top with a chef's head and various kitchen tools. Below the logo is the text 'MESS MASTER' in bold black letters, followed by 'LOGIN' in green. There are two input fields: 'Username' and 'Password'. Below these fields are two links: 'Don't Have An Account?' and 'Sign Up Now'. At the bottom is a large green button labeled 'LOGIN'.

**MESS MASTER**  
**LOGIN**


Username

Password

[Don't Have An Account?](#) [Sign Up Now](#)

**LOGIN**

Figure 7.1 Login Page



The sign-up page for the 'MESS MASTER' application. It features the same circular logo as the login page. Below the logo is the text 'MESS MASTER' in bold black letters, followed by 'SIGN UP' in green. There are three input fields: 'Full Name', 'Username', and 'Password'. Below these fields are two links: 'Already Have An Account?' and 'Login Now'. At the bottom is a large green button labeled 'SIGN UP'.

**MESS MASTER**  
**SIGN UP**

Full Name

Username

Password

[Already Have An Account?](#) [Login Now](#)

**SIGN UP**

Figure 7.2 Sign-Up

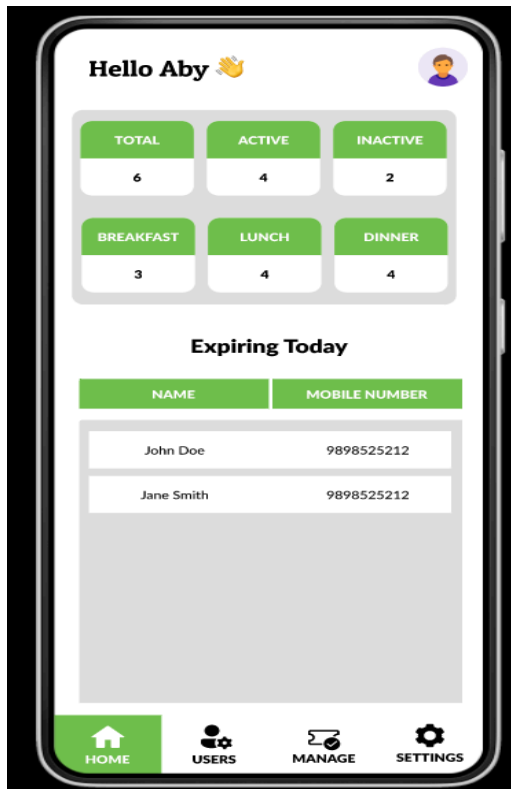


Figure 7.3 Front-Page

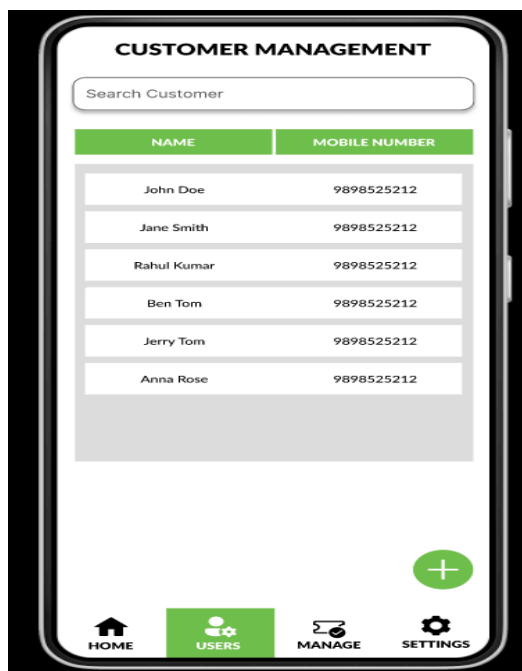
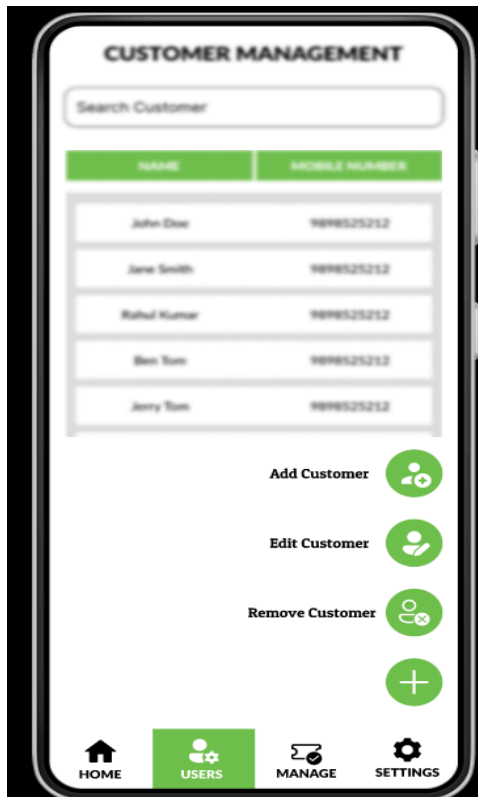
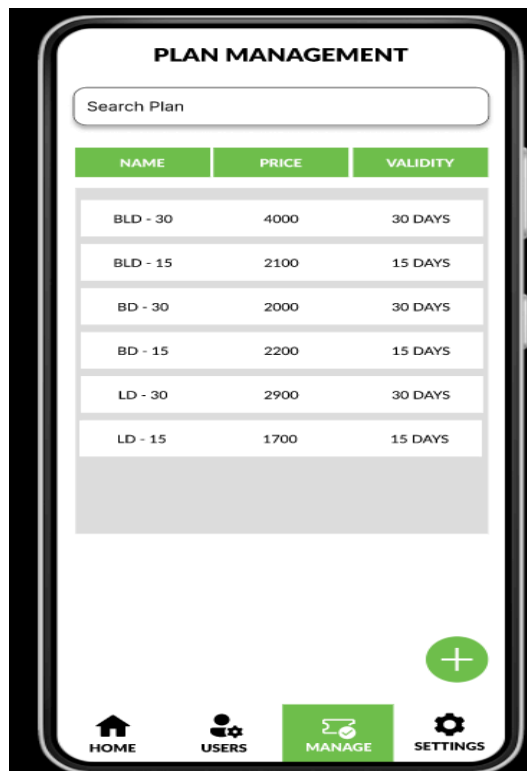


Figure 7.4 Customer Management



**Figure 7.5 Customer Options**



**Figure 7.6 Plan Management**



Figure 7.7 Plan Options

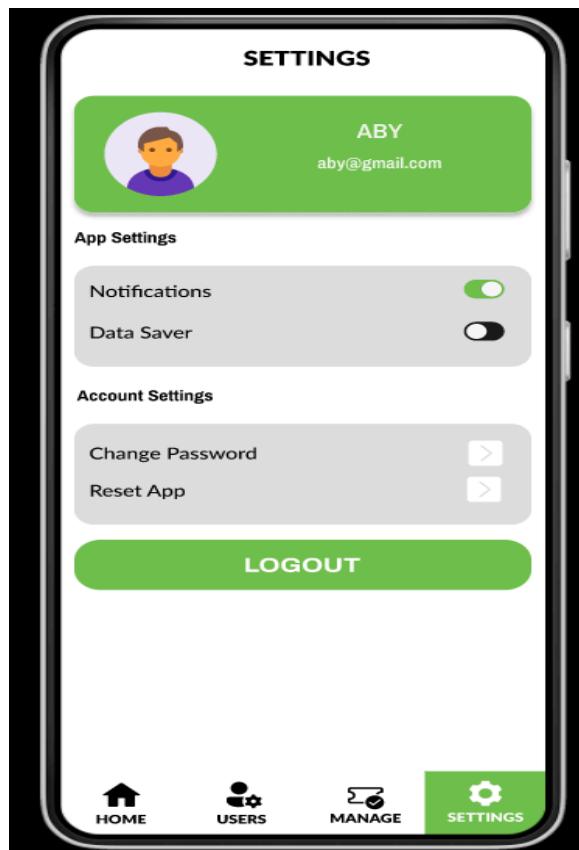
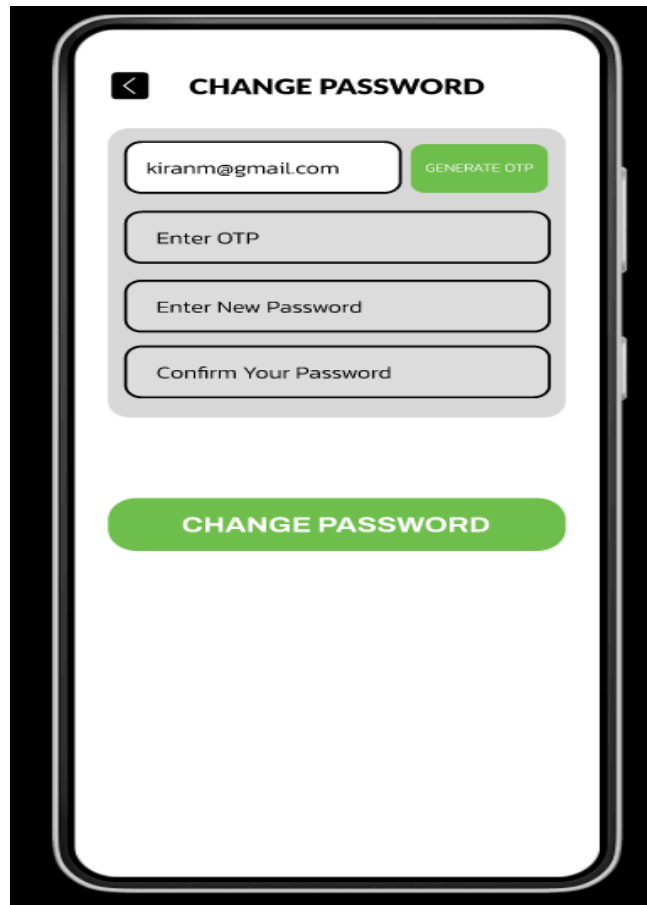
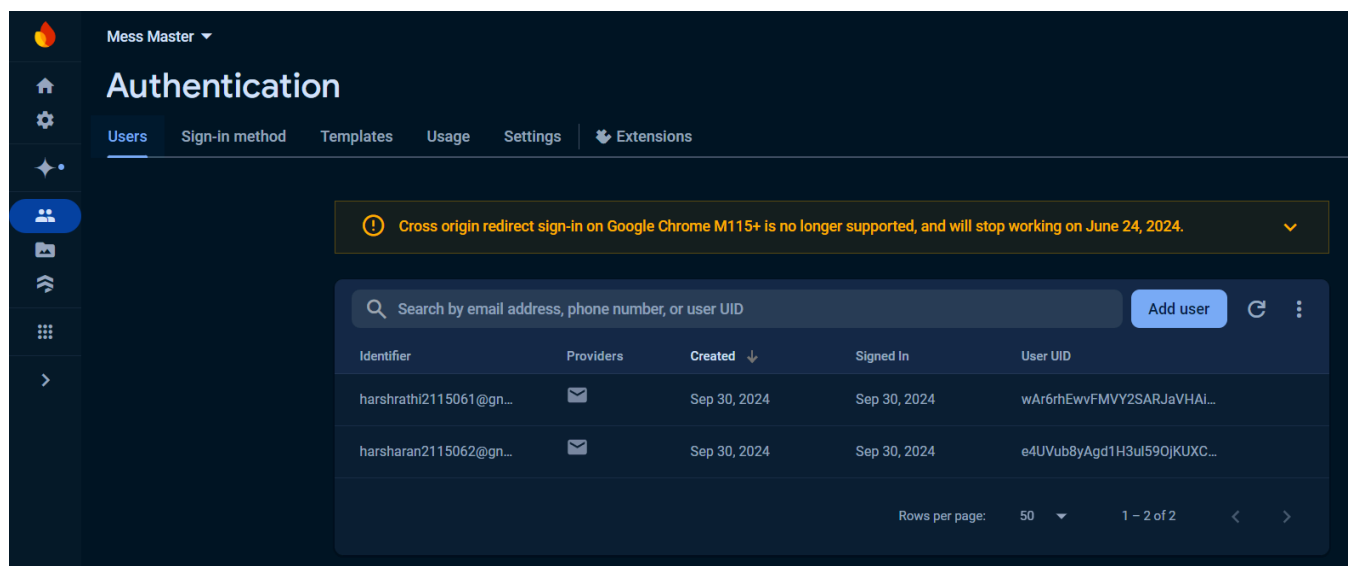


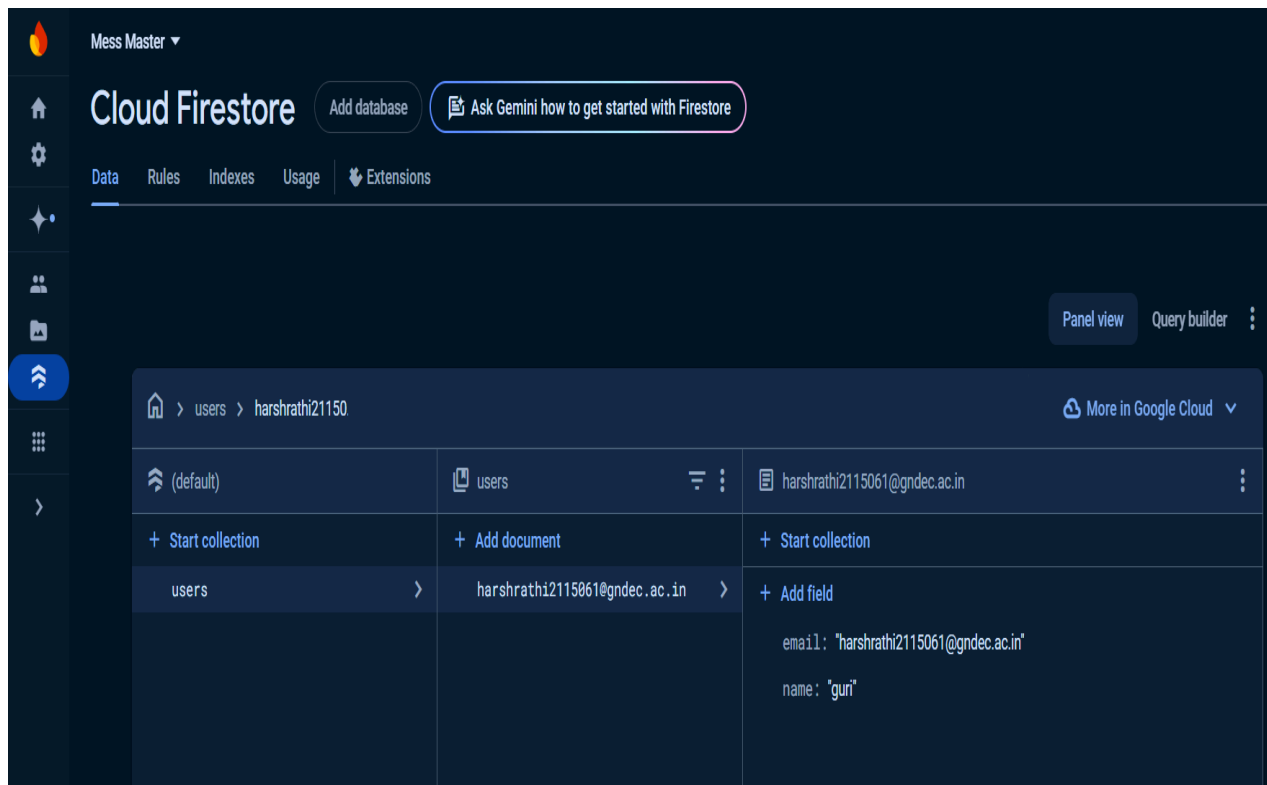
Figure 7.8 Settings



**Figure 7.9 Change Password**



**Figure 7.10 Firebase**



**Figure 7.11** Firebase



## Chapter - 8 References

- [1] Mr. A.Aswar, Mr. A.Ganesan, Dr. V.Kavitha, Mr. V.Karthik Sabri PG & Research Department of Computer Applications, on Hostel Mess System.
- [2] Development of an Automated Mess Facility System Journal of Science and Engineering
- [3] SSRG International Journal of Computer Science and Engineering (SSRG-IJCSE) – volume 3 Issue 4–April 2016 ISSN: 2348 – 8387 [www.internationaljournalsrsg.org](http://www.internationaljournalsrsg.org)
- [4] Online Hostel Management International Journal of Advanced Engineering & Science Research (IJAES) Volume 5, Issue 1, March 2017
- [5] SOFTWARE FOR MESS MANAGEMENT SYSTEM Master’s Degree student, 2) PhD., Lecturer
- [6] MESS MANAGEMENT SYSTEM USING SERVICE NOW European Journal of Molecular & Clinical Medicine, 2020, Volume 7, Issue 4, Pages 1078-1084
- [7] Mastering the Management System by Robert S. Kaplan and David P. Norton
- [8] Lore: a database management system for semistructured data Publication:ACM SIGMOD Record
- [9] HOTEL FRONT OFFICE MANAGEMENT THIRD EDITION James A. Bardi, Ed.D.,CHA The Pennsylvania State University
- [10] Measuring Hotel Guest Satisfaction by Using an Online Quality Management System Kesh Prasad,Philip W. Wirtz &Larry Yu