

Mini-Project Report On

Med Map (Medical assistance at your figure tip)

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award of the degree of*

Bachelor of Technology

in

Computer Science & Engineering

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CERTIFICATE

This is to certify that the mini-project report entitled "Med Map (Medical assistance at your fingure tip)" is a bonafide work done by , Mr. Nandagovind.P (U2003143), Ms. Sheethal Mariya Binoy (U2003195), Ms. Shafc Sulthana (U2003192), submitted to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology (B. Tech.) in Computer Science and Engineering during the academic year 2022-2023.

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ABSTRACT

The MedMap app is a comprehensive platform designed to assist users in locating nearby hospitals using Google Maps. The app offers a user-friendly interface that seamlessly integrates with Google Maps' location-based services, enabling users to quickly find and navigate to hospitals in their vicinity. By providing real-time information, including name, address, MedMap aims to streamline the process of seeking medical assistance and reduce time-consuming searches. Through strategic marketing and partnerships with local medical facilities, MedMap aims to maximize its reach and provide a valuable resource for individuals in need of medical care.

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Chapter 1

Introduction

1.1 Background

1.1.1 Android Development

Flutter is a popular framework for Android development that offers cross-platform capabilities and a simplified development process. It allows developers to create visually appealing and high-performance applications using a single codebase. With features like hot reload and a widget-based architecture, Flutter enables quick iteration and easy User Interface customization. Its performance is enhanced through native code compilation and the use of the Skia graphics engine. Flutter also benefits from a thriving community that provides resources and plugins to support developers. Overall, Flutter simplifies Android development, resulting in efficient and impressive applications.

Android Studio is used which is an integrated development environment (IDE) specifically designed for Android app development. It provides robust support for Flutter-based app development, offering features such as project creation, code editing, emulator and device testing, hot reload, debugging, performance profiling, and deployment. Android Studio streamlines the process of developing Flutter apps, allowing developers to create high-quality, cross-platform applications efficiently.

1.2 Objectives

1. Provide Convenient Access to Hospital Information: The primary objective of MedMap is to offer users a convenient and centralized platform to access nearby hospitals. This includes name, location.

2. Simplify the Process of Finding Nearby Hospitals: MedMap aims to simplify and streamline the process of finding nearby hospitals by integrating with Google Maps. Users

can easily locate hospitals on a map, get directions, saving them time and effort.

3. **Promote Accessibility:** MedMap seeks to promote accessibility to healthcare services by empowering users to easily locate nearby hospitals. The app aims to bridge the gap between individuals in need of medical assistance and the resources available to them, contributing to healthcare equity.

These objectives collectively drive MedMap's mission to facilitate seamless access to hospital information, improve the user experience, and contribute to better healthcare outcomes for individuals.

1.3 Problem Statement

To develop an app to address the problem of time consumption created due to wandering around different hospitals in case of emergencies by creating an integrated platform so that all hospitals and other facilities are brought together and accessed easily through Google Maps.

1.4 Motivation

The development of the MedMap app stems from the recognition of the need for a centralized platform that simplifies the process of finding nearby hospitals. In times of medical emergencies or when seeking immediate healthcare, individuals often face challenges in identifying the nearest and most suitable healthcare facility. The MedMap app aims to alleviate this issue by leveraging the power of Google Maps and providing users with a single, user-friendly interface to locate hospitals in their vicinity.

1.5 Summary of Report

The report presents an overview of MedMap, an innovative app designed to simplify the process of finding nearby hospitals. With a focus on convenience and accessibility. MedMap integrates Google Maps to provide users with a centralized platform for locating hospitals in their vicinity. The primary objectives of the app include offering convenient access to hospital information, simplifying the search process, enhancing user experience promoting accessibility and healthcare equity and continuously expanding functionality.

By integrating with Google Maps, MedMap enables users to locate hospitals on a map, obtain directions, saving them valuable time and effort. The app provides comprehensive hospital information including name and location. This empowers users to make informed decisions regarding their healthcare needs.

In conclusion, MedMap is a valuable resource for individuals seeking timely access to healthcare services. The app simplifies the process of finding nearby hospitals, enhances user experience, and contributes to improved healthcare outcomes. With its user-centric approach and commitment to continuous improvement, MedMap aims to make a significant impact in the healthcare sector.

Chapter 2

Literature Review

2.1 Existing Systems

findERnow uses the iPhone's GPS to quickly locate ERs anywhere in the U.S. You can select the closest ER or another nearby ER in a map or list format and can locate the closest ERs by driving time or by distance.

2.2 Firebase (Back end as A Service) for Mobile Application Development

Authors: Prachi R. Saraf, Sakshi M. Jadhao, Saurabh J. Wanjari, Shital G. Kolate, Prof. Ankush D. Patil

A. Back end As A Service(BaaS) In the area of mobile application development, there are two major terms on which the developers has to work i.e. for front end and back end. Back end is the most crucial part of mobile application development which responsible for storing the data, securing data, etc. The back end of the application is like a server for mobile apps, as it stores and sorts the data properly and the end user can only see the necessary information. BaaS i.e Back end-as-a-Service is a cloud service model in which developers outsource all the behind-the-scenes aspects of a web applications or mobile application so that they only have to write and maintain the front end part. BaaS vendors provide pre-written software for activities that take place on servers, such as user authentication, database ,remote updating, and push notifications (for mobile apps), as well as cloud storage and hosting.

B. Firebase 1. Introduction to Firebase: Firebase is a real-time database and also acts as a Backend-as-a-Service(BaaS). It allows to store a list of objects. Google Firebase is Googlebacked application development software which allows developers to develop applications for Android, iOS, and Web apps. Firebase is a grouping of Google's many services in the cloud, including instant messaging, user authentication, real-time database, stor-

age, hosting, etc. Firebase offer real time database, authentication, cloud storage, cloud functions, etc. Firebase accomplishes real-time data in the database. Firebase makes easy to exchanges the data to and from the database. Firebase provides backend for iOS, Android, and Web applications. Firebase applications can be arranged over a protected connection to the firebase server. Firebase offers a dashboard simple control. It provides number of useful services. It is highly secure and minimal setup. Cloud Functions feature is one of the new feature of firebase cloud which allows developers to write programs in JavaScript language and placed them on the Firebase cloud platform. Using Firebase, each unit can directly access the database. Firebase is a Google-owned multi-service cloud-computing solution for mobile and web developers. The feature grouping in Firebase rushes the cloud database integration automatically in both web and mobile app.

2. Ease of using Firebase: Firebase is a web application development platform created by Google. It lets you to developed the whole application on the front-end without any server-side code. At the same time, it does let you set up some server-side logic through Firebase Functions if you need to react to certain events (Creation of data or files, login, https requests) so that you can send emails or push notifications or process the data after it is written. It's easy to start a project with Firebase or add a Firebase to your project. It allows real-time database connection, which means multiple users can see the changes in the data when the data gets created or edited. Data transmission is handled with web sockets so you don't have to send requests to get new data, you only need to subscribe once. The same applies for file storage. Quick setup authentication through the major providers (Google, Twitter, Facebook, GitHub). https by default - secure http traffic without setting up certificates. Any static html/javascript content can be hosted.

3. Services of Firebase : Analytics, This feature are also enables the application developer to understand how users are using his application. The Software Development Kit capture events and properties on its own and also allows you to get custom data. The dashboard also provides details like your most active user or what feature of your application is used most.

2.3 Mobile Application Development Based on Flutter Platform

Authors: Shreya A. Bhagat, Sakshi G. Dudhalkar, Prathmesh D. Kelapure, Aniket S. Kokare, Prof. Sudesh A. Bachwani Flutter as a framework is very promising and right now has a big dev community. Even now we can find complex apps in the market which are based on Flutter, like Alibaba, Google Ads, Reflect, Birch Finance, Hamilton Musical, Hookle (Skuzza, 2019). In the Authors opinion, this technology is a good choice for small and medium-size applications or when content and basic features require constant iteration. The technology potential is also big as during Flutter interact conference Google introduces support for web applications (Sneath, 2019). Dart language is also the fastest-growing programming language nowadays. Its list features added during the last two years is also big and includes extension functions, null safety support. Flutter itself is not a programming language. Rather, it's an Software Development Kit with pre-written code, consisting of ready-to-use and customizable widgets. The programming language that's used is Dart, is also developed by Google. By avoiding using a bridge to communicate with the native layer such as Android or iOS, Flutter minimizes performance issues and boosts app start-up time. To develop an app using Flutter, you need developers to code in Dart. That should not be an issue, because it's similar to Kotlin, Java, Swift, and JavaScript. Also, it's easy to learn. According to Google, Dart is a client-optimized language for fast apps on any platform. Object-oriented like Java, C++, and Python, it compiles ahead of time to native ARM or x64 machine code, and to JavaScript byte code for web. As a result, apps written in Dart are impossible to distinguish from native apps at the machine level.

2.4 A Systematic Review of Healthcare Applications for Smartphones

Recent years have seen an increased adoption of smart-phones by healthcare professionals as well as the general public [1-6]. The smartphone is a new technology that combines mobile communication and computation in a handheld-sized device, facilitating mobile computing at the point of care. The main objective of this study is to classify the smartphone-based healthcare technologies in the literature according to their functionalities and summarize them in each category. We present a systematic literature review in this regard. To the best of our knowledge, this study is the first study for classifying

and summarizing healthcare applications for smart-phones in a systematic literature review format. The healthcare system is highly mobile in nature, involving multiple clinical locations such as clinics, in patient wards, outpatient services, emergency departments, operating theaters, intensive care units (ICUs), laboratories, etc. [7-10]. As such, working in the healthcare system requires extensive mobility of healthcare professionals as well as communication and collaboration among different individuals, including their colleagues and patients. Healthcare professionals mainly used pagers for mobile communication until the wide availability of cell phones in 1990s [11]. The advent of mobile Personal Digital Assistants (PDAs) during 1990s enabled healthcare professionals to organize their contacts and calendars electronically, adding another device in their pockets. The combined functionality of a pager, a cell phone and a PDA is now replaced by a single device called a “smartphone”, which is becoming very popular among healthcare professionals as well as the general public [12].

2.5 Mobile Devices and Apps for Health Care Professionals

The use of mobile devices by health care professionals (HCPs) has transformed many aspects of clinical practice. Mobile devices have become commonplace in health care settings, leading to rapid growth in the development of medical software applications (apps) for these platforms. Numerous apps are now available to assist HCPs with many important tasks, such as: information and time management; health record maintenance and access; communications and consulting; reference and information gathering; patient management and monitoring; clinical decision-making; and medical education and training.

Mobile devices and apps provide many benefits for HCPs, perhaps most significantly increased access to point-of-care tools, which has been shown to support better clinical decision-making and improved patient outcomes. However, some HCPs remain reluctant to adopt their use. Despite the benefits they offer, better standards and validation practices regarding mobile medical apps need to be established to ensure the proper use and integration of these increasingly sophisticated tools into medical practice. These measures will raise the barrier for entry into the medical app market, increasing the quality and safety of the apps currently available for use by HCPs.

Conclusion

In conclusion, MedMap is a valuable mobile application that simplifies access to nearby hospitals and facilitates the search for hospitals. By integrating with Google Maps and providing real-time information, MedMap offers convenience and accessibility to users, saving them time and effort in locating hospitals. The app enhances user experience through a user-friendly interface and comprehensive hospital information.

While MedMap demonstrates significant potential, there are challenges to address, such as ensuring data reliability, protecting user privacy, and promoting user engagement. Ongoing advancements in data integration techniques, privacy measures, and user engagement strategies can help overcome these challenges and further enhance the capabilities of MedMap.

Overall, MedMap plays a crucial role in improving healthcare outcomes by connecting individuals in need of medical assistance with nearby hospitals. Its user-centric approach, convenience, and commitment to continuous improvement make it a promising tool for simplifying access to healthcare services and contributing to better healthcare experiences for users

Chapter 3

System Analysis

3.1 Expected System Requirements

The system of user which is a smart phone is expected to have the following features:

- Android platform with version above 8.0(Oreo).
- Requirement of Internet Connection to connect to database.
- Storage space of approximate 100MB for the app.
- Minimum RAM size of 2GB is required in the device.

3.2 Feasibility Analysis

3.2.1 Technical Feasibility

This aspect assesses whether the technology and resources required to build and maintain the app are available and feasible. Considerations include:

- Expertise and skills: Evaluate whether the development team possesses the necessary skills in Flutter, Android Studio, Figma, and Firebase to create the app successfully.
- Integration: Analyze the compatibility and integration of the app with various hospitals and related datas.
- Scalability: Determine whether the app can handle increased user traffic and data as it grows in popularity.

3.2.2 Operational Feasibility

Operational feasibility evaluates whether the app can be effectively integrated into the existing operations and processes. Consider the following:

- User adoption: Analyze the ease of use and acceptability of the app among target users (mainly the one in require of a hospital according to their need).
- Customer support: Plan for providing adequate customer support and addressing user inquiries and issues.
- Data management: Ensure that the database (Firebase) can handle data efficiently and securely.

3.2.3 Economic Feasibility

The app can reduce the overhead of expense by saving travelling cost and time consumption. The development of the app is also zero budget as it was built using free resources.

3.3 Hardware Requirements

The following are the requirements to develop the MedMap app.

- Processor: i5 processor
- Hard Disk: Minimum 100GB
- RAM: 4GB RAM

3.4 Software Requirements

The following are the Softwares used to develop the MedMap app.

Operating System: Windows

3.4.1 Android Studio for flutter app development

Android Studio is a popular Integrated Development Environment (IDE) for developing Flutter apps, as it provides a wide range of tools and features that can help you build highquality apps faster.

A rich set of tools for debugging, testing, and profiling your app. A powerful code editor with support for code completion, refactoring, and more A flexible build system with support for building, testing, and deploying your app. Integration with popular version control systems like Git. A visual layout editor for building attractive user interfaces.

3.4.2 Firebase

Firebase is a Backend-as-a-Service (BaaS) app development platform that provides hosted backend services such as a real time database, cloud storage, authentication, crash reporting, machine learning, remote configuration, and hosting for your static files.

Firebase supports Flutter. For more information, see: [The Firebase plugins page](#) [Getting started with Firebase and Flutter](#) [Get to know Firebase for Flutter video workshop](#) based on the code lab [Get to know Firebase for Flutter code lab](#) [Use Firebase to host your Flutter app on the web](#).

3.4.3 Flutter and flutter plugins

Plugins are the wrapper of the native code like android(java or kotlin) and iOS(swift or Objective C). Plugins are written in platform-specific code to access the platform-specific features. Flutter does support using packages and plugins contributed by other developers to its ecosystem For instance, if you wanted to access a sensor on the phone, the only way is to write a plugin (or use one that's already there). The API of the plugin is written in Dart.

A module is able to integrate the flutter with the help of the existing native application. These are the major differences between the flutter plugin and the flutter module.

3.4.4 Figma(UI/UX Design)

Figma is a collaborative web application for interface design, with additional offline features enabled by desktop applications for macOS and Windows. The feature set of Figma focuses on user interface and user experience design, with an emphasis on realtime collaboration,utilising a variety of vector graphics editor and prototyping tools.The Figma mobile app for Android and iOS allows viewing and interacting with Figma prototypes in real-time on mobile and tablet devices.

Chapter 4

System Design

4.1 Architectural Diagram



Figure 4.1: Overall Architectural Diagram

4.2 Design of System



Figure 4.2: Design of System

4.3 Sequence Diagram

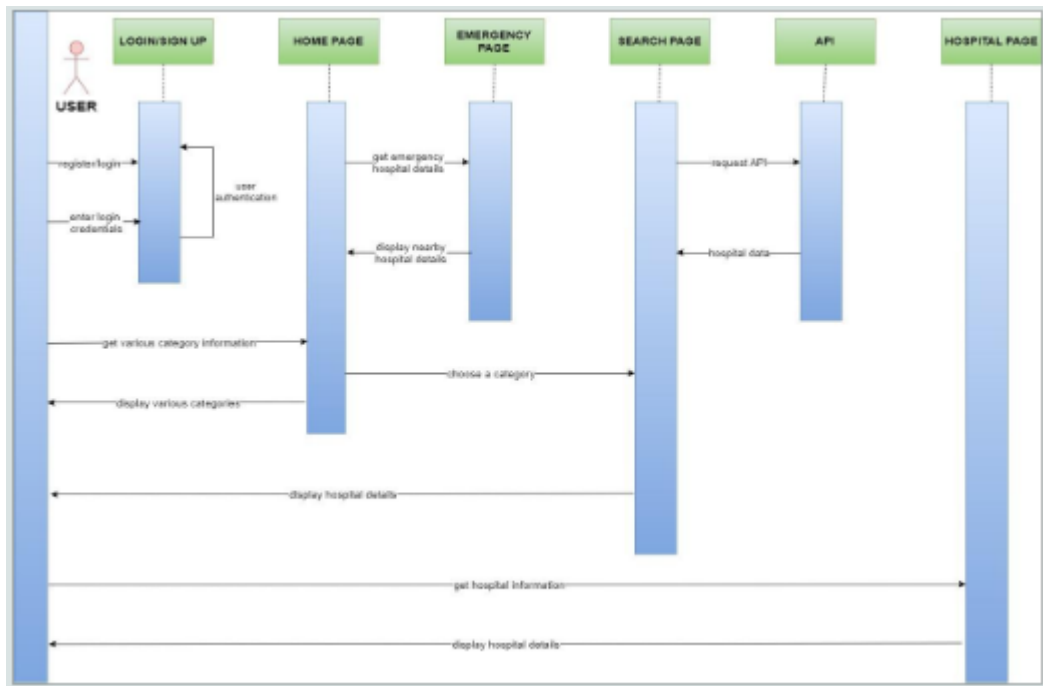


Figure 4.3: Sequence Diagram

4.4 Module Diagram

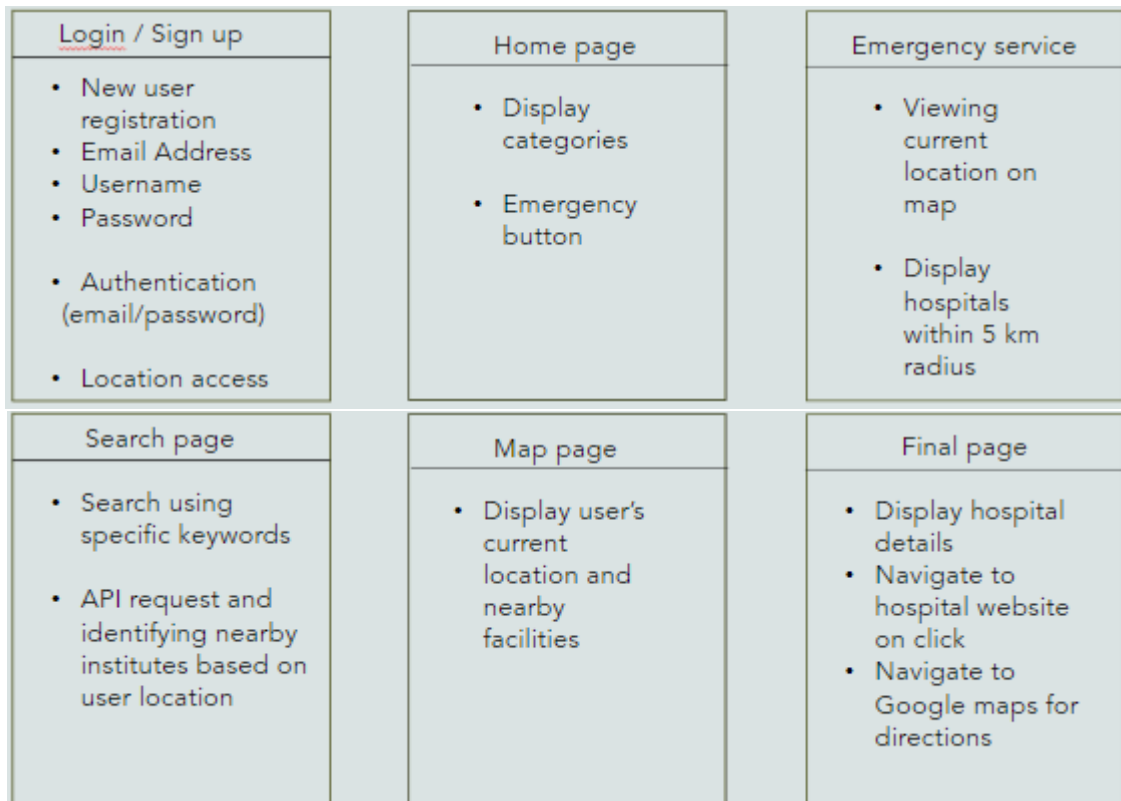


Figure 4.4: Module Wise Diagrams

Chapter 5

Results



Figure 5.1: Home page

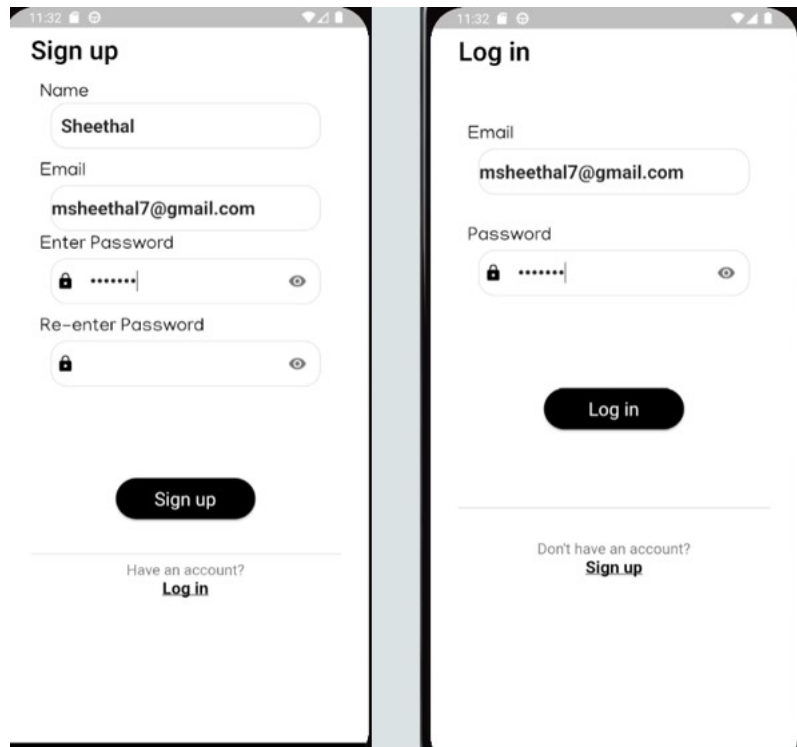


Figure 5.2: SignUp and Login page

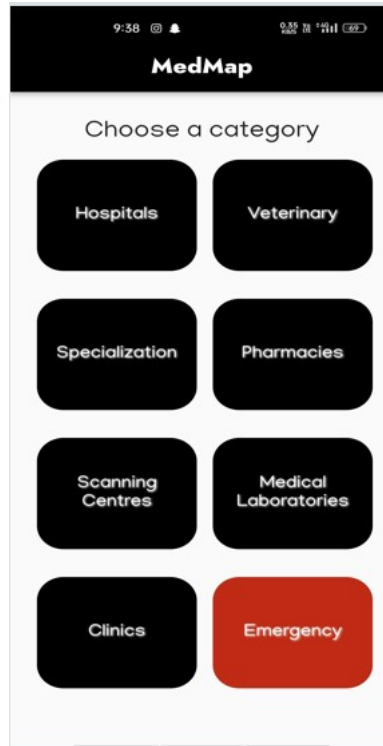


Figure 5.3: First page

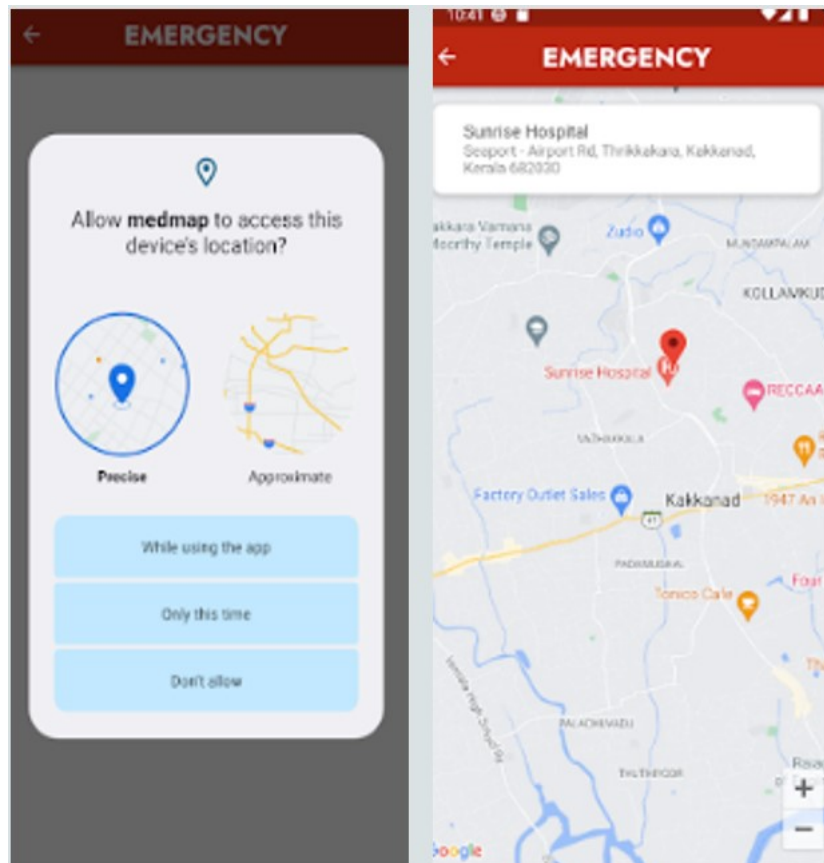


Figure 5.4: Emergency page

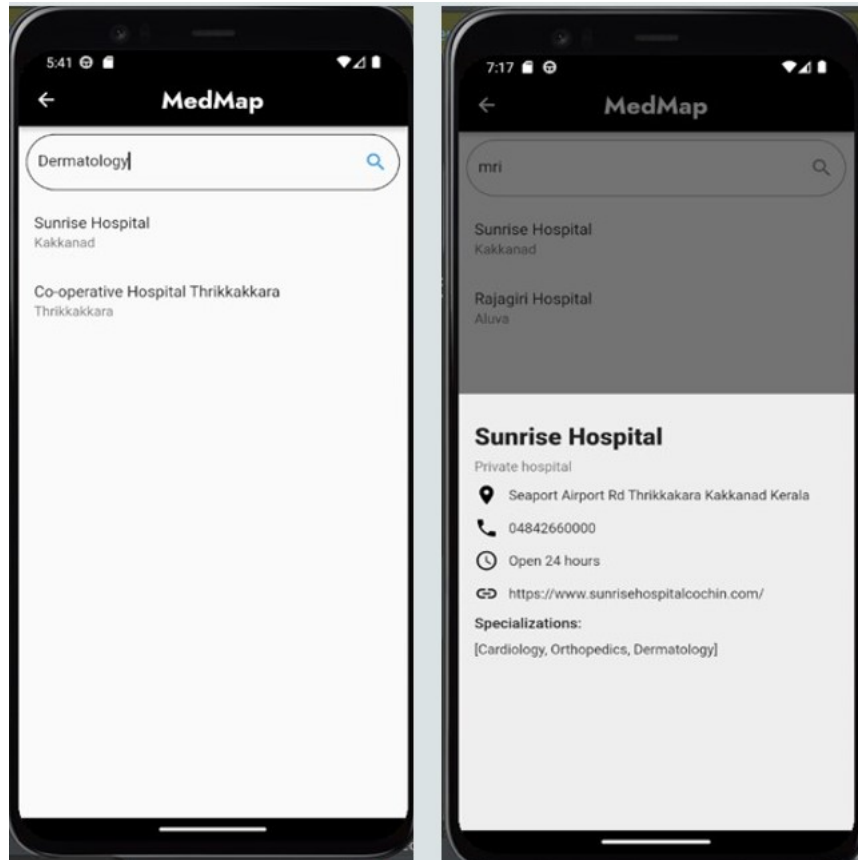


Figure 5.5: Search page

Chapter 6

Conclusion and Future Scope

6.1 Risk and Challenges

1. Firebase connection
2. Connection to Google Cloud platform
3. Payment for certain location based services
4. Data integrity should not be compromised

6.2 Conclusion

In conclusion, MedMap is a valuable resource for individuals seeking timely access to healthcare services. The app simplifies the process of finding nearby hospitals, enhances user experience, and contributes to improved healthcare outcomes. With its user-centric approach and commitment to continuous improvement, MedMap aims to make a significant impact in the healthcare sector.

By integrating with Google Maps, MedMap enables users to locate hospitals on a map, obtain directions, saving them valuable time and effort. The app provides comprehensive hospital information including name and location. This empowers users to make informed decisions regarding their healthcare needs.

We have used Android Studio version arctic fox 2020.3.1, Flutter and flutter plugins and Firebase. The initial User Interface designing was done using Figma. We developed all the designed screens using flutter and connected the database using Firebase. The application will work for test purposes and smaller system.

6.3 Scope of Future Work

By integrating with Google Maps, MedMap enables users to locate hospitals on a map, obtain directions, saving them valuable time and effort. The app provides comprehensive hospital information and emergency availability. This empowers users to make informed decisions regarding their healthcare needs.

References

- [1] <https://www.emnet-usa.org/community/findernow-htm/>
- [2] <https://www.google.com/url?sa=tsource=webrct=jopi=89978449url=https://firebase.google.com/Nup5ZeAAxUTcWwGHUyHC7wQFnoECAwQAQusg=AOvVaw2jBOiSblTk11XUUuGnA5F2>
- [3] <https://www.google.com/url?sa=tsource=webrct=jopi=89978449url=https://firebase.google.com/Nup5ZeAAxUTcWwGHUyHC7wQFnoECAwQAQusg=AOvVaw2jBOiSblTk11XUUuGnA5F2>
- [4] <https://support.google.com/googleapi/answer/6158862?hl=en>
- [5] <https://support.google.com/looker-studio/answer/10988075?hl=en>

Appendix: Sample Code

SEARCH BODY - SAMPLE CODE

```
import 'package:flutter/material.dart';
import 'package:cloud_firestore/cloud_firestore.dart';
class searchbody extends StatefulWidget {
  const searchbody({Key? key}) : super(key: key);

  @override
  State<searchbody> createState() => _searchbodyState();
}

class _searchbodyState extends State<searchbody> {
  late TextEditingController _searchController;

  List<QueryDocumentSnapshot<Map<String, dynamic>>> _searchResults = [];
  final FirebaseFirestore firestore = FirebaseFirestore.instance;
  CollectionReference<Map<String, dynamic>> hospitalsCollection =
    FirebaseFirestore.instance.collection('hospitals');

  String textFieldValue="";
  Map<String, dynamic>? selectedHospital;
  @override
  void initState() {
    super.initState();
    _searchController = TextEditingController();
  }
  Future<void> performSearch(String keyword) async {
    try {
      Query<Map<String, dynamic>> nameQuery =
        hospitalsCollection.where('name', isEqualTo: keyword);
      Query<Map<String, dynamic>> locationQuery =
        hospitalsCollection.where('location', isEqualTo: keyword);
      Query<Map<String, dynamic>> specializationsQuery =
        hospitalsCollection.where('specializations', arrayContains: keyword);
      Query<Map<String, dynamic>> insurancePoliciesQuery =
        hospitalsCollection.where('insurance_policies', arrayContains: keyword);
      Query<Map<String, dynamic>> mriQuery =
        hospitalsCollection.where(keyword, isEqualTo: true);
      List<QuerySnapshot<Map<String, dynamic>>> querySnapshots = await Future.wait([
        nameQuery.get(),
        locationQuery.get(),
        specializationsQuery.get(),
        insurancePoliciesQuery.get(),
```



```

    mriQuery.get(),
  ]);

  // Merge the query results into a single list
  List<QueryDocumentSnapshot<Map<String, dynamic>>> documents = [];
  for (var querySnapshot in querySnapshots) {
    documents.addAll(querySnapshot.docs);
  }

  setState(() {
    _searchResults = documents;
  });
} catch (error) {
  print('Failed to perform search: $error');
}
}

```

```

@override
Widget build(BuildContext context) {
  return Column(
    children: [
      Padding(
        padding: const EdgeInsets.all(8.0),
        child: TextField(
          cursorColor: Colors.black,
          controller: _searchController,
          onChanged: (value) {
            setState(() {
              textFieldValue = value;
            });
            performSearch(value);
          },
        ),
        decoration: InputDecoration(
          border: OutlineInputBorder(
            borderRadius: BorderRadius.circular(30),
          ),
          focusedBorder: OutlineInputBorder(
            borderSide: BorderSide(color: Colors.black),
            borderRadius: BorderRadius.circular(30),
          ),
          hintText: "Enter any keyword",
          suffixIcon: Icon(Icons.search),
        ),
      ),
    ],
  ),

```

```

    ),
    Expanded(
      child: ListView.builder(
        itemCount: _searchResults.length,
        itemBuilder: (context, index) {
          final hospital = _searchResults[index].data();

          return InkWell(
            child: ListTile(
              title: Text(hospital['name']),
              subtitle: Text(hospital['location']),
              // Display other hospital details as needed
            ),
            onTap: () { setState(() {
              selectedHospital = hospital;
            });
              _showHospitalDetailsBottomSheet(context);
            },
          );
        },
      ),
    ),
    if (selectedHospital != null) ...[
      // Display the hospital details section if a hospital is selected

    ],
  ],
);
}

void _showHospitalDetailsBottomSheet(BuildContext context) {
  showModalBottomSheet(
    context: context,
    builder: (BuildContext context) {
      return Container(
        decoration: BoxDecoration(borderRadius: BorderRadius.vertical(top:
Radius.circular(20))),
        child: Container(

          padding: EdgeInsets.symmetric(horizontal: 16, vertical: 30),
          color: Colors.grey[200],
          child: Column(
            crossAxisAlignment: CrossAxisAlignment.start,
            children: [
              Text('${selectedHospital!['name']}'),

```

```

        style: TextStyle(
          fontWeight: FontWeight.w900,
          fontSize: 25,
        ),
      ),
      SizedBox(height: 8),

      Text('${selectedHospital!['description']}', style: TextStyle(color: Colors.black54)),

      Container(
        margin: EdgeInsets.only(top: 10),
        child: Row(
          children: [
            Icon(Icons.location_on, color: Colors.black,),
            SizedBox(width: 10),
            Text('${selectedHospital!['address']}'),
          ],
        ),
      ),
      Container(
        margin: EdgeInsets.only(top: 10),
        child: Row(
          children: [
            Icon(Icons.phone, color: Colors.black,),
            SizedBox(width: 10),
            Text('${selectedHospital!['contact']}'),
          ],
        ),
      ),
      Container(
        margin: EdgeInsets.only(top: 10),
        child: Row(
          children: [
            Icon(Icons.access_time_rounded, color: Colors.black,),
            SizedBox(width: 10),
            Text('${selectedHospital!['time']}'),
          ],
        ),
      ),
      Container(
        margin: EdgeInsets.only(top: 10),
        child: Row(
          children: [
            Icon(Icons.link_outlined, color: Colors.black,),

```

```

        SizedBox(width: 10),
        Text('${selectedHospital!['website']}'),
      ],
    ),
  ),
  Container(
    margin: EdgeInsets.only(top: 10),
    child: Column(
      crossAxisAlignment: CrossAxisAlignment.start,
      children:[
        Text('Specializations:',style: TextStyle(fontWeight: FontWeight.w600,fontSize: 15)),
        SizedBox(height: 10,),
        Text('${selectedHospital!['specializations']}'),
      ],
    ),
  ),
  Container(
    margin: EdgeInsets.only(top: 10),
    child: Column(
      crossAxisAlignment: CrossAxisAlignment.start,
      children:[
        Text('Insurance Policies:',style: TextStyle(fontWeight: FontWeight.w600,fontSize:
15)),
        SizedBox(height: 10,),
        Text('${selectedHospital!['insurance_policies']}'),
      ],
    ),
  ),
],
),
),
);
},
);
}
}
}

```


PO CO

COURSE OUTCOMES:

After completion of the course the student will be able to

SL. NO	DESCRIPTION	Blooms' Taxonomy Level
CO1	Identify technically and economically feasible problems (Cognitive Knowledge Level: Apply)	Level 3: Apply
CO2	Identify and survey the relevant literature for getting exposed to related solutions and get familiarized with software development processes (Cognitive Knowledge Level: Apply)	Level 3: Apply
CO3	Perform requirement analysis, identify design methodologies and develop adaptable & reusable solutions of minimal complexity by using modern tools & advanced programming techniques (Cognitive Knowledge Level: Apply)	Level 3: Apply
CO4	Prepare technical report and deliver presentation (Cognitive Knowledge Level: Apply)	Level 3: Apply
CO5	Apply engineering and management principles to achieve the goal of the project (Cognitive Knowledge Level: Apply)	Level 3: Apply

CO-PO AND CO-PSO MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	3	3		2	2	3	2	2	2	3	2	2	2
CO2	3	3	3	3	3	2		3	2	3	2	3	2	2	2
CO3	3	3	3	3	3	2	2	3	2	2	2	3			2
CO4	2	3	2	2	2			3	3	3	2	3	2	2	2
CO5	3	3	3	2	2	2	2	3	2		2	3	2	2	2

3/2/1: high/medium/low

JUSTIFICATIONS FOR CO-PO MAPPING

MAPPING	LOW/ MEDIUM/ HIGH	JUSTIFICATION
100003/CS6 22T.1-PO1	HIGH	Identify technically and economically feasible problems by applying the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
100003/CS6 22T.1-PO2	HIGH	Identify technically and economically feasible problems by analysing complex engineering problems reaching substantiated conclusions using first principles of mathematics.
100003/CS6 22T.1-PO3	HIGH	Design solutions for complex engineering problems by identifying technically and economically feasible problems.
100003/CS6 22T.1-PO4	HIGH	Identify technically and economically feasible problems by analysis and interpretation of data.
100003/CS6 22T.1-PO6	MEDIUM	Responsibilities relevant to the professional engineering practice by identifying the problem.
100003/CS6 22T.1-PO7	MEDIUM	Identify technically and economically feasible problems by understanding the impact of the professional engineering solutions.
100003/CS6 22T.1-PO8	HIGH	Apply ethical principles and commit to professional ethics to identify technically and economically feasible problems.
100003/CS6 22T.1-PO9	MEDIUM	Identify technically and economically feasible problems by working as a team.
100003/CS6 22T.1-PO10	MEDIUM	Communicate effectively with the engineering community by identifying technically and economically feasible problems.
100003/CS6 22T.1-PO11	MEDIUM	Demonstrate knowledge and understanding of engineering and management principles by selecting the technically and economically feasible problems.
100003/CS6 22T.1-PO12	HIGH	Identify technically and economically feasible problems for long term learning.
100003/CS6 22T.1-PSO1	MEDIUM	Ability to identify, analyze and design solutions to identify technically and economically feasible problems.
100003/CS6 22T.1-PSO2	MEDIUM	By designing algorithms and applying standard practices in software project development and Identifying technically and economically feasible problems.
100003/CS6 22T.1-PSO3	MEDIUM	Fundamentals of computer science in competitive research can be applied to Identify technically and economically feasible problems.
100003/CS6 22T.2-PO1	HIGH	Identify and survey the relevant by applying the knowledge of mathematics, science, engineering fundamentals.

100003/CS6 22T.2-PO2	HIGH	Identify, formulate, review research literature, and analyze complex engineering problems get familiarized with software development processes.
100003/CS6 22T.2-PO3	HIGH	Design solutions for complex engineering problems and design based on the relevant literature.
100003/CS6 22T.2-PO4	HIGH	Use research-based knowledge including design of experiments based on relevant literature.
100003/CS6 22T.2-PO5	HIGH	Identify and survey the relevant literature for getting exposed to related solutions and get familiarized with software development processes by using modern tools.
100003/CS6 22T.2-PO6	MEDIUM	Create, select, and apply appropriate techniques, resources, by identifying and surveying the relevant literature.
100003/CS6 22T.2-PO8	HIGH	Apply ethical principles and commit to professional ethics based on the relevant literature.
100003/CS6 22T.2-PO9	MEDIUM	Identify and survey the relevant literature as a team.
100003/CS6 22T.2-PO10	HIGH	Identify and survey the relevant literature for a good communication to the engineering fraternity.
100003/CS6 22T.2-PO11	MEDIUM	Identify and survey the relevant literature to demonstrate knowledge and understanding of engineering and management principles.
100003/CS6 22T.2-PO12	HIGH	Identify and survey the relevant literature for independent and lifelong learning.
100003/CS6 22T.2-PSO1	MEDIUM	Design solutions for complex engineering problems by Identifying and survey the relevant literature.
100003/CS6 22T.2-PSO2	MEDIUM	Identify and survey the relevant literature for acquiring programming efficiency by designing algorithms and applying standard practices.
100003/CS6 22T.2-PSO3	MEDIUM	Identify and survey the relevant literature to apply the fundamentals of computer science in competitive research.
100003/CS6 22T.3-PO1	HIGH	Perform requirement analysis, identify design methodologies by using modern tools & advanced programming techniques and by applying the knowledge of mathematics, science, engineering fundamentals.
100003/CS6 22T.3-PO2	HIGH	Identify, formulate, review research literature for requirement analysis, identify design methodologies and develop adaptable & reusable solutions.

100003/CS6 22T.3-PO3	HIGH	Design solutions for complex engineering problems and perform requirement analysis, identify design methodologies.
100003/CS6 22T.3-PO4	HIGH	Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
100003/CS6 22T.3-PO5	HIGH	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools.
100003/CS6 22T.3-PO6	MEDIUM	Perform requirement analysis, identify design methodologies and assess societal, health, safety, legal, and cultural issues.
100003/CS6 22T.3-PO7	MEDIUM	Understand the impact of the professional engineering solutions in societal and environmental contexts and Perform requirement analysis, identify design methodologies and develop adaptable & reusable solutions.
100003/CS6 22T.3-PO8	HIGH	Perform requirement analysis, identify design methodologies and develop adaptable & reusable solutions by applying ethical principles and commit to professional ethics.
100003/CS6 22T.3-PO9	MEDIUM	Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.
100003/CS6 22T.3-PO10	MEDIUM	Communicate effectively with the engineering community and with society at large to perform requirement analysis, identify design methodologies.
100003/CS6 22T.3-PO11	MEDIUM	Demonstrate knowledge and understanding of engineering requirement analysis by identifying design methodologies.
100003/CS6 22T.3-PO12	HIGH	Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change by analysis, identify design methodologies and develop adaptable & reusable solutions.
100003/CS6 22T.3-PSO3	MEDIUM	The ability to apply the fundamentals of computer science in competitive research and prior to that perform requirement analysis, identify design methodologies.
100003/CS6 22T.4-PO1	MEDIUM	Prepare technical report and deliver presentation by applying the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
100003/CS6 22T.4-PO2	HIGH	Identify, formulate, review research literature, and analyze complex engineering problems by preparing technical report and deliver presentation.

100003/CS6 22T.4-PO3	MEDIUM	Prepare Design solutions for complex engineering problems and create technical report and deliver presentation.
100003/CS6 22T.4-PO4	MEDIUM	Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions and prepare technical report and deliver presentation.
100003/CS6 22T.4-PO5	MEDIUM	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools and Prepare technical report and deliver presentation.
100003/CS6 22T.4-PO8	HIGH	Prepare technical report and deliver presentation by applying ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
100003/CS6 22T.4-PO9	HIGH	Prepare technical report and deliver presentation effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.
100003/CS6 22T.4-PO10	HIGH	Communicate effectively with the engineering community and with society at large by prepare technical report and deliver presentation.
100003/CS6 22T.4-PO11	MEDIUM	Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work by prepare technical report and deliver presentation.
100003/CS6 22T.4-PO12	HIGH	Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change by prepare technical report and deliver presentation.
100003/CS6 22T.4-PSO1	MEDIUM	Prepare a technical report and deliver presentation to identify, analyze and design solutions for complex engineering problems in multidisciplinary areas.
100003/CS6 22T.4-PSO2	MEDIUM	To acquire programming efficiency by designing algorithms and applying standard practices in software project development and to prepare technical report and deliver presentation.
100003/CS6 22T.4-PSO3	MEDIUM	To apply the fundamentals of computer science in competitive research and to develop innovative products to meet the societal needs by preparing technical report and deliver presentation.
100003/CS6 22T.5-PO1	HIGH	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
100003/CS6 22T.5-PO2	HIGH	Identify, formulate, review research literature, and analyze complex engineering problems by applying engineering and management principles to achieve the goal of the project.

100003/CS6 22T.5-PO3	HIGH	Apply engineering and management principles to achieve the goal of the project and to design solutions for complex engineering problems and design system components or processes that meet the specified needs.
100003/CS6 22T.5-PO4	MEDIUM	Apply engineering and management principles to achieve the goal of the project and use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
100003/CS6 22T.5-PO5	MEDIUM	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools and to apply engineering and management principles to achieve the goal of the project.
100003/CS6 22T.5-PO6	MEDIUM	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities by applying engineering and management principles to achieve the goal of the project.
100003/CS6 22T.5-PO7	MEDIUM	Understand the impact of the professional engineering solutions in societal and environmental contexts, and apply engineering and management principles to achieve the goal of the project.
100003/CS6 22T.5-PO8	HIGH	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice and to use the engineering and management principles to achieve the goal of the project.
100003/CS6 22T.5-PO9	MEDIUM	Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings and to apply engineering and management principles to achieve the goal of the project.
100003/CS6 22T.5-PO11	MEDIUM	Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments and to apply engineering and management principles to achieve the goal of the project.
100003/CS6 22T.5-PO12	HIGH	Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change and to apply engineering and management principles to achieve the goal of the project.
100003/CS6 22T.5-PSO1	MEDIUM	The ability to identify, analyze and design solutions for complex engineering problems in multidisciplinary areas. Apply engineering and management principles to achieve the goal of the project.

100003/CS6 22T.5-PSO2	MEDIUM	The ability to acquire programming efficiency by designing algorithms and applying standard practices in software project development to deliver quality software products meeting the demands of the industry and to apply engineering and management principles to achieve the goal of the project.
100003/CS6 22T.5-PSO3	MEDIUM	The ability to apply the fundamentals of computer science in competitive research and to develop innovative products to meet the societal needs thereby evolving as an eminent researcher and entrepreneur and apply engineering and management principles to achieve the goal of the project.

