A
Project Report
on
Food And PG Recommendation System Using ML

Submitted for the Course of BE in Computer Engineering by

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GURU GOBIND SINGH COLLEGE OF ENGINEERING AND RESEARCH CENTRE

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Department of Computer Engineering

CERTIFICATE

This is to certify that the PROJECT REPORT entitled

Food And PG Recommendation System Using ML

is submitted as fulfilment of the

Project Examination BE in Computer Engineering

BY

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Abstract

This project aims to develop a food(Mess) and PG recommendation application us ing machine learning. The application will take into account various factors, such as the user's budget, location preferences, food preferences to recommend the best food messes and PGs for the user. The application will use content-based filtering, which will recom mend Food(mess) and PGs to users based on the features of the items themselves. The application will be developed using a variety of open source technologies, such as Flutter and Python. The application will be using Firebase Realtime Database. The application will be evaluated using a variety of metrics, such as accuracy, precision, and recall. The application will also be evaluated by a group of users to get their feedback on the user interface and the quality of the recommendations. Once the application is developed and evaluated, it will be released to the public as a free-to-use mobile app. The app will be available on both the Android and iOS platforms. The application has the potential to benefit both users and food mess and PG owners. For users, the application can help them to save time and effort in finding the best food messes and PGs. The application can also help them to find food messes and PGs that meet their specific needs and pref erences. For food mess and PG owners, the application can help them to attract more customers. The application can also help them to get feedback from their customers and to improve their services.

Keywords:- *Content-based filtering, Free-to use mobile app, Mess recommendation, PG recommendation*

Abbreviation

Sr No.	Abbriviation	Full Form
1	PG	Paying Guest
2	ML	Machine Learning
3	HMS	Hostel Management System
4	GUI	Graphical User Interface
5	DFD	Data Flow Diagram
6	UML	Unified Modeling Language
7	CBF	Content Based Filtering

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Chapter 1

Introduction

Machine learning (ML) revolutionizes the way systems operate by enabling them to learn and improve autonomously, without explicit programming. At its core, ML focuses on developing algorithms capable of learning from data and using that knowledge to make predictions or decisions. These algorithms are trained on extensive datasets containing labeled examples, allowing them to discern patterns and relationships within the data. Once trained, an ML algorithm can apply its acquired knowledge to new, unlabeled data, making it adept at handling diverse tasks across various domains.[1]

Content-based filtering stands out as a subtype of recommender systems, designed to provide personalized recommendations to users based on their past preferences. The Hostel and Mess recommendation system will adapt the content based filtering algorithm to suggest best suitable options .[3]This approach involves hostel and mess representing each item with a feature vector, encapsulating relevant information such as genre, keywords, or ratings. By comparing the feature vectors of hostel items that a user has previously liked to those of other items within the system, content-based filtering identifies similarities and recommends hostel that align closely with the user's preferences.[6] This process ensures that recommendations are tailored to individual tastes, enhancing user satisfaction and engagement with the system. Through the utilization of content-based filtering techniques, recommender systems delivers personalized experiences, facilitating more informed decision-making and enriching user interactions.[8]

1.1 Overview

The project aims to develop a mobile application utilizing machine learning to recommend food messes and paying guest accommodations (PGs) based on user preferences, budget, and location. Leveraging content-based filtering, the app will analyze features of

the items themselves to provide tailored recommendations. Developed using open-source technologies like Flutter and Python, with Firebase Realtime Database managing user data, the application will undergo evaluation using metrics such as accuracy, precision, and recall. User feedback will be solicited to refine both the interface and recommendation quality. Once developed and tested, the app will be released for free on Android and iOS platforms. With potential benefits for both users and food mess/PG owners—including time-saving for users and enhanced customer attraction and service improvement for owners—the project seeks to provide a valuable solution benefiting all stakeholders.

1.2 Aim

1] This system aims to provide personalized, data-driven recommendations to students based on their unique preferences and requirements. 2] The project's outcome aims to enhance the user experience for all stakeholders involved while ensuring transparency and ease of use throughout the process.

1.3 Objectives

1. **To implement a novel approach that recommends food facility and PGs using Machine Learning algorithms:**

   The objective is to create a state-of-the-art recommendation system that can provide highly personalized suggestions for food facilities and PG accommodations based on individual user preferences, budget constraints, and location preferences.

2. **To implement a novel approach that recommends food facility and PGs using Machine Learning algorithms :**

   The goal is to develop an innovative recommendation system utilizing machine learning algorithms to suggest food facilities and PG accommodations, catering to individual preferences efficiently and accurately.

3. **To improve decision making on basis of ratings, reviews :**

   The objective is to enhance decision-making processes by leveraging ratings and reviews, providing users with valuable insights to make informed choices efficiently.

1.4 Organization of Report

The rest of this report is organized in the following manner. In all chapters, related contents are described in detail.

- **Introduction (Chapter 1)**: In this chapter, the overview of existing systems and their problem is discussed. This chapter describes the aim, motivation, and objectives of the software system.
- **Literature Survey (Chapter 2)**: In this chapter, Related work done in the Previous papers have advantages and disadvantages. Related information is available in standard Books, Journals, Transactions, Internet Websites, etc. is discussed.
- **Software Requirement Specification (Chapter 3)**: In this chapter, the detailed description of requirements is specified.
- **System Design (Chapter 4)**: This chapter discusses the proposed system with the help of system architecture, system design, and UML diagrams
- **Technical Specifications (Chapter 5)**: This chapter, discusses the technical details used in the project
- **Project Estimation Schedule and Team Structure (Chapter 6)**: This chapter discusses project estimate, brief of COCOMO model, and related calculation and team structure
- **Software Implementation (Chapter 7)**: This chapter discusses important module and algorithm also business logic and archite
- **Software Testing (Chapter 8)**: This chapter gives a briefing about testing for various modules
- **Software Testing (Chapter 9)**: This chapter discusses about installation and uninstallation of project as well as maintenance
- **Conclusion and Future Scope (Chapter 10)**: This chapter summarizes and concludes the project report and give the future scope.
- **Plagiarism Report(Chapter 11)**: This chapter shows the plagiarism report.

Chapter 2

Literature Survey

The literature survey reveals a common problem among out-of-town students: difficulty in finding good food and accommodation. This motivates the project. Insights from the survey guide the project's planning, emphasizing the need to address user needs effectively, including preferences, budgets, and location. The goal is to provide innovative solutions to ease students' struggles in accessing quality food and accommodation.

1. A Web Platform for Mess Management System: An Overview, Prof. R.B.Gaurav, Bhakti Hingane, Vaishnavi Poojari, FizaTamboli, AkanshaBhongane: [April 2021]

In an effort to streamline mess management processes and enhance student sat isfaction, a mobile mess management system is proposed. This comprehensive solution aims to automate all aspects of mess management, including menu planning, inventory control, and leave applications. To further enhance its accessibility, the system will be offered free of charge for users and readily available for download on smartphones. Be yond its core automation features, the mobile mess management system boasts a range of valuable functionalities designed to simplify and enrich the student experience. Stu dents can conveniently order meals directly through the app, eliminating the need for lengthy queues at the mess counter. Additionally, the app provides detailed nutritional information for each meal, empowering students to make informed and health-conscious choices. To foster student engagement and continuous improvement, the system incor porates a real-time feedback mechanism, allowing students to provide valuable insights on the mess food. Furthermore, seamless payment integration with popular payment gateways facilitates effortless meal payments. The implementation of the mobile mess

management system is anticipated to yield a multitude of benefits for both students and the mess management team. By streamlin ing meal ordering and leave applications, the system is expected to significantly reduce waiting times for students, enhancing their overall experience. Concurrently, the automa tion of many manual tasks, such as menu planning and inventory management, will free up valuable time for mess management staff, enabling them to focus on more strategic initiatives such as quality improvement and customer service enhancement.

2. A Proposed Model based on Modern Requirements to Optimize Hostel Re sources in Oman, Alla Khamis, Duaa Mohammad, Aya Yahya, Jitendra Pandey:[March 2020]

To address the evolving needs of hostel stakeholders, a comprehensive and mod ern hostel management system is proposed. This innovative solution aims to streamline hostel operations by digitizing all records, automating routine tasks, and enhancing com munication channels between various groups. The system will cater to the specific needs of hostel owners, employees, students, and parents, ensuring a seamless and efficient hos tel management experience for all. The proposed hostel management system will digitize all hostel records, including stu dent information, room allocations, and financial records. This digital transformation will eliminate the need for manual record-keeping, ensuring data accuracy and facilitat ing easy retrieval of information. Additionally, the system will automate routine tasks such as room booking, fee calculation, and report generation. This automation will significantly improve efficiency, reduce errors, and free up staff to focus on providing personalized services to residents. To enhance communication and collaboration among hostel stakeholders, the system will integrate various communication channels. Hostel owners can monitor hostel oper ations and receive real-time updates, while employees can access essential information and streamline daily tasks. Students can conveniently access their hostel information, submit maintenance requests, and communicate with hostel staff directly through the system. Parents can stay informed about their child's hostel life, track payments, and receive important announcements. Hostel owners can expect improved operational efficiency, reduced costs, and enhanced resident satisfaction. Employees can enjoy a more streamlined workflow, reduced paperwork, and greater opportunities for interaction with residents. Students will experience a seamless check-in process, convenient access to in formation, and prompt resolution of concerns. Parents will gain peace of mind knowing that their child's hostel life is well-managed and that they can stay connected and in formed.

3. Implementation Of Hostel Management With Automation Using Design Think ing, Dinesh.B, Gogul Nithin.R, Pavatharani.R,Sneha.R,C.Senthilkuma:[April 2021]

To alleviate the administrative burden on hostel staff and enhance the student experience, a comprehensive hostel management system is proposed. This innovative so lution aims to streamline hostel operations by automating various administrative tasks, including hostel allocation, room assignments, and fee payments. The system is designed to seamlessly integrate with existing systems and boasts a user-friendly interface, ensur ing a smooth transition for both staff and students. The proposed hostel management system will automate the hostel allocation process, eliminating the need for manual room assignments and ensuring efficient and fair distri bution of rooms. Students can conveniently apply for hostel accommodations through the system, submitting their preferences and requirements. The system will then auto matically allocate rooms based on availability, student preferences, and hostel policies. The system also automates fee payments, eliminating the need for students to stand in queues or make physical payments. Students can easily view their outstanding fees, gen erate payment challans, and make online payments directly through the system. This automation streamlines the payment process, reducing administrative overhead and en suring timely collections for the hostel. To ensure seamless integration with existing systems, the hostel management system is designed to be compatible with various software applications, including student informa tion systems and financial management systems. This compatibility enables the system to exchange data seamlessly, eliminating the need for manual data entry and ensuring data consistency across different systems. The proposed hostel management system prioritizes user-friendliness, featuring a simple and intuitive interface that is accessible to both staff and students. The system provides clear navigation, comprehensive help documentation, and contextual guidance to ensure that users can easily perform tasks and access information. Additionally, the system offers multiple language options to cater to the diverse linguistic needs of the hostel community.

4. Modelling the relationship between perceived value, customer satisfaction, and customer loyalty in Youth Hostel: an empirical study, Xiaohong Chen, Qianying Liu, Kaishan Huang, Tingting Liu:[March 2019]

This study delves into the intricacies of customer satisfaction and loyalty towards youth hostels, employing path modeling to unravel the underlying factors that contribute to these crucial aspects of the hospitality industry. The study uncovers that aesthetic, hedonic, and location dimensions of customer perceived value exert a significant direct

positive impact on customer satisfaction, highlighting the importance of creating visu ally appealing, enjoyable, and conveniently located hostel experiences. Interestingly, price and prestige, often considered key factors in hospitality, were found to have no significant influence on customer satisfaction, suggesting that youth hostel patrons prioritize value over luxury. Customer satisfaction, in turn, was revealed to have a direct relationship with customer loyalty, emphasizing the importance of fostering positive customer expe riences to cultivate a loyal clientele. Drawing upon these insights, the study recommends that youth hostel managers adopt a value-driven approach, focusing on enhancing the aesthetic, hedonic, and location aspects of their hostels. By creating visually appealing spaces, providing enjoyable experiences, and offering convenient locations, youth hostels can effectively attract and retain cus tomers. Additionally, managers should cultivate a customer-centric culture, prioritizing satisfaction at every touchpoint to foster loyalty and encourage repeat business. The study's findings offer valuable guidance for youth hostel managers, enabling them to make informed decisions that optimize customer satisfaction and loyalty, ultimately contributing to the success and sustainability of their businesses.

5. Mess Management System Implementation, Vineetha Rohra, Anurag Sukhija Nikita Lalwani, Ajay Karare : [**March 2020**]

Conventional mess management practices, often characterized by manual record keeping and labor-intensive tasks, are prone to errors and inefficiencies. The implementa tion of a comprehensive software solution could revolutionize mess management, stream lining operations, reducing costs, and enhancing overall efficiency. This software could automate various mess management tasks, including food billing and cadet information management, thereby eliminating human error and freeing up valuable staff time for more strategic initiatives. Acentralized database of food items, including detailed descriptions, nutritional informa tion, and pricing, would facilitate accurate billing, ensuring transparency and eliminating discrepancies. The software could also generate reports on food consumption patterns, providing valuable insights into cadet preferences and dietary trends. This data could inform procurement decisions, optimize menus, and minimize food waste. The cadet management module would consolidate cadet information, including atten dance records, dietary restrictions, and payment history. This centralized repository would streamline administrative tasks, facilitating easy access to information and en abling staff to quickly address cadet queries and concerns. Additionally, the software could integrate with existing student information systems, ensuring seamless data exchange and eliminating the need for manual data entry. By integrating these functional

ities, the software could transform mess management into a more efficient, accurate, and user-friendly process.

6. Study of Digitalized Hostel Management System, Kartik Chaudhri, Riddhi Kevat :[March 2021]

eHostel emerges as a transformative Android application poised to revolutionize hostel management practices by seamlessly automating routine tasks and providing a plethora of user-friendly features. This innovative solution streamlines hostel operations, enhances communication channels, and fosters a connected hostel community. eHostel empowers hostel administrators to effortlessly manage room allocation, fee pay ments, and student information. The app's intuitive interface facilitates room assign ments based on availability, student preferences, and hostel policies. It also enables efficient fee management through online payment gateways, eliminating the need for physical payments and ensuring timely collections. The app streamlines student management by providing a centralized repository for stu dent records, including attendance, academic performance, and personal information. This centralized access facilitates easy retrieval of information, enabling staff to promptly address student inquiries and concerns. eHostel prioritizes transparency and accountability by introducing a complaint manage ment system. Students can conveniently register complaints, track their progress, and receive timely resolutions. This system fosters open communication and ensures that student concerns are addressed promptly and effectively. Visitor management is simplified through eHostel's visitor records feature. Visitors can pre-register their visits, and hostel staff can easily verify their identities and maintain accurate visitor records. This feature enhances security and streamline visitor manage ment procedures. eHostel streamlines leave management by enabling students to apply for leave electroni cally. The app facilitates easy submission of leave requests, routing them to the appro priate authorities for approval. This automated process eliminates paperwork, reduces administrative overhead, and ensures timely processing of leave requests.

7. Hostel Management System (HMS),Prof. Deepali Narkhede, Rutuja Bamgude, Mayuri Sonawane, Mandar Shevade:[April 2022]

In the ever-evolving landscape of educational institutions, the need for efficient hostel management has become paramount. As institutions grow and student popula tions expand, manual hostel management processes become increasingly cumbersome and prone to errors. The "Online Hostel Management System" emerges as a transfor-

mative solution, streamlining hostel operations and replacing outdated manual processes with a centralized, user-friendly, and GUI-oriented software platform. This innovative system seamlessly integrates with existing systems, eliminating the need for data duplication and ensuring compatibility with the institution's overall IT infras tructure. By automating routine tasks such as room allocation, fee management, and student record-keeping, the system significantly reduces administrative workloads, free ing up valuable staff time for more strategic initiatives such as quality improvement and student engagement. The intuitive GUI interface of the "Online Hostel Management System" empowers hostel administrators and staff to navigate the system with ease, effortlessly performing tasks and accessing essential information. This user-friendly design ensures that even those with limited technical expertise can effectively utilize the system, minimizing the need for training and support.

8. Design of Smart Mess Application Using Ubiquitous Computing, Anant Nema, Kathiravan Srinivasan, Chao-Hsi Huang, Tung Yang:[March 2018]

To address the challenges of traditional mess management systems and enhance food safety and quality, this project proposes the implementation of a smart mess man agement system leveraging ubiquitous computing technologies. This innovative solution aims to monitor and control various aspects of mess operations, including food storage, quality, and other environmental factors, in real-time, ensuring a seamless and efficient mess management experience. The smart mess management system utilizes a network of sensors strategically deployed throughout the mess facility to collect real-time data on various parameters, including temperature, humidity, food temperature, and air quality. This comprehensive data is then transmitted to a centralized database for storage and analysis. Advanced analytics algorithms are employed to process the collected data, identifying anomalies and potential issues that could compromise food safety and quality. The sys tem is capable of detecting food temperature fluctuations, indicating potential spoilage, and monitoring humidity levels to prevent the growth of mold and bacteria. In the event of any detected anomalies or potential food safety threats, the system promptly generates notifications and alerts to the mess manager. These notifications provide timely information about the specific issue, its location, and the severity of the situation. This enables the mess manager to take immediate corrective actions, ensuring food safety and preventing the spread of foodborne illnesses. The smart mess management system extends beyond food safety monitoring to encom pass the optimization of mess operations and resource utilization. By tracking food consumption patterns, the system can generate insights into food preferences and de mand. This data can inform menu planning, reduce

food waste, and optimize inventory management, leading to cost savings and improved resource allocation.

9. The Hostel Buddy, Gauri Kulkarni. Nikita V Supekar, Mayank M Nikose, Nikhilesh S Chauhan, Shreya Nikole, Kunal A Nimkar, Anshul V Nimje :[June 2023]

TheHostel Buddyemerges as acomprehensive online platform designed to stream line the hostel search process for students, alleviating the stress and uncertainty associ ated with finding suitable accommodation. This user-friendly website empowers students to make informed decisions by providing a comprehensive search functionality based on various criteria, including proximity to campus, budget constraints, and security consid erations. The Hostel Buddy's intuitive interface allows users to effortlessly filter and compare hos tels, enabling them to identify options that align with their preferences and requirements. Detailed hostel profiles provide students with valuable information about amenities, fa cilities, and student reviews, empowering them to make informed choices. To further enhance the user experience, The Hostel Buddy incorporates a room man agement module specifically designed for hostel managers. This module provides hostel managers with real-time occupancy and availability status, enabling them to efficiently manage room allocation and optimize utilization. This feature streamlines hostel man agement practices, reducing administrative burdens and enhancing overall efficiency. The Hostel Buddy's location system utilizes advanced mapping technologies to provide users with accurate directions to their chosen hostels. This feature eliminates the hassle of navigation, ensuring that students can easily locate and reach their new accommoda tions. The Hostel Buddy's commitment to user satisfaction extends beyond its core search and management functionalities. The website features a dedicated section for frequently asked questions, providing students with readily accessible answers to common inquiries. Additionally, the website includes a comprehensive list of hostel-related resources, such as packing guides and tips for adjusting to hostel life.

10. Food Recommendation SystemUsing Machine Learning, Mr.Anil S.Manmothe1, Miss.Jayashree Mahale2, Miss.Bhagyashri Patil3,Mr.Abhijeet patil4, Prof.Kanchan Mahajan:[April 2020]

Conventional recommender systems, often limited in their ability to consider multiple criteria for each item, fall short in addressing the nuances of hotel food rec ommendations. While traditional rating-based food recommender systems hold promise, their

effectiveness hinges on the availability of a large pool of user ratings, a condition often unmet in the context of hotel food recommendations. To bridge this gap, this paper proposes a novel rating criteria recommendation system that tailors food suggestions to a user's preferences and leverages the collective wisdom of other users' ratings. The proposed system harnesses natural language processing techniques to extract rating criteria from a corpus of hotel food reviews, meticulously constructing a user-item-feature database. This database serves as a repository of valuable insights into the multifaceted aspects of hotel food that users consider when making their recommendations. To further personalize the recommendation process, the system incorporates user feed back by inviting users to provide ratings for their hotel food experiences upon checkout. This feedback enriches the user-item-feature database, enabling the system to refine its recommendations for future users. In instances where two users express similar ratings for a particular hotel's food, the system leverages this shared sentiment to extend recommendations to other users who have yet to rate that hotel. This collaborative approach expands the pool of recommen dations, ensuring that users are exposed to a wider range of options that align with their preferences.

2.1 Conclusion From Literature Survey

The overall conclusion from the above literature survey is that everywhere the outside students are facing the big trouble for finding the good food and accommodation for living. This is the big problem and motivation for developing this project. This literature survey give's us the idea for managing the various things that would necessary to plan out for this project.

Chapter 3

Software Requirement Specification

3.1 Introduction

3.1.1 Purpose

The purpose is to develop a content-based hostel and mess recommenda tion system to address the challenge of finding suitable hostel accommodations and mess facilities for students. The system leverages advanced machine learning techniques, and user profiling to provide personalized, data-driven recommendations to students based on their unique preferences and requirements.

Why the project is Chosen?

We choose this project because it addresses the critical challenge of finding suitable hostels and food mess as per requirements. We encountered problems like not getting proper hostels in nearby area which will fulfil our requirements, the problem of mess was also a big hectic to us in our initial years and by observing same condition of new students we decided to take a move to find optimal solution. It aligns perfectly with our goal of providing best hostel and mess recommendations using review-based system and has the potential to resolve students' problem of suitable accommodation and mess according to their need.

3.1.2 Intended audience and reading suggestion

- **Educational Institutions:** Colleges can use this system during admission process to provide students trust and assurity of secure living which may help in boost admission process and trust on college.
- **Students:** They can get the best available and suitable place of living near college

area and will solve the problem of food facility too for new comers mainly.

3.1.3 Project Scope

1) This system can be use in various institution, organization and industry for recommendation purpose.

2) Implement recommendation algorithms that analyze user preferences and hostel/mess data to provide personalized suggestions.

3.1.4 Design and Implementation Constrain

Consider following example wrt Automated Document Verification System

1. **Data Availability:** Availability and quality of data could be a constraint. Ensuring access to a sufficient amount of high-quality data regarding food facilities, PG accommodations, user preferences, and reviews might be challenging.

2. **Evaluation and Feedback:** Establishing methods for evaluating the effectiveness of the recommendation system and gathering feedback from users to continuously improve its performance is essential. Implementing mechanisms for collecting and analyzing user feedback in real-time may be a constraint.

3. **User Interface Design:** Designing a user-friendly interface that effectively communicates recommendations while accommodating various user inputs and preferences can be challenging. Balancing simplicity with functionality is essential to ensure a positive user experience..

4. **Algorithm Complexity:** Implementing machine learning algorithms, especially those capable of providing accurate recommendations based on various user preferences and constraints, can be complex. Ensuring that the chosen algorithms are both effective and computationally feasible is crucial.

3.1.5 Assumption and Dependencies

Assumptions:

Availability of Sufficient Data: Assuming there is an ample amount of data available regarding food facilities, PG accommodations, user preferences, and reviews to train and evaluate the recommendation system effectively.

User Engagement: Assuming that users will actively engage with the application by providing feedback, ratings, and reviews to improve the accuracy of recommendations over time.

Reliable Internet Connection: Assuming users will have access to a reliable internet connection to use the mobile application seamlessly.

Trust in Recommendations: Assuming users will trust the recommendations provided by the system and be willing to act upon them when selecting food facilities and PG accommodations.

Dependencies:

Data Sources: Dependency on external data sources such as APIs for retrieving information about food facilities, PG accommodations, and user reviews.

Machine Learning Libraries: Dependency on machine learning libraries and frameworks such as TensorFlow or scikit-learn for implementing recommendation algorithms.

Cloud Infrastructure: Dependency on cloud infrastructure providers such as Google Cloud Platform or Amazon Web Services for hosting the application and managing computational resources.

Integration with Firebase: Dependency on Firebase Realtime Database for storing user data, preferences, and recommendations.

User Feedback Mechanism: Dependency on implementing a mechanism for collecting user feedback and integrating it into the recommendation system to improve its performance.

3.2 System Features

3.2.1 User Profile Creation:

Users can create profiles and input their preferences, budget constraints, dietary restrictions, and location preferences.

3.2.2 Personalized Recommendations:

Generates personalized recommendations for food messes and PG accommodations tailored to each user's preferences, budget, dietary restrictions, and location.

3.2.3 Rating and Reviews:

Enables users to rate and review food facilities and PG accommodations they have visited, contributing to the accuracy and reliability of recommendations.

3.2.4 User Feedback Mechanism:

Implements a mechanism for collecting user feedback and incorporating it into the recommendation system to continuously improve recommendation accuracy and user satisfaction.

3.3 External Interface Requirement

3.3.1 User Interface

1] The user interface should be intuitive, user-friendly, and visually appealing.

2] It should include options for users to create profiles, input preferences, view recommendations, search for specific criteria, rate and review facilities, and make bookings.

3.3.2 Software Interface

1] Integration with machine learning libraries and frameworks such as TensorFlow or scikit-learn for recommendation algorithms.

2] Interaction with Firebase Realtime Database for storing and retrieving user data, preferences, recommendations, and reviews.

3.3.3 Communication Interface

1] The system should support secure communication protocols (e.g., HTTPS) to ensure the confidentiality and integrity of user data during transmission.

2] Integration with email or messaging services for communication purposes, such as account verification, password reset, or promotional messages.

3.4 Non Functional Requirements

Performance Requirements :

Response time: The system should be able to respond to user requests in less than 1 second.

Throughput: The system should be able to handle 1000 concurrent users.

Scalability: The system should be scalable to handle more users and food messes/PGs without sacrificing performance.

Availability :

1. The system should be available 99.9 percent of the time.

2.The system should be able to be scaled to meet the needs of a growing user base.

Functionality : 1. The system should be able to recommend food messes and PGs to users based on their preferences.The preferences can include location, price, amenities, food type, and so on.

2. The system should be able to learn the user's preferences over time and provide more accurate recommendations.

4. The system should allow users to rate and review food messes and PGs. This will help other users to make informed decisions about which food messes and PGs to choose.

3.5 Other Requirement

3.5.1 Functional Requirements:

1. **Recommendation:** The system should be able to recommend food messes and PGs to users based on their preferences.

2. **Rating and Review:** The system should allow users to rate and review food messes and PGs

3. **Scalability:** The system should be able to handle a large number of users and food messes/PGs.

4. **Budget:** The system should be able to recommend food messes and PGs to users based on their budget.

5. **Information:** The system should be able to provide users with information about the food messes and PGs, such as the menu, amenities, and photos.

3.6 Analysis Model

3.6.1 Data Flow Diagram

By utilizing DFDs, documenting hostel and mess recommendation system's data flow and how it interacts with the ML model to generate recommendations for users. This visual representation aids in understanding the system's functionality and facilitates communication among team members involved in development.

DFD Level 0

Data Flows:

User Input: This data flow likely represents the information users enter into the system through the user interface. This could include search criteria like location, price range, amenities desired for hostels and food preferences.

Mess and Hostel Data: This data flow represents information related to hostels and food options stored in the system's database. This data would likely include details like hostel locations, amenities offered, pricing, and mess (food service) menus or dietary options.

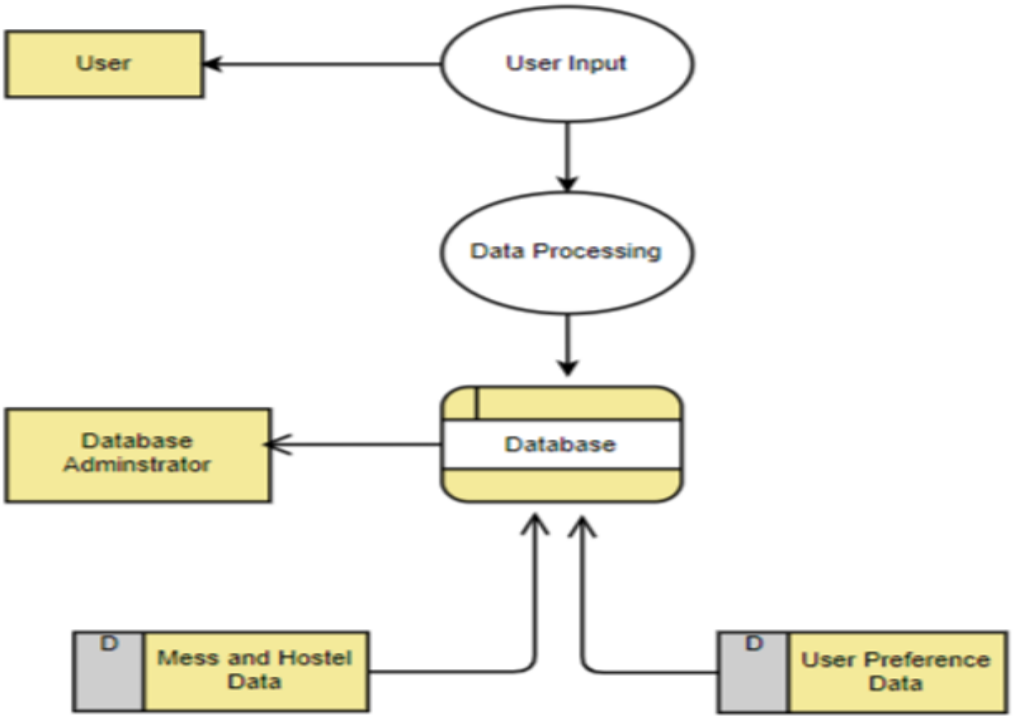

Figure 3.1: Dataflow Diagram

DFD Level 1

In Data Flow Diagram (DFD) Level 1,

Hostel and Food Data: This data flow represents the information related to hostels and food options that the data administrator will provide to update the system. This could include details like hostel names, locations, amenities offered, pricing, food menus, and dietary options.

Data Update Request: This data flow likely represents the data administrator's actions or instructions specifying which data needs to be updated. This could involve selecting specific hostels or food options and indicating the changes to be made.

Updated Hostel and Food Data: This data flow represents the modified hostel and food information that gets stored back into the system's database after processing.

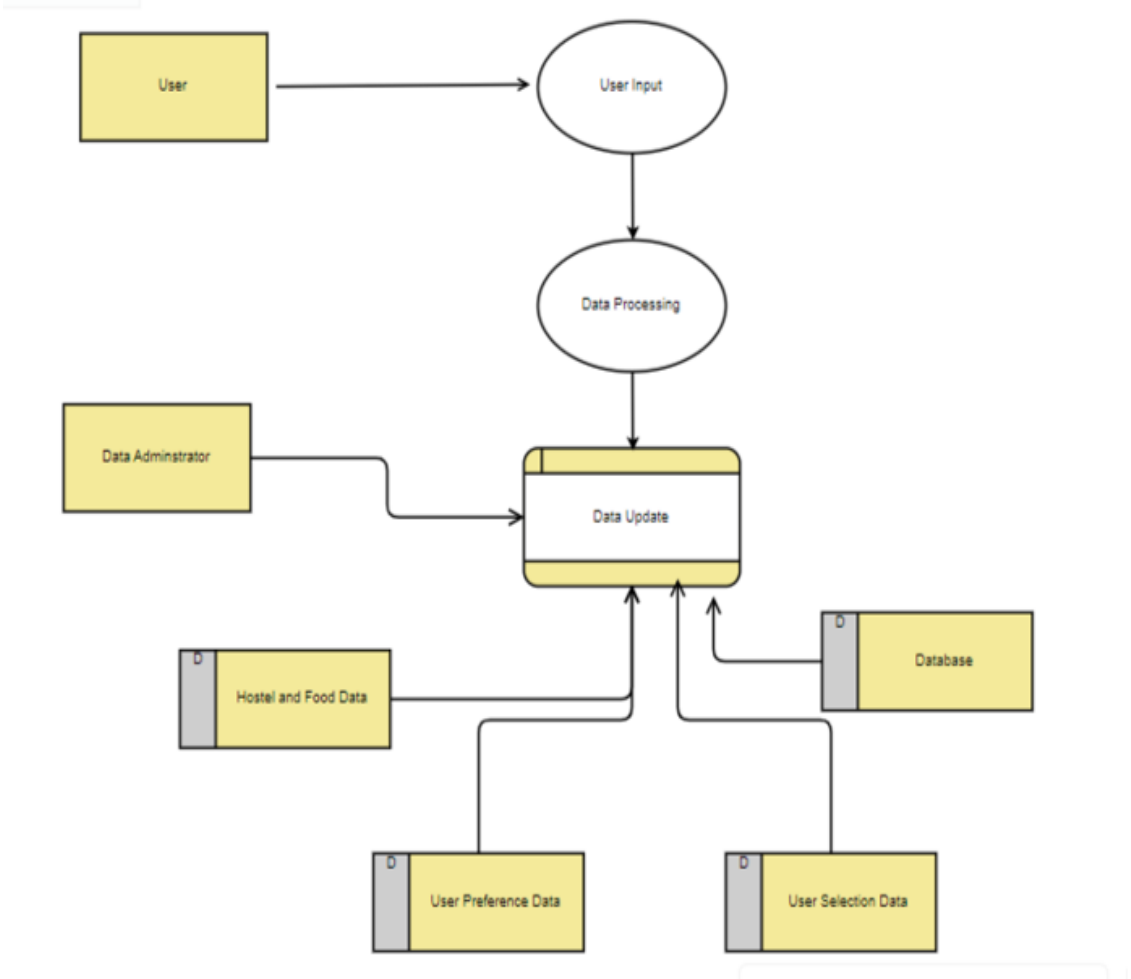

Figure 3.2: Dataflow Diagram

DFD Level 2

Data Flows:

User Selection: This data flow likely represents the criteria users enter into the system to narrow down their hostel and mess preferences. This could include selections like location, price range, desired amenities (for hostels), and dietary restrictions (for food options).

Processes:

Filter Hostel based on User Selection: This process takes the user's location and amenity preferences as input and filters the hostel data stored in the database to identify hostels that match the user's criteria.

Filter Mess based on User Selection: This process takes the user's dietary restrictions (if any) as input and filters the mess data stored in the database to identify food options that align with the user's preferences.

Figure 3.3: Dataflow Diagram

3.6.2 Class Diagram

The class diagram depicts a system for a hostel and mess recommendation . It includes classes of function like 'AddDetails', 'add bills', 'Login', 'add bill no', 'add address ', 'check payment status', each likely performing specific functions related to managing hostel and mess recommendations. At tributes such as 'Name', 'Address', 'Email Address', 'Contact no', and 'Password' are associated with these classes. Interactions between classes suggest that certain actions trigger other actions within the system.

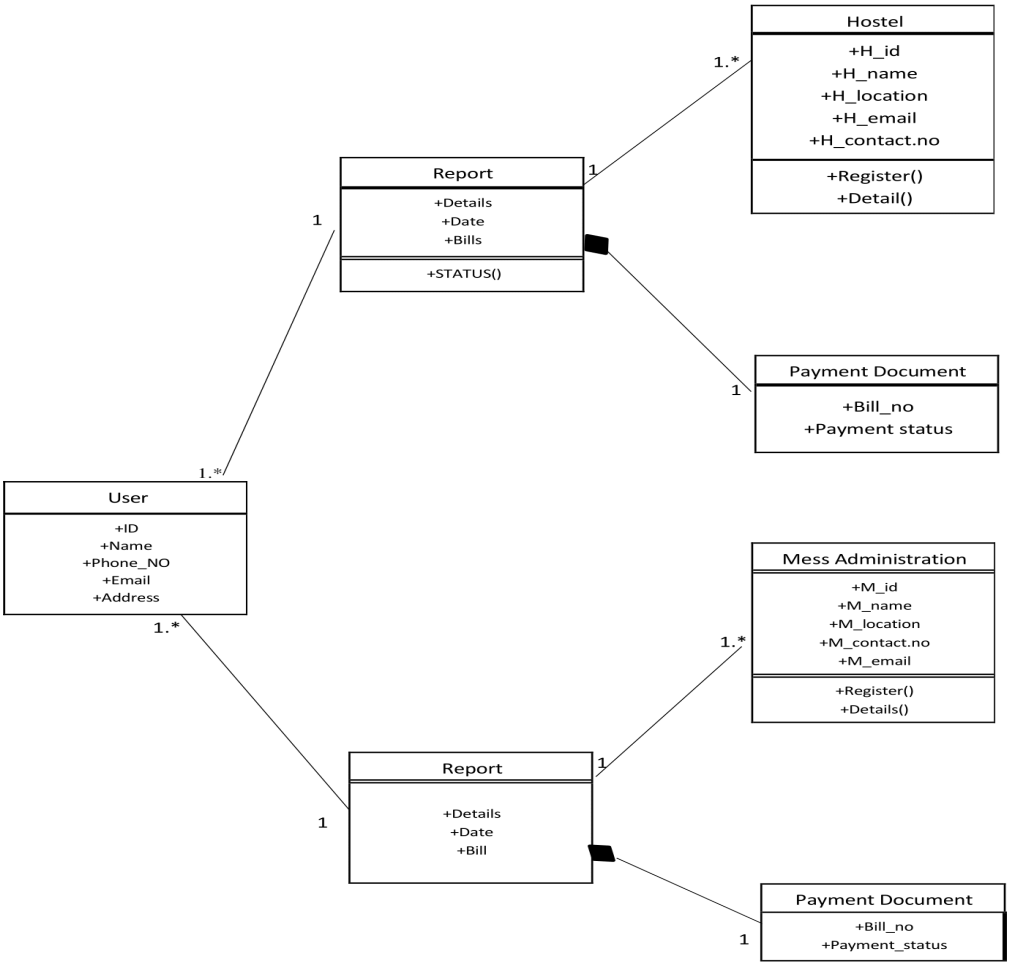

Figure 3.4: Class Diagram

3.6.3 State Machine Diagram

• Initial state: In this state system represent enter of students to system. • student booking: After veryfing Valid document only you can book of accomodate hostel

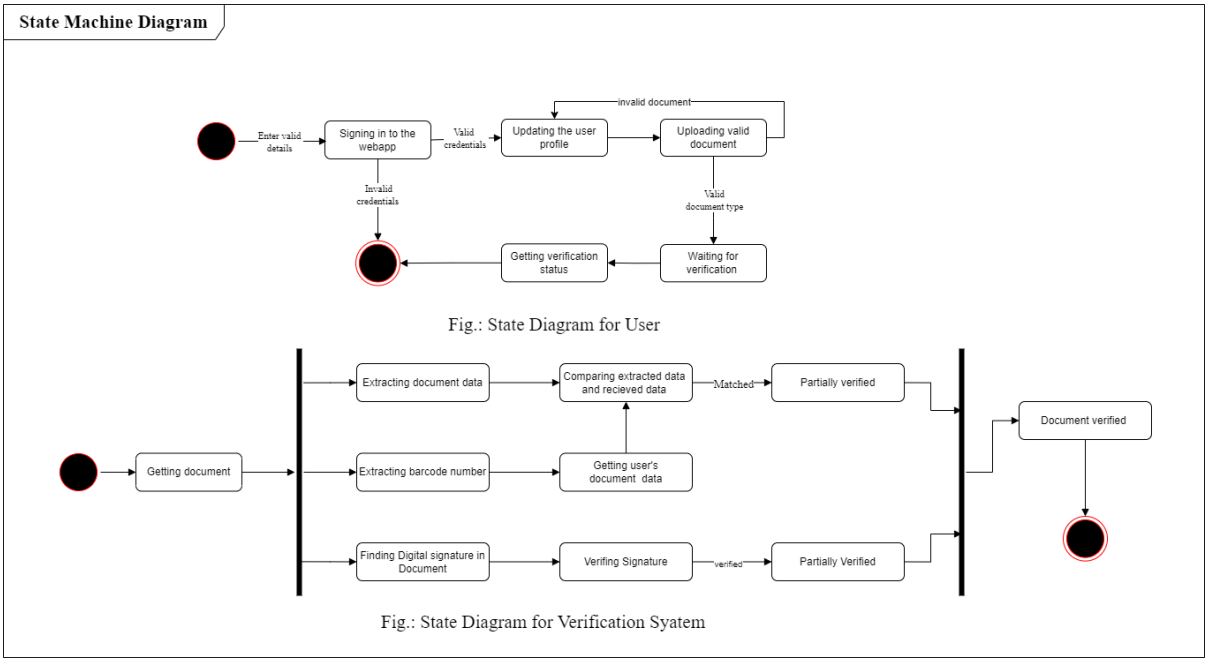

Figure 3.5: State Machine Diagram

3.7 System Implementation Plan

3.7.1 Implementation Plan

Task No.	Task to be Accomplished
T1	Topic Finalization
T2	Requirement specification
T3	Technology Familiarization
T4	System Set up
T5	Concept Review Study
T6	Study of technologies used in the project
T7	Design of User Interface
T8	Creation of Database
T9	Design of System Architecture
T10	Creation of database files and rules
T11	System Module Design
T12	System Testing
T13	Paper Drafting and Publication
T14	Black Book Drafting
T15	Black Book Submission

Table 3.1: Implementation Plan

Chapter 4

System Design

4.1 System Architecture

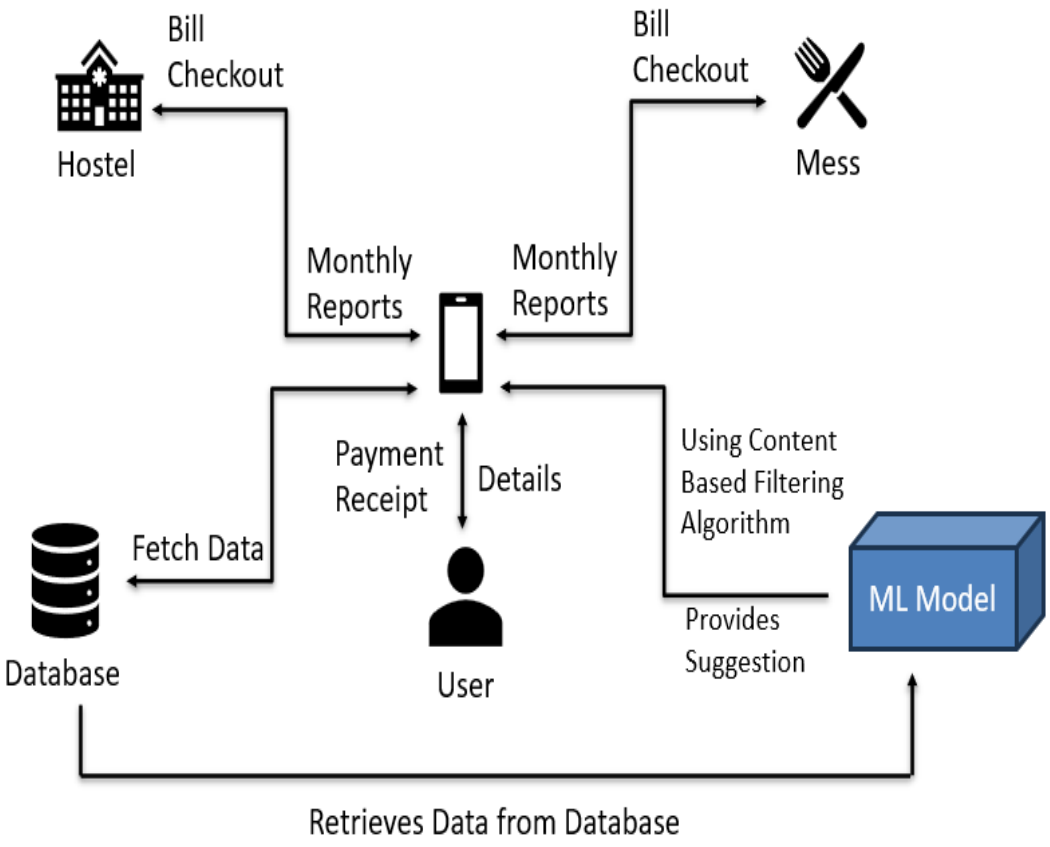

Figure 4.1: System Architecture

4.1.1 Working :

User Input and Data Preparation:

The journey begins with users interacting with the system's user interface. They provide information about their preferences, including location, price range, desired amenities for hostels, and any dietary restrictions for food options. This user input is collected and undergoes preprocessing to ensure it's suitable for the machine learning model. This might involve handling missing data entries, converting textual preferences into numerical formats for analysis, or scaling numerical data to a common range.

Data Retrieval and Feature Engineering:

Behind the scenes, the system retrieves relevant data from its database to fuel the recommendation engine. This data encompasses details about hostels (location, amenities, pricing) and messes (location, dietary options offered). Additionally, the system might incorporate historical user data and ratings if your system employs collaborative filtering techniques.

Machine Learning Recommendation Engine:

This is where the magic of machine learning comes into play. The system utilizes an ML model to analyze the user's preferences and the retrieved data to generate personalized recommendations. Here's a closer look at the process:

Feature Engineering: The system transforms the raw data into features, which are essentially data points relevant to the recommendation task. This might involve creating features from user input (location preference), one-hot encoding amenities offered by hostels, or using dummy variables for dietary options at messes. **Model Selection and Training:** The system might leverage an ML model like collaborative filtering, content-based filtering, or a hybrid approach to generate recommendations. This model is likely trained on historical user data and ratings (if available) to learn patterns and preferences from past interactions. **Prediction:** Based on the user's features and the trained model, the system predicts hostels and messes that best align with the user's needs. It essentially forecasts which options a user is most likely to find suitable based on the analyzed data. Recommendation Refinement and Presentation:

Filtering: Recommendations that fall outside the user's specified criteria (e.g., exceeding budget) might be filtered out to ensure they align with the user's search parameters. Ranking:This could include the predicted preference score from the ML model, distance from the user's location, or user reviews. Finally, the system displays the final set of ranked recommendations to the user through a user-friendly interface. This list might include details about the hostels and messes, such as their names, locations, amenities offered (for hostels), dietary options available (for messes)..

4.2 UML Diagrams

4.2.1 Entity Relationship Diagram

Users can optionally write reviews about hostels or messes they've experienced (one-to-many relationship). The core functionality revolves around users searching for hostels and messes, but the specific nature of this search process isn't explicitly shown. It's likely users can search based on various criteria. An important indirect relationship exists between users and hostels/messes. User preferences and hostel/mess attributes (amenities, dietary options) influence recommendations. While not directly shown, the system likely considers these factors to match users with suitable options. It highlights the essential entities (users, hostels, messes, and optional reviews) and their connections, enabling the system to manage user data, hostel/mess information, and potentially user reviews to recommend suitable accommodations and food options for users.

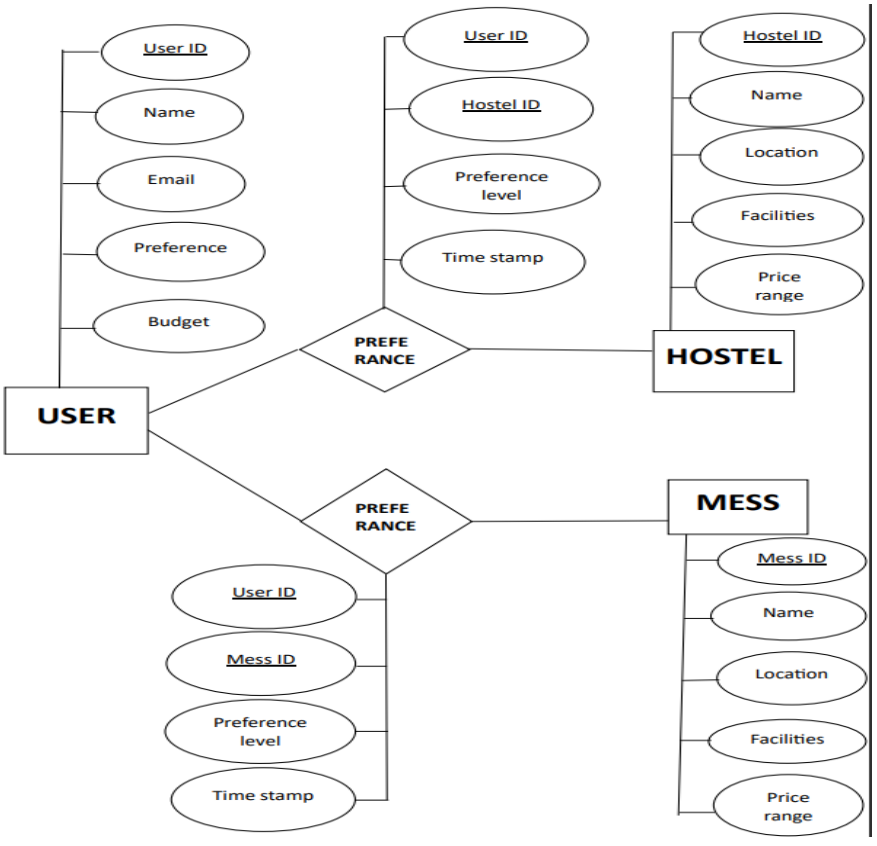

Figure 4.2: ER Diagram

4.2.2 Activity Diagram

The system waits for the user to initiate a search. The user enters their search preferences, like location, price range, desired amenities for hostels, and dietary needs for food options. The system gets to work! It searches the database for hostels that match the user's location, price, and amenities. It also searches for messes that align with the user's location and dietary restrictions. The system then presents the search results to the user. This might be a list of suitable hostels, messes, or even ranked recommendations based on the user's preferences (if applicable). The user might choose to refine their search based on the initial options or view detailed information about specific hostels or messes that caught their interest. Finally, the system remains active, ready for the user's next interaction or search refinements..

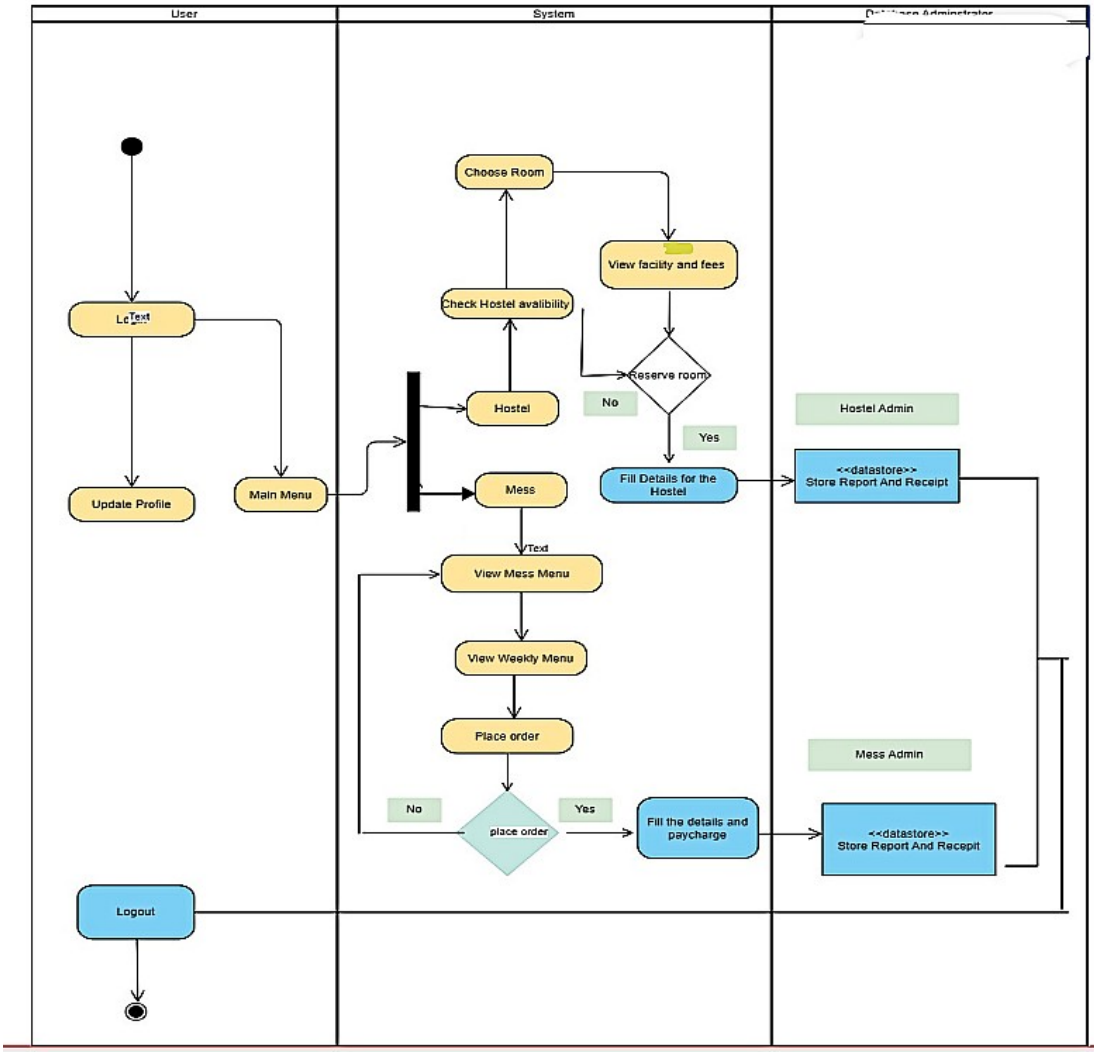

Figure 4.3: Activity Diagram

4.2.3 Use Case Diagram

The use-case diagram for the hostel and mess recommendation system provides an overview of how users interact with the system and the tasks they perform. Actors within the system, such as "Students," "mess admin," "hostel admin,". The diagram illustrates specific actions, or use cases, that users can perform, including managing users details, updating information, viewing hostel and mess information as well as student information to mess and hostel admins. the diagram highlights interactions between different tasks, demonstrating how certain actions trigger others within the system.

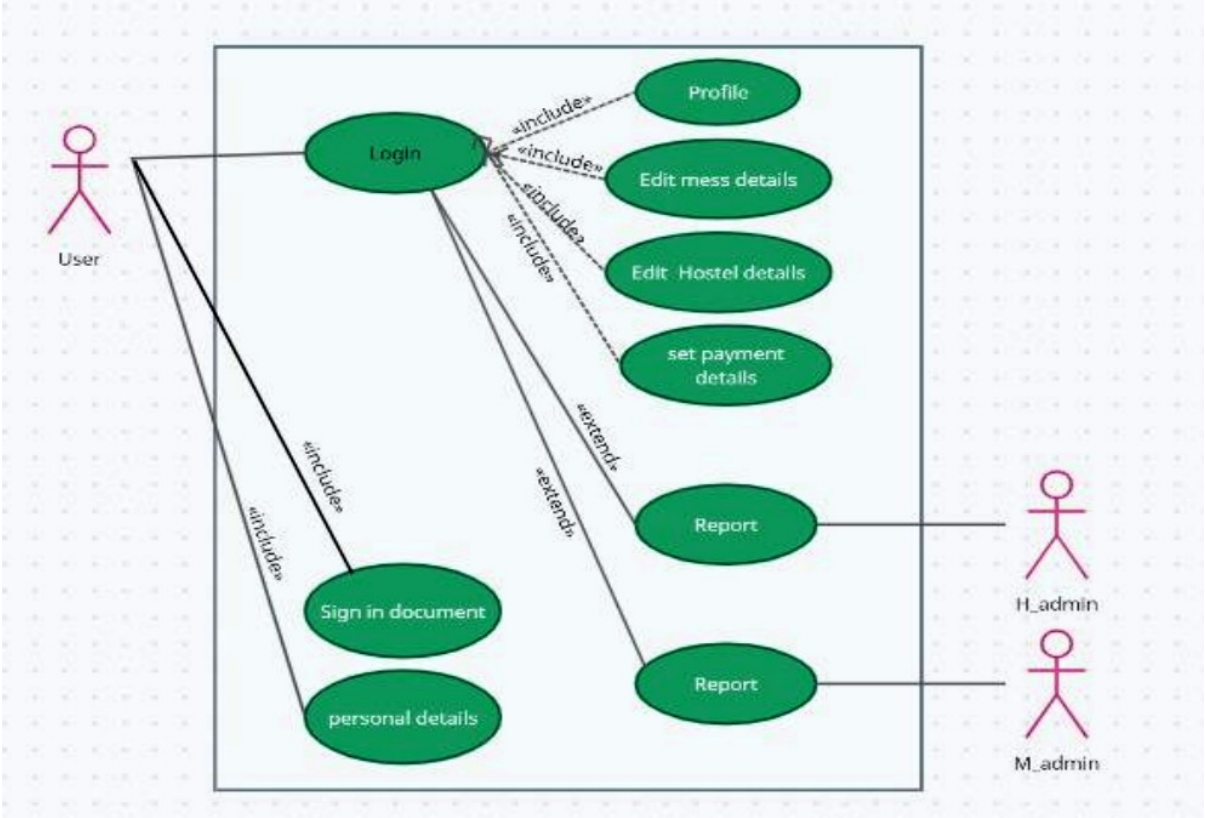

Figure 4.4: Use Case Diagram

4.2.4 Communication Diagram

It includes participants like the "Student," "hostel owner," each representing entities involved in the system. The diagram depicts messages exchanged between participants, such as hostel information sent from the hostel owner to the database, or hostel and tiffin bookings from student to hostel and mess owners for tiffin .It shows how machine learning is integrated into the system, indicating how system follows relationship between entites. The diagram visually represents data flow, highlighting information sharing during different stages of the process in our system. Overall, it provides a proper view of how participants interact and exchange information, emphasizing the role of machine learning.

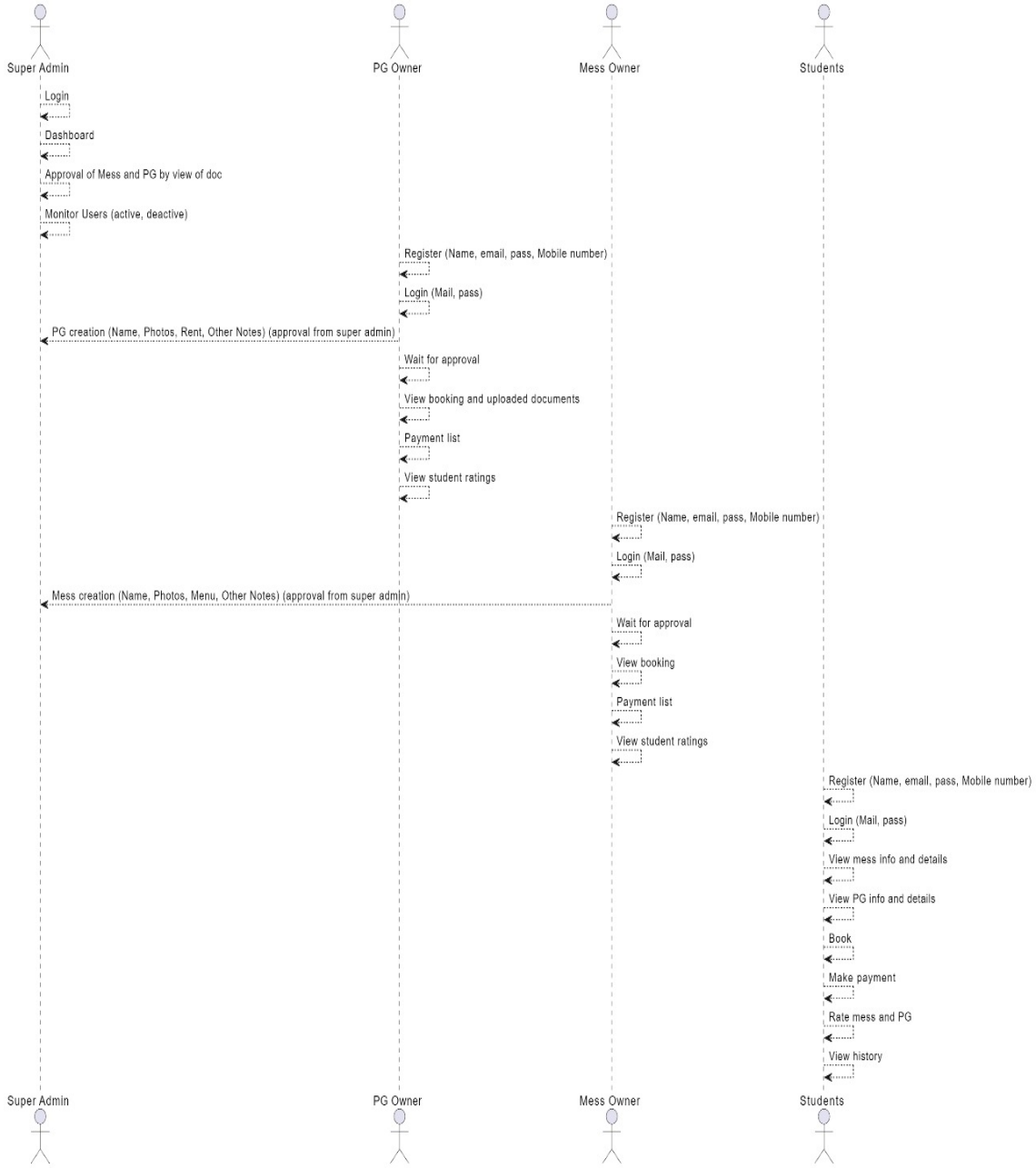

Figure 4.5: Communication Diagram

4.2.5 Sequence Diagram

In this diagram sequence of the activities involved in the recommendation process. The recommendation process starts from requesting requirements from student based on hostel or mess is required, then the request given by user is proccesed to database and retrieved succesfully passing through recommendation process fulfilling users requirement on the basis of his request. User preference is studied and compared to available data , then filteres options from all available options to best matched according to user selection. Using ML the best and accurate opion is provided. then the information is updated in database.

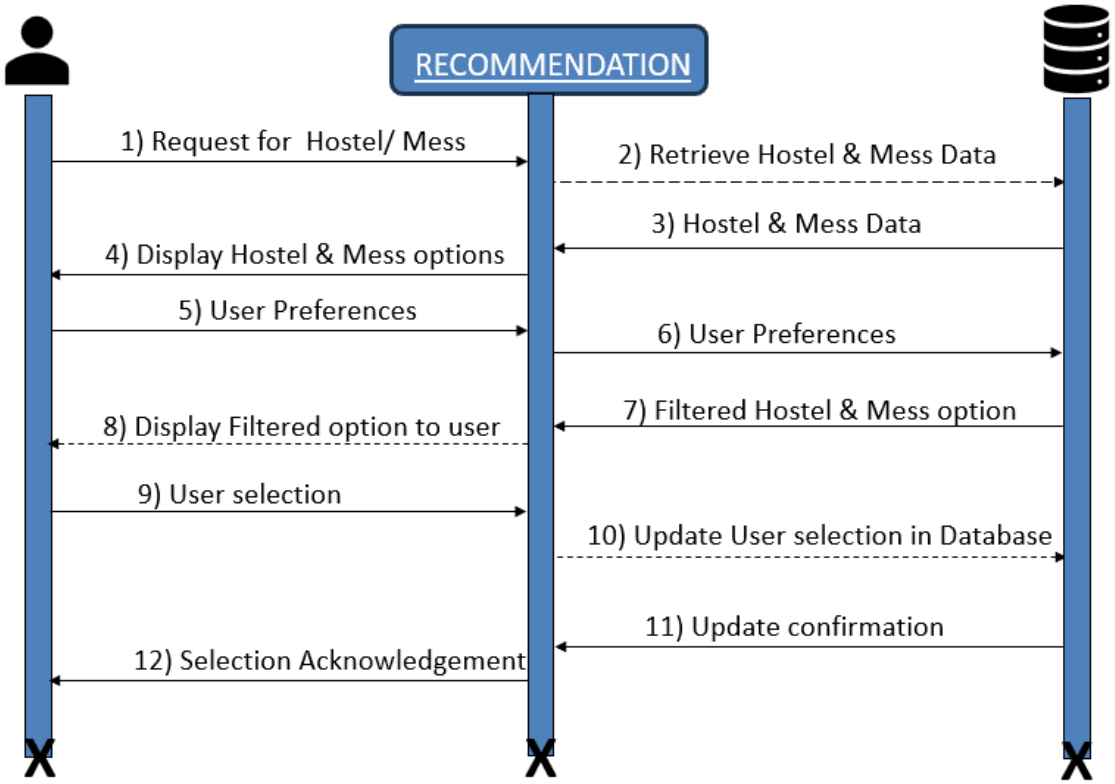

Figure 4.6: Sequence Diagram

4.2.6 Component Diagram

This Diagram Components include the database,Ml Model , payment . where login and registration is provided where user can login or new user can register . Then after successful login one can search and find hostel and messes where first document signing is required which is for verification purpose as a security. the ml model interacts with database to provide the result to user requirement . At last payment process takes place.

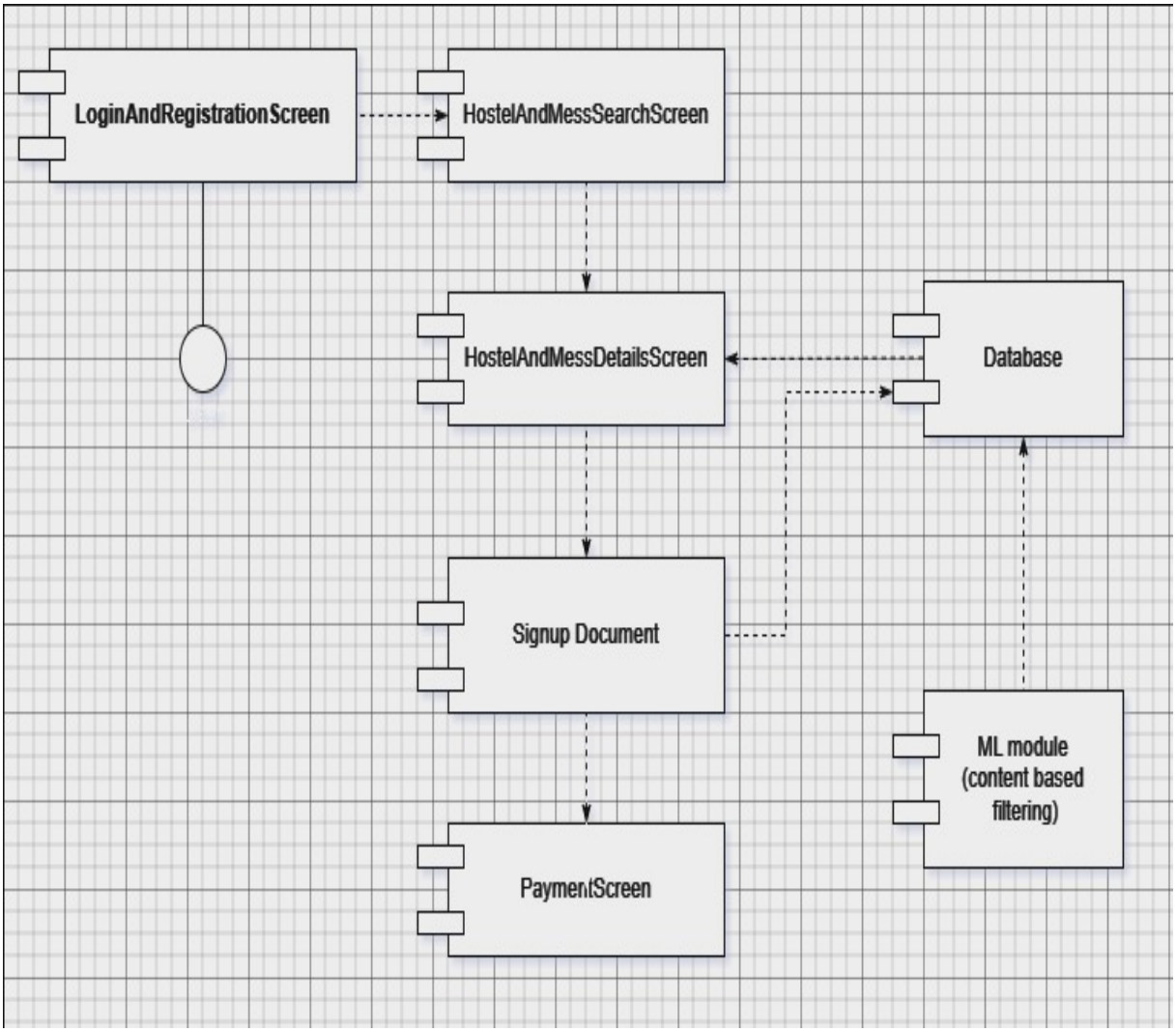

Figure 4.7: Component Diagram

4.2.7 Deployment Diagram

The deployment diagram for a Machine Learning based hostel and mess recommendation system illustrates the physical arrangement of essential software components and their interactions within the system. At the forefront is the Frontend Client, serving as the user interface through which Students engage with the system, accessing features like Billing , Ratings and Reviews availability ment also provides trasparency in recommendation. the web server is inter connected with Application server and database server.

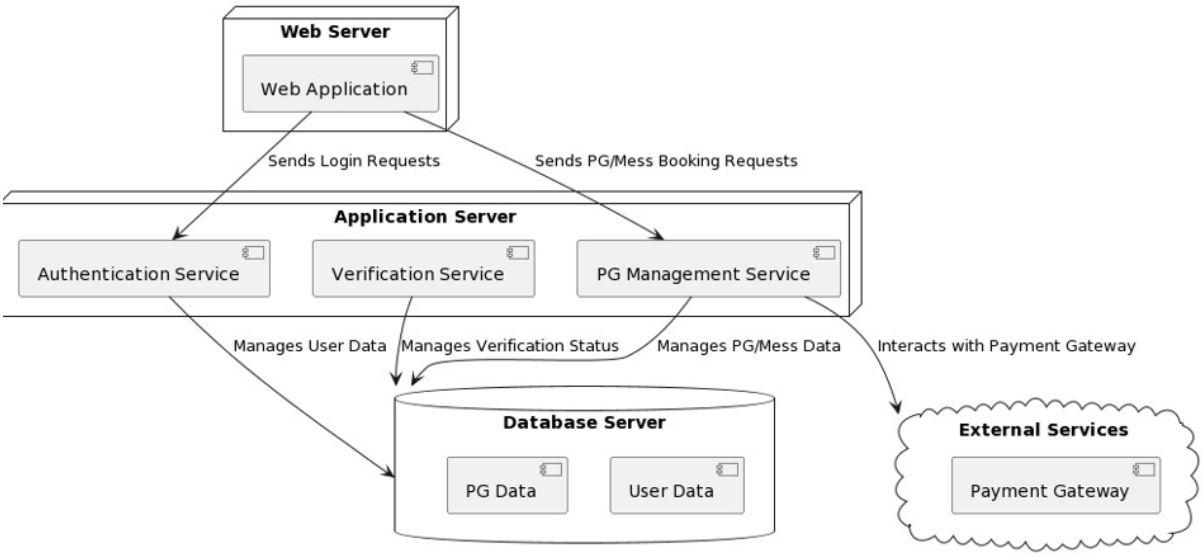

Figure 4.8: Deployment Diagram

Chapter 5

Technical Specifications

5.1 Technology details used in the project

For Web Application -
The project integrates HTML, CSS, and JavaScript for the frontend to create an in teractive user interface The project integrates HTML, CSS, and Java for the frontend to create an in teractive user interface

1. **HTML:** HTML is the standard markup language used to create the structure of web pages. It defines the elements and layout of the web application's user interface.

2. **CSS:** It is a Node.js web application framework that is compact and adaptable. It offers a selection of functions and resources for creating server-side programs and APIs. Express.js makes adding functionality to the application easier by managing middleware, processing HTTP requests and replies, and routing.

3. **Java:** Java is a general-purpose, class-based, object-oriented programming language that is designed to have as few implementation dependencies as possible. Java is a popular language for developing web applications, mobile applications, and desktop applications. It is also used in embedded systems and scientific computing.

4. **Php CodeIgniter:** CodeIgniter is a free, open-source web framework for building dynamic websites using PHP. CodeIgniter has many advanced libraries, plug-ins, helpers, and other sources to facilitate complex functions and processes. It allows developers to create interactive and easy-to-navigate websites.

5. **My Sql Database:** MySQL is a relational database management system (RDBMS) based on structured query language (SQL). It's a client/server system that stores

data in separate tables, which are often related to each other. The server stores the data and the client is the tool used to access and retrieve it.

For Android Application -

6. **XML:** XML stands for Extensible Markup Language. XML tags define the data and used to store and organize data. It's easily scalable and simple to develop. In Android, the XML is used to implement UI-related data, and it's a lightweight markup language that doesn't make layout heavy. XML only contains tags, while implementing they need to be just invoked.

7. **Python:** Python brings an exceptional amount of power and versatility to machine learning environments. The language's simple syntax simplifies data validation and streamlines the scraping, processing, refining, cleaning, arranging and analyzing processes, thereby making collaboration with other programmers less of an obstacle. Python also offers a vast ecosystem of libraries that take much of the monotonous routine function writing tasks out of the equation to free developers up to focus on code and reduces the chances for error when programming. Python also offers a great deal of flexibility and we pair it with other programming languages to complete a machine learning model.

Chapter 6

Project Estimation Schedule and Team Structure

6.1 Project Estimate

COCOMO Model A popular method for estimating software costs is called the Constructive Cost Model (COCOMO), which was created by Barry Boehm. It offers an organised method for determining the amount of work, time, and money needed to develop software projects. To determine the effort and cost estimations, COCOMO takes into account a variety of variables and project features. COCOMO is available in three versions: Basic, Intermediate, and Advanced. An overview of each version is given below:

1. **COCOMO Basic:** Based on the project size, expressed in lines of code (LOC), the COCOMO Basic model calculates the software development effort. It takes into account the formula:

$$Effort = a * (KLOC)^b * EAF$$

where,

- a and b are constants based on the project type.
- KLOC is the estimated size of the project in thousands of lines of code.
- EAF is the Effort Adjustment Factor.
  For an organic project (which is typically smaller and less complex), the values of a and b are 2.4 and 1.05 respectively.
  Given: KLOC = 2.5
  Total members = 4

Months worked = 8
Total expense per month = 500 INR

6.1.1 Estimation of KLOC:

KLOC according to module
Total number of code required to estimate to be 4.2 KLOC.
Efforts: In which we are calculated efforts done by the each person in month. Efforts are calculated by using formula

Table 6.1: Estimation of KLOC

Sr.No.	Module Estimated	KLOC
1	Graphical user interface	0.5
2	Get Values	0.9
3	Processing data values	0.1
4	Display result	0.2
5	Notification	0.8
6	Total KLOC	2.5

6.2 Formula

The estimation of KLOC (Kilo Lines of Code) is a technique used to estimate the size or effort required for software development projects. It provides an approximation of the number of lines of code that will be written for a particular software system. Several formulas have been proposed to estimate KLOC based on various factors, such as requirements, complexity, and project characteristics. One commonly used formula is the Delphi formula.
KLOC = (Total Function Points) x (Average Lines of Code per Function Point)

Total Function Points: Function Points (FP) is a unit of measurement used to quantify the functionality or size of a software system. It considers various factors, such as inputs, outputs, inquiries, files, and interfaces, to determine the overall functional complexity. Function Points can be calculated using specific methods,

such as the Function Point Analysis (FPA) technique, which assigns weights to different functional elements of the system

Average Lines of Code per Function Point: This value represents the average number of lines of code required to implement one Function Point. It is usually determined based on historical data or industry norms. The value can vary depending on the programming language, development practices, and complexity of the system.

6.2.1 Cost Estimate

Like all estimation model, the COCOMO model requires sizing information. This information can be specified in the form of
1. Object Point (OP)
2. Function Point (FP)
3. Lines of Source Code (KLOC)
For our project, we use the sizing information in the form of Lines of source code.

6.2.2 Efforts

Effort=2.4×(2.5)1.05×EAF
We'll assume EAF=1EAF=1 for simplicity:
Effort=2.4×(2.5)1.05×1
Effort=2.4×(2.5)1.05
Effort=2.4×3.184
Effort=7.6416 PM
Where PM stands for Person-Months.
So, for this project, the estimated effort required is approximately 7.64 Person-Months, and the total expense is 16000 INR.

6.2.3 Development time per month

E=3.2(KLOC)1:05E = 3:2(4:2)1:05
E=4*30 Person-month
Development time:
D=E/N
D=4*30/4

D=3.82 month

6.2.4 Development time for Project

Requirements analysis require 3 months
Implementation and testing requires 3.82 months.
Total Duration for completion of project D= 6.82 months.

6.2.5 Number of Persons

Total Four persons are required to complete the project successfully within given time span.

6.3 Project Schedule

6.3.1 Project task set

Major Tasks in the Project stages are:

- Task 1: Requirement Analysis (Base Paper Explanation).
- Task 2: Project Specification (Paper Work).
- Task 3: Technology Study and Design.
- Task 4: Coding and Implementation (Module Development).

6.3.2 Overview of Risk Mitigation,Monitoring,Management

Risk analysis actually helps the project development team to build strategy to handle all possible risk.Following are three important issues(or steps) that must be considered for developing effective strategies:

- Risk mitigation(Risk avoidance)

- Risk monitoring
- Risk management and planning

6.3.3 Implementation Plan

A project timeline chart is presented. This may include a time line for the entire project.

Milestone	Tasks	Time	Remarks
1	Selecting project domain	June	DONE
2	Understanding project need	June	DONE
3	Understanding project pre-requisites	June	DONE
4	Information gathering	July	DONE
5	Literature Survey	July	DONE
6	Refine project scope	August	DONE
7	Concept understanding	August	DONE
8	Planning and scheduling	September	DONE
9	Reqiurement analysis	September	DONE
10	Risk identification and monitoring	October	DONE
11	Design and module understanding	October	DONE
12	Design review and refinement	December	DONE
13	Paper publishing-Sem I	December	DONE
14	Report Creation	December	DONE
15	Admin module	January	DONE
16	Route module	January	DONE
17	User Module	February	DONE
18	GUI design	February	DONE
19	Implementation	March	DONE
20	Review and suggestions for implementation	March	DONE
21	Outcome assessment	March	DONE
22	Testing and QA	March	DONE
23	Review and suggestions for Testing and QA	April	DONE
24	Refined QA activites	April	DONE

Table 6.2: Implementation Plan

6.3.4 Timeline Chart

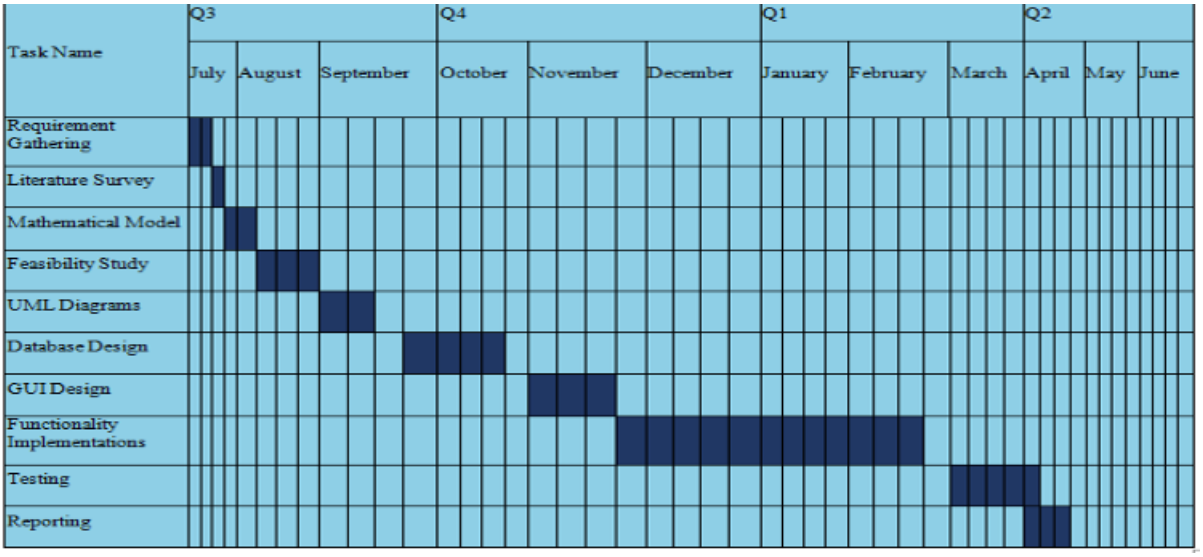

Figure 6.1: Timeline Chart

6.4 Project Schedule and Team Structure

All our project tasks are divided as shown in the table

Task No.	Task Title
T1	Topic Finalization
T2	Requirement specification
T3	Technology Familiarization
T4	System Set up
T5	Concept Review Study
T6	Study of technologies used in the project
T7	Design of user interface
T8	Creation of Database
T9	Design of system Architecture
T10	Creation of database files and rules
T11	System Module Design
T12	System Testing
T13	Paper Drafting and Publication
T14	Black Book Drafting
T15	Black Book Submission

Table 6.3: Lists Of Tasks

Each task is assigned to one or more team members as shown in fig:

Developer ID	Developer Name
D1	Megha Tajane
D2	Chaitanya Pawar
D3	Gaurav Pawar
D4	Rupesh Patil

Table 6.4: Lists of Developers

Chapter 7

Software Implementation

7.1 Introduction

To efficiently handle and verify documents, an automated document verification system typically includes a number of essential capabilities. The following are some of the key features that these systems often have:

(a) **Ratings Generation:** This feature involves providing ratings to hostels and messes by which other students will get helped to pick right choice according to their requirements. It sorts the most rated mess and hostel postion it to top and worst rated at lowest.

(b) **Feedback:** This feature involves providing students an option to give feedback to hostel and mess by which students can let them know the fault from students point of view which leads in beneficial for both hostel , mess and students.

7.2 Databases

The database of the system is build on MySQL is a relational database management system (RDBMS) based on structured query language (SQL). It's a client/server system that stores data in separate tables, which are often related to each other. MYSQL database serves as a versatile backend storage solution for the ML based hostel and mess recommendation system.

7.3 Important module and algorithms

7.3.1 Modules

i. **User Registration:**

The process by which a user registers in the system, enters the required information. This module assists the user in registering on the portal for the next step.

ii. **User Login:**

The process by which an individual gains access to application by identifying and authenticating themselves The user credentials are typically some combination of a username and a password, and these credentials are sometimes referred to as a login. It also enables to create an new accound if registering for first time.

iii. **Billing:**

The process by which user will get the exact count for tiffin . It will be adding each new tiffin as purchased by student and will show final count which will make it easier to calculate monthly bill for both student and mess owner also.

iv. **Feedback :**

The process by which student will give feedback to mess and hostels which makes it beneficial to owners to overcome their drawback and improve it . And it also leads to benefit in overall quality.

v. **Ratings :**

this is the most important module , It is the process by which other students will get helped to pick right choice . It sorts the most rated mess and hostel postion it to top and worst rated at lowest.

.

7.3.2 Algorithm

Content Based Filtering Algorithm :

Content-based filtering (CBF) is a recommendation system technique that recommends items to users based on the similarity of the items to items the

user has liked or interacted with in the past. It focuses on the characteristics or features of the items themselves, rather than relying on the preferences of other users.

Step 1 User Profiles and Item Profiles :

The system creates user profiles that capture a user's preferences. This involve attributes like: Location preferences Price range Desired amenities (for hostels) Dietary restrictions (for messes).

Step 2: Feature Engineering: :

Both user and item profiles undergo feature engineering, where the raw data is transformed into numerical features suitable for machine learning algorithms. This involve techniques like: One-hot encoding categorical features (e.g., converting "amenities" into separate features for Wi-Fi, laundry, etc.)

Step 3: Recommendation Generation: :

Based on the calculated similarities, the system recommends hostels and messes with the highest similarity scores to the user's profile. This essentially suggests options that closely align with the user's specified preferences or past interactions (if user profiles incorporate historical data).

7.4 Business logic

The project integrates HTML, CSS, and JavaScript for the frontend to create an in teractive user interfaceThe proposed project aims to establish a comprehensive online platform connecting accommodation providers (PG owners and Mess owners) with students seeking suitable living and dining options. Through this platform, PG and Mess owners can register their establishments, providing details such as photos, amenities, menus, and rental rates. Upon approval by the Super Admin, these listings become visible to students, who can then browse, book, and make payments securely. Additionally, students can rate and review their experiences, fostering a transparent and trustworthy community. The Super Admin oversees the entire process, ensuring the quality and legitimacy of listings while managing user accounts and resolving any disputes. This business logic facilitates seamless transactions, enhances user satisfaction, and streamlines the process of finding accommodation and dining options for students.

Chapter 8

Software Testing

8.1 Introduction

Software testing must be started as early in the software development process as possible, and it must be integrated into the process of determining requirements. One stage of a lifecycle is testing. The lifecycle of software development is one in which we identify a requirement, write some code to address it, and then assess if we have satisfied the stakeholders, including the users, owners, and other parties with an interest in the product's functionality.

8.1.1 Test cases for Student

No	Behaviour Description	Property
1	Unique Test case ID	TC01
2	Test Case Name	Successful login
3	Prerequisites	Constant Internet Connection
4	Test Case Description	Enter Data in the field
5	Input	First Name, Last Name, Email, Phone number, DoB, Gender, User Name, Password
6	Expected Result	should login successful
7	Actual Result	Registered Successfully!
8	Pass/Fail	Pass

Table 8.1: Test Case for successful login

No	Behaviour Description	Property
1	Unique Test case ID	TC02
2	Test Case Name	PG selection
3	Prerequisites	Constant Internet Connection
5	Input	Blank Field
6	Expected Result	”show the PG list”
7	Actual Result	Required
8	Pass/Fail	Pass

Table 8.2: Test case for PG selection

No	Behaviour Description	Property
1	Unique Test case ID	TC03
2	Test Case Name	select the ID proof document and upload
3	Prerequisites	Constant Internet Connection
5	Input	ID proof
6	Expected Result	ID proof should be uploaded succesfully
7	Actual Result	ID is uploaded
8	Pass/Fail	Pass

Table 8.3: Test case for ID approval

No	Behaviour Description	Property
1	Unique Test case ID	TC04
2	Test Case Name	Status for PG
3	Prerequisites	Constant Internet Connection
5	Input	upload valid ID
6	Expected Result	Status get updated to approved
7	Actual Result	Status is updated to approve
8	Pass/Fail	Pass

Table 8.4: Test case for PG status

No	Behaviour Description	Property
1	Unique Test case ID	TC05
2	Test Case Name	Make Payment
3	Prerequisites	Constant Internet Connection
5	Input	Password
6	Expected Result	” QR will be visible to scan”
7	Actual Result	” QR is visible and able to scan”
8	Pass/Fail	Pass

Table 8.5: Test cases for Payment

No	Behaviour Description	Property
1	Unique Test case ID	TC06
2	Test Case Name	Give Feedback
3	Prerequisites	Constant Internet Connection
4	Test Case Description	Enter genuine feedback
5	Input	feedback related to PG
6	Expected Result	feedback bar will be open
7	Actual Result	feedback space is opened
8	Pass/Fail	Pass

Table 8.6: Test cases for feedback

No	Behaviour Description	Property
1	Unique Test case ID	TC07
2	Test Case Name	Mess selection
3	Prerequisites	Constant Internet Connection
4	Test Case Description	mess should be selected
5	Input	mess name
6	Expected Result	show the mess list
7	Actual Result	Mess list shown
8	Pass/Fail	Pass

Table 8.7: Test cases for mess selection

No	Behaviour Description	Property
1	Unique Test case ID	TC08
2	Test Case Name	status for mess
3	Prerequisites	Constant Internet Connection
4	Test Case Description	status of mess applied
5	Input	submit for approval
6	Expected Result	Status get updated to approved
7	Actual Result	status is updated to approved
8	Pass/Fail	Pass

Table 8.8: Test cases for mess status

8.1.2 Test cases for PG

No	Behaviour Description	Property
1	Unique Test case ID	TC09
2	Test Case Name	Register New PG
3	Prerequisites	Constant Internet Connection
4	Test Case Description	enter credentials for registration
5	Input	required information
6	Expected Result	New form of PG registration is displaying
7	Actual Result	Form is displayed on screen
8	Pass/Fail	Pass

Table 8.9: Test case for PG registration

No	Behaviour Description	Property
1	Unique Test case ID	TC10
2	Test Case Name	PG Status
3	Prerequisites	Constant Internet Connection
4	Test Case Description	if PG status is being approved
5	Input	blank
6	Expected Result	Status wil be updated soon
7	Actual Result	Status get updated to approved
8	Pass/Fail	Pass

Table 8.10: Test cases for PG status

No	Behaviour Description	Property
1	Unique Test case ID	TC11
2	Test Case Name	PG count
3	Prerequisites	Constant Internet Connection
4	Test Case Description	total PG count will shown
5	Input	Click on sidebar
6	Expected Result	Count of PG's will be shown
7	Actual Result	Count of PG's are shown
8	Pass/Fail	Pass

Table 8.11: Test cases for PG count

No	Behaviour Description	Property
1	Unique Test case ID	TC12
2	Test Case Name	Action button check
3	Prerequisites	Constant Internet Connection
4	Test Case Description	check for pg deletion
5	Input	click on delete
6	Expected Result	PG will be deleted
7	Actual Result	PG is deleted
8	Pass/Fail	Pass

Table 8.12: Action Button

No	Behaviour Description	Property
1	Unique Test case ID	TC13
2	Test Case Name	My Profile updation
3	Prerequisites	Constant Internet Connection
4	Test Case Description	check for Profile updation
5	Input	click on QR button
6	Expected Result	file manager will be open
7	Actual Result	file manager is open
8	Pass/Fail	Pass

Table 8.13: Profile updation

8.1.3 Test Cases For Mess

No	Behaviour Description	Property
1	Unique Test case ID	TC14
2	Test Case Name	Successful document upload
3	Prerequisites	Constant Internet Connection
4	Test Case Description	Upload the relevant document
5	Input	Relevant Student Document
6	Expected Result	Document will get successfully uploaded
7	Actual Result	Document is successfully uploaded
8	Pass/Fail	Pass

Table 8.14: Test cases for successful document upload

No	Behaviour Description	Property
1	Unique Test case ID	TC15
2	Test Case Name	Register New Room
3	Prerequisites	Constant Internet Connection
4	Test Case Description	new registration will create
5	Input	emter required data
6	Expected Result	New form of Mess registration is displaying
7	Actual Result	Form is displayed on screen
8	Pass/Fail	Pass

Table 8.15: Test cases for PG registration

No	Behaviour Description	Property
1	Unique Test case ID	TC16
2	Test Case Name	PG Count
3	Prerequisites	Constant Internet Connection
4	Test Case Description	to display all PGs
5	Input	blank
6	Expected Result	Count of Mess will be shown
7	Actual Result	Count of Mess are shown
8	Pass/Fail	Pass

Table 8.16: Test cases for PG count

No	Behaviour Description	Property
1	Unique Test case ID	TC17
2	Test Case Name	Action button check
3	Prerequisites	Constant Internet Connection
4	Test Case Description	Action button check for profile
5	Input	go to edit
6	Expected Result	Edit in profile will be shown to user
7	Actual Result	Profile can edit and update
8	Pass/Fail	Pass

Table 8.17: Test cases for Action button of profile

8.1.4 Test Cases For Super Admin

No	Behaviour Description	Property
1	Unique Test case ID	TC 18
2	Test Case Name	Dashboard Check
3	Prerequisites	Constant Internet Connection
4	Test Case Description	all data will be shown
5	Input	blank
6	Expected Result	Count of PGs Mess and Users will be shown
7	Actual Result	Count of PGs Mess and Users are shown
8	Pass/Fail	Pass

Table 8.18: Test case for Super Admin Dashboard Check

No	Behaviour Description	Property
1	Unique Test case ID	TC 19
2	Test Case Name	Super admin Login
3	Prerequisites	Constant Internet Connection
4	Test Case Description	enter credentials for login
5	Input	password
6	Expected Result	Should Login Successfully
7	Actual Result	login successful
8	Pass/Fail	Pass

Table 8.19: Test case for super admin login

No	Behaviour Description	Property
1	Unique Test case ID	TC 20
2	Test Case Name	Pending PGs approval
3	Prerequisites	Constant Internet Connection
4	Test Case Description	All pending PGs
5	Input	blank
6	Expected Result	list of pending request of PGs will be shown
7	Actual Result	list of pending request of PGs are seen
8	Pass/Fail	Pass

Table 8.20: Test case for approval

No	Behaviour Description	Property
1	Unique Test case ID	TC 21
2	Test Case Name	Action on pending requests
3	Prerequisites	Constant Internet Connection
4	Test Case Description	show and perform action on pending requests
5	Input	blank
6	Expected Result	pending request must be approved/deleted
7	Actual Result	pending request is approved/deleted
8	Pass/Fail	Pass

Table 8.21: Test case for Action on pending requests

8.2 Snapshot of testcases

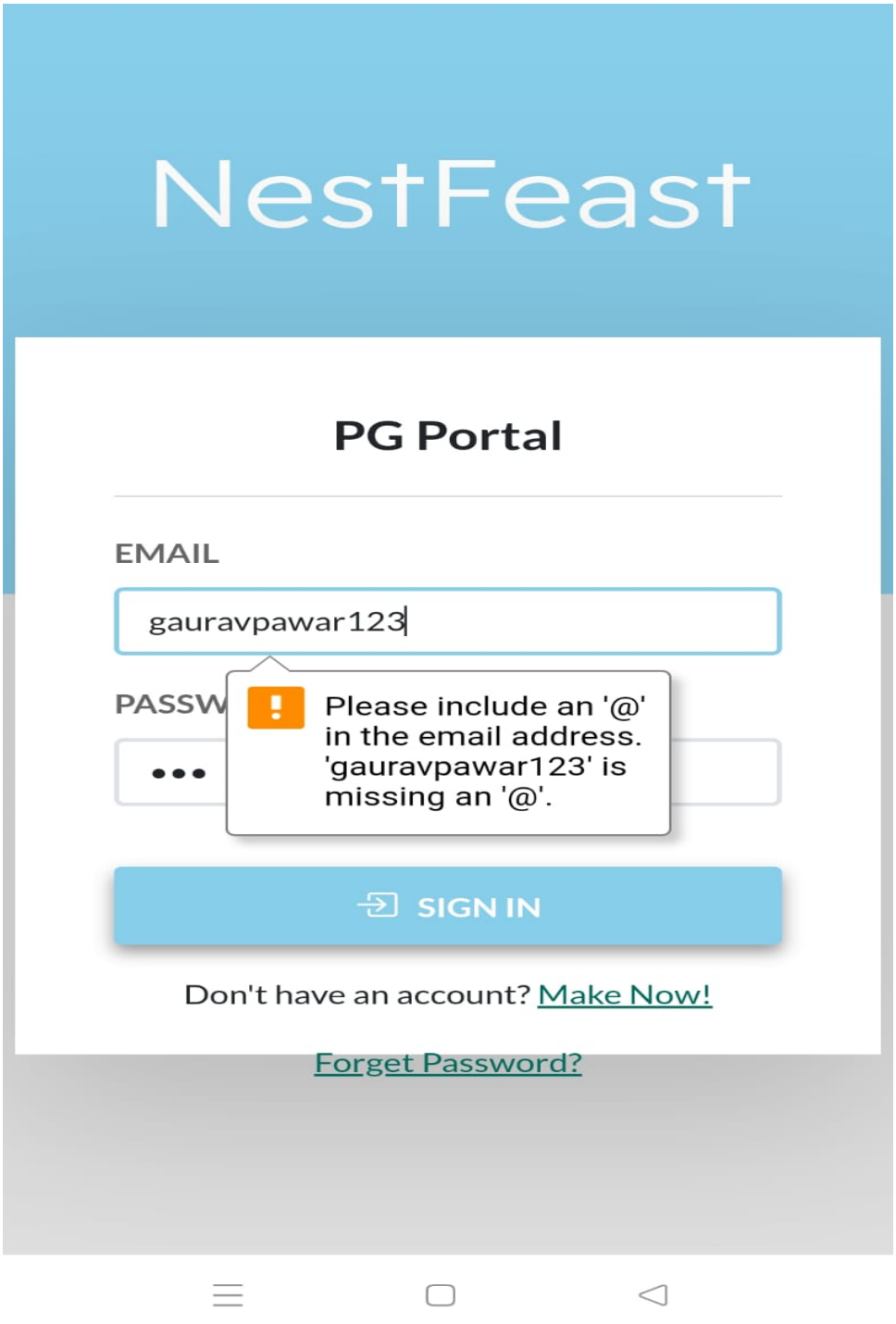

Figure 8.1: Blank Email

Figure 8.2: Validate Mobile no.

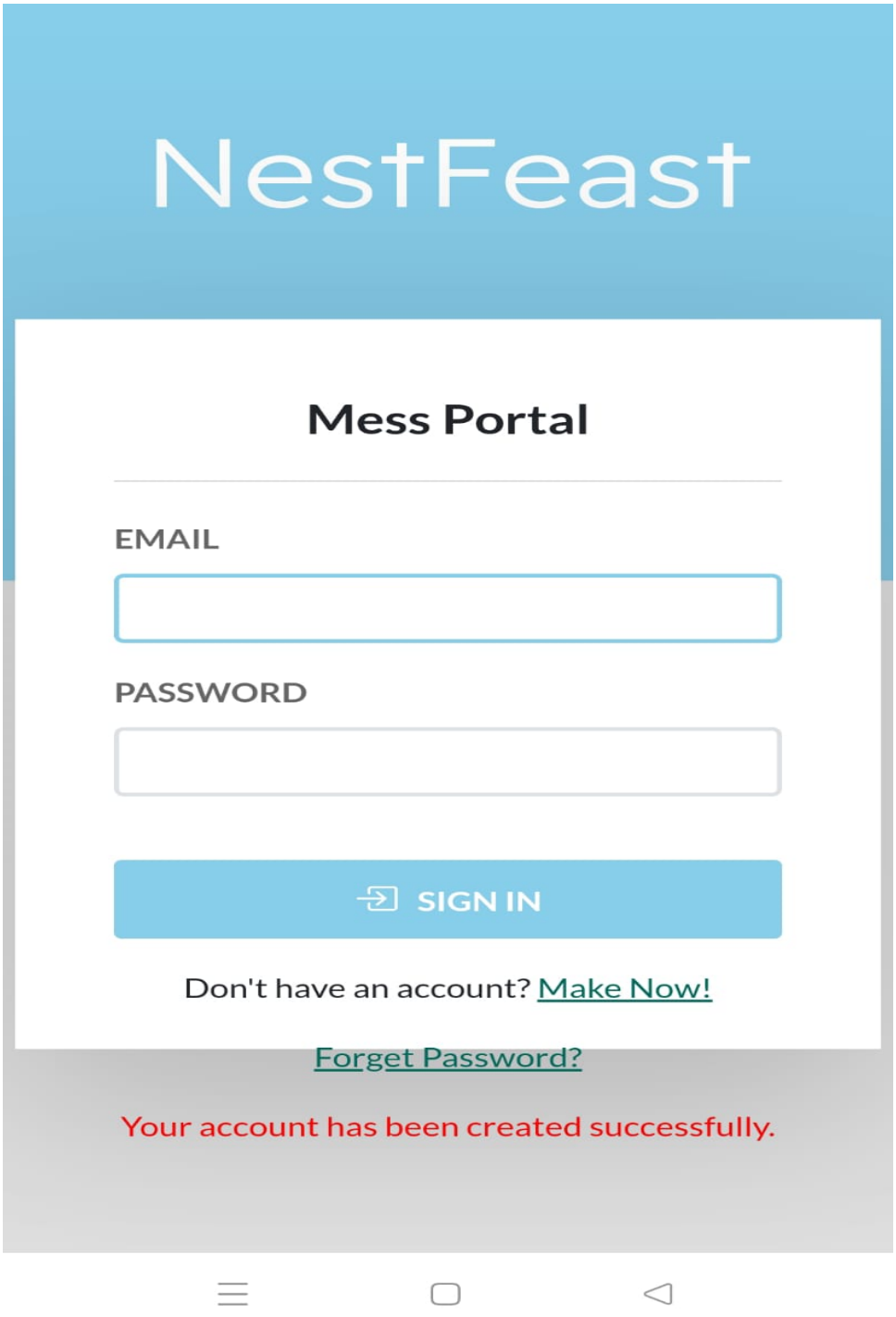

Figure 8.3: Successfully Account Creation

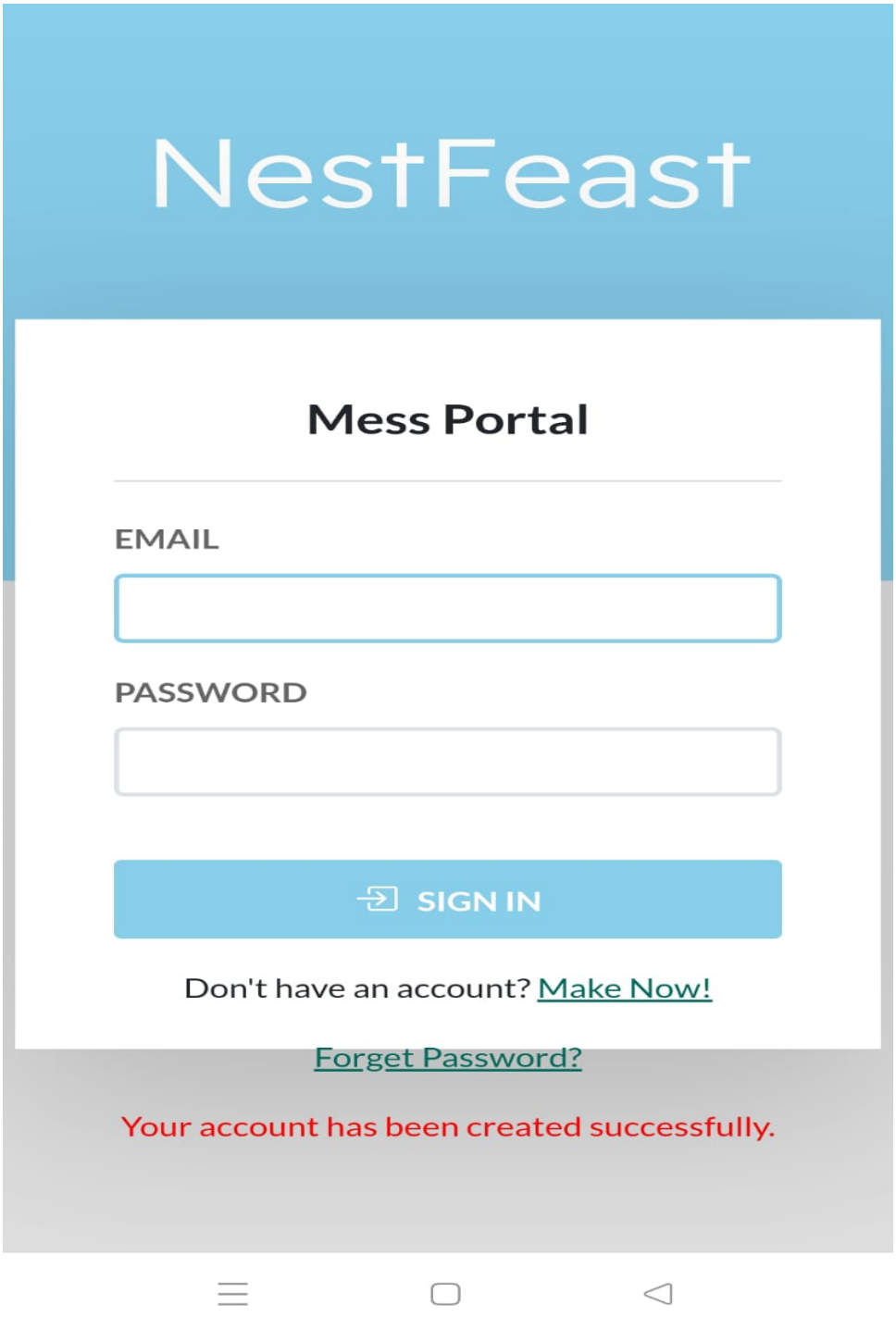

Figure 8.4: Successfully Account Creation

Chapter 9

Result

9.1 Snapshots of the results

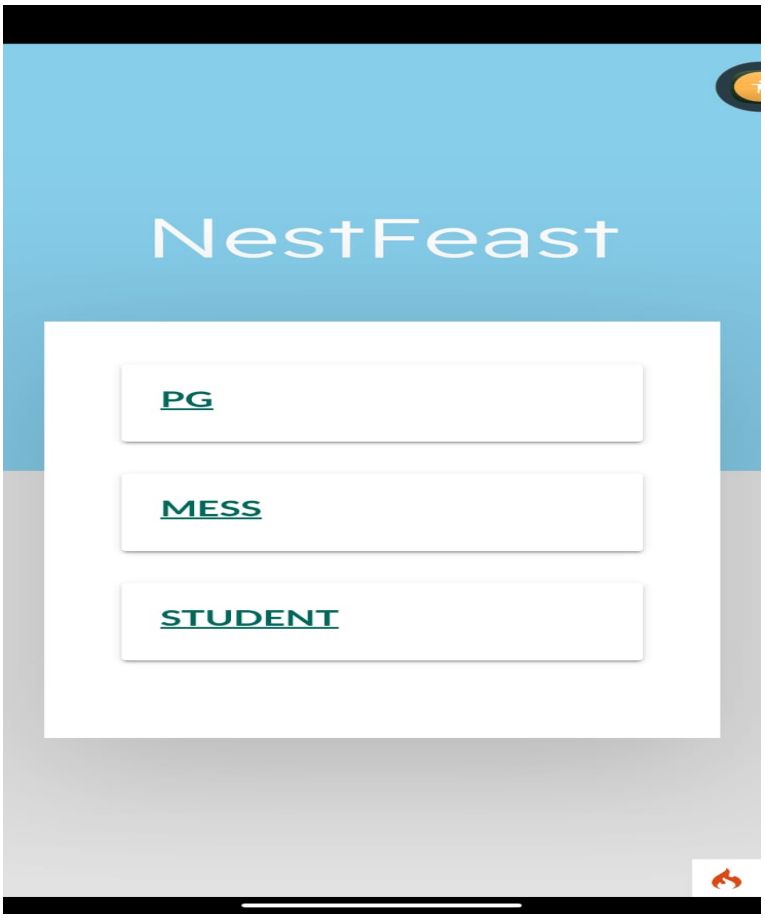

Figure 9.1: home screen

(c) **Fig 9.1 is the home screen of our system , where PG owner , Mess owner and Student options are visible.**

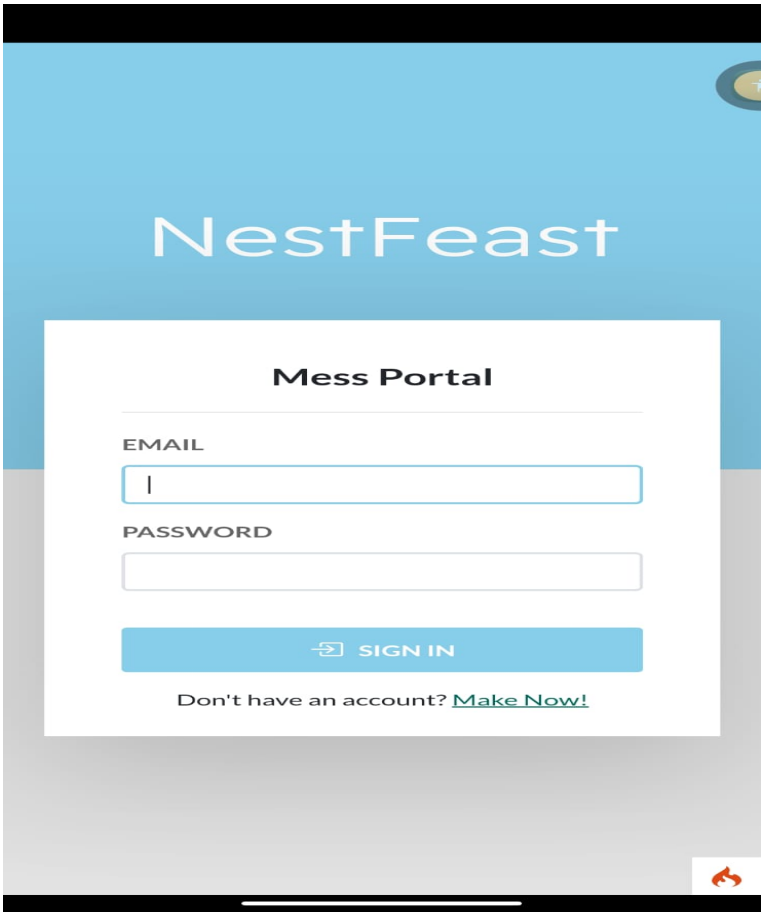

Figure 9.2: mess login

(d) **Fig 9.2 is the login page for Mess owner , where Mess owner can login using email id and password and can register if new using "Make Now" option.**

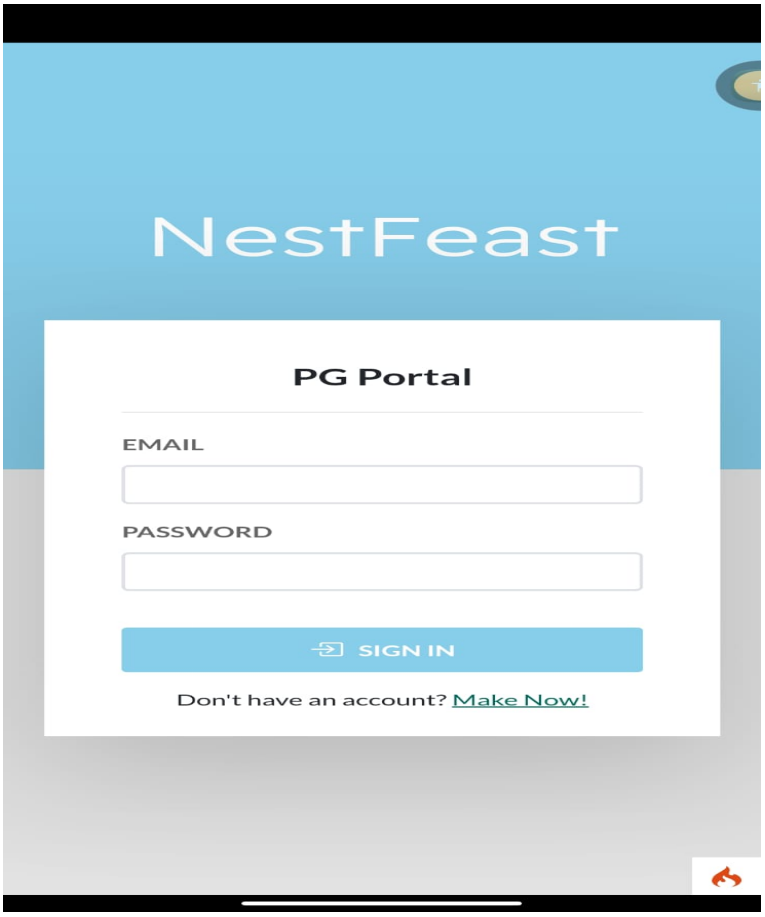

Figure 9.3: PG login

(e) **Fig 9.3 is the login page for PG owner , where PG owner can login using email id and password and can register if new using "Make Now" option.**

Figure 9.4: all PGs

(f) **Fig 9.4 In this fig all types of PG are visible to student where all pg details are visible like rating , capacity , ph no and monthly rent .**

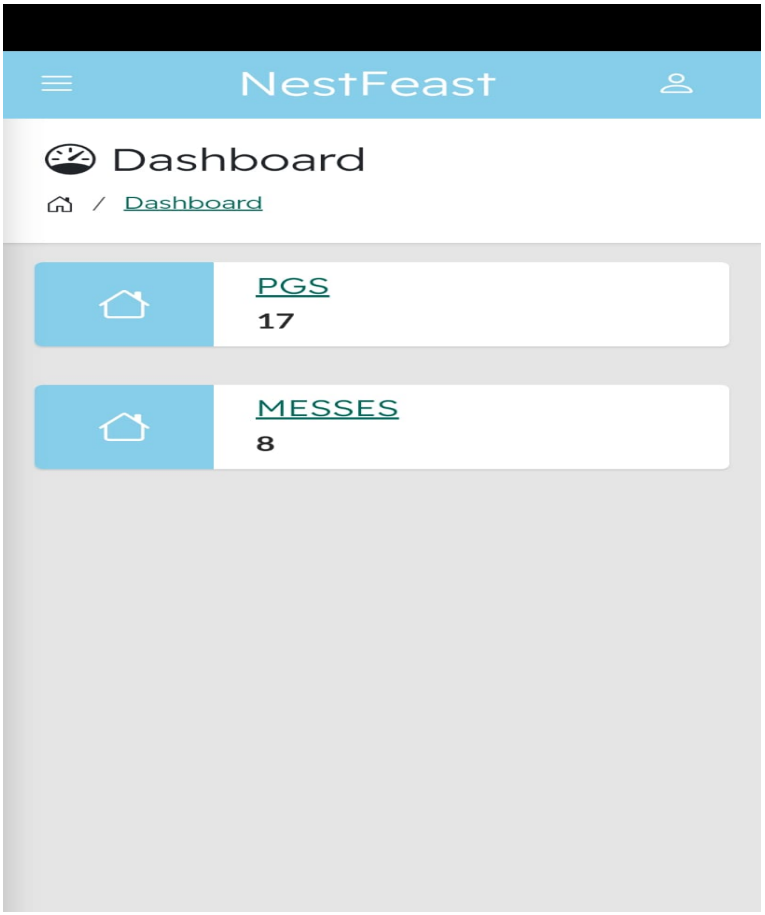

Figure 9.5: Student Dashboard

(g) **Fig 9.5 is the student dashboard for students, where all PGs and Messes are visible to student and can apply to it.**

Figure 9.6: All Mess

(h) **Fig 9.4 In this fig all types of messes are visible to student where all mess details are visible like rating , total capacity , ph no and monthly rent .**

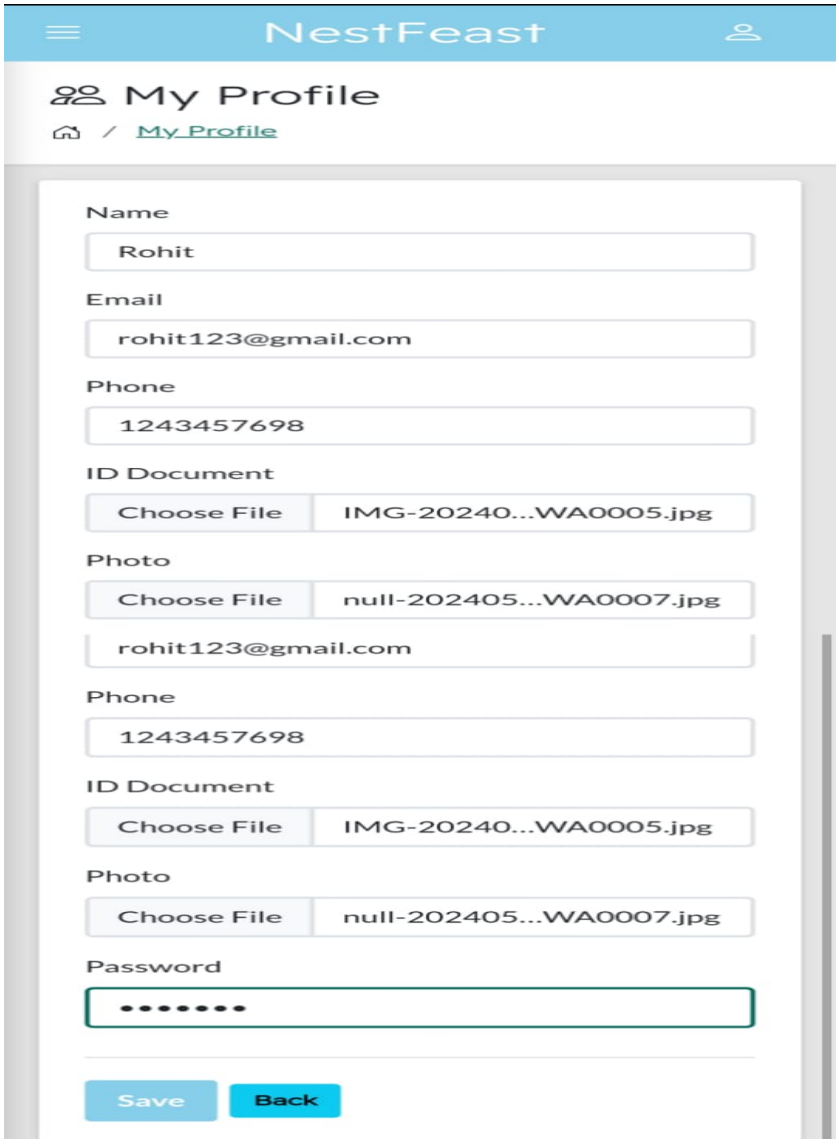

Figure 9.7: student profile

(i) **Fig 9.7 In this you can see student profile where name , email and all important fields like ID proof documents are there.**

Chapter 10

Deployment and Maintenance

10.1 Deployment and Maintenance

10.1.1 Installation and un-installation

i. Download XAMPP from the official website. ii. Run the installer. iii. Begin installation by clicking "Next." iv. Select components to install (default is usually fine). v. Choose installation directory. vi. Decide on Start Menu shortcuts. vii. Optionally, select additional modules from Bitnami. viii. Review installation settings and click "Next." ix. Wait for the installation progress to complete. x. Finish the installation and close the installer. xi. Start Apache and MySQL services using the XAMPP Control Panel. xii. Verify the installation by opening a web browser and navigating to "http://localhost."

For un-installation:

1. Stop Apache and MySQL services using the XAMPP Control Panel. 2. Close any XAMPP-related applications or processes. 3. Navigate to the directory where XAMPP is installed. 4. Run the uninstaller executable (usually named "uninstall.exe" on Windows). 5. Follow the prompts to uninstall XAMPP. 6. Optionally, manually delete any remaining files or directories related to XAMPP. 7. Restart your computer to complete the uninstallation process.

10.1.2 Maintenance

1] Maintain the stability of the project by fixing bugs and addressing performance issues to ensure smooth operation. 2] Regularly update and patch the project to address any security vulnerabilities and protect against potential threats. 3] Implement new features or enhancements based on user feedback and evolving requirements to improve the project's functionality and user experience. 4] Ensure compatibility with the latest hardware, software, and browser versions to avoid compatibility issues and provide a seamless experience across different platforms. 5] Keep project documentation up to date, including user manuals, technical guides, and system architecture documentation, to facilitate future maintenance and development efforts. 6] Implement robust backup and disaster recovery mechanisms to protect against data loss and minimize downtime in case of system failures or disasters. 7] Continuously monitor and optimize the project's performance to ensure efficient resource utilization and optimal response times for end users.

Conclusion and Future Scope

Conclusion

Our application offers a highly accurate and efficient recommendation system for food messes and PG accommodations tailored to users' individual preferences. By considering factors such as location, price, and amenities, we ensure that users receive personalized recommendations that match their needs.Furthermore, our platform allows users to perform detailed searches based on a variety of criteria, granting them the flexibility to find exactly what they're looking for. This not only saves users valuable time but also reduces the effort required to discover suitable food messes and PG accommodations. Our goal is to streamline the search process for users, helping them locate accommodations that align with their specific requirements. This includes not only a convenient search experience but also access to comprehensive information about the properties, making it easier for users to make informed decisions. We believe that our food mess and PG recommendation application holds great promise in enhancing the experiences of both users and property owners. Our commitment to continuous development and improvement ensures that our application will evolve to meet changing needs and deliver even more value in the future

Future Scope:

This system can be use in various institution, organization and industry for recommendation purpose.Implement recommendation algorithms that analyze user preferences and hostel/mess data to provide personalized suggestions.

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Plagiarism Report

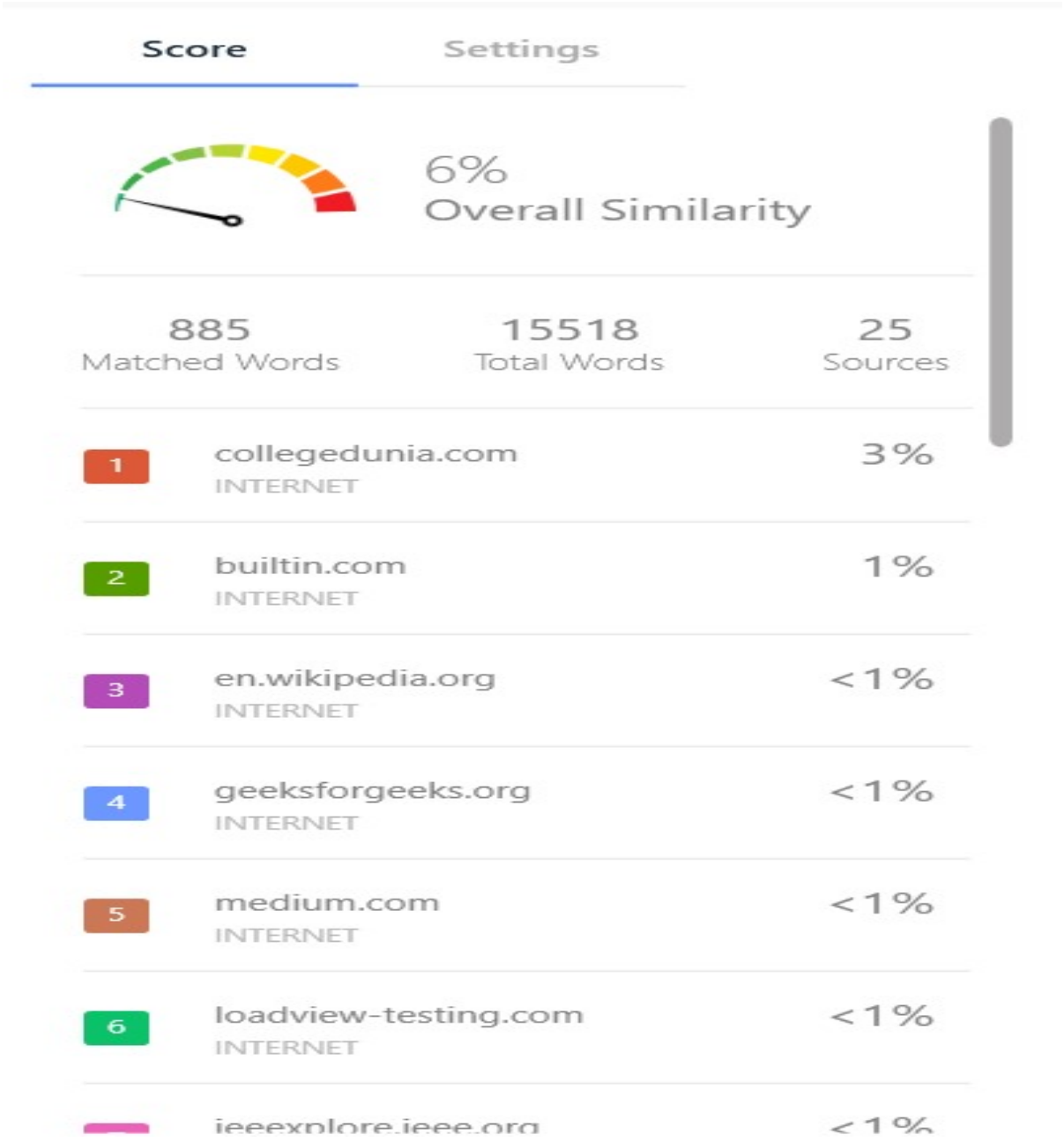

Figure 10.1: Plagiarism Report

Chapter 11

Paper Publication and Certificate Details

Published Paper

Published paper in International Journal of Innovative Research in Engineering Multidisciplinary Physical Sciences (IJIRMPS) on "Food And PG Recommendation System Using ML" Paper ID:12, ISSN-2349-7300.

Conference Paper

11th National Conference Recent Advances in Computer Engineering (RACE) 2024 at M.E.S's Wadia College Of Engineering,Pune

Project Competitions

1] ” International Level Technical Event (Concepts 2024) ” at P.I.C.T , Pune.

2] ” National Level Project Competition ” at Guru Gobind Singh College of Engineering and Research Center, Nashik.

3] National Level Project Competition ” TECH EXPO-2024 at Pravara Rural Engineering College, Loni.

11.0.1 Published Paper

Volume 12 Issue 2 @ 2024 IJIRMPS | ISSN: 2349-7300

A Content-Based Hostel and Mess Recommendation System for Educational Institutions

[1]Pravin R. Pachorkar, [2]Megha M. Tajane, [3]Chaitanya B. Pawar, [4]Gaurav S. Pawar, [5]Rupesh B. Patil

[1]Professor, [2,3,4,5]Student
Department Of Computer Engineering
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Nashik, Maharashtra, India.

Abstract-
In today's rapidly evolving educational landscape, the well-being and satisfaction of students are paramount. One critical aspect of student life is finding suitable hostel accommodations and mess facilities. This research paper introduces a novel approach to address this challenge through the development of a content-based hostel and mess recommendation system. Leveraging advanced data analytics, machine learning techniques, and user profiling, this system aims to provide personalized, data-driven recommendations to students based on their unique preferences and requirements. The proposed content-based recommendation algorithm analyses rich datasets encompassing textual descriptions, amenities, location, pricing, meal options, dietary preferences, and user feedback. It then calculates relevance scores for hostels and mess facilities, offering tailored suggestions that enhance the overall student experience. The system also incorporates mechanisms for continuous learning and feedback integration to refine recommendations over time. Ultimately, this research contributes to the broader discourse on the intersection of technology, education, and student satisfaction. By enhancing the hostel and mess selection process, educational institutions can significantly improve student wellbeing, retention rates, and overall academic success

Keywords: **Content-Based Filtering, Educational Technology, Hostel Recommendation, Mess Recommendation, Machine Learning, Personalization, Student Satisfaction, Scalability.**

Published in IJIRMPS (E-ISSN: 2349-7300), Volume 12, Issue 2, March- April 2024

INTRODUCTION: The journey of higher education brings with it numerous challenges, experiences, and opportunities. Among the pivotal factors shaping this journey is the provision of suitable accommodations and dining facilities. For students embarking on their academic pursuits away from home, finding the right hostel and mess options can significantly impact their overall wellbeing, academic performance, and satisfaction during their educational tenure. However, this quest is often marred by complexity, uncertainty, and time-consuming efforts, underscoring the need for innovative solutions to streamline the process. This research paper addresses this critical aspect of the student experience by introducing a content-based hostel and mess recommendation system designed to cater to the diverse needs and preferences of students within educational institutions. In the era of advanced data analytics, machine learning, and personalized user experiences, such systems are poised to play a pivotal role in enhancing student satisfaction and academic success.

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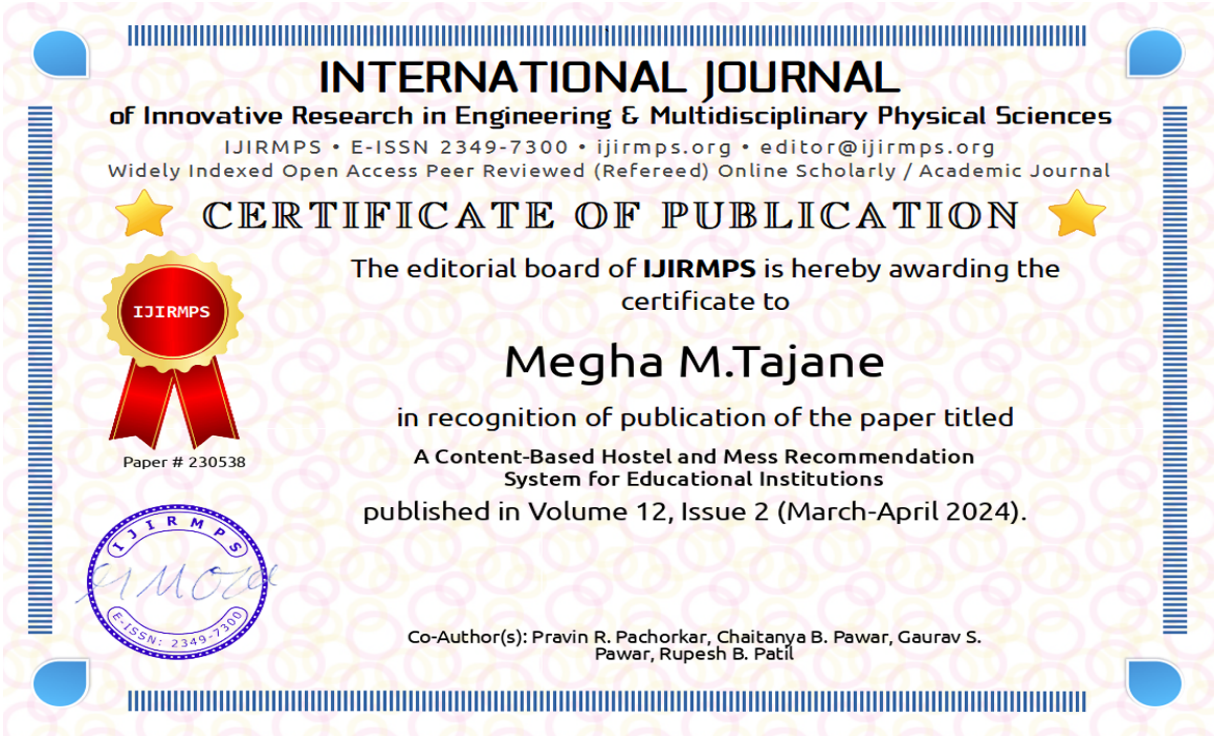

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Co-Author(s): Pravin R. Pachorkar, Chaitanya B. Pawar, Gaurav S. Pawar, Rupesh B. Patil

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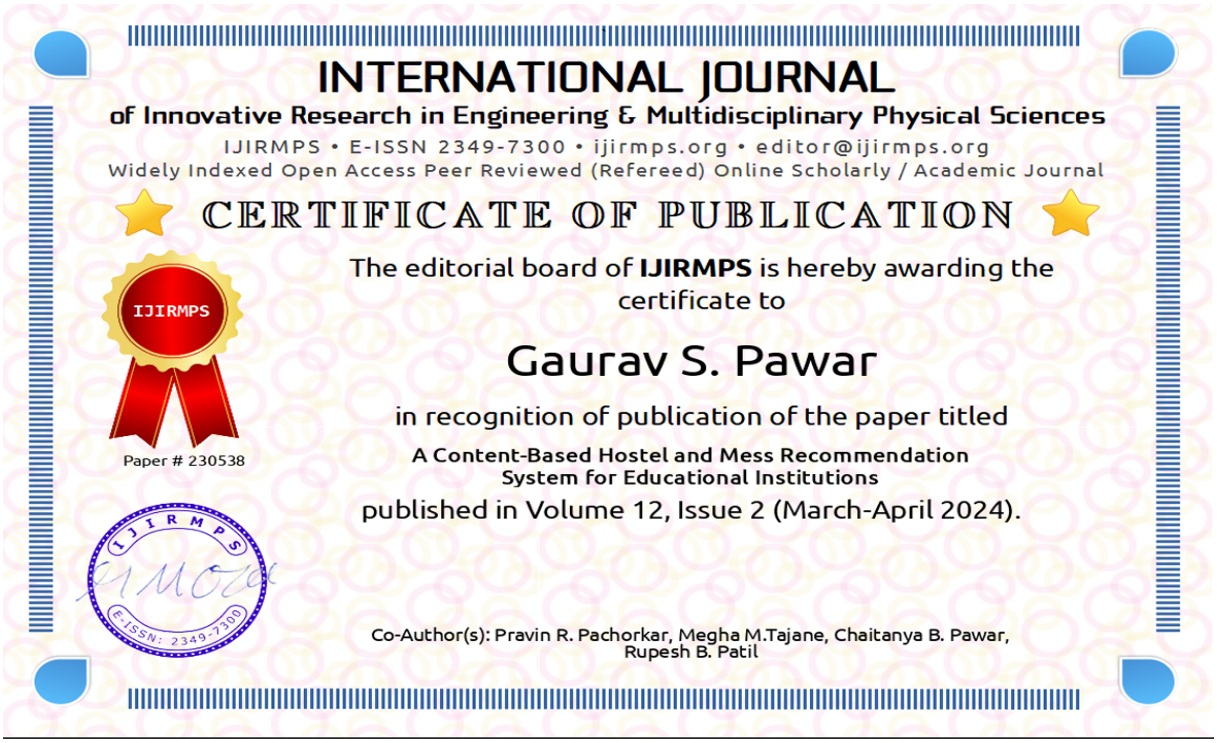

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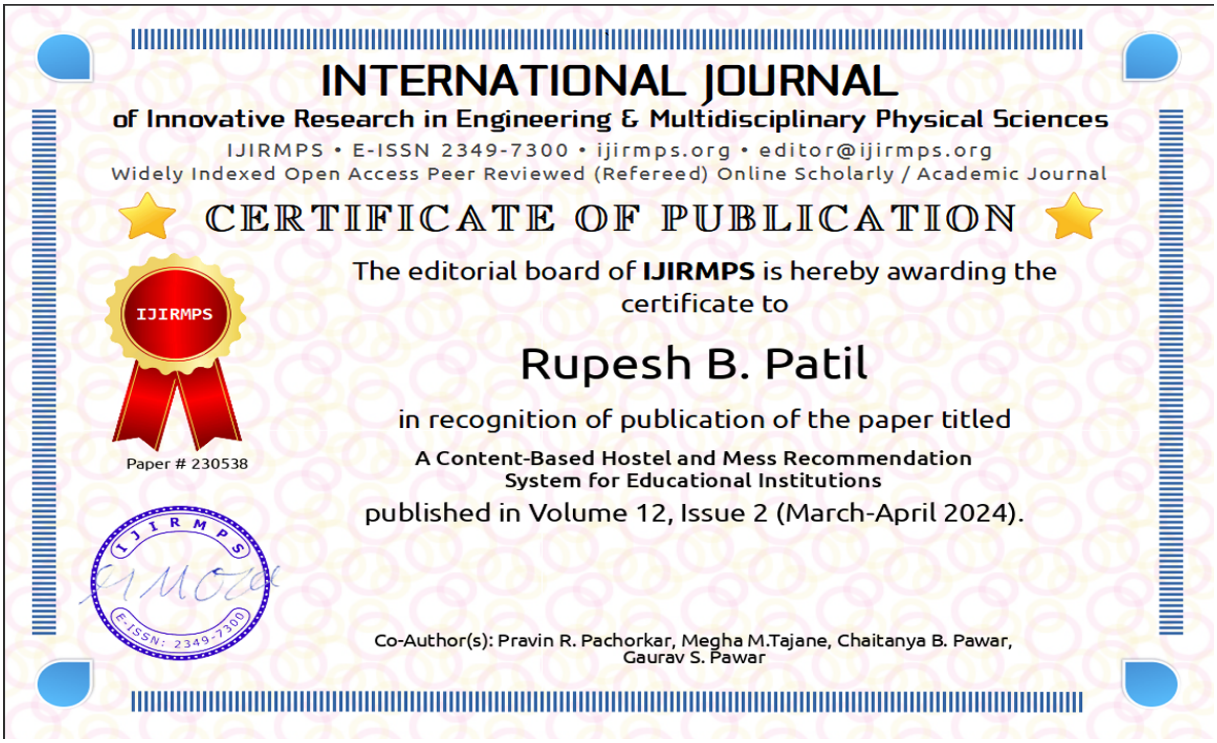

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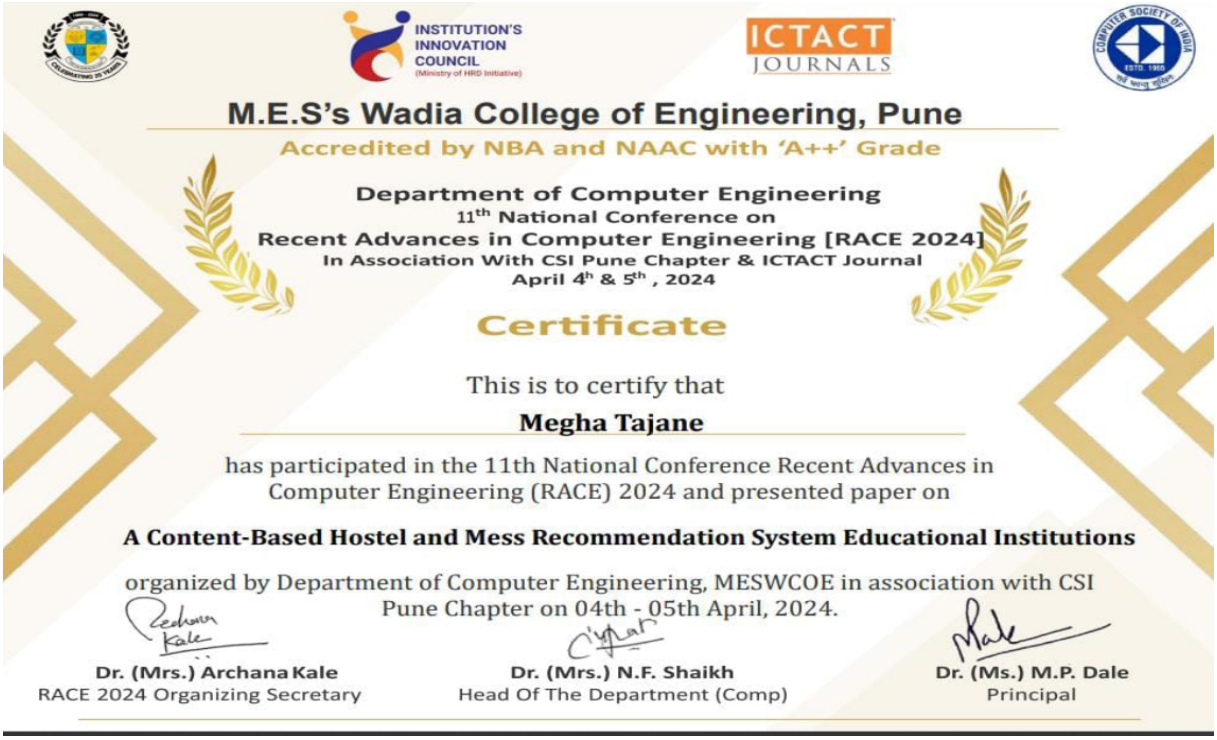

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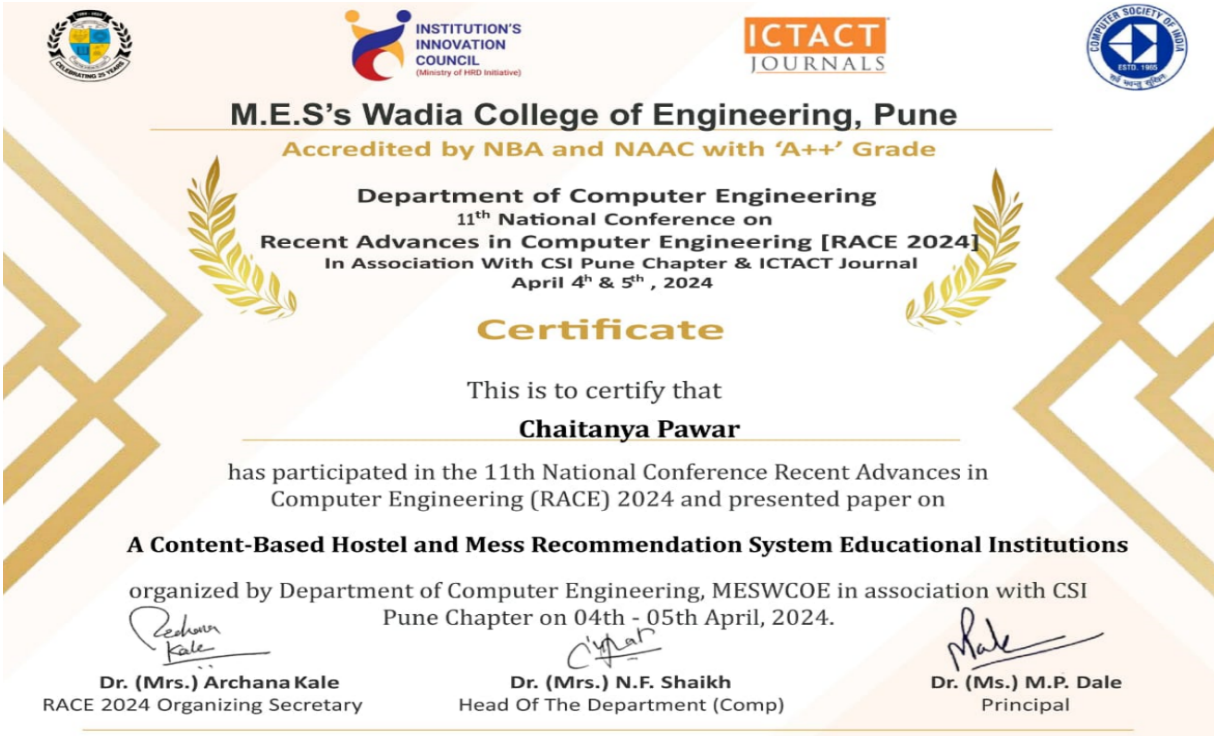

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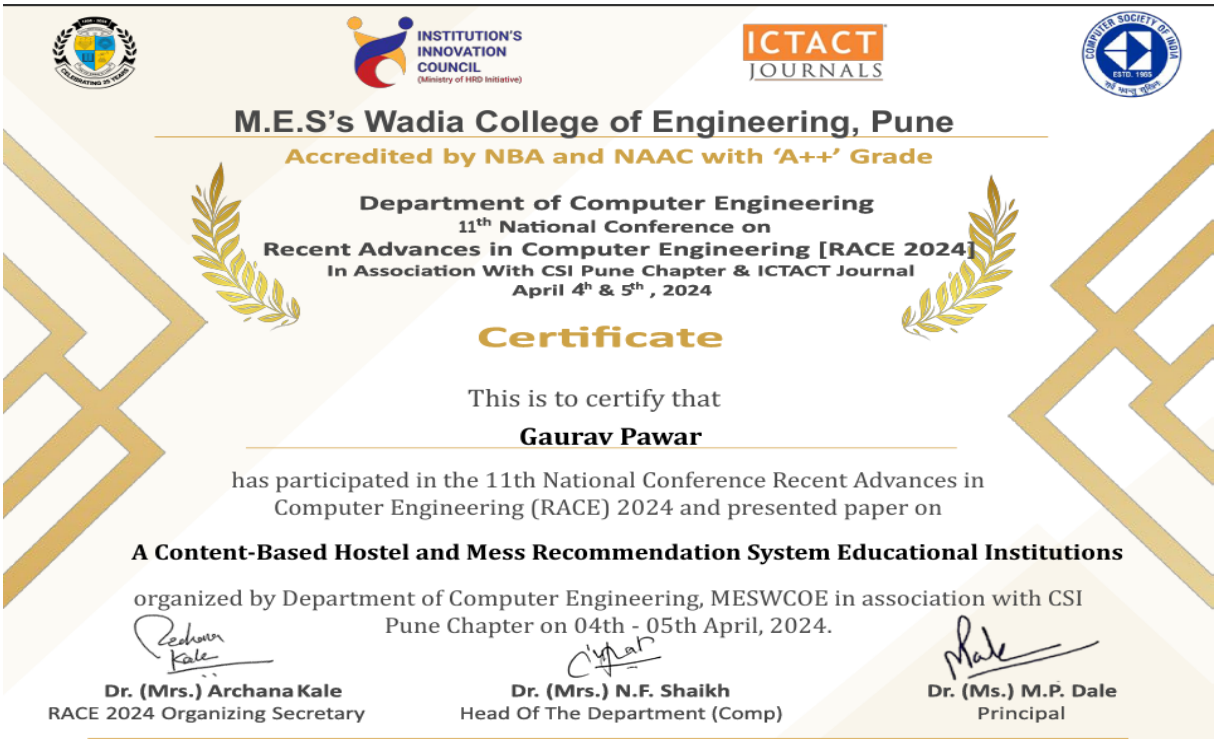

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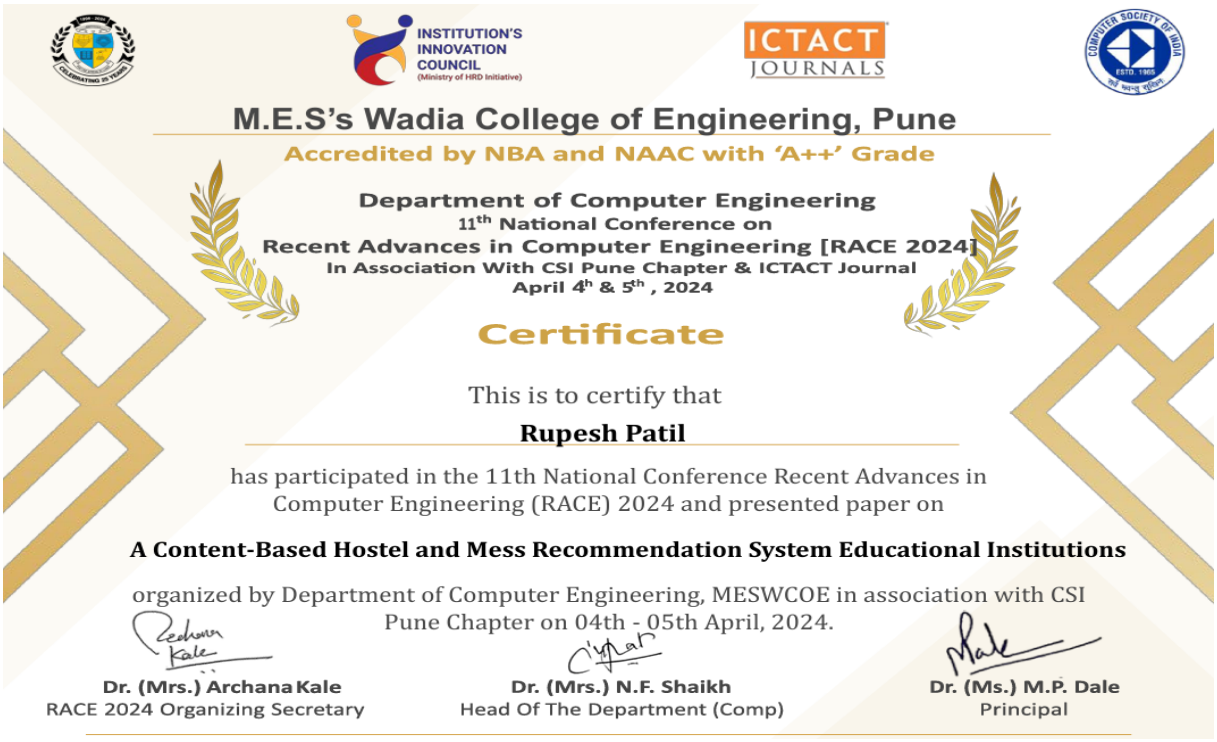

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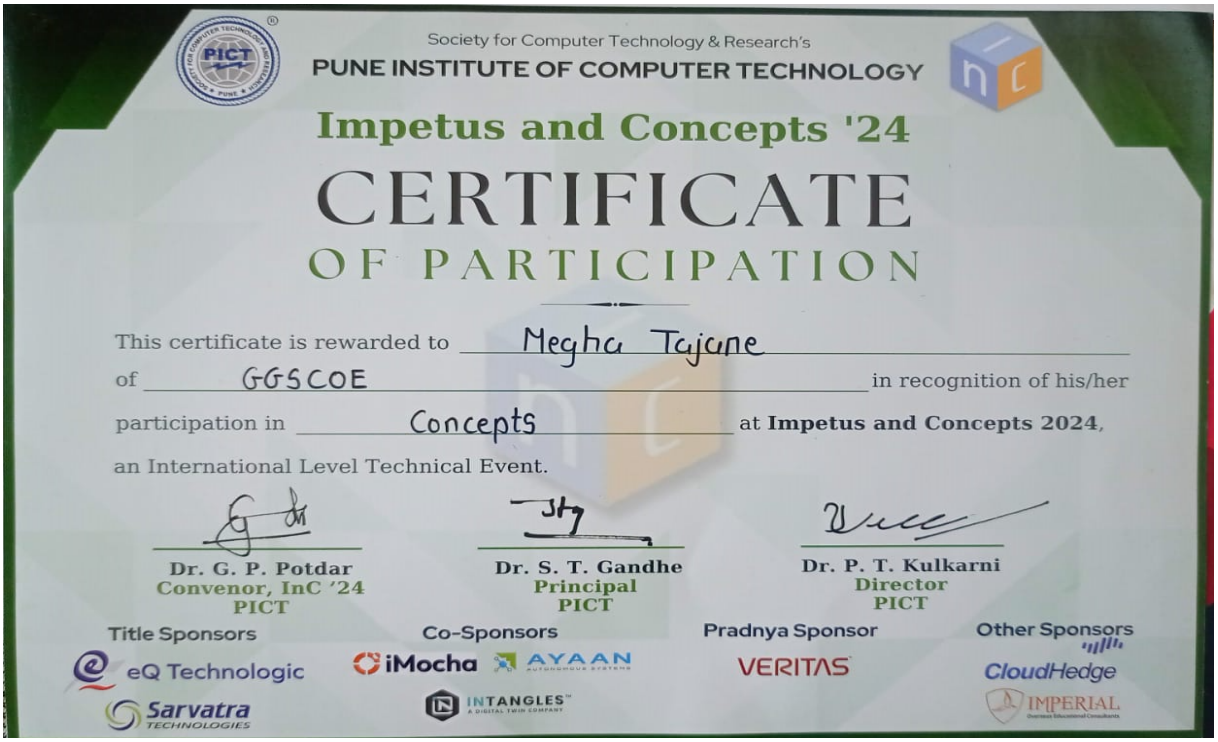

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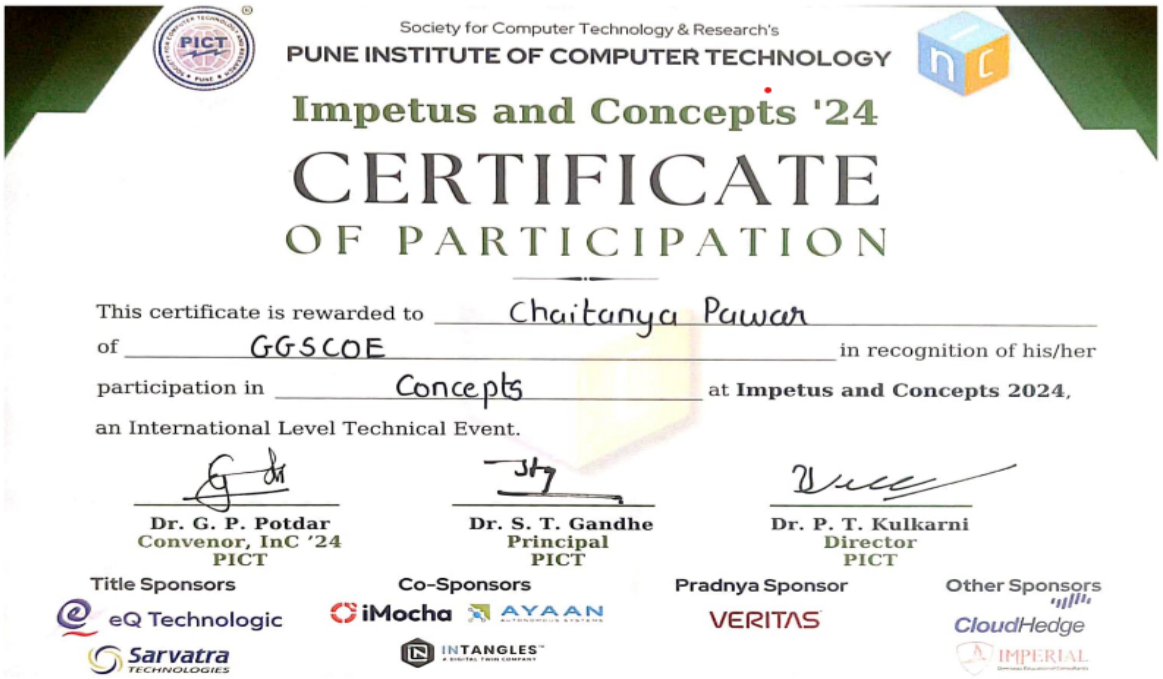

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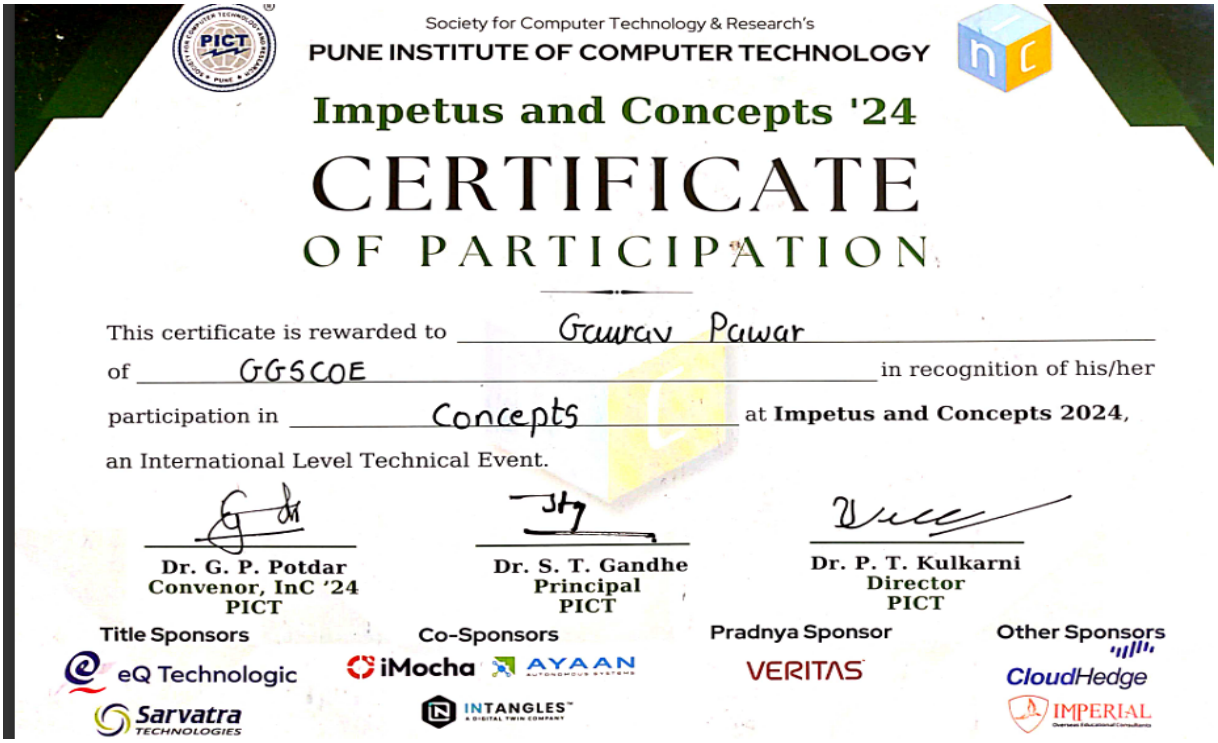

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11.4 TechExpo Competition Certificates

LOKNETE. DR. BALASAHEB VIKHE PATIL
(PADMA BHUSHAN AWARDEE)
PRAVARA RURAL EDUCATION SOCIETY
PRAVARA RURAL ENGINEERING COLLEGE
LONI

Certificate

This is to certify that

Mr. Gaurav Sunil Pawar

from

Guru Gobind Singh college of engineering and research centre nashik

has presented a project titled

Nestfeast:Food and PG recommendation system using ML

in the 3rd National Level Project competition
"TECH EXPO-2024" organized by Department of Instrumentation and
Control Engineering, Pravara Rural Engineering College, Loni
on 3rd & 4th April, 2024.

Mrs. V. S. Takate — Coordinator
Mr. N .N. Lokhande — Coordinator
Dr. C. B. Kadu — Convener
Dr. S. M. Gulhane — Principal

TechExpo24/151

PRAVARA

LOKNETE. DR. BALASAHEB VIKHE PATIL
(PADMA BHUSHAN AWARDEE)
PRAVARA RURAL EDUCATION SOCIETY
PRAVARA RURAL ENGINEERING COLLEGE
LONI

Certificate

This is to certify that

Mr. Rupesh Bhagwan Patil

from

Guru Gobind Singh college of engineering and research centre nashik

has presented a project titled

Nestfeast:Food and PG recommendation system using ML

in the 3rd National Level Project competition
"TECH EXPO-2024" organized by Department of Instrumentation and
Control Engineering, Pravara Rural Engineering College, Loni
on 3rd & 4th April, 2024.

Mrs. V. S. Takate — Coordinator
Mr. N .N. Lokhande — Coordinator
Dr. C. B. Kadu — Convener
Dr. S. M. Gulhane — Principal

TechExpo24/151

PRAVARA

11.5 Kaushalya Competition Certificates


NetLeap
IT Training & Solutions
Presents
kaushalya
In Association with
SABEDOR
Software India (SSI)
Powered by
GWS Fiber
GWS Web
Associate Sponsors
PROFOUND
Guru Gobind Singh College of Engineering and
Research Centre, Nashik
Computer Engineering Student's Association
kaushalya
29th Feb & 1st March 2024
National Level Competition
Certificate
This is to certify that Mr./Ms. Chaitanya Pawar
of GCOERC , Nashik has
participated in Project Competition Event at National Level
Competition Organized by Guru Gobind Singh College of Engineering And Research
Centre, Nashik for academic year 2023-2024 and secured Participant
position.
Congratulations...!
Prof.Pramod Patil
Event Co-ordinator
Prof.Sandeep Shukla
HOD Comp.Department
Dr.Neelkanth G. Nikam
Principal GCOERC


NetLeap
IT Training & Solutions
Presents
kaushalya
In Association with
SABEDOR
Software India (SSI)
Powered by
GWS Fiber
GWS Web
Associate Sponsors
PROFOUND
Guru Gobind Singh College of Engineering and
Research Centre, Nashik
Computer Engineering Student's Association
kaushalya
29th Feb & 1st March 2024
National Level Competition
Certificate
This is to certify that Mr./Ms. Rupesh Patil
of GCOERC , Nashik has
participated in Project Competition Event at National Level
Competition Organized by Guru Gobind Singh College of Engineering And Research
Centre, Nashik for academic year 2023-2024 and secured Participant
position.
Congratulations...!
Prof.Pramod Patil
Event Co-ordinator
Prof.Sandeep Shukla
HOD Comp.Department
Dr.Neelkanth G. Nikam
Principal GCOERC