

Roomeet (Explore Rooms and Roomates)

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Abstract - Now a days, roommate services are in high demand these days. With the world getting flattered by the day, people have transcended physical boundaries to look for study and work options in places they haven't visited before. Although a new place throws up its unique challenges, one is today well-equipped to deal with them. The advent of the net has made this possible, with people finding it increasingly easy to relocate to a new apartment and find a suitable roommate in no time. Roomeet (Explore rooms and Roomates) is a android application that makes sure you find good flatmates with the specific requirements the user has provided. The user will be asked to log in or create an account to enter the website. Then they will be asked a few questions about themselves and the roommate they prefer to be with. With the logistic regression algorithm and recommendation algorithm with collaborative filtering, they will get suggestions as to who can be the perfect fit for their flat buddy, and then if the other end user feels the same way they will enable the option of texting each other and can have a great conversation and see if they are a good fit or not. Roomeet (Explore rooms and Roomates) offers a marketplace where you can search for potential roommates. Roomeet (Explore rooms and Roomates) will use a highly advanced search algorithm to make the search much more effective. With comprehensive search options, this site makes sure that only results that meet your specific requirements are displayed.

Keywords: Roommate, Website, Algorithm, SHA, Algorithm, Collaborative filtering, Texting, Search, Requirements, etc.

I. INTRODUCTION

The project addresses the critical need for accurate and reliable models in the real estate domain. As housing markets continue to evolve with complex dynamics influenced by factors such as location, size, amenities, and economic conditions, the demand for precise house price predictions has become paramount. Traditional regression models have laid the foundation for predictive analytics in real estate, but this project aims to elevate the accuracy and efficiency of predictions by delving into advanced regression techniques.

By exploring methodologies like multiple linear regression, polynomial regression, and ensemble methods such as random forests, this research seeks to uncover nuanced patterns and relationships within extensive housing datasets. The overarching goal is to develop a robust predictive model that not only captures the intricacies of the housing market but also provides valuable insights for homeowners, real estate professionals, and policymakers. Through this investigation, the project aspires to contribute to the advancement of predictive analytics in real estate and offer a refined tool for anticipating housing market trends with greater precision. In an average university study, it is proved that living off-campus during study at university has been increased by 13 Percent.

There are many benefits of living off campus like less expense, privacy, independence, more space and living with more preferable roommate. This application provides seamless process of searching roommate. It has rich features like sending messages, searching based on university name and address, potential match based on users preferences and short listing. For developing eye catching and interactive user interface, Android Material Design is used. The proposed application will provide time efficient mobile and tablet Android App for people who are looking for roommate and apartment. The proposed system will have users having an apartment, but looking for a roommate, preferably from the same university. Users can use this app only after signing up for it. The registration process follows 6 steps. After completing the registration process, user will have login access to app. Once the user is successfully logged in, the app provides access to the user to view and update profile and preferences. Potential match will provide preferred matches based on users preferences and interests. A user looking for roommate can search it using the university name. A user looking for an apartment can use the address as a keyword to search. The app includes feature to shortlist a person who is looking for roommate or who owns an apartment. This is an android app which facilitates roommate search based on user interests. People generally find it difficult to find a roommate who is compatible and like-minded to oneself. This app helps students/professionals in building their profiles in India, more and more people are shifting to A-tier cities for better opportunities, so the demand for affordable housing is also

increasing. The best option is to have flatmates which help to reduce the cost and have a more family environment in the house. But finding flatmates is a daunting task and having the wrong flatmates can be a nightmare. Having a flat mate reduces the overall cost of living as the rent, electricity and some other expenses are also shared. People leave their hometowns and come to cities for jobs and other opportunities, they feel homesick. Having someone to talk to is nice and can be helpful for your mental health. Now if you are living in a shared accommodation then you will surely have to part your space with a roommate, we have observed that the presence of a roommate is equally disturbing as the absence of a roommate. Having a roommate with no compatibility might lead to problems such as stress, anxiety, and sometimes depression, but this is a risk to be endured for survival in metro cities where the cost of living alone is very high.

The research objective extends beyond mere algorithmic application, encompassing a holistic consideration of diverse features that influence property values. This entails the incorporation of not only fundamental structural attributes but also more nuanced socio-economic indicators that contribute to the overall valuation. Data preprocessing techniques and feature engineering play a pivotal role in refining the input dataset, ensuring that the model is equipped to discern meaningful patterns amidst the myriad variables. The model's predictive performance is meticulously evaluated through cross-validation, ensuring its adaptability to diverse datasets and the provision of reliable predictions. This project seeks to advance the current understanding of house price prediction, offering a nuanced and effective tool for stakeholders within the real estate sector to make informed decisions based on accurate valuation assessments. As the complexities of the real estate market continue to evolve, this research endeavors to provide a forward-looking and adaptable solution that addresses the multifaceted nature of property valuation.

II. LITERATURE REVIEW

The research paper focuses on improving rental property management by addressing challenges such as paperwork, data loss, and security concerns. It aims to simplify the lives of rental managers and enhance their productivity through the development of a rental home management system. The system emphasizes ease of use with an intuitive interface for rental managers. Users access a dashboard upon login, serving as a central hub for property management tasks. Menu options include House Type, Houses, Tenants, Payments, Reports, and Users, covering all aspects of property management, from house types to user accounts. 2023[1].

Inefficient record management for house rental agents and landlords due to data growth, lack of computerized systems, and data security concerns. Prospective tenants wasting time in their search for rental properties due to manual-based techniques, exacerbated by population growth and metropolitan migration. This research presents a cloud-based mobile rental management system with two main components: users (prospective tenants, tenants, agents, landlords) and the cloud. The system includes modules for location tracking, notifications, payments, authentication, messaging, cloud infrastructure, wallet management, reports, chat, rental posting, and search. 2020[2]

The research paper addresses the deficiency in existing vacation rental management systems by introducing a solution for managing access keys to rental properties. It specifically focuses on integrating a smart lock system to simplify and enhance door access for users. This paper details the design and development of a vacation rental management system that incorporates a smart lock system to address the key access issue. A prototype of the integrated system is created to assess its feasibility. The prototype undergoes testing to evaluate its performance. The system emphasizes ease of use with an intuitive interface for rental managers. Users access a dashboard upon login, serving as a central hub for property management tasks. Menu options include House Type, Houses, Tenants, Payments, Reports, and Users, covering all aspects of property management, from house types to user accounts.[3]

The research paper addresses the limitations of an existing room allocation model that assumes uniform room capacity and disregards budget constraints. It introduces a more practical and complex room allocation problem that considers varying room capacities and budget constraints, aiming to maximize social welfare in the allocation process. This paper explores the room allocation problem with capacity diversity and budget constraints, focusing on maximizing social welfare. It presents the complexity of this problem by proving it to be NP-hard, even in a simplified scenario. The paper offers an approximation algorithm for cases where room capacities are bounded by a constant.[4]

The research paper addresses the critical issue of affordable housing among middle income groups. It examines how housing affordability problems impact societal wellbeing and proposes options to manage these issues. The study collected data from fifty respondents using housing issues questionnaires. Descriptive statistics were used to analyze the data, revealing that the primary housing challenges faced by middle-income groups are housing prices, housing loans, and housing schemes' policies. The paper emphasizes the need to address these issues to ensure a majority of the population can

afford livable properties, which would enhance the quality of life in Malaysia.[5]

III. EXISTING SYSTEM

Accommodation in today’s world has been soaring at high rates. In addition, to get a shelter that matches one’s preference, budget, interest and proximity is a challenge. This problem becomes even more bigger if the person looking for accommodation is a student. For students, factors like affordability, proximity to the university, similar company etc. matters the most. There are number of websites and mobile apps that provide facilities for finding suitable roommate and vacant apartment, but as of now, there is no such mobile app that helps to find roommate or apartment for a specific university.

IV. PROPOSED SYSTEM

The proposed work encompasses a structured methodology for the development and implementation of an advanced Flat mate model. The initial phase involves comprehensive data collection, sourcing a diverse dataset that includes both fundamental structural attributes and nuanced socio-economic factors. Subsequent data preprocessing techniques ensure dataset cleanliness and prepare it for effective model training. Feature engineering, a pivotal step, involves creating new features and transformations to enhance the model's capacity to discern intricate patterns within the data.

The proposed system for paper is designed to revolutionize the process of finding compatible flatmates by leveraging advanced web technologies and intuitive user interfaces. At its core, ROOMEET offers a user-friendly platform where individuals seeking shared accommodation can create profiles, specify preferences, and connect with potential flat mates seamlessly. The system features a comprehensive user registration and profile creation module, allowing users to input personal details, lifestyle preferences, and housing requirements. Utilizing sophisticated matching algorithms, ROOMEET intelligently analyzes user profiles to suggest compatible matches based on shared interests, habits, and preferences.

Moreover, the system incorporates robust search and filtering functionalities, enabling users to refine their search criteria based on location, budget, lifestyle preferences, and other relevant factors. Interactive communication tools, such as instant messaging and video calls, facilitate direct interaction between users, fostering communication and collaboration throughout the flat mate selection process. Additionally, Roomeet (Explore rooms and Roomates) prioritizes security and privacy, implementing stringent

verification measures and data encryption protocols to safeguard user information and ensure a trustworthy environment for all users.

Furthermore, ROOMEET offers additional features such as real-time notifications for new matches, in-app messaging for seamless communication, and a ratings and review system to provide feedback on flat mate experiences. The system's responsive and intuitive design ensures compatibility across various devices, including desktops, tablets, and smart phones, enhancing accessibility and usability for users on-the-go. Overall, ROOMEET aims to streamline the flat mate searching experience, revolutionizing the way individuals find compatible living arrangements and fostering meaningful connections in shared accommodations.

The final phase involves the practical implementation and deployment of the developed model. This could manifest as a user-friendly web application or an API, allowing real estate professionals and stakeholders to input property features and receive accurate price predictions. This ensures the model's insights are accessible and applicable in real-world scenarios, contributing to informed decision-making within the dynamic real estate market. Overall, the proposed work aims to deliver a comprehensive and effective solution to the challenges of house price prediction, integrating advanced regression techniques with meticulous methodology for practical deployment and utilization.

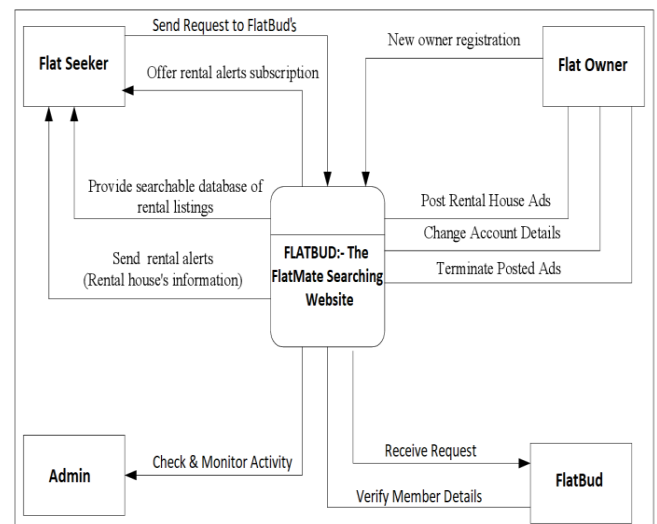


Figure 1: Architecture Diagram

The proposed work outlines a systematic and comprehensive strategy for the development and implementation of a robust house price prediction model using advanced regression and Collaborative filtering techniques. The methodology encompasses several key stages, each contributing to the refinement and efficacy of the predictive model.

V. IMPLEMENTATION OF SA ALGORITHM

A) Collaborative Filtering

Use collaborative filtering techniques to match users with similar preferences and lifestyles. Collaborative Filtering is a recommendation technique that leverages user behavior and preferences to provide personalized suggestions. This method assumes that users who have similar preferences in the past will continue to share similar tastes in the future. There are two main types: user based and item-based collaborative filtering.

In user-based collaborative filtering, recommendations are made based on the preferences of users with similar profiles, while item-based collaborative filtering recommends items similar to those a user has liked or interacted with previously. Collaborative Filtering is widely used in recommendation systems for products, services, or content, and it is known for its ability to offer serendipitous suggestions by identifying patterns and relationships within a user community.

B) Content-Based Filtering

Incorporate content-based filtering techniques to match users with similar preferences and lifestyles. Content-Based Filtering is a recommendation technique that suggests items to users based on the characteristics of those items and the preferences expressed by the users. Unlike Collaborative Filtering, Content-Based Filtering does not rely on user similarities but rather focuses on analyzing the intrinsic features of items and comparing them to a user's profile or preferences. The system evaluates items and assigns them relevant attributes or tags, such as keywords or genres. It then recommends items that align with the user's past interactions or explicitly stated preferences. This method is particularly effective in scenarios where user-item interactions are sparse or when there is a need to provide personalized recommendations for niche or specialized content. Content-Based Filtering is commonly used in various recommendation systems, such as movie or music recommendations, where the attributes of items play a crucial role in the recommendation process.

C) Leverage geolocation algorithms

Leveraging geolocation algorithms for mapping and location-based services involves utilizing algorithms that process geographical data to enhance user experiences, particularly in displaying nearby rooms on a map. These algorithms determine the user's current location and use it to filter and present relevant information, such as available rooms in proximity. By incorporating geolocation, the

application can dynamically showcase nearby rooms, offering users a visual representation of their options within a specified radius. This functionality not only streamlines the room-search process but also provides a spatial context that allows users to make more informed decisions based on the physical proximity of potential living spaces. Implementing geolocation algorithms for mapping and location-based services significantly enhances the user experience in the context of room rentals. These algorithms utilize GPS coordinates or other positioning methods to accurately determine a user's location. By integrating this technology into the application, users can effortlessly visualize and explore available rooms in their vicinity on an interactive map. This feature aids users in making informed decisions by consider ring factors such as neighborhood, amenities, and proximity to points of interest. Additionally, geo location algorithms enable dynamic updates, ensuring that users receive real-time information about nearby rooms. This not only simplifies the room-search process but also adds a spatial context, enriching the overall user engagement and interaction with the room rental platform.

D) SHA1: Secure Hash Algorithm 1

Secure Hash Algorithm 1 is a cryptographic hash function which takes an input and produces a 160-bit (20-byte) hash value. This hash value is known as a message digest. This message digest is usually then rendered as a hexadecimal number which is 40 digits long. It is a U.S. Federal Information Processing Standard and was designed by the United States National Security Agency. SHA-1 is now considered insecure since 2005. Major Tech giants browsers like Microsoft, Google, Apple and Mozilla have stopped accepting SHA-1 SSL certificates by 2017. To calculate cryptographic hashing value in Java, Message Digest Class is used, under the package `java.security`. These algorithms are initialized in static method called `getInstance()`. After selecting the algorithm the message digest value is calculated and the results are returned as a byte array. `BigInteger` class is used, to convert the resultant byte array into its sig num representation. This representation is then converted into a hexadecimal format to get the expected Message Digest.

VI. RESULTS

This application is aimed at trying to solve the major accommodation problem for university students. This application consists of a variety of features like sending messages, searching based on university name and address, potential match based on user's preferences and short listing. This Application is developed using Android API for front end and Spring MVC for creating Restful web service and Google Maps API for location based services.

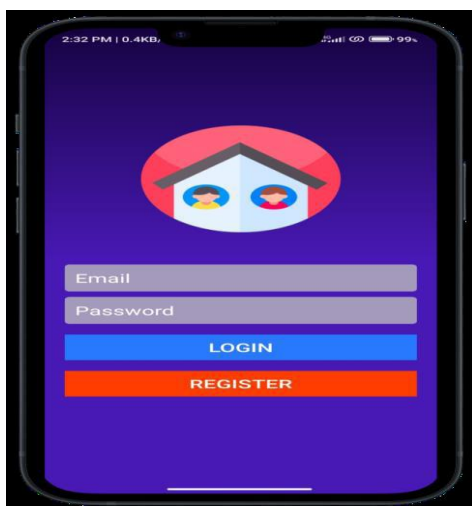


Figure 2: Output User Panel

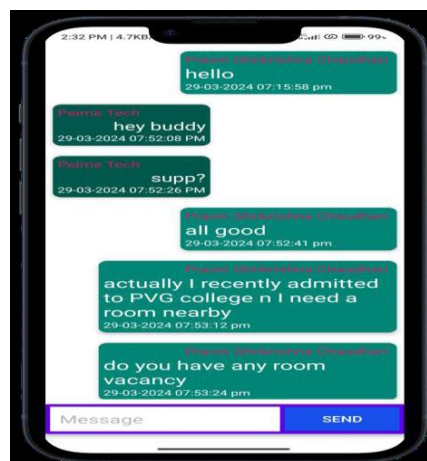


Figure 5: Chat with Roomeet

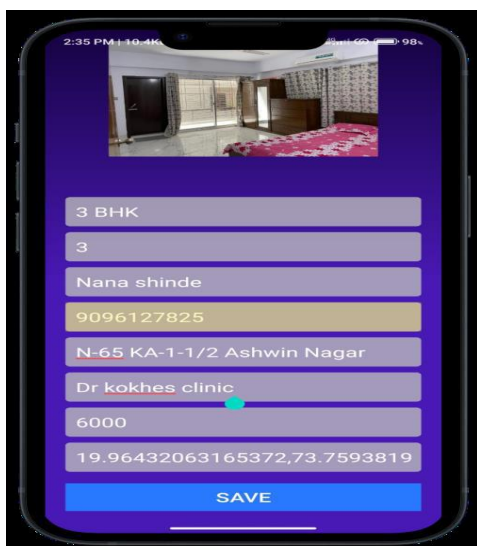


Figure 3: Add Rooms

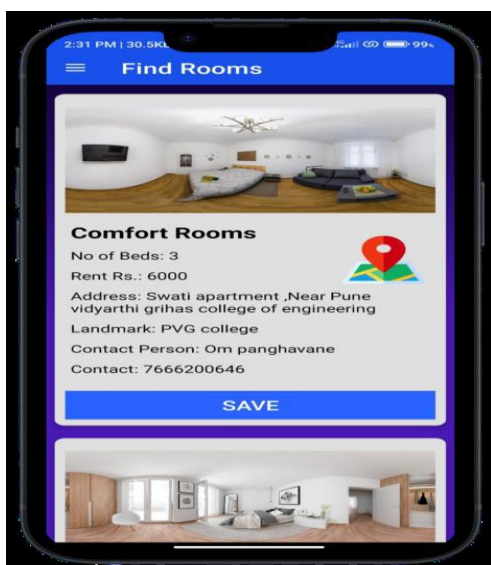


Figure 4: Find Rooms

VII. CONCLUSION

This app is extremely useful for finding roommate or vacant apartment around university campus. It is easy to access and its features can help to search preferred matches. This application can be used by wide range of people as it satisfies need for two types of users. Moreover, it provides different type of communication to connect to two users like app-to-app messages, text message to other users phone, and direct email to other users.

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