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Student Accommodation Finder

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ABSTRACT

Finding suitable housing is a major challenge for students moving to new cities for education or internships. Traditional housing platforms often lack personalization and fail to meet the unique needs of students, such as budget constraints, location preferences, and roommate compatibility. This mini project presents a Personalized Student Housing Recommendation System designed to simplify the housing search process for students.

The system allows students to register, specify their preferences (such as location, budget, amenities, and room type), and receive AI-generated housing recommendations tailored to their needs. Using a content-based filtering approach with cosine similarity, the system matches student preferences with available listings to produce a ranked list of suitable properties. Property owners can register and post their listings with details and images, making them visible to interested students.

By integrating intelligent recommendation algorithms and a user-friendly interface, this project aims to offer a smart, scalable, and student-focused solution for finding safe and affordable accommodation.

1. INTRODUCTION

Finding suitable accommodation is one of the major challenges faced by students who move to new cities for education or internships. Most students struggle with limited time, unfamiliar localities, and a lack of reliable information while searching for a place to stay. Traditional housing platforms are not specifically designed for students and often fail to provide personalized recommendations based on their unique needs such as budget, preferred room type, amenities, and safety considerations.

This project aims to develop a Personalized Student Housing Recommendation System that simplifies the house-hunting process using AI-based recommendation techniques. By collecting student preferences and matching them with available listings using content-based filtering and cosine similarity, the system generates accurate and relevant housing suggestions. Additionally, the platform enables property owners to upload listings, making it easier for students to discover suitable accommodations from verified sources. The goal is to create an efficient, student-friendly, and intelligent housing search experience.

2-LITERATURE REVIEW

Several research studies have explored the application of artificial intelligence and machine learning in the housing sector, especially in developing recommendation systems that personalize user experiences. Ojokoh et al. (2018) proposed a user-centric housing recommender system that uses content-based filtering to suggest properties based on user preferences such as location, budget, and required amenities. While effective, content-based systems often require well-structured user profiles and may not perform optimally when dealing with new users or listings, commonly referred to as the "cold start" problem. One widely used technique in such systems is cosine similarity, which calculates the similarity between user preference vectors and property feature vectors.

This method is particularly useful when dealing with categorical features such as location, amenities, or property type, making it highly suitable for student housing recommendations.

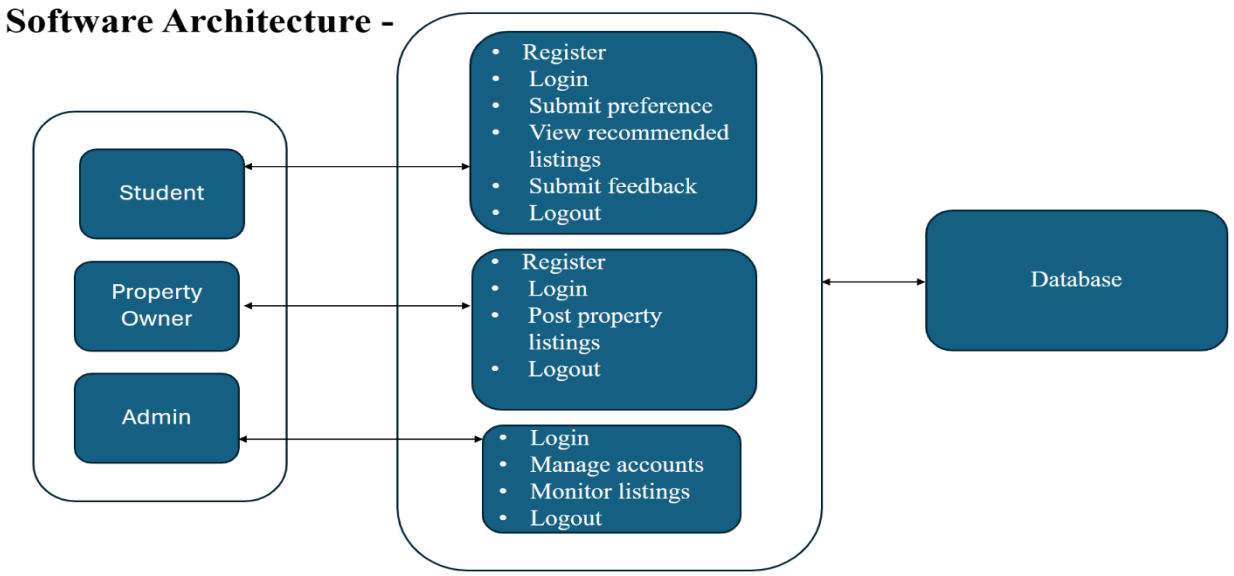
3-DESIGN

Methodology

The project follows a structured approach starting with requirement analysis for both students and property owners. The frontend is developed using React.js and Bootstrap, while the backend is built with Node.js and Express.js, and MongoDB is used for data storage.

Student and property data are collected and encoded using one-hot encoding. A content-based filtering algorithm using cosine similarity is applied to match student preferences with property listings. The system generates a ranked list of personalized housing recommendations.

Once the recommendation logic is tested, the system is integrated and evaluated through functional testing, ensuring that all modules including registration, login, listing uploads, preference submission, and result display are working correctly. Feedback mechanisms are included to help refine future recommendations and improve user experience.



Algorithm:

1. Import dataset and libraries (Pandas, Scikit-learn, etc.)

   Import necessary Python libraries such as pandas for data manipulation, scikit-learn for one-hot encoding and cosine similarity, and numpy for numerical operations. Load the student preference dataset and property listing dataset.

2. Handle missing data and normalize numeric columns

   Handle missing or null values in the dataset using appropriate imputation techniques (e.g., filling with mode or median). Normalize or encode categorical columns using One-Hot Encoding to prepare for similarity calculation.

3. Prepare feature vectors for students and properties

   Convert student preferences and property attributes into numerical feature vectors using one-hot encoding. Ensure that both datasets have matching

encoded feature columns.

4. Apply cosine similarity to match preferences

   Compute cosine similarity between the student preference vector and each property listing vector using sklearn.metrics.pairwise.cosine_similarity.

5. Rank property listings based on similarity scores

   Sort the property listings based on their similarity scores in descending order. The top N properties with the highest scores are recommended to the student.

6. Display recommendations

   Show the top-ranked recommended houses to the student through the frontend interface. Include listing details such as location, room type, amenities, and rent.

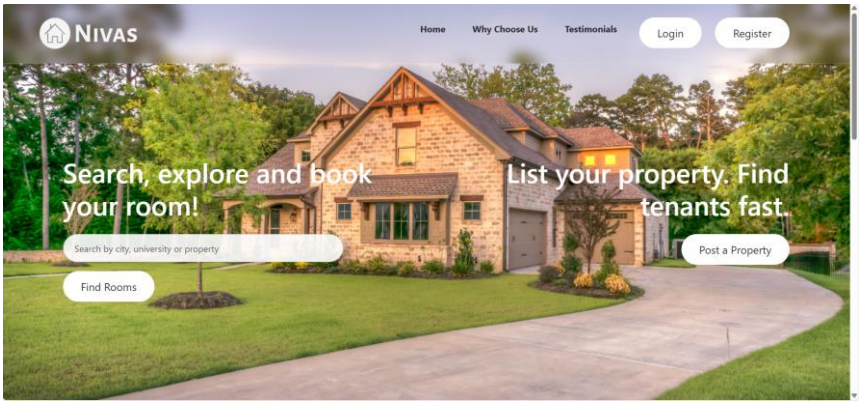
4-SCREENSHOTS

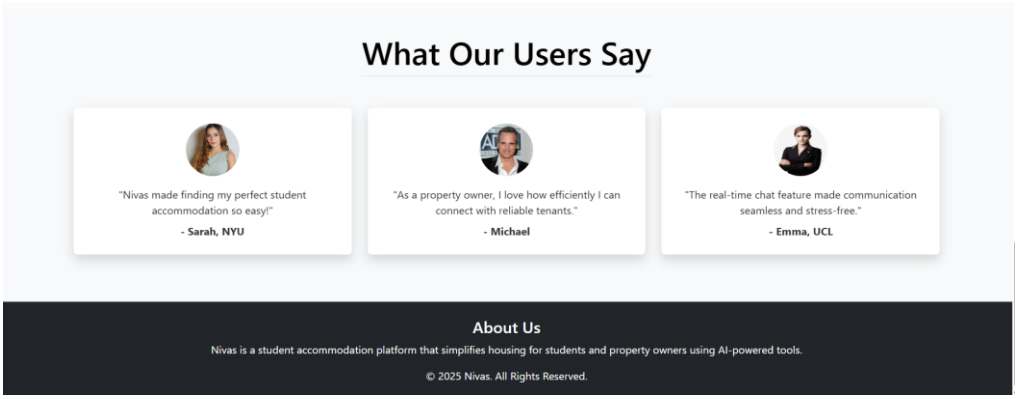
To Activate the Project :

```
(venv) C:\Users\Dell\student-housing\backend\recommendation_service>python app.py
 * Serving Flask app 'app'
 * Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on http://127.0.0.1:5001
Press CTRL+C to quit
 * Restarting with stat
 * Debugger is active!
 * Debugger PIN: 945-125-126
```

```
C:\Users\Dell\student-housing\backend>node server.js
(node:5780) [MONGODB DRIVER] Warning: useNewUrlParser is a deprecated option: useNewUrlParser has no effect since Node.j
s Driver version 4.0.0 and will be removed in the next major version
(Use `node --trace-warnings ...` to show where the warning was created)
(node:5780) [MONGODB DRIVER] Warning: useUnifiedTopology is a deprecated option: useUnifiedTopology has no effect since
Node.js Driver version 4.0.0 and will be removed in the next major version
Server running on http://localhost:5000
MongoDB connected successfully
```

```
C:\Users\Dell\student-housing\frontend>npm start

> frontend@0.1.0 start
> react-scripts start

(node:16172) [DEP_WEBPACK_DEV_SERVER_ON_AFTER_SETUP_MIDDLEWARE] DeprecationWarning: 'onAfterSetupMiddleware' option is d
eprecated. Please use the 'setupMiddlewares' option.
(Use `node --trace-deprecation ...` to show where the warning was created)
(node:16172) [DEP_WEBPACK_DEV_SERVER_ON_BEFORE_SETUP_MIDDLEWARE] DeprecationWarning: 'onBeforeSetupMiddleware' option is
 deprecated. Please use the 'setupMiddlewares' option.
Starting the development server...
Compiled successfully!

You can now view frontend in the browser.

  Local:            http://localhost:3000
  On Your Network:  http://192.168.0.3:3000

Note that the development build is not optimized.
To create a production build, use npm run build.

webpack compiled successfully
```




What Our Users Say
"Nivas made finding my perfect student accommodation so easy!"
- Sarah, NYU
"As a property owner, I love how efficiently I can connect with reliable tenants."
- Michael
"The real-time chat feature made communication seamless and stress-free."
- Emma, UCL
About Us
Nivas is a student accommodation platform that simplifies housing for students and property owners using AI-powered tools.
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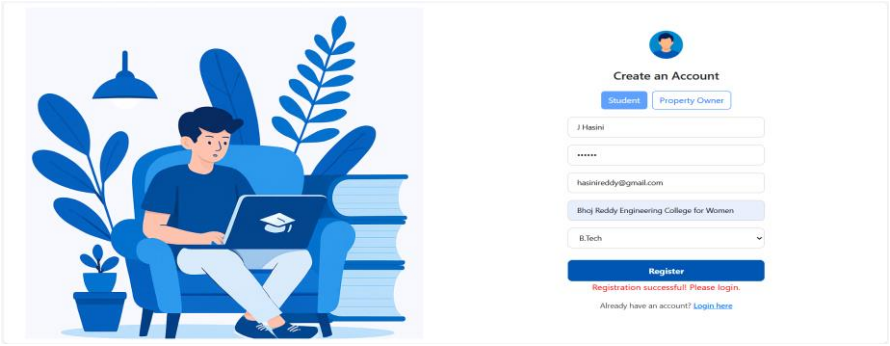
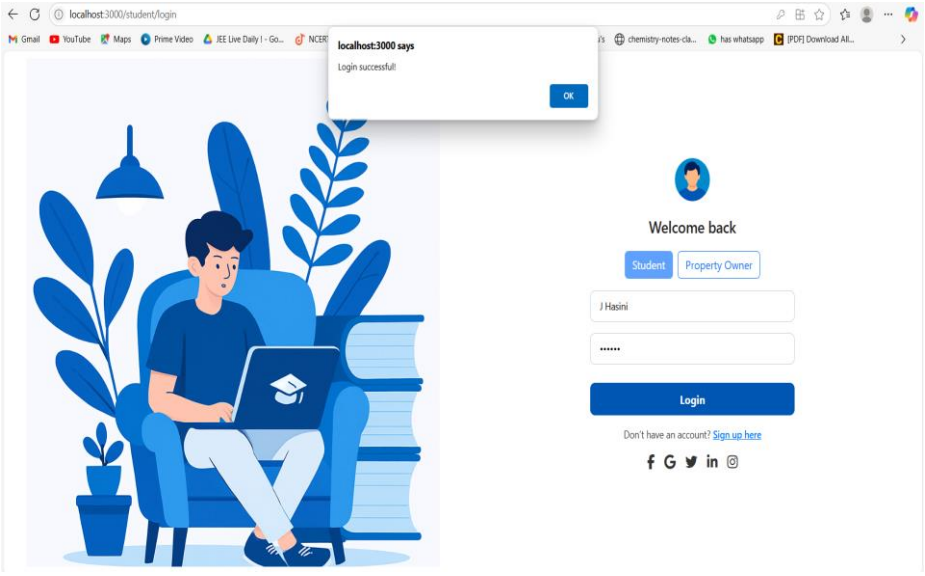
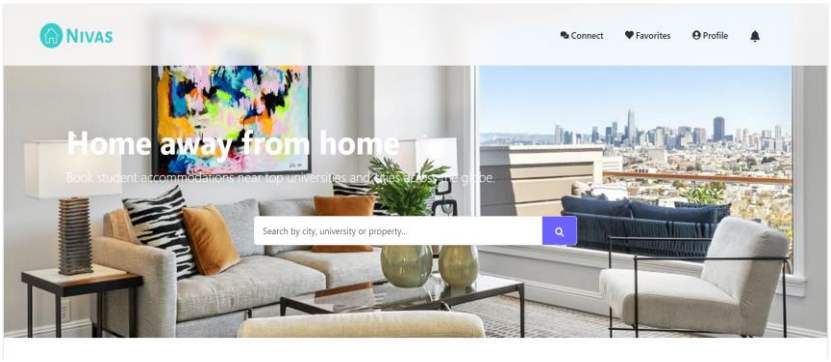
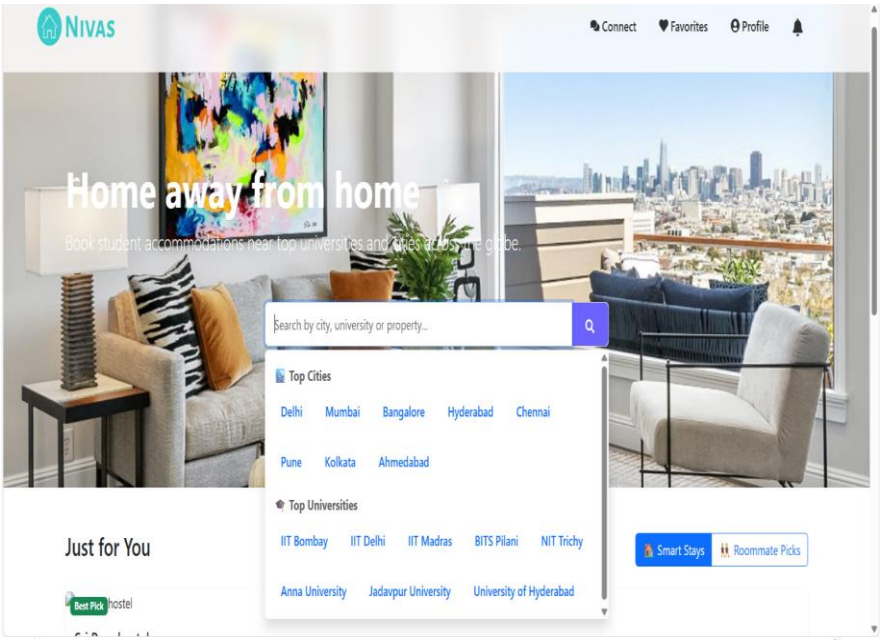
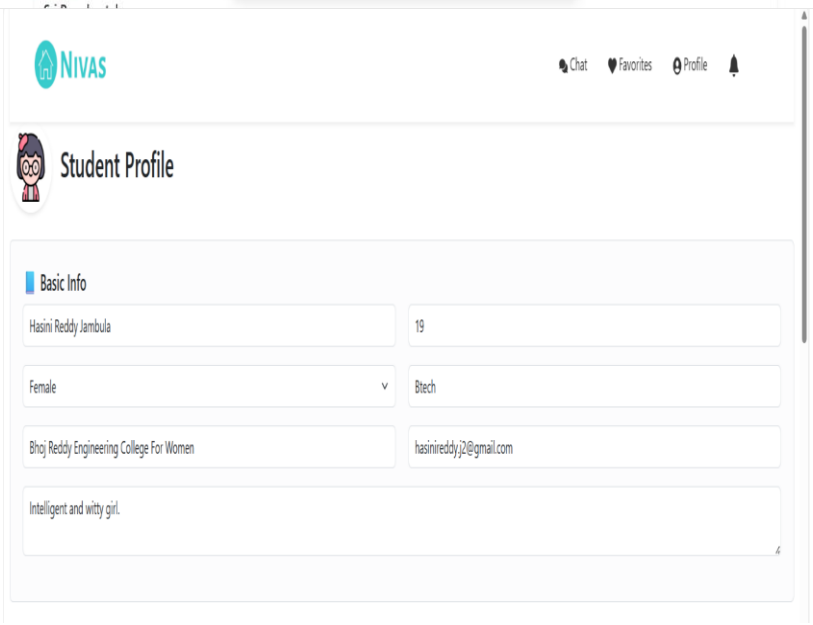
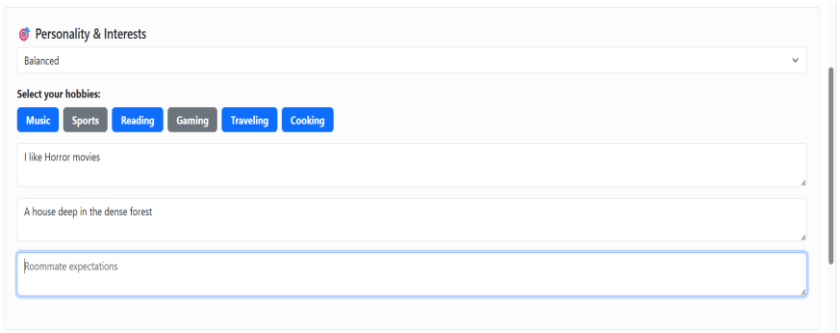

Create an Account
Student
Property Owner
J Hasini
hasinireddy@gmail.com
Bhoj Reddy Engineering College for Women
B.Tech
Register
Registration successful! Please login.
Already have an account? Login here

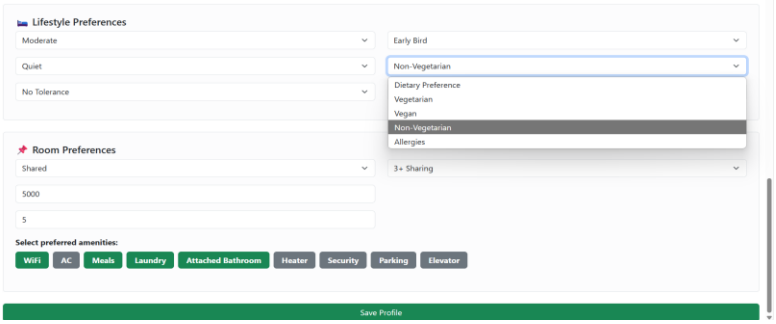

localhost:3000/student/login
localhost:3000 says
Login successful!
OK
Welcome back
Student
Property Owner
J Hasini
Login
Don't have an account? Sign up here

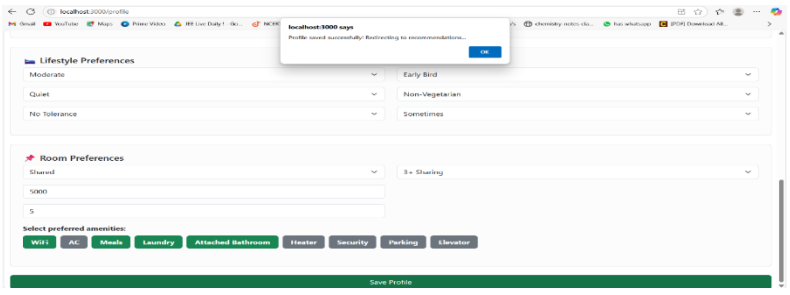

NIVAS
Connect
Favorites
Profile
Home away from home
Search by city, university or property...

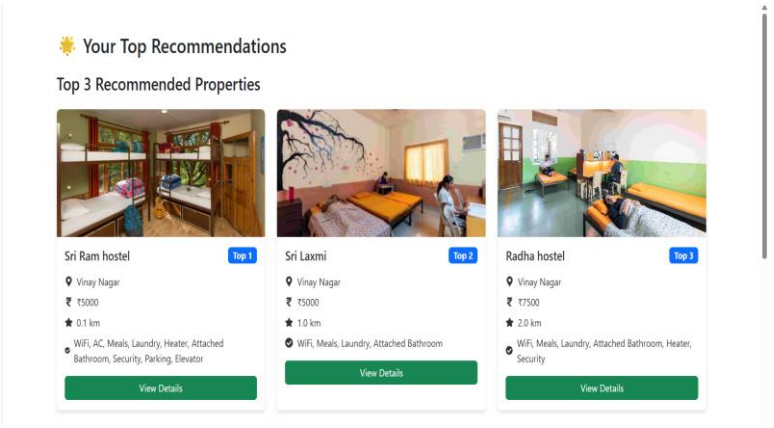

NIVAS
Connect
Favorites
Profile
Home away from home
Search by city, university or property...
Top Cities
Delhi
Mumbai
Bangalore
Hyderabad
Chennai
Pune
Kolkata
Ahmedabad
Top Universities
IIT Bombay
IIT Delhi
IIT Madras
BITS Pilani
NIT Trichy
Anna University
Jadavpur University
University of Hyderabad
Just for You
Smart Stays
Roommate Picks
Best Pick

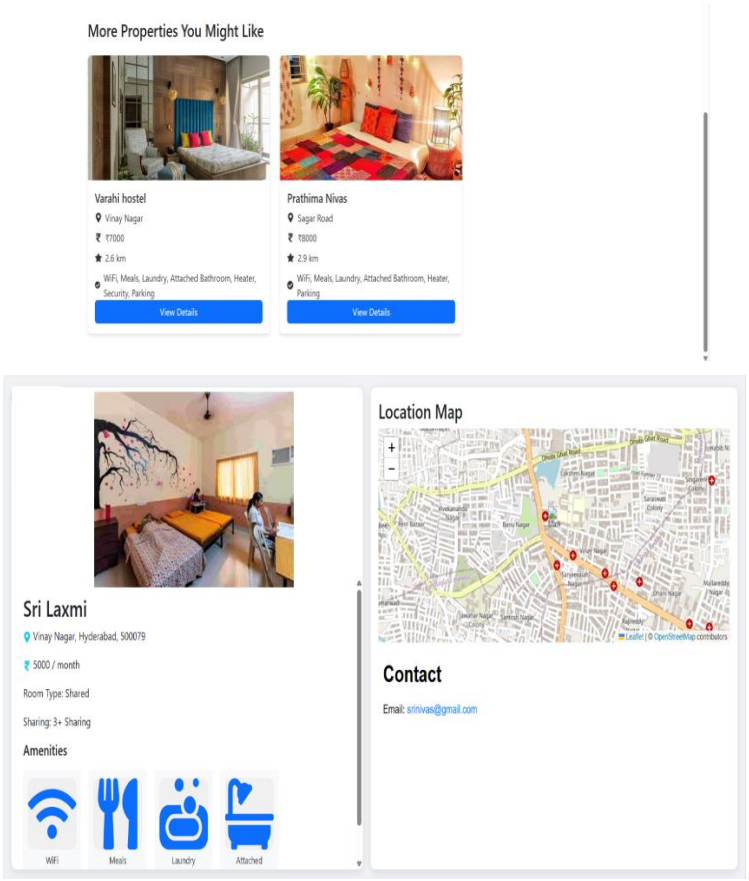

NIVAS
Chat
Favorites
Profile
Student Profile
Basic Info
Hasini Reddy Jambula
19
Female
Btech
Bhoj Reddy Engineering College For Women
hasinireddy.j2@gmail.com
Intelligent and witty girl.


Personality & Interests
Balanced
Select your hobbies:
Music
Sports
Reading
Gaming
Traveling
Cooking
I like Horror movies
A house deep in the dense forest
Roommate expectations


Lifestyle Preferences
Moderate
Early Bird
Quiet
Non-Vegetarian
No Tolerance
Dietary Preference
Vegetarian
Vegan
Non-Vegetarian
Allergies
Room Preferences
Shared
3+ Sharing
5000
5
Select preferred amenities:
WiFi
AC
Meals
Laundry
Attached Bathroom
Heater
Security
Parking
Elevator
Save Profile


localhost:3000/profile
localhost:3000 says
Profile saved successfully! Redirecting to recommendations...
OK
Lifestyle Preferences
Moderate
Early Bird
Quiet
Non-Vegetarian
No Tolerance
Sometimes
Room Preferences
Shared
3+ Sharing
5000
5
Select preferred amenities:
WiFi
AC
Meals
Laundry
Attached Bathroom
Heater
Security
Parking
Elevator
Save Profile


Your Top Recommendations
Top 3 Recommended Properties
Sri Ram hostel
Top 1
Vinay Nagar
₹5000
0.1 km
WiFi, AC, Meals, Laundry, Heater, Attached Bathroom, Security, Parking, Elevator
View Details
Sri Laxmi
Top 2
Vinay Nagar
₹5000
1.0 km
WiFi, Meals, Laundry, Attached Bathroom
View Details
Radha hostel
Top 3
Vinay Nagar
₹7500
2.0 km
WiFi, Meals, Laundry, Attached Bathroom, Heater, Security
View Details



5-CONCLUSION

The Personalized Student Accommodation Finder offers a smart and efficient way for students to discover suitable accommodations based on their preferences. It utilizes AI algorithms to generate tailored housing recommendations and facilitates better decision-making through advanced filtering and preference matching. By focusing on student-centric needs and usability, the platform enhances the overall housing search experience.

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