



**CSE471: System Analysis and Design**  
**Project Report**  
**Project Title: AbroadEase**

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**Submission Date: 30.08.2025**

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# 1. System Request

## **Business need:**

AbroadEase, an Overseas Companion, a project to offer students a one stop solution for all the initial queries required during the application process, such as visa requirements, Statement of Purpose Guidelines, housing options and university profiles. It solves the problem of scattered information, and helps make moving overseas easier and clearer.

## **Business requirements:**

1. Develop a secure system for user authentication, allowing users to sign up, log in, and manage their profiles.
2. Implement a content management system for administrators to post, update, and delete information regarding visas and SOPs.
3. Create a robust search and filtering system for users to find information on visas, universities, and rental properties based on various criteria.
4. Establish a separate dashboard for landowners to list their properties with detailed information.
5. Integrate a bookmarking feature for users to save important information, such as SOPs, visas, and housing listings.
6. Develop a notification system, specifically an email API, to alert users about new rental listings in their preferred locations

## **Business value:**

1. **Improved User Experience:** Provides a single, user-friendly platform for all necessary information, reducing the time and effort required to gather data from multiple sources.
2. **Increased Efficiency:** Automates the process of finding housing and information, benefiting both users and landowners. The email alert

system ensures users are promptly notified of new listings, giving them a competitive advantage.

3. **Enhanced Content Management:** Allows admins to easily manage and update critical information, ensuring the content remains current and accurate.
4. **Monetization Potential:** The platform can be a basis for future monetization through features like sponsored university listings, premium landowner accounts, or paid guides.

### **Special issues or constraints:**

1. **Data Accuracy:** Ensuring that visa and university information remains up-to-date and accurate will be a continuous challenge due to frequent changes in regulations and policies.
2. **User Adoption:** Attracting a critical mass of both users and landowners will be necessary to make the housing feature valuable.
3. **Security:** The system must handle sensitive user data, such as emails and resumes, securely, requiring robust authentication and data protection measures.
4. **Scalability:** The system needs to be designed to handle a growing number of users, posts, and listings without performance degradation, especially with features like real-time alerts and filtering.

## 2. Functional Requirements

The functional requirements are categorized into three modules:

- **User Account and Profile Management:** This module handles user sign-up, login, profile updates, and password changes. It also includes a separate dashboard for landowners and the ability for users to view bookmarks.
- **Post guidelines and filtering:** This module allows users to get information about visas and SOPs, filter universities, and bookmark posts. Admins can also create, update, and delete posts.
- **Housing:** This module includes features for filtering rental listings, viewing detailed property information, receiving new rental alerts, and bookmarking housing options. Admins have management capabilities for these listings.

## 3. Technology (Framework, Languages)

- Language: JS
- Framework: MERN
- Styling: Tailwind
- Database: MongoDB
- ORM: Mongoose
- Deployment: Vercel

### 3. Backend Development

Attach at least 5 code snippets of Backend/API development with proper description. Also, attach corresponding screenshots of Postman API testing.

a) code for server.js file for API connection.

**Module 2:** Post guidelines and filtering:

**Feature-4:**

Admin will be able to write posts regarding SOP instructions.

```
JS server.js > ...
37
38 const SopPost = mongoose.model('SopPost', SopPostSchema);
39
40 // Health (optional, helps you show server is up)
41 app.get('/api/health', (req, res) => {
42   res.json({ status: 'ok', time: new Date().toISOString() });
43 });
44
45 // Feature: Admin writes SOP instruction posts
46 // Endpoint: POST /api/sop-posts
47 app.post('/api/sop-posts', async (req, res) => {
48   try {
49     const { title, country, degreelevel = 'other', tags = [], content } = req.body;
50
51     // Minimal validation (fast and clear errors)
52     if (!title || title.length < 5) {
53       return res.status(400).json({ error: 'Title is required and must be at least 5 characters.' });
54     }
55     if (!country || country.length < 2) {
56       return res.status(400).json({ error: 'Country is required and must be at least 2 characters.' });
57     }
58     if (!content || content.length < 50) {
59       return res.status(400).json({ error: 'Content is required and must be at least 50 characters.' });
60     }
61   }
```

```

JS server.js > ...
47 app.post('/api/sop-posts', async (req, res) => {
60   }
61
62   const doc = await SopPost.create({ title, country, degreeLevel, tags, content });
63   return res.status(201).json({ message: 'SOP post created', data: doc });
64 } catch (err) {
65   console.error('Create SOP error:', err);
66   return res.status(500).json({ error: 'Internal server error' });
67 }
68 });
69
70 // Not found fallback
71 app.use((req, res) => {
72   res.status(404).json({ error: 'Route not found' });
73 });
74
75 // Start server on 1689
76 app.listen(PORT, () => {
77   console.log(`🔥 Server running on http://localhost:${PORT}`);
78 });
79
80

```

b) Code for property.js

```

routes > JS propertyRoutes.js > ...
1  const express = require('express');
2  const router = express.Router();
3  const {
4    getAllProperties,
5    getPropertyById,
6    createProperty,
7    updateProperty,
8    deleteProperty
9  } = require('../controllers/propertyController');
10
11 // Get all properties
12 router.get('/', getAllProperties);
13
14 // Get property by ID
15 router.get('/:id', getPropertyById);
16
17 // Create new property
18 router.post('/', createProperty);
19
20 // Update property
21 router.put('/:id', updateProperty);
22
23 // Delete property
24 router.delete('/:id', deleteProperty);
25
26 module.exports = router;

```

```

server.js package-lock.json propertyController.js x Property.js propertyRoutes.js
modules > propertyController.js > updateProperty > updateProperty
15 exports.createProperty = async (req, res) => {
24 };
25
26 // Create new property
27 exports.createProperty = async (req, res) => {
28   try {
29     const property = new Property(req.body);
30     const savedProperty = await property.save();
31     res.status(201).json(savedProperty);
32   } catch (err) {
33     res.status(400).json({ error: 'Failed to create property' });
34   }
35 };
36
37 // Update property
38 exports.updateProperty = async (req, res) => {
39   try {
40     const property = await Property.findByIdAndUpdate(
41       req.params.id,
42       req.body,
43       { new: true }
44     );
45     if (!property) {
46       return res.status(404).json({ error: 'Property not found' });
47     }
48     res.json(property);
49   } catch (err) {
50     res.status(400).json({ error: 'Failed to update property' });
51   }
52 };
53
54

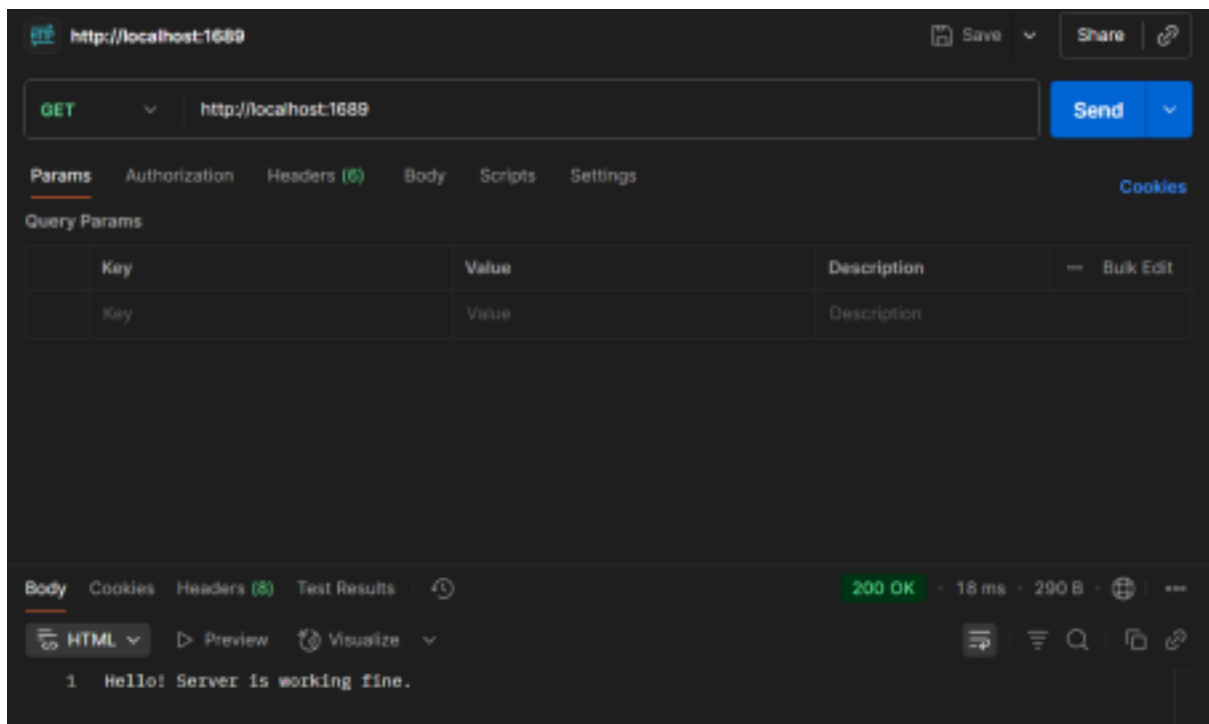
```

```

54 // Delete property
55 exports.deleteProperty = async (req, res) => {
56   try {
57     const property = await Property.findByIdAndDelete(req.params.id);
58     if (!property) {
59       return res.status(404).json({ error: 'Property not found' });
60     }
61     res.json({ message: 'Property deleted successfully' });
62   } catch (err) {
63     res.status(500).json({ error: 'Failed to delete property' });
64   }
65 };
66
67
68 exports.createProperty = async (req, res) => {
69   try {
70     const newProperty = new Property(req.body);
71     const savedProperty = await newProperty.save();
72     res.status(201).json({
73       message: 'Property added successfully',
74       propertyId: savedProperty._id
75     });
76   } catch (error) {
77     console.error('✖ Error in createProperty:', error);
78     res.status(500).json({ error: error.message });
79   }
80 };
81

```

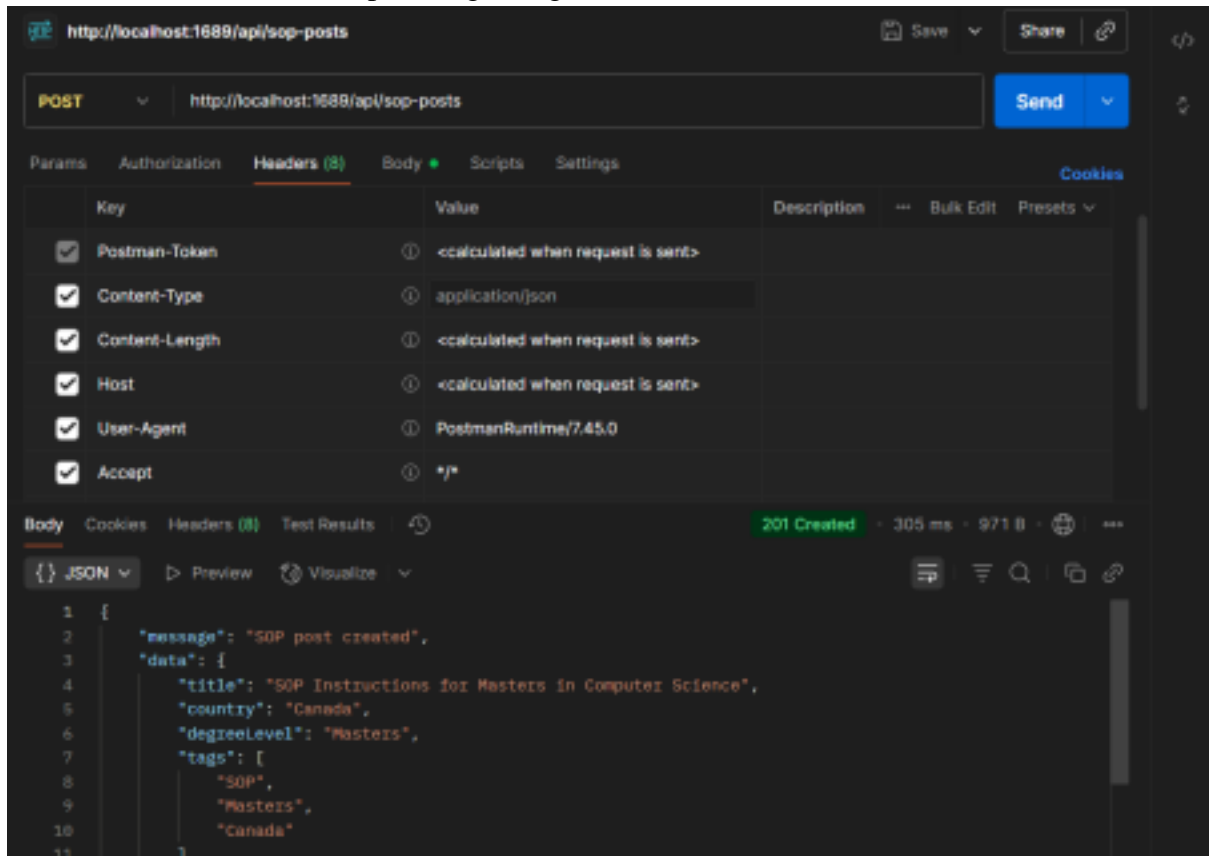


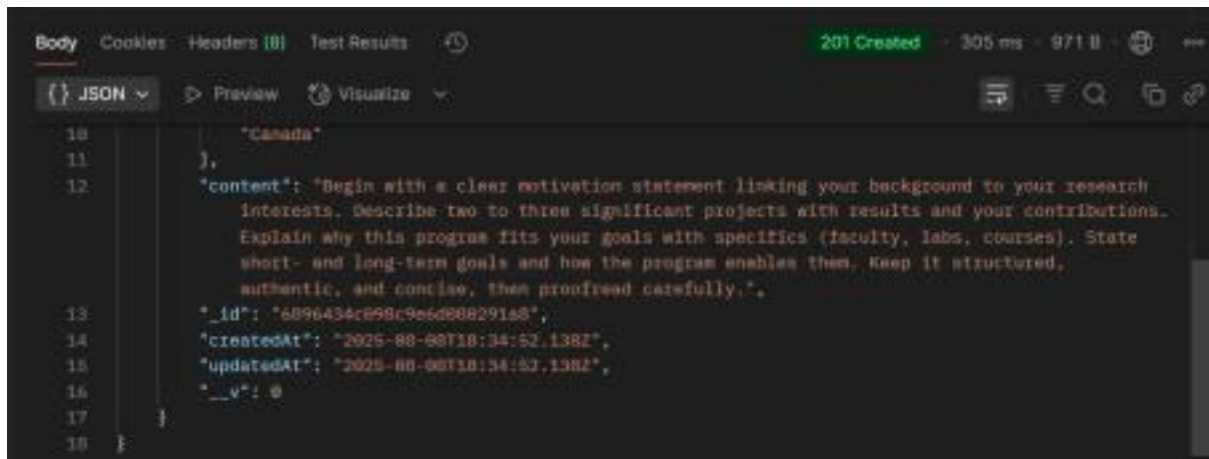


API for : Module 2: Post guidelines and filtering:

Feature-4:

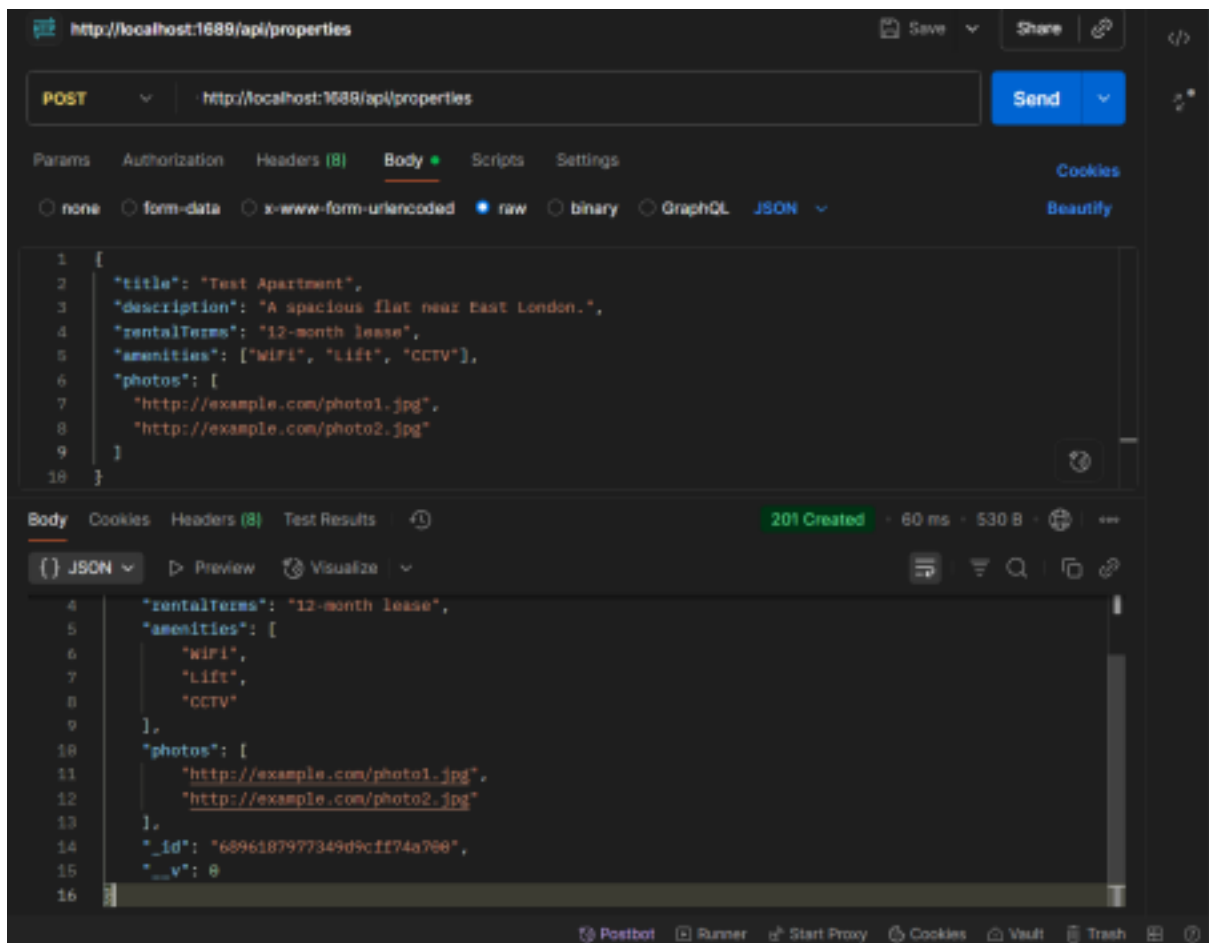
Admin will be able to write posts regarding SOP instructions.

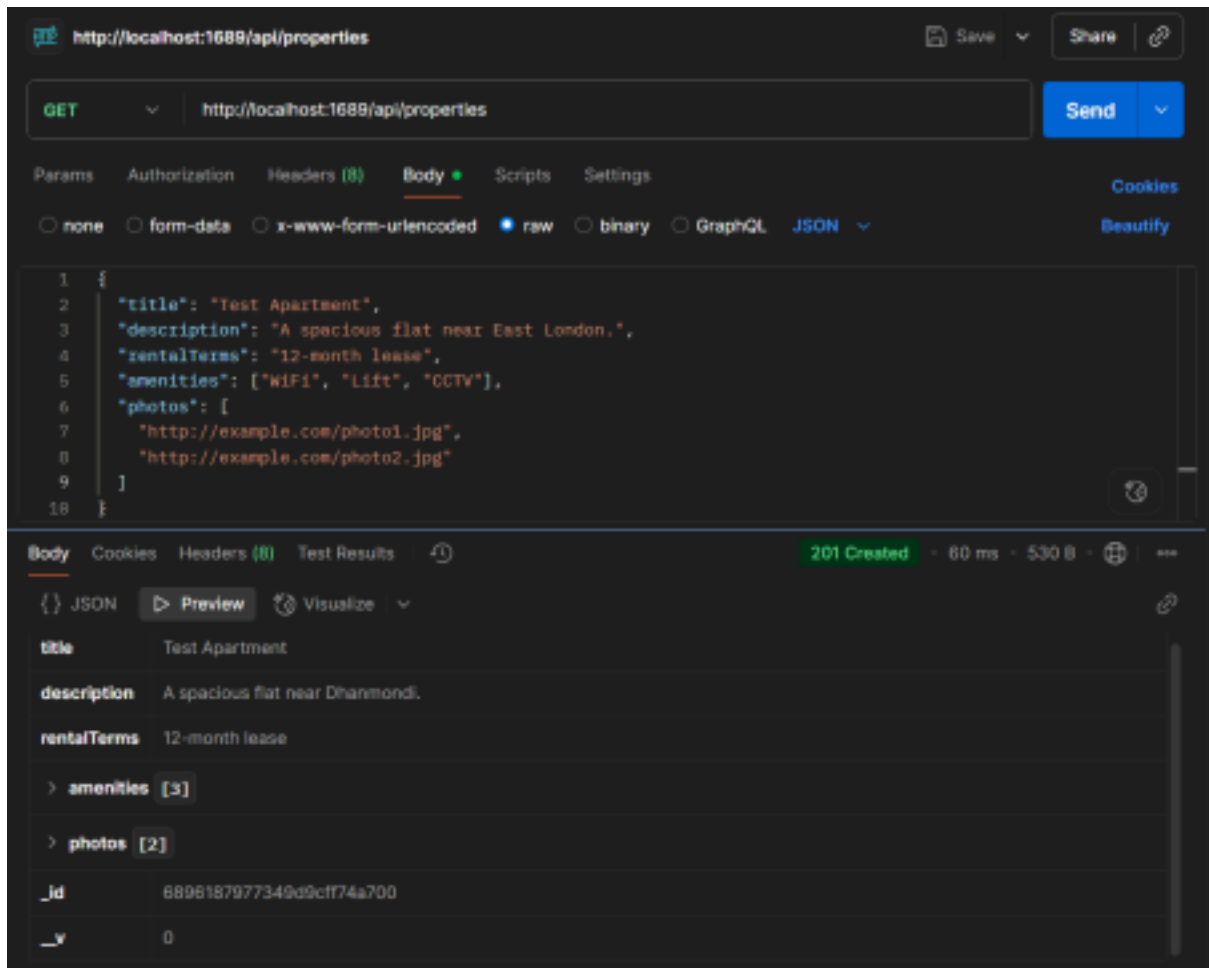




## API for : Module 3: Housing: Feature-2:

Detailed Property Information: Each listing includes property photos, descriptions, rental terms, and amenities for better decision-making.





## 4. User Interface Design

Attach at least 5 interface designs generated in Figma. Attach the figma project link.

<https://www.figma.com/design/DTkPcpMykGUpXVrEJh4bKL/Lab2?node-id=0-1&t=4WuxyVXsLdeaR2en-1>


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## University of Cambridge - United Kingdom

[Apply Now](#)

The Old Schools, Trinity Ln, Cambridge CB2 1TN, United Kingdom


Programs offered in University of Cambridge:


Program Name	Department	Term	Degree Type
<a href="#">Start application</a>	<a href="#">Search...</a>	<a href="#">Search...</a>	<a href="#">Search...</a>
<a href="#">Start application</a>	<a href="#">Search...</a>	<a href="#">Search...</a>	<a href="#">Search...</a>


[Filters](#) 2 items found

[Ranking](#)
[Public Uni](#)


Page 1


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Page 2


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## Housing for Students


Book your perfect student housing.




All Filters




From \$520/ week



From \$300/ week

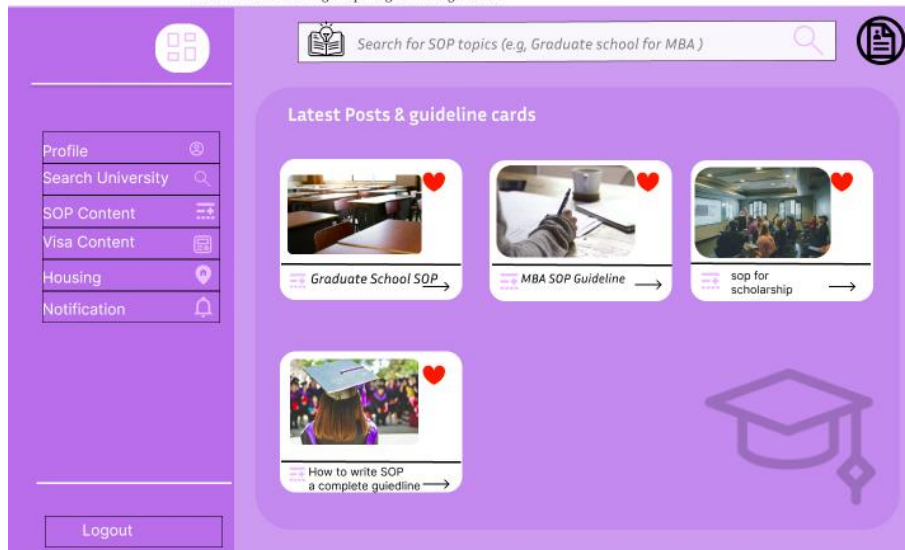
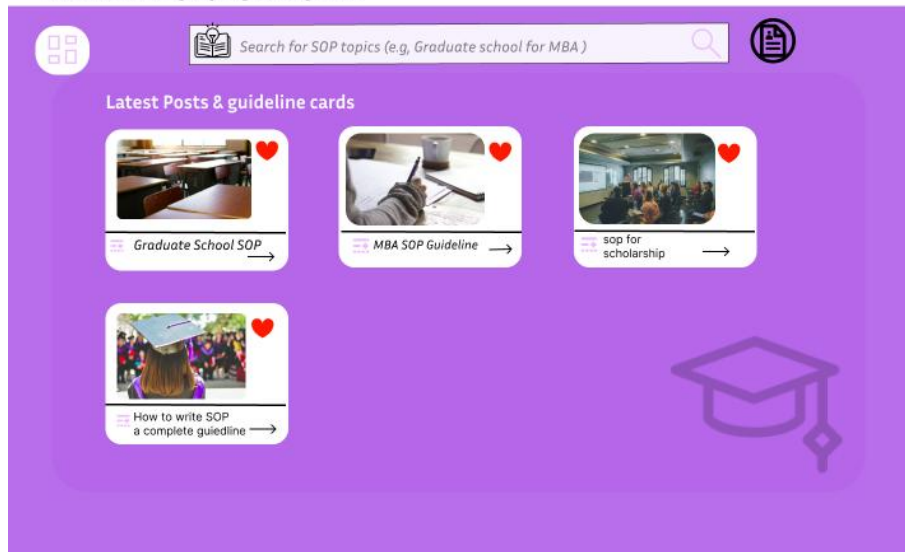


From \$593/ week



From \$350/ week

Showing 1-4 of 25 items  
Page 1 of 3



### The Essential SOP Structure: A Step-by-Step Guide

Crafting a Statement of Purpose (SOP) can seem daunting, but with a clear structure, you can ensure all crucial elements are included and presented logically. This guide breaks down the essential sections of a compelling SOP.

#### 1. Introduction: Hook Your Reader

Begin with a captivating opening that clearly states your purpose for applying to the specific program and university. This is where you grab the admissions committee's attention.

- State the program and university you are applying to.
- Briefly mention your motivation or a key experience that led you to this path.
- Provide a concise overview of what the SOP will cover.

#### 2. Academic Background: Showcase Your Foundation

Detail your academic journey, highlighting relevant coursework, projects, and achievements. Connect your past studies to your future aspirations.

- Discuss your undergraduate degree and major.
- Mention significant academic projects, research, or theses.
- Highlight relevant courses and skills gained.
- Explain any academic challenges and how you overcame them.

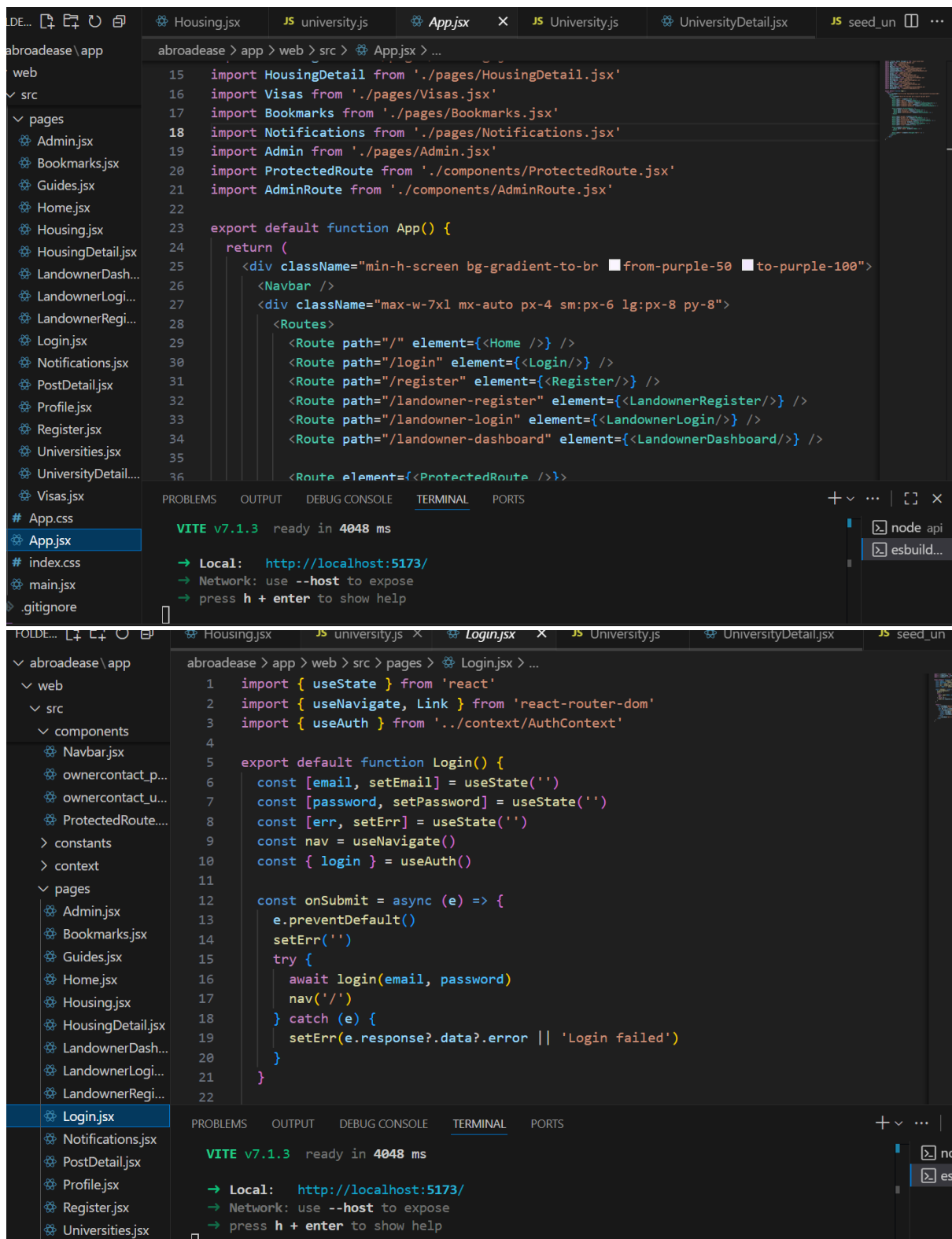
- Briefly recap your qualifications and motivations.
- Express your eagerness to join the university community.
- Thank the admissions committee for their time and consideration.

[← Back to SOP Hub](#)

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## 5. Frontend Development

Attach at least 5 frontend code snippets with proper description.





```
abroadease > app > web > src > components > Navbar.jsx > Navbar
4  export default function Navbar() {
15
16      return (
17          <nav className="bg-white border-b border-purple-200 shadow-sm">
18              <div className="max-w-7xl mx-auto px-4 sm:px-6 lg:px-8">
19                  <div className="flex items-center justify-between h-16">
20                      <Link to="/" className="flex items-center gap-2">
21                          <span className="text-2xl">✈️</span>
22                          <span className="font-bold text-2xl text-purple-700">AbroadEase</span>
23                      </Link>
24
25                      <div className="flex items-center gap-1">
26                          {user && <NavLink to="/guides" className={linkClass}>📖 Guides</NavLink>}
27                          <NavLink to="/universities" className={linkClass}>🌐 Universities</NavLink>
28                          <NavLink to="/housing" className={linkClass}>🏠 Housing</NavLink>
29                          <NavLink to="/visas" className={linkClass}>🛂 Visas</NavLink>
30
31                          {user && <
32                              <NavLink to="/bookmarks" className={linkClass}>🔖 Bookmarks</NavLink>
33                              <NavLink to="/notifications" className={linkClass}>🔔 Notifications</NavLink>
34                              <NavLink to="/profile" className={linkClass}>👤 Profile</NavLink>
35                          </>
36                      </div>
37                  </div>
38              </div>
39          </nav>
40      )
41  }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

VITE v7.1.3 ready in 4048 ms

→ Local: http://localhost:5173/  
→ Network: use --host to expose  
→ press h + enter to show help

```
abroadease > app > web > src > api > JS axios.js > ...
1  import axios from 'axios'
2
3
4  export const api = axios.create({
5      baseURL: '/api',
6      withCredentials: true, // send/receive httpOnly cookie
7  })
8
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

VITE v7.1.3 ready in 4048 ms

→ Local: http://localhost:5173/  
→ Network: use --host to expose  
→ press h + enter to show help



The screenshot shows a VS Code editor with a file explorer on the left and a code editor in the center. The file explorer shows a project structure with folders like 'de\_modules', 'blic', 'pi', 'axios.js', 'ssets', 'react.svg', 'omponents', and files like 'AdminLandown...', 'AdminRoute.jsx', 'Navbar.jsx', 'ownercontact\_p...', 'ownercontact\_u...', 'ProtectedRoute....', 'onstants', 'ontext', 'ages', 'Admin.jsx', 'Bookmarks.jsx', 'Guides.jsx', 'Home.jsx', and 'Housing.jsx'. The 'AdminRoute.jsx' file is selected. The code editor shows the following code:

```
1 import { Navigate, Outlet } from 'react-router-dom'
2 import { useAuth } from '../context/AuthContext'
3
4 export default function AdminRoute() {
5   const { user, loading } = useAuth()
6   if (loading) return <div>Loading...</div>
7   if (!user || user.role !== 'admin') return <Navigate to="/" />
8   return <Outlet />
9 }
10
```

The terminal at the bottom shows the output of the Vite development server:

```
VITE v7.1.3 ready in 4048 ms
→ Local: http://localhost:5173/
→ Network: use --host to expose
```

## 6. User Manual

How a new user will navigate or use the system with screenshots.

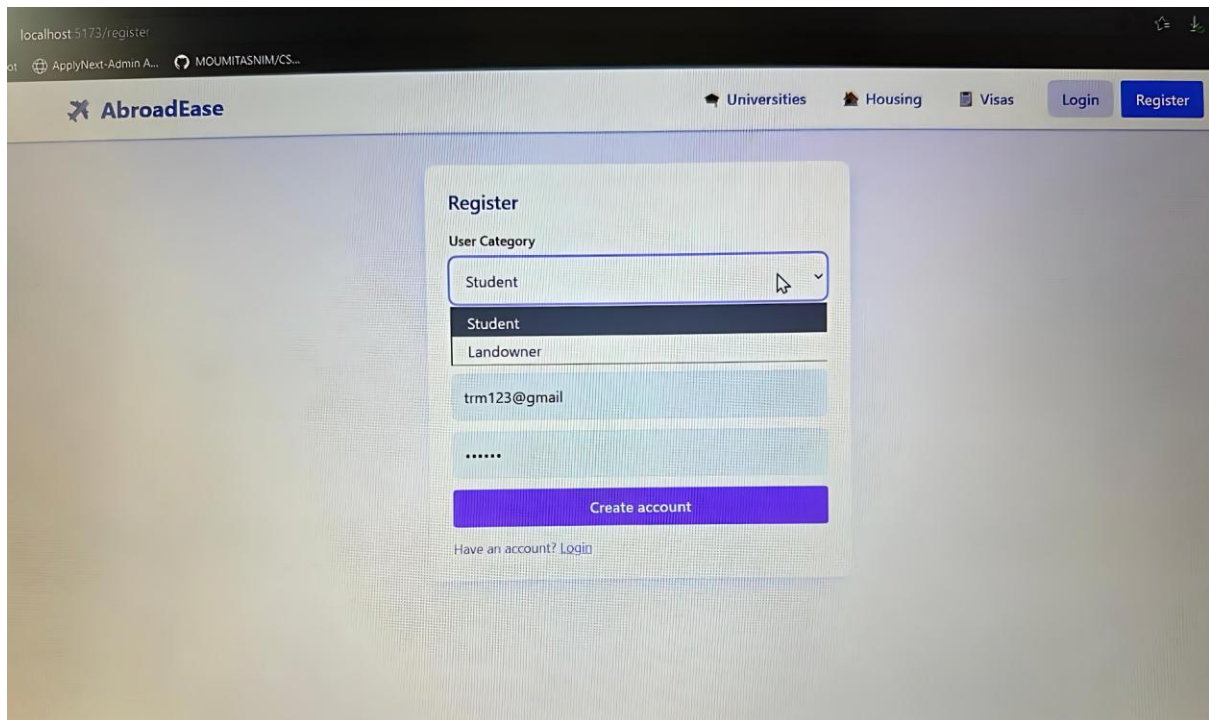
# AbroadEase: An Overseas Companion

## Introduction

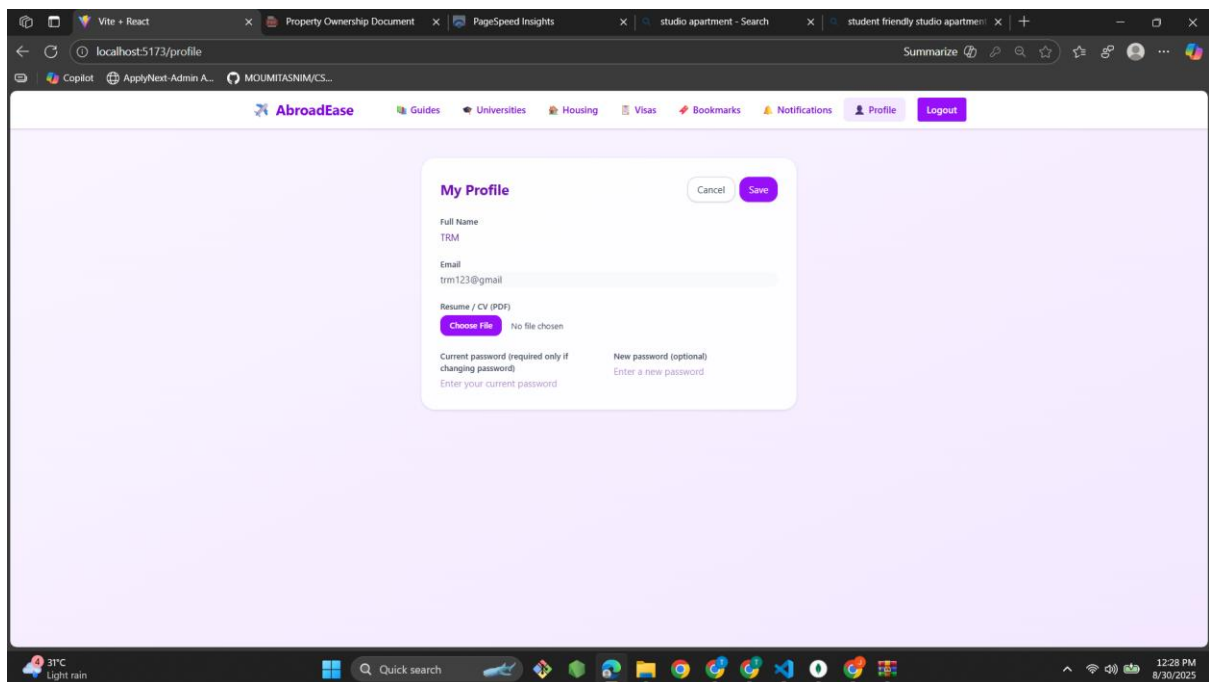
AbroadEase is a platform designed to simplify the initial queries students face when applying to study abroad. It provides a single, easy-to-use solution for finding information on visas, universities, housing, and writing a Statement of Purpose (SOP).

## Getting Started: Sign Up and Login

To begin, a user must **sign up** or **log in** using an email address. This creates a personalized profile that allows access to all features and content. Once logged in, a user can update their profile, including their name, email, and resume.



## Profile update:



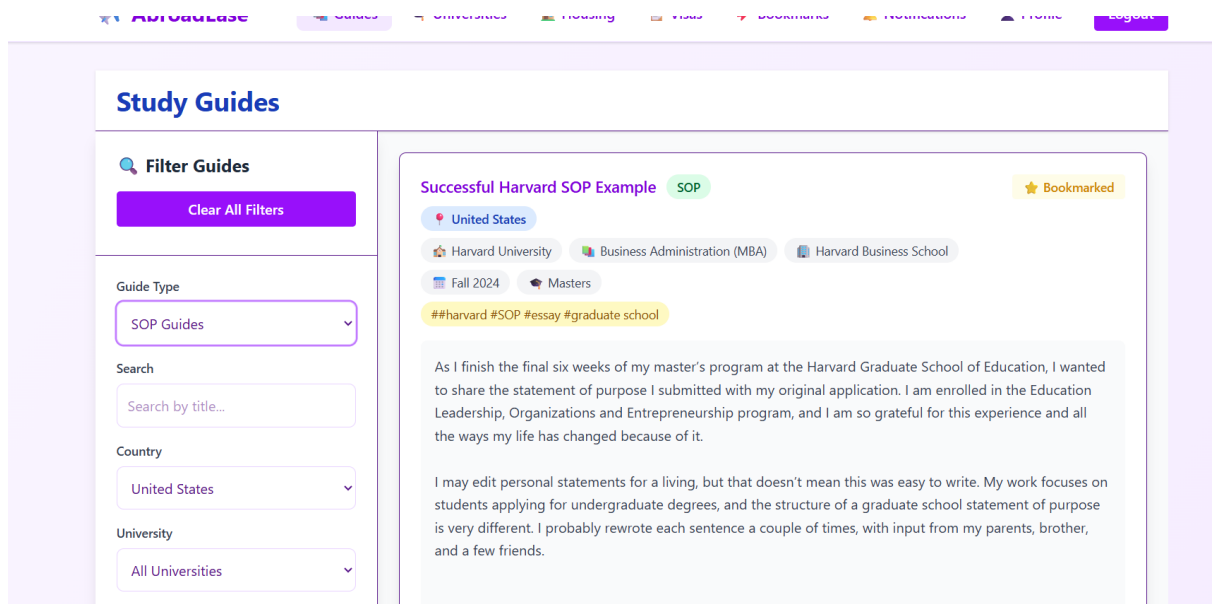
## For Landowners: Registration and Verification

Landowners who wish to list properties on the platform must first register. An administrative team will verify a landowner's request for registration to the system. This process includes checking the request, viewing documents of property ownership, and then approving or deleting the request. Once approved, the landowner can access their dedicated dashboard.

## Navigating the Platform

The platform is organized into three main modules:

1. **Visa and SOP Guidelines:** This section contains valuable information on visa requirements for various countries and instructions on how to write an effective SOP. Users can search for specific visa information using a dropdown menu. All posts related to SOP and visa guidelines can be bookmarked for future reference.



## Study Guides

### Filter Guides

[Clear All Filters](#)

#### Guide Type

VISA Guides

#### Search

#### Country

United States

### Additional Docs for US visa

VISA

[★ Bookmarked](#)[United States](#)

Review the instructions for how to apply for a visa on the website of the U.S. Embassy or Consulate where you will apply. Additional documents may be requested to establish if you are qualified. For example, additional requested documents may include evidence of:

The purpose of your trip,  
Your intent to depart the United States after your trip, and/or  
Your ability to pay all costs of the trip.

Evidence of your employment and/or your family ties may be sufficient to show the purpose of your trip and your intent to return to your home country. If you cannot cover all the costs for your trip, you may show evidence that another person will cover some or all costs for your trip.

Note: Visa applicants must qualify based on their ties abroad/to their home country, rather than assurances from U.S. family and friends. A letter of invitation or Affidavit of Support is not needed to apply for a visitor.

2. **University and Housing Search:** This module helps find the right university and housing.
- **Universities:** Users can search for universities by filtering by location, program, and cost. Each university profile provides details on the programs offered.

AbroadEase

GuidesUniversitiesHousingVisasBookmarksNotificationsProfileLogout

AbroadEase

Explore your study interests and preferred location.

University of Cambridge - United Kingdom

The Old Schools, Trinity Ln, Cambridge CB2 1TN, United Kingdom

Apply Now

GB

Programs offered in University of Cambridge:

Program Name

Search...

Department

Search...

Term

Search...

Degree Type

Search...

Bachelor of Science (Honours) - Computer Science	Computer Science	Fall 2024		Start application
Application Fee: Free Tuition Fee: 19800 USD Duration: 3 years Bachelor's degree				
Master of Arts - Photography	Computer Science	Fall 2024		Start application
Application Fee: Free Tuition Fee: 13400 USD Duration: 2 years Master's degree				
2 items found				

Ranking

Public Uni

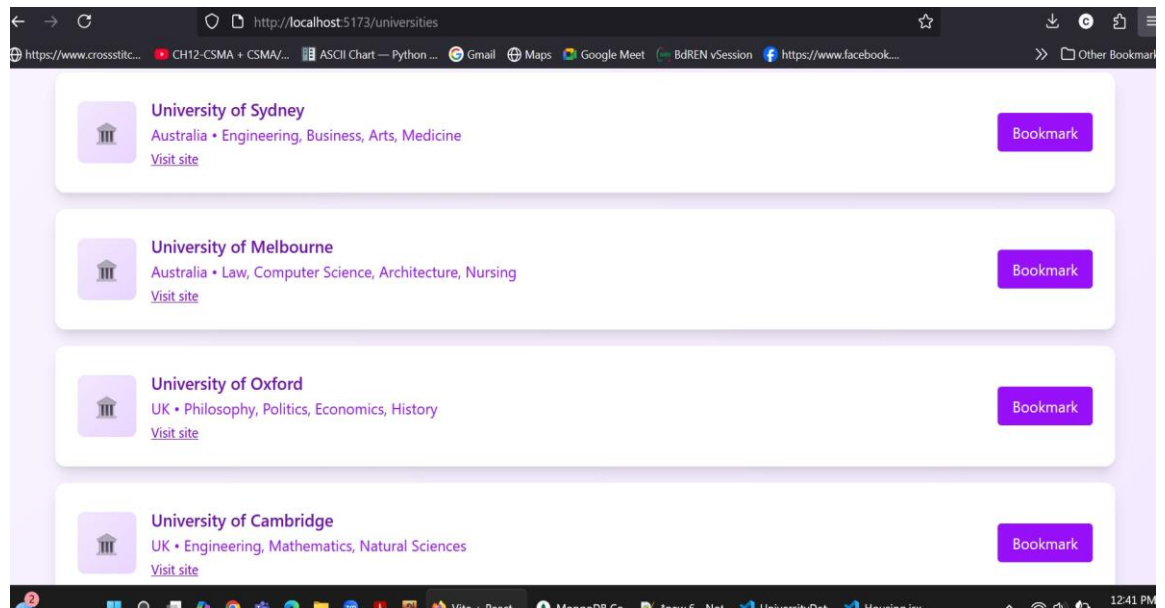
Country

Program

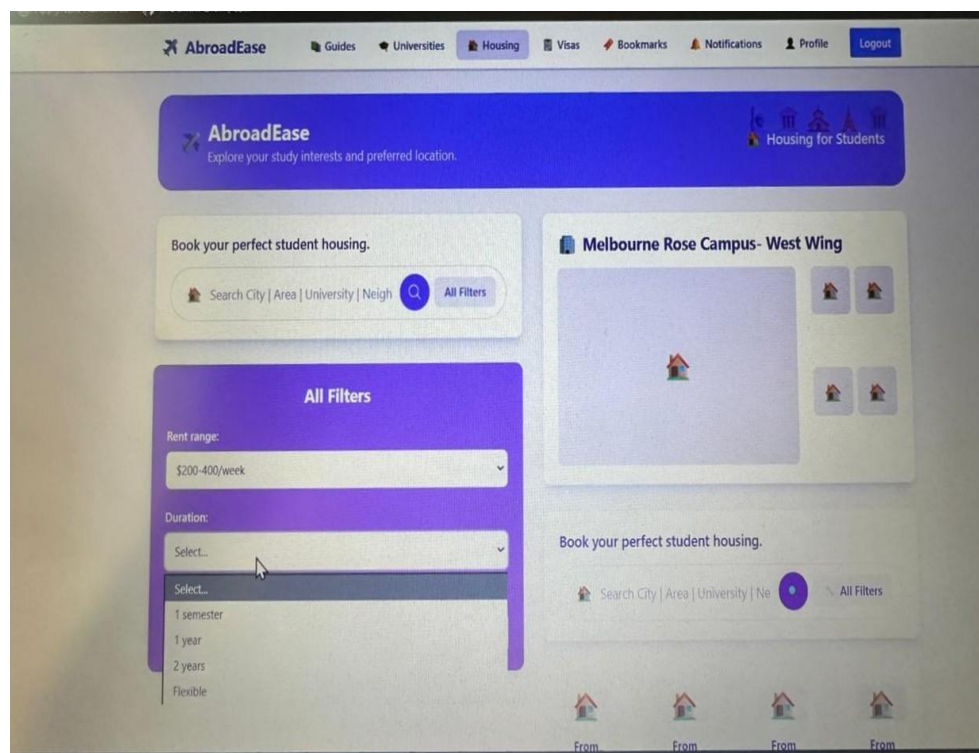
Max Cost

Apply Filters

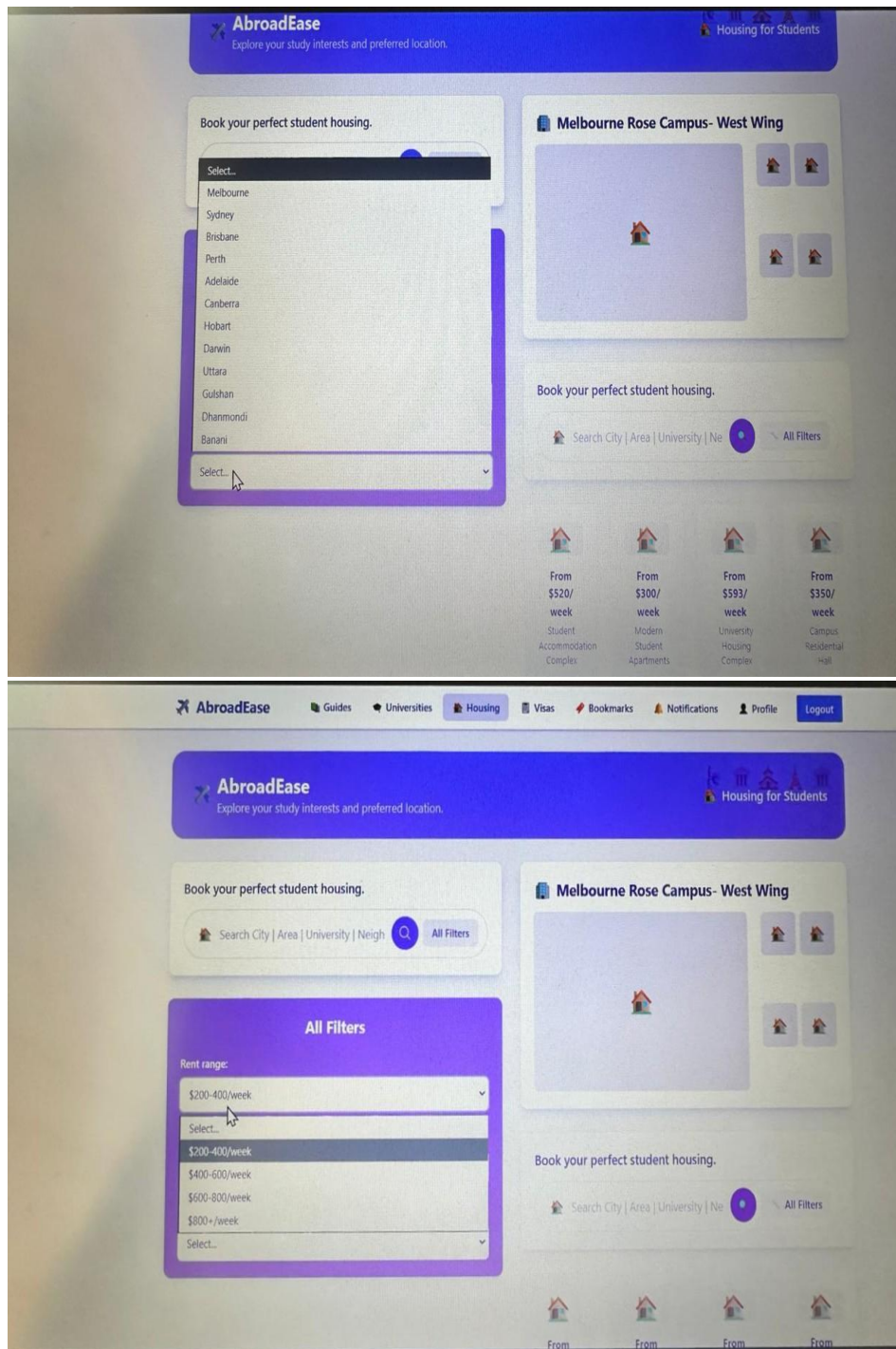
21



- **Housing:** A search function allows users to find rental properties using filters like price, location, and property type. Property listings include photos, descriptions, and rental terms to help in making an informed decision.



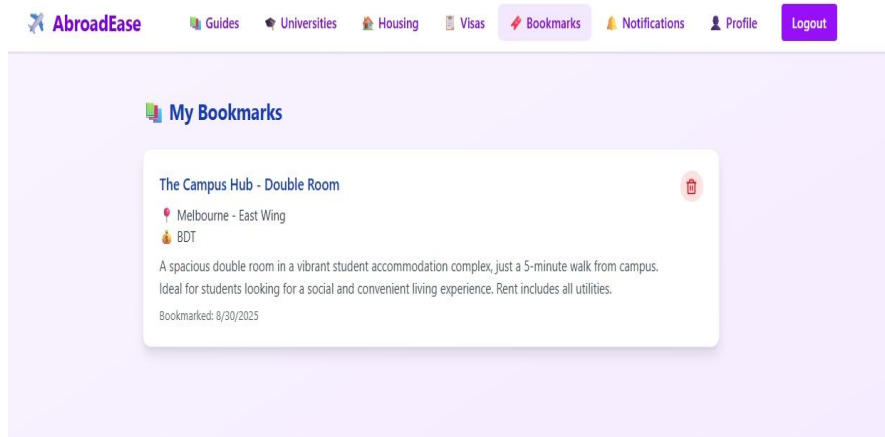
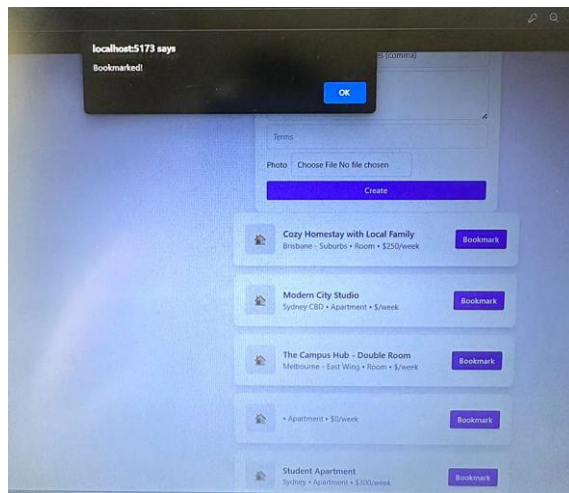




3. **Notifications and Bookmarks:** This module is designed to keep users updated and organized.

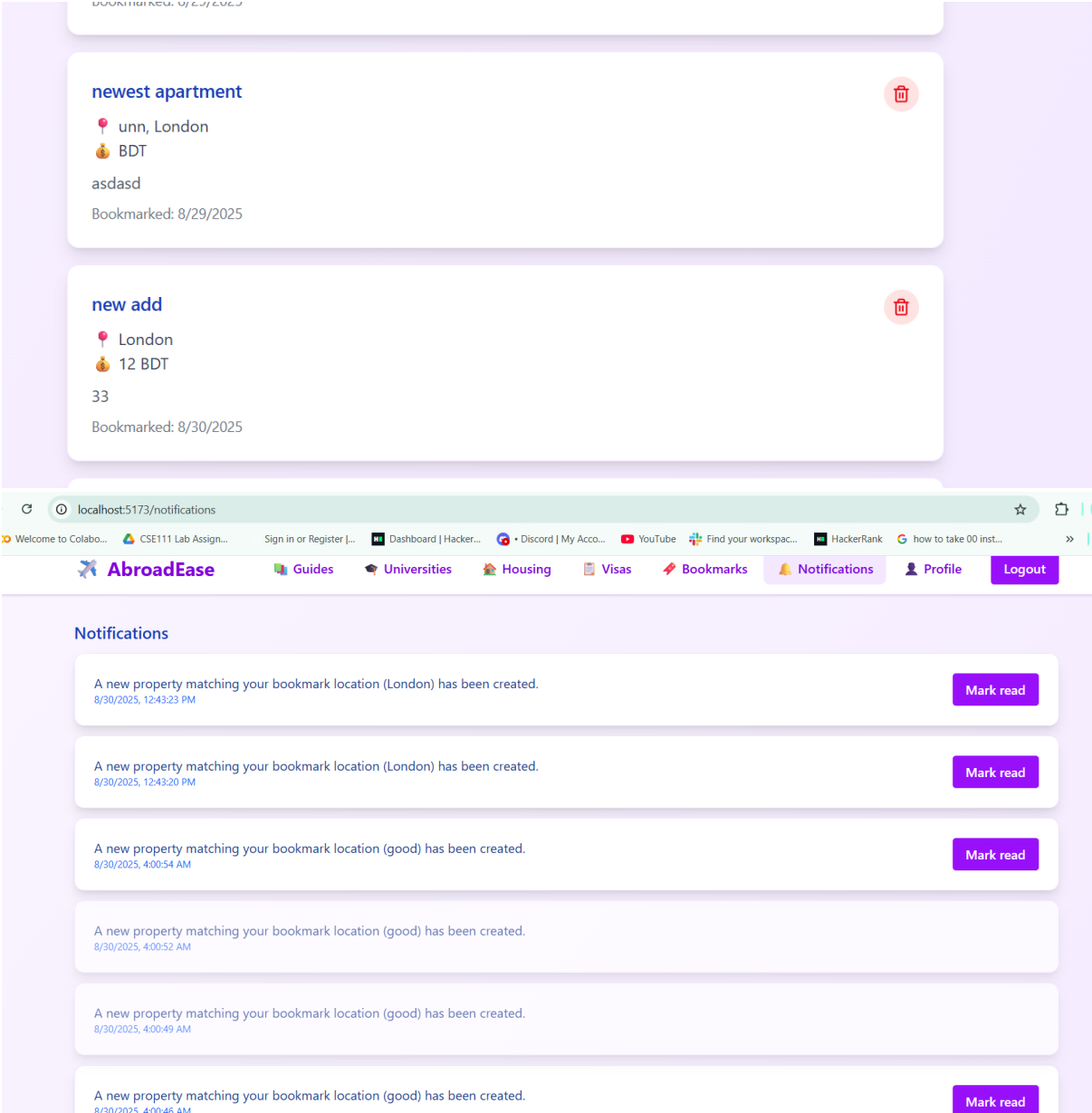
- **Bookmarks:** Any content from the Visa, SOP, and Housing sections can be bookmarked and saved to a dedicated page for quick and easy access.

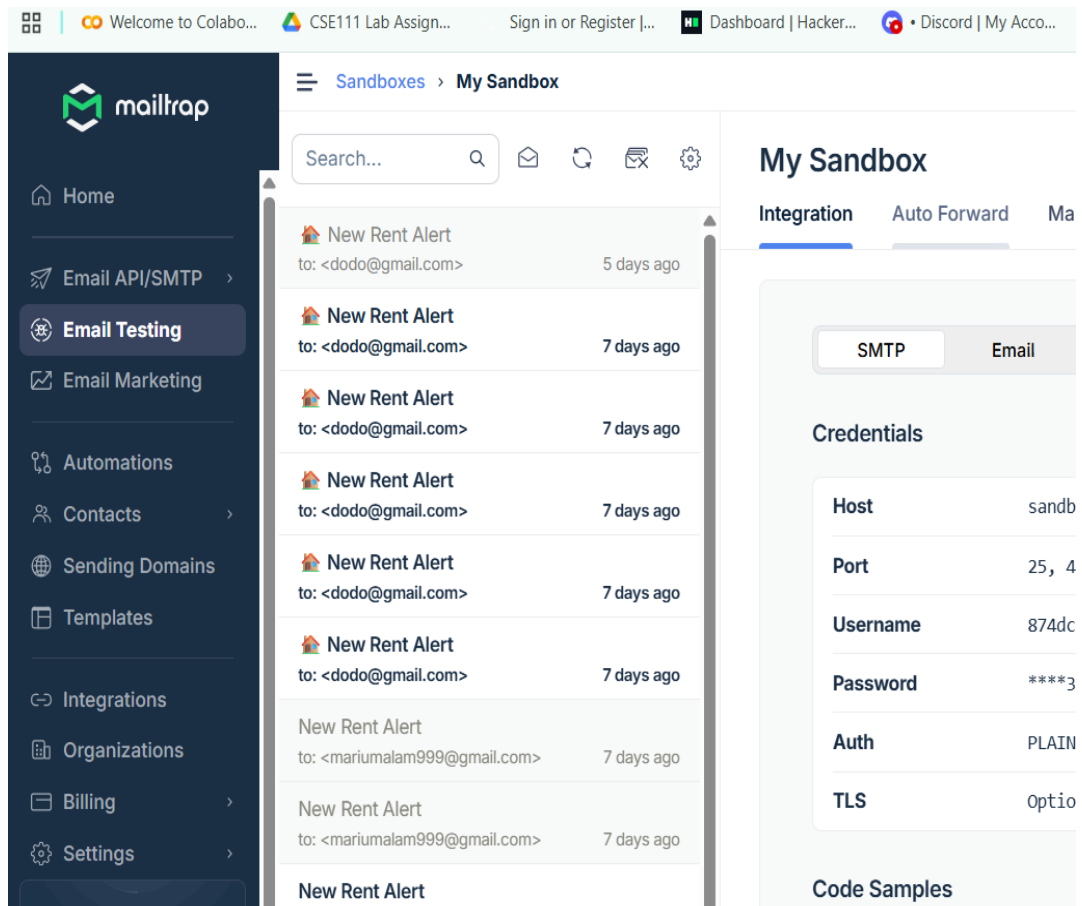
O





**New Rent Alerts:** Users will receive notifications on the platform and via email when a new rental property is posted in a preferred location.





## For Landowners: Managing Listings

Once approved, a separate dashboard is available for landowners to streamline the process of listing and managing rental properties. This dedicated area allows a landowner to:

- **Create a new listing:** Add a new property post by providing detailed information, including photos, a description of the space, rental terms, and a list of amenities.
- **Manage existing listings:** Update or remove property posts as needed, ensuring all information is accurate and up-to-date.
- **Track property status:** Mark a property as rented, which helps in managing availability.
- **Include contact information:** Ensure that contact details are associated with each listing, so authorized users can easily get in touch.

All property posts created by landowners are viewable by authenticated users on the main Housing page, making it easier to connect with prospective renters.

### Landowner: Create Property

Studio Aptmenc

East London

200 Pounds

Studio



Furnished (bed, desk, chair, wardrobe)

private bathroom, making it ideal for a single student or a couple. The apartment is conveniently located a short walk from key public transport links, and is surrounded by local shops, cafes, and parks.



Lease: A 12-month fixed-term lease. Rent: A monthly rent of

Photo

Choose File perfe...1.jpg



Create

Book your perfect student housing.

london
 

All Filters

From \$520/week

Student Accommodation Complex

From \$300/week

Modern Student Apartments

From \$593/week

University Housing Complex

From \$350/week

Campus Residential Hall

Showing 1-4 of 20 items

Page 1 of 5

Landowner: Create Property

Title

Location

Price

Apartment

Amenities (comma)

Description

Terms

Photo

Choose File No file chosen

Create

Cozy Homestay with Local Family

Brisbane - Suburbs • Room • \$250/week

Bookmark

Modern City Studio

Sydney CBD • Apartment • \$/week

Bookmark

The Campus Hub - Double Room

Melbourne - East Wing • Room • \$/week

Bookmark

• Apartment • \$0/week

Bookmark

Student Apartment

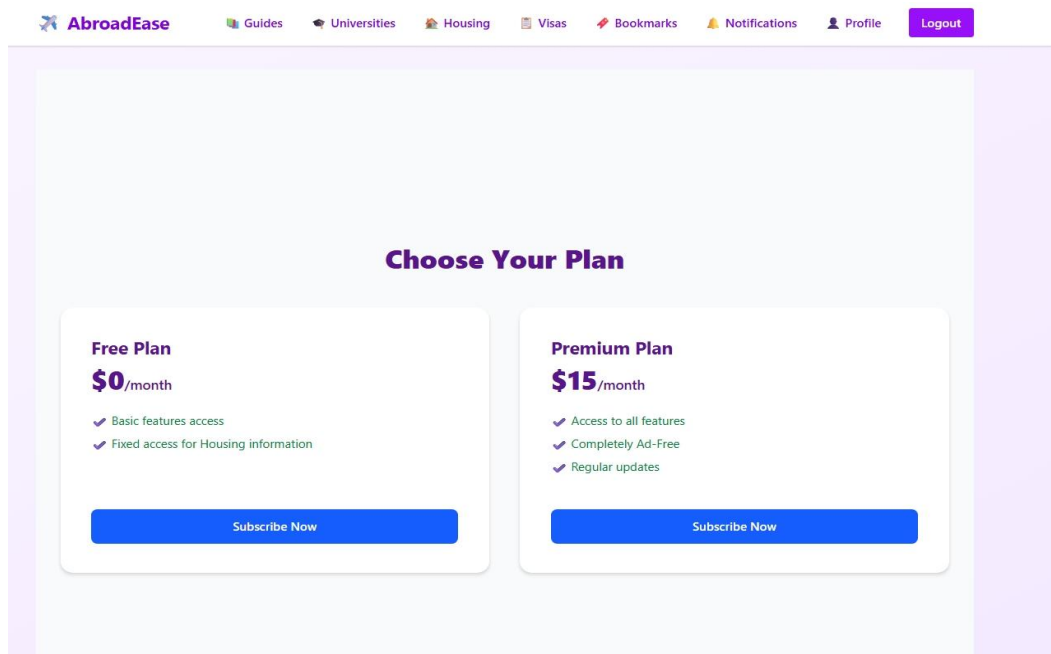
Sydney • Apartment • \$300/week

Bookmark

## Subscription Plans

AbroadEase offers two versions to meet different needs:

7. **Free Plan:** This version allows access to all basic features, including browsing universities, housing, and general visa and SOP guidelines.
8. **Premium Plan:** This version, available for a subscription fee, offers additional benefits such as new rent alerts and the ability to bookmark content, providing a more personalized and streamlined experience. Users can choose to cancel their subscription at any time.



← New business sandbox  Sandbox

Subscribe to Premium Plan

**\$15.00** per month

'All Basic features', 'Unlimited access to Housing information', 'Daily updates',

Pay with 

Or

Email

email@example.com

Payment method

Card information

1234 1234 1234 1234

MM / YY

CVC



Cardholder name

Full name on card

Country or region

Bangladesh

☐

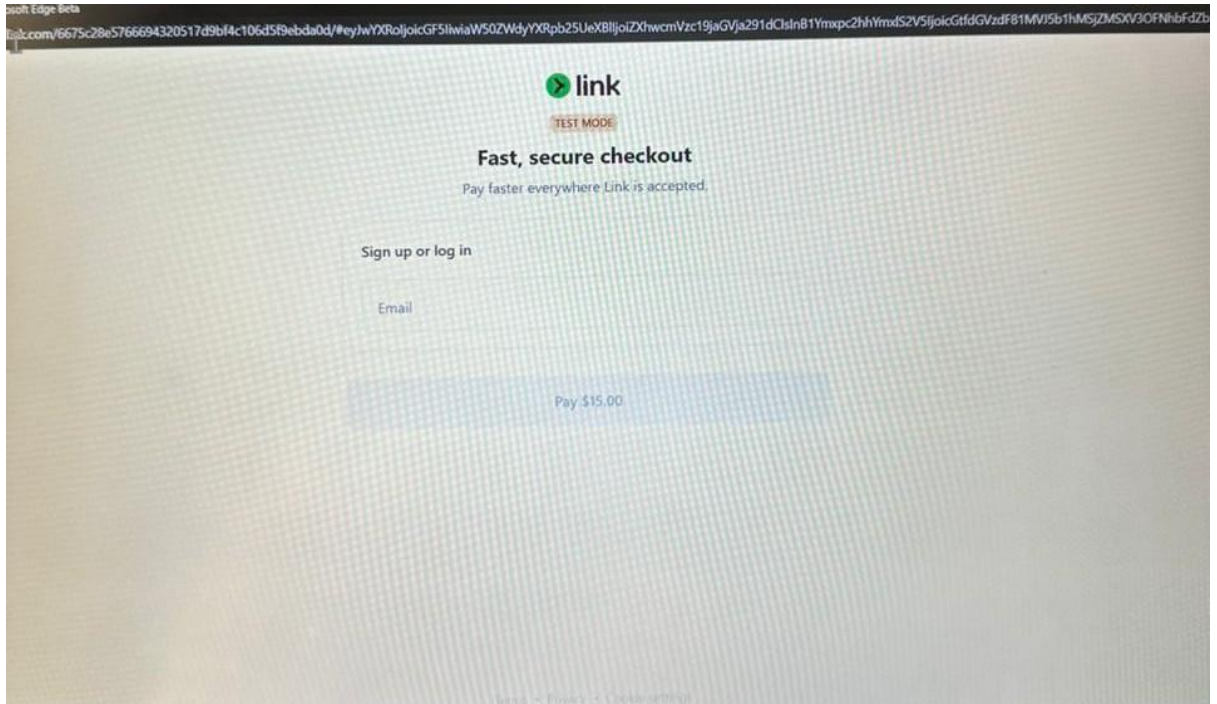
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By subscribing, you authorize New business sandbox to charge you according to the terms until you cancel.

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## 9. Performance and Network Analysis

Generate Performance and Network analysis report using lighthouse DevTool. Add screenshots of the report. Also, attach a screenshot of your system in any mobile viewport. **The system UI must be responsive.**

## 10. Github Repo [Public] Link:

<https://github.com/UmmaMariamAlam/testerAbroadease.git>

## 11. Link of Deployed Project :

Static: <https://testerabroadease-11.onrender.com/register>

## 12. Individual Contribution

Group member - 01	
Name: Umma Mariam Alam	Student ID:22201096
<b>Functional Requirements which are developed by this member:</b>	
1. All Users can give bookmarks to desired or likeable contents, like SOP and Visa post, Properties, Universities.	

2. Users can view all their bookmarks in a designated page
3.Users will get notification via website in designated notification pages, where they can mark as read, and through email (using email api) when landowners upload a new rent place with the same location of user preferences. (from bookmarked properties)
4.Stripe implementation where students can choose from free and premium account and can cancel subscription if they want

Group member - 02	
Name: Jerin Khan	Student ID: 21301617
<b>Functional Requirements which are developed by this member:</b>	
1.User can get information on how to write SOP and different directions and guidelines through posts	
2.User can get information on how to write SOP and different directions and guidelines through posts	
3.Admins can add, update, or remove rental listings and mark properties as rented.	
4.Users can view and update their profile information, such as name, email, CV, resume. The change password feature allows users to update their login credentials.	

Group member - 03	
Name: Cynthia Safa	Student ID: 22301618
<b>Functional Requirements which are developed by this member:</b>	
1. Students or landowners will sign up, then login using their email address. They can also log out on the homepage. They can view their profile.	
2. Users can get general information (instructions and requirements) regarding visas of different countries by using dropdown search for filtering.	
3. Users can see universities by filtering universities by location, program, and cost.	
4. Users can search rental properties using filters such as price, location, and property type.	

Group member - 04	
Name: Tasnim Rahman Moumita	Student ID: 22301689
<b>Functional Requirements which are developed by this member:</b>	
1.Landowner will have a separate dashboard, and there he/she can create property posts with contact information which can be viewed by authorized users.	
2. Admin will be able to write posts regarding SOP instructions.	
3.Admin will write visa guidelines for different countries.	
4.Landowner's each listing includes property photos, descriptions, rental terms, and amenities for better decision-making.	

### 13. References

Opportunities Circle. (2018, December 4). *Explore Opportunities* -

*Opportunities Circle*. <https://www.opportunitiescircle.com/?sfid=143>

[https://www.opportunitiescircle.com/?sfid=143#google\\_vignette](https://www.opportunitiescircle.com/?sfid=143#google_vignette)