Accommodation Web Portal

Project Report

Team Name: Suda

Scurm master:
Jintao Wang

Team Member & Developer:
Xiaoyun Shi (z5104857@ad.unsw.edu.au)
Jintao Wang (z5092923@ad.unsw.edu.au)
Fengyu Wang (z5050411@ad.unsw.edu.au)
Li Chen (z5100331@ad.unsw.edu.au)

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1 Overview

With the development of society, people pay more and more attention to their spare time, and going out for a holiday or leisure time is also the trend of this era. With the rapid development of tourism and the rapid flow of population, the lodging industry is also developing more and more prosperous. Among them, the form of short-term rental apartments known for their cost-effectiveness has quietly emerged, occupying many markets in the lodging industry. The proportion of short-term rental apartments is the rental of the hotel. The relatively low price, complete facilities, and warm home-like services attract the attention of the students, the poor travelers, and the small white-collar workers who are on the business trip. Generally speaking, the rental of the hotel is more complete than that of a budget hotel or a star hotel, and the price is not as high as that of a hotel.

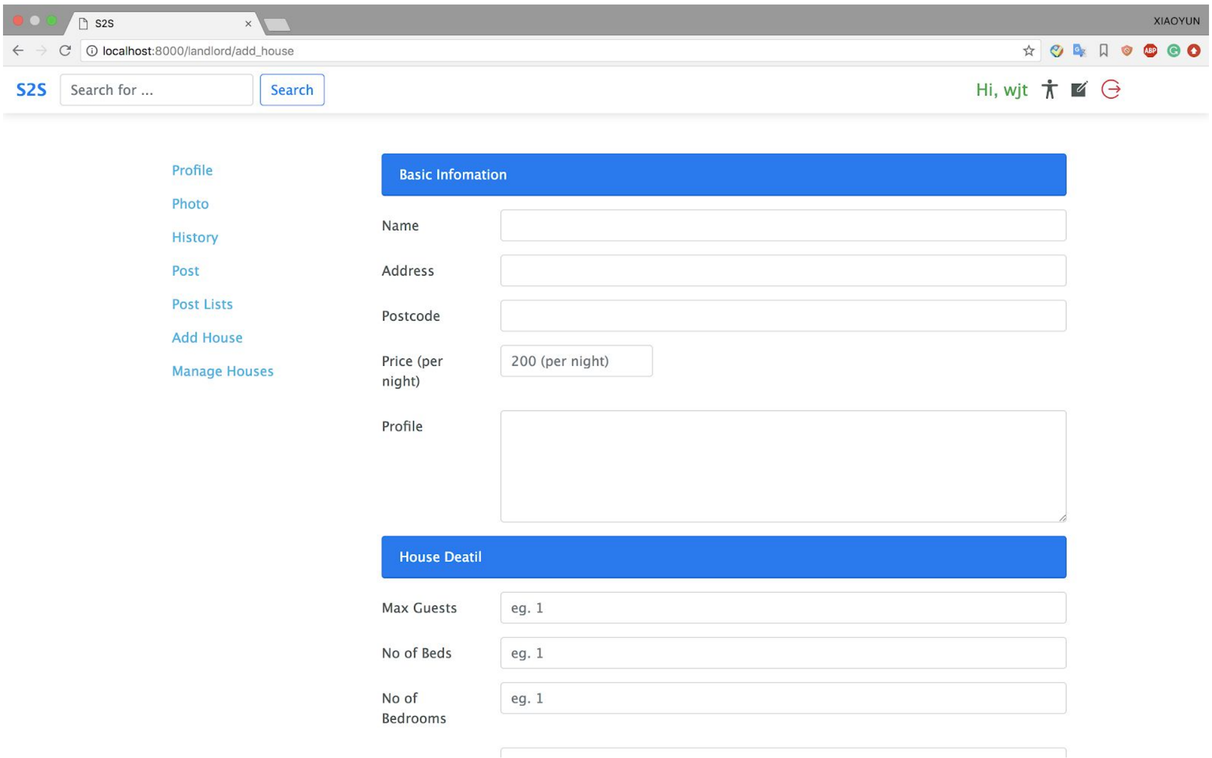
The reservation system of the homestay house is to allow people to make reservations and rents for the homestay on the Internet, providing convenience for both the tenant and the landlord. The landlord can post information about the rental property on the app side, such as locations, prices, etc. Tenants can filter information on the app, choose the right house, and rent a short rent. The booking system of the homestay house is based on the backend server management. It is an application for tenants and homeowners with the core of homestay rental and management order as the core technology. It implement the functions of house rental, order generation, and release of information. The system uses an advanced Python web framework Django, MySQL database, and KNN training model for recommendation.

2 Functionalities

2.1 The achieved function mentioned in proposal

2.11 Landlord System Module

The landlord can upload the detail information about their house on this website. The landlord needs to provide detailed information about the house, such as the number of furniture in the house and the specific address of the appliance. In addition, the landlord can also notify the tenant house rules and decide some rules about the cancellation of the house. After landlord confirmed their house information, this house could be searched from our website(search function available).



Basic Infomation

Name

Address

Postcode

Price (per night) 200 (per night)

Profile

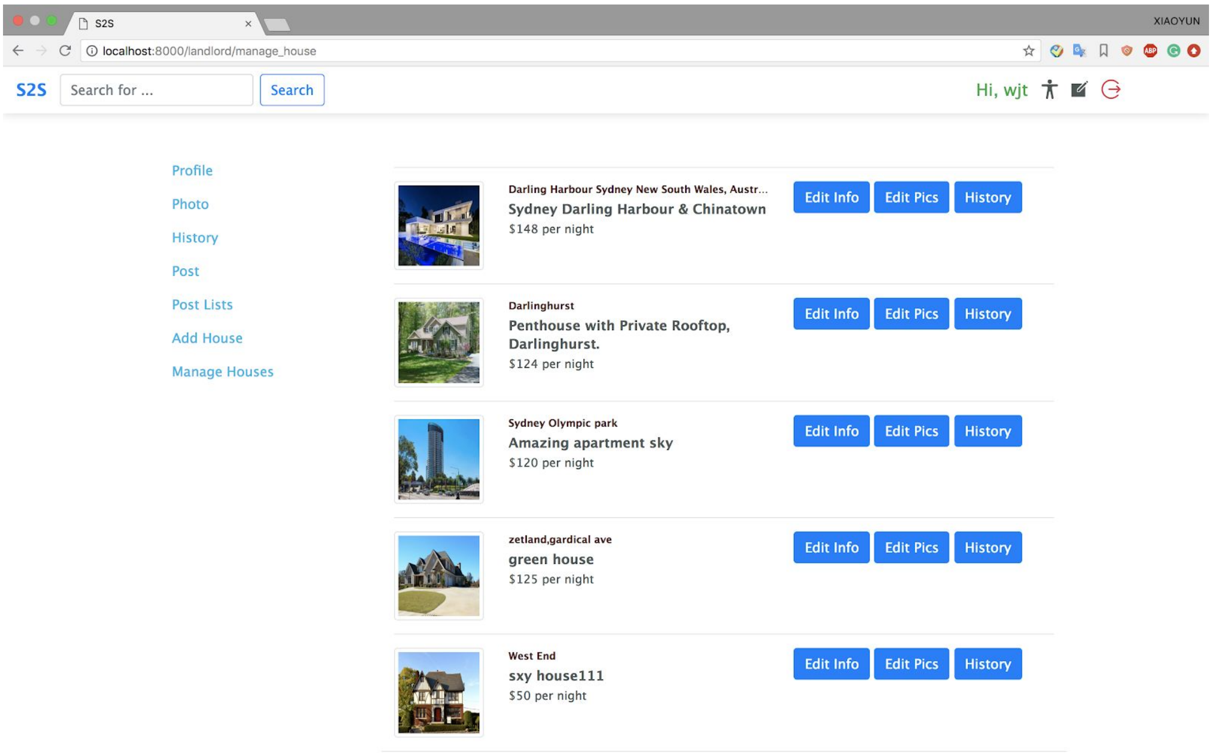
House Deatil

Max Guests eg. 1

No of Beds eg. 1

No of Bedrooms eg. 1

After the user uploads their house information, they can manage their house information in ‘Manage House’ part(e.g. upload the photo of their house). This means that for landlords with multiple houses, they can quickly view the information about the houses on one page.



Darling Harbour Sydney New South Wales, Austr...
Sydney Darling Harbour & Chinatown
$148 per night

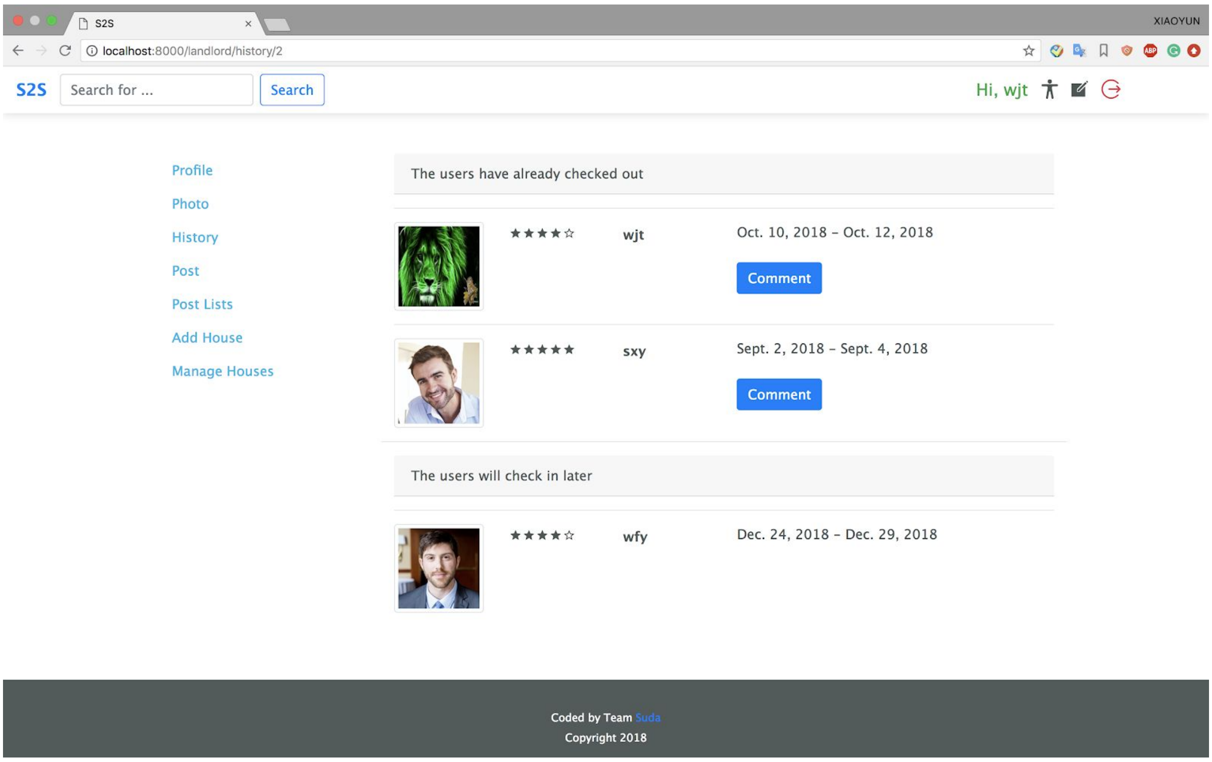
Darlinghurst
Penthouse with Private Rooftop, Darlinghurst.
$124 per night

Sydney Olympic park
Amazing apartment sky
$120 per night

zetland,gardical ave
green house
$125 per night

West End
sxy house111
$50 per night

Once the house is rented out and successfully traded with the user, they have the right to rate the user's behaviour and score the user's behaviour (max score five stars). This is a function that tries to ensure the right of the landlord and help them to get away from some unruly tenants.



The users have already checked out

★★★★☆ wjt Oct. 10, 2018 – Oct. 12, 2018

★★★★★ sxy Sept. 2, 2018 – Sept. 4, 2018

The users will check in later

★★★★☆ wfy Dec. 24, 2018 – Dec. 29, 2018

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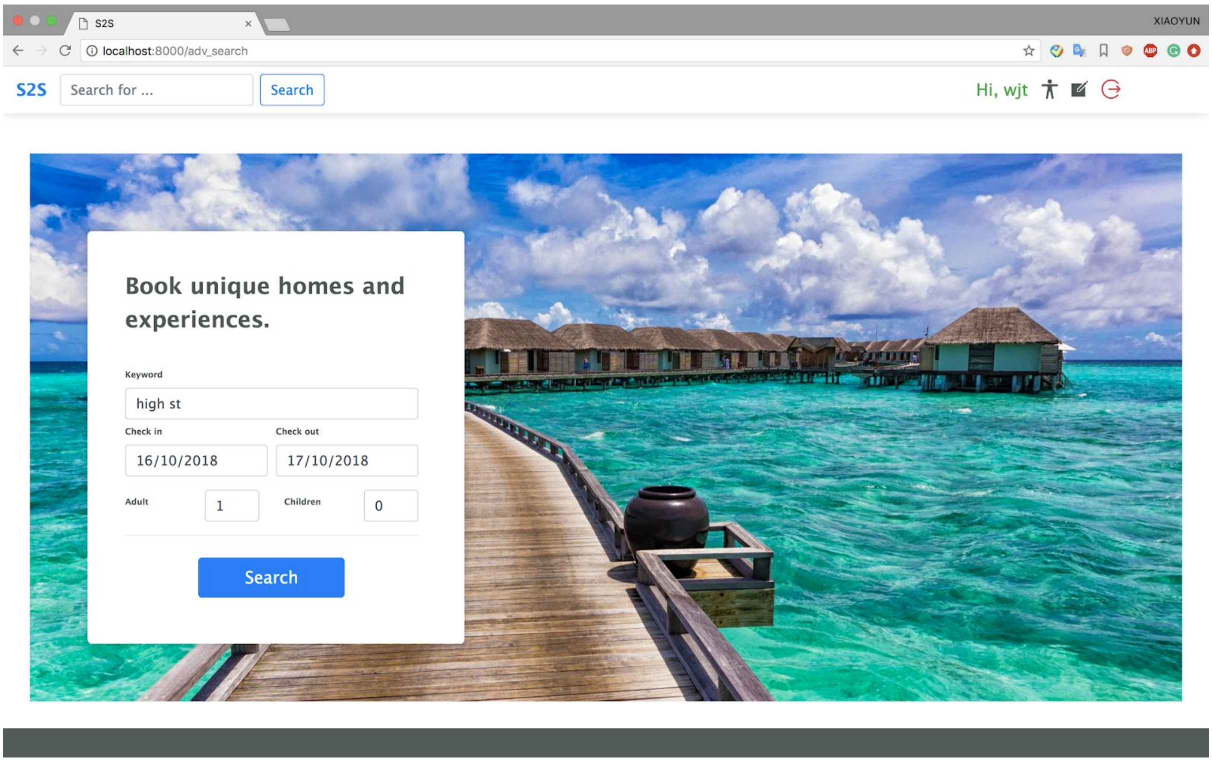
2.12 Tenant System Module

Once the customer opens the website, they can directly go to the search and book in a block, in this area, they can enter a keyword description of the house, the time period they want to stay and their number of people into the search bar and then to find a house that completely meets their requirements and is free during that time range.



S2S

localhost:8000/adv_search

S2S Search for ... Search Hi, wjt

Book unique homes and experiences.

Keyword: high st

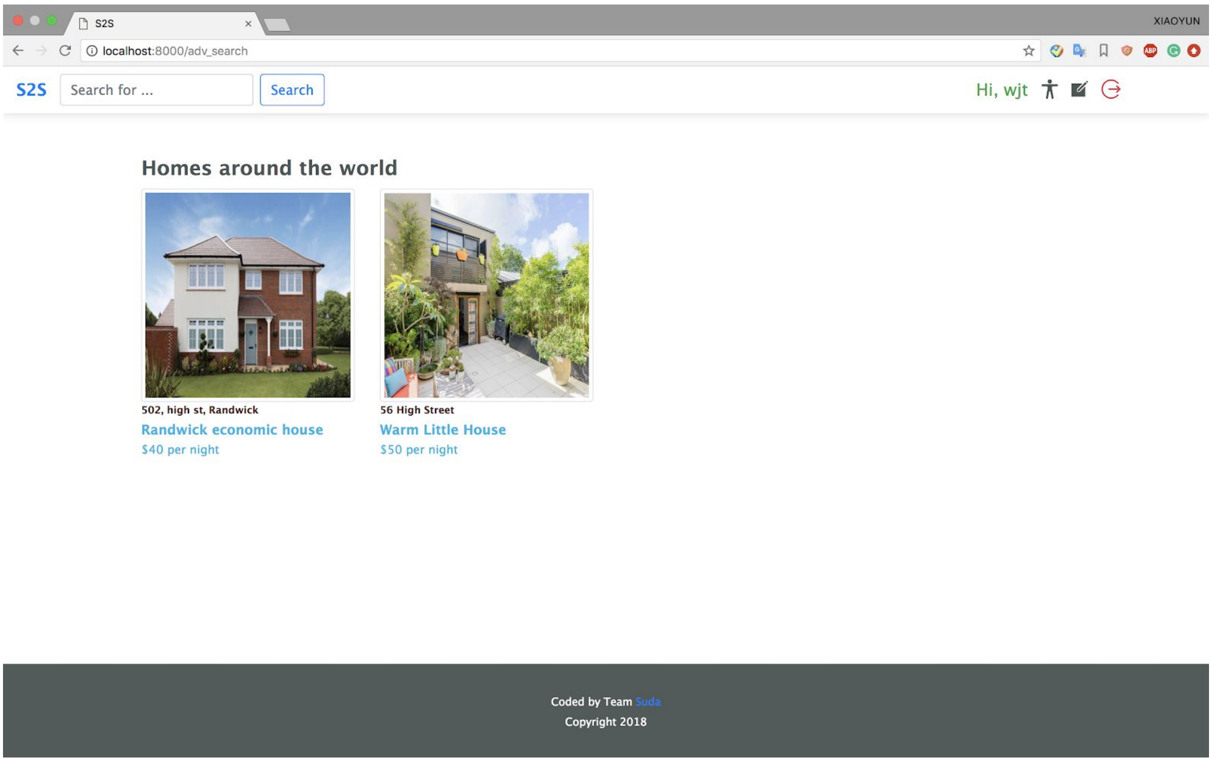
Check in: 16/10/2018

Check out: 17/10/2018

Adult: 1

Children: 0

Search



S2S

localhost:8000/adv_search

S2S Search for ... Search Hi, wjt

Homes around the world

502, high st, Randwick
Randwick economic house
$40 per night

56 High Street
Warm Little House
$50 per night

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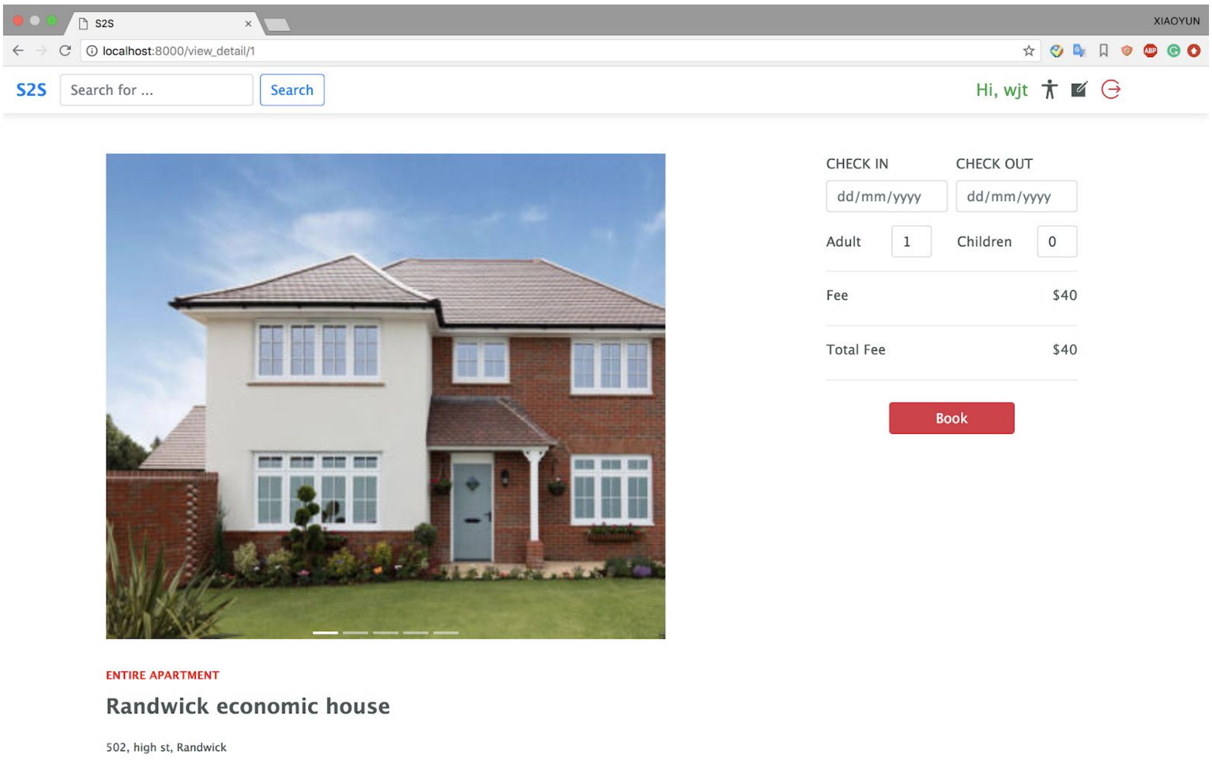
After this operation, the customer could get a couple of results with pictures and a short description in the page. They choose a house to click in and see the details of the house with the pictures, address, structure, description, policies and cancellations of the house. Moreover, they can also read the comments of former tenants' and the rank of multiple qualities of the house (such as location, value...), this information may help them get further information about the house instead of brief description.



CHECK IN dd/mm/yyyy

CHECK OUT dd/mm/yyyy

Adult 1 Children 0

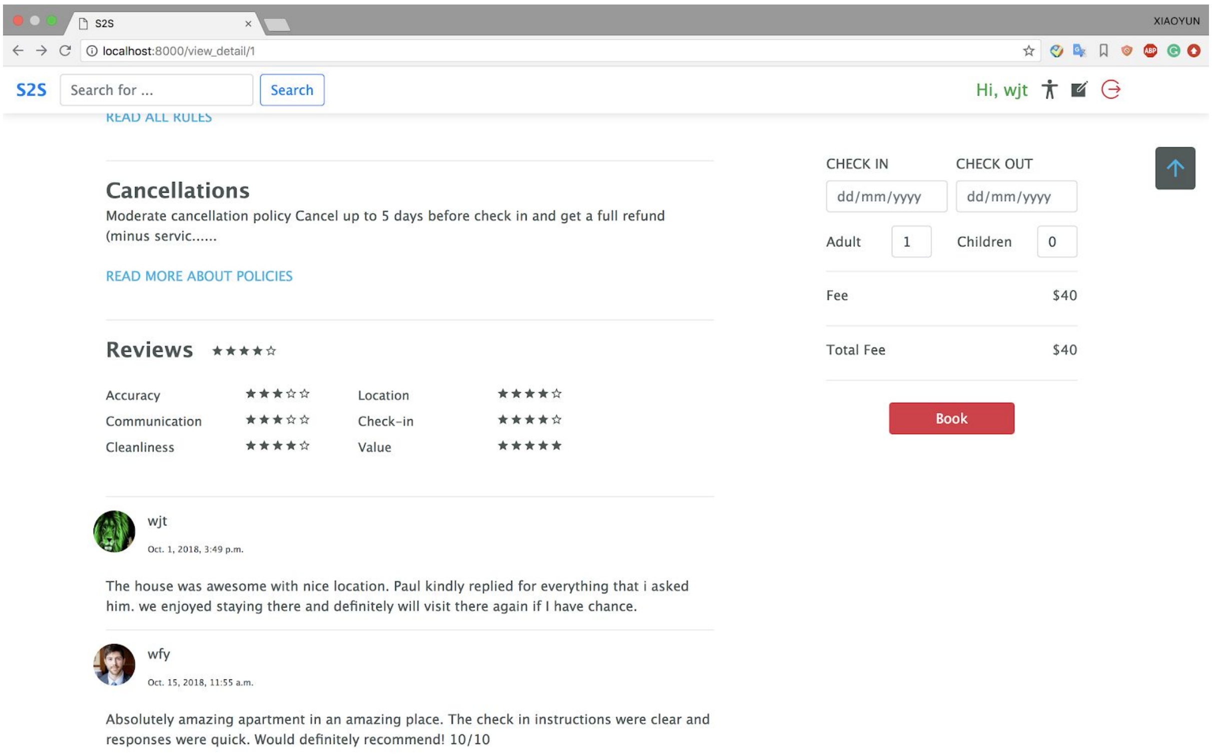
Fee	$40
Total Fee	$40

Book

ENTIRE APARTMENT

Randwick economic house

502, high st, Randwick



READ ALL RULES

Cancellations

Moderate cancellation policy Cancel up to 5 days before check in and get a full refund (minus servic......

READ MORE ABOUT POLICIES

Reviews ★★★★☆

Accuracy	★★★☆☆	Location	★★★★☆
Communication	★★★☆☆	Check-in	★★★★☆
Cleanliness	★★★★☆	Value	★★★★★

wjt

Oct. 1, 2018, 3:49 p.m.

The house was awesome with nice location. Paul kindly replied for everything that i asked him. we enjoyed staying there and definitely will visit there again if I have chance.

wfy

Oct. 15, 2018, 11:55 a.m.

Absolutely amazing apartment in an amazing place. The check in instructions were clear and responses were quick. Would definitely recommend! 10/10

CHECK IN dd/mm/yyyy

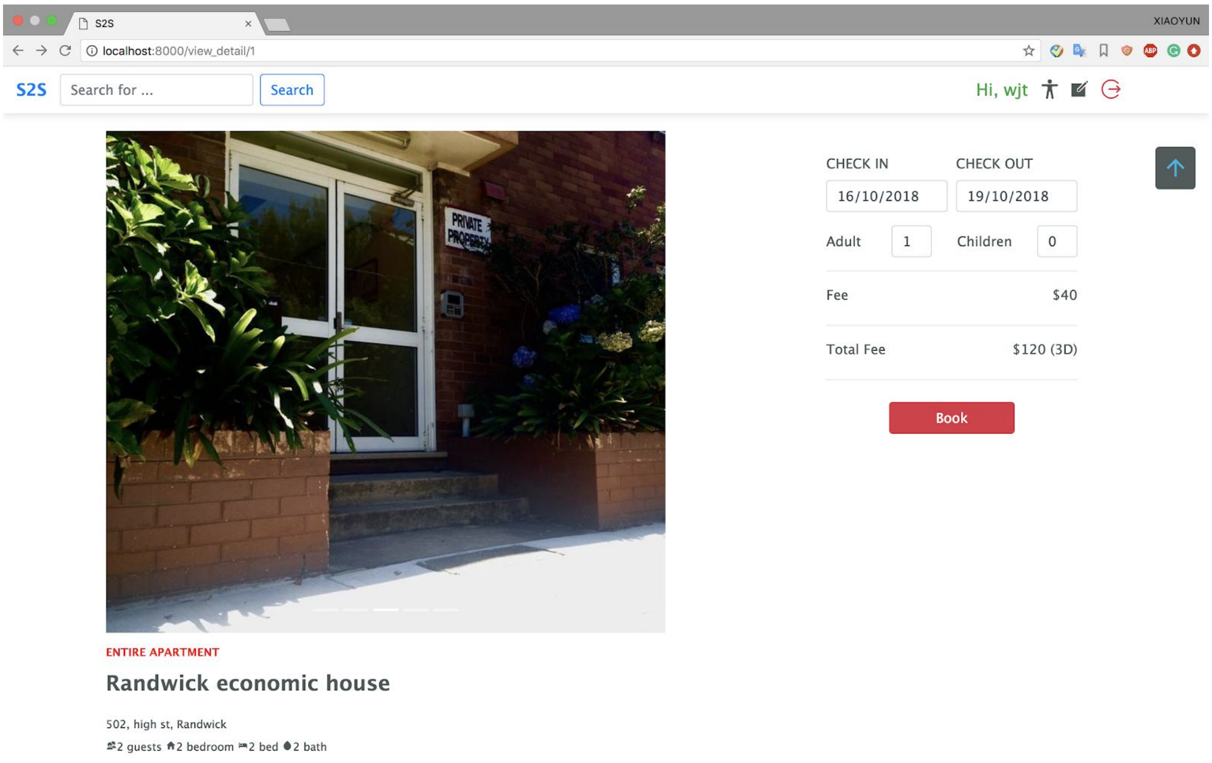
CHECK OUT dd/mm/yyyy

Adult 1 Children 0

Fee	$40
Total Fee	$40

Book

In addition, apart from viewing the information of the house, they can also book the house, if they are interested in, they can choose the date range and will see the total price. If they are satisfied with the price, they are a book the house directly.



CHECK IN 16/10/2018

CHECK OUT 19/10/2018

Adult 1 Children 0

Fee $40

Total Fee $120 (3D)

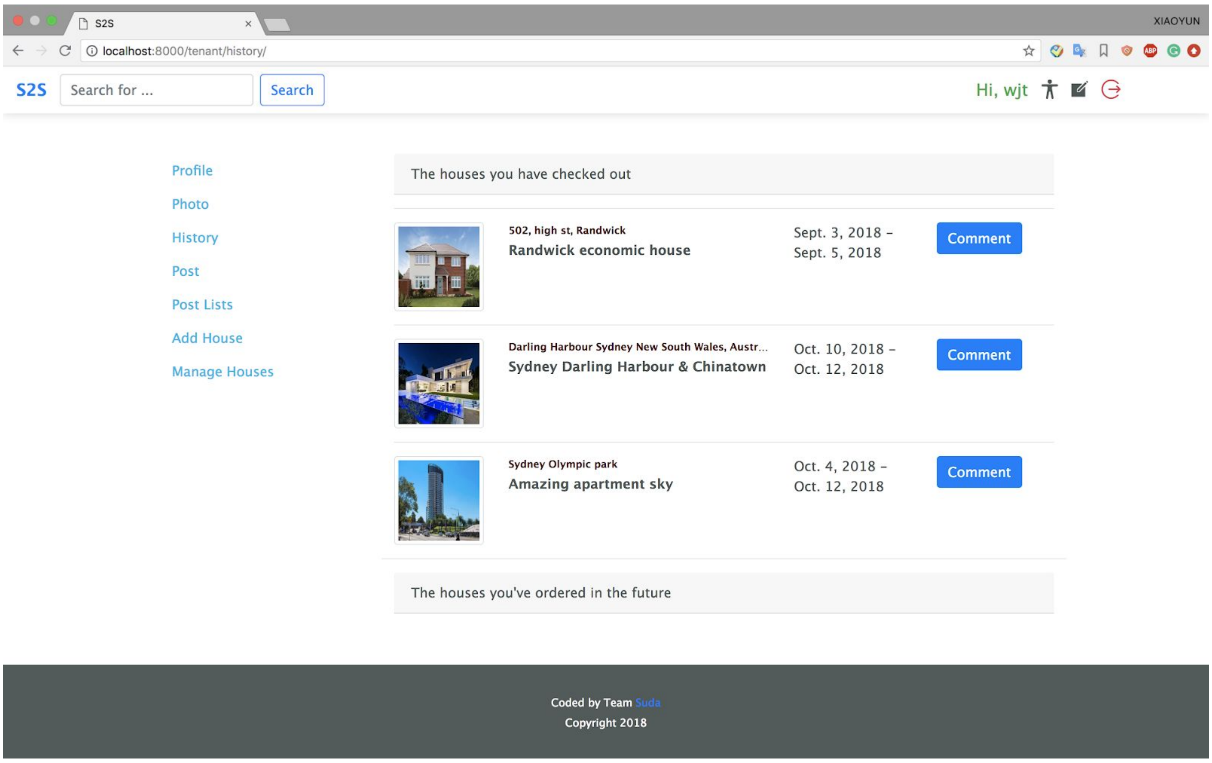
ENTIRE APARTMENT

Randwick economic house

502, high st, Randwick

2 guests 2 bedroom 2 bed 2 bath

Once they book the house successfully, they can see this house information in their history part. Moreover, once they check out, they can make some comments about the house and give a rank as well. This function helps the customer to identify the good house easily.



The houses you have checked out

502, high st, Randwick
Randwick economic house
Sept. 3, 2018 – Sept. 5, 2018

Darling Harbour Sydney New South Wales, Austr...
Sydney Darling Harbour & Chinatown
Oct. 10, 2018 – Oct. 12, 2018

Sydney Olympic park
Amazing apartment sky
Oct. 4, 2018 – Oct. 12, 2018

The houses you've ordered in the future

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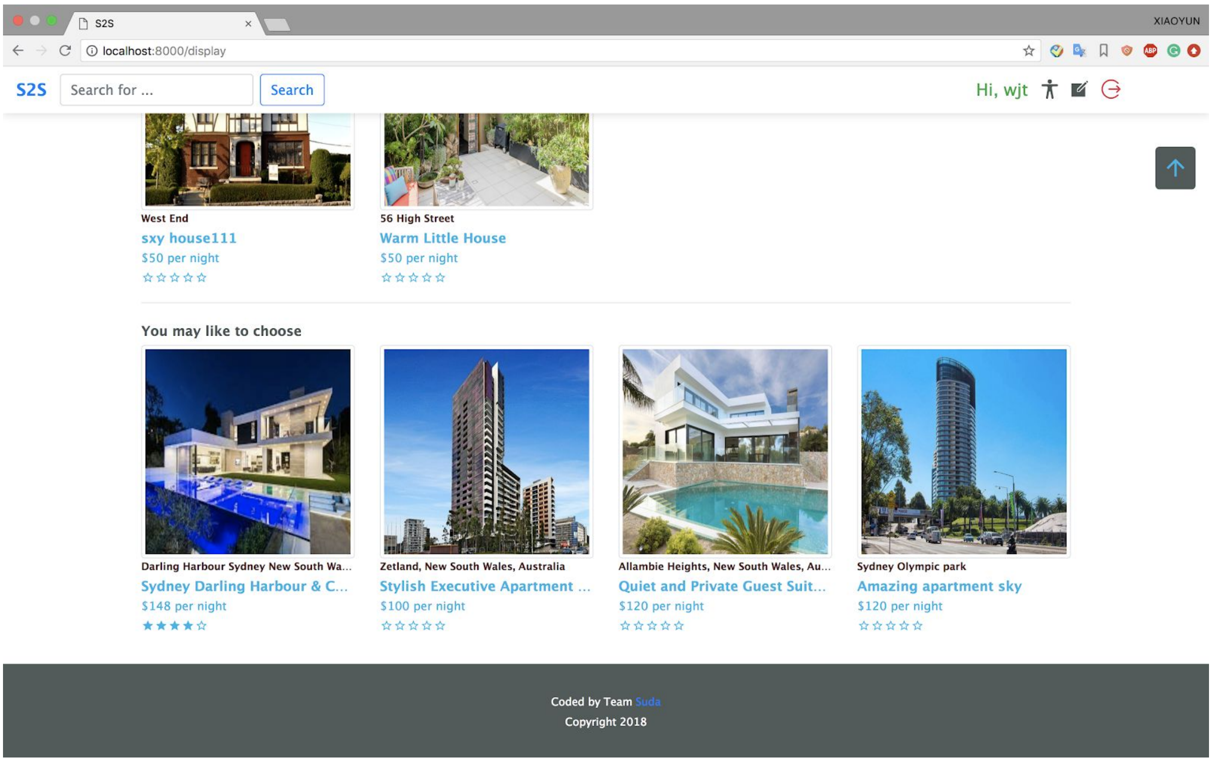
By the way, even though the customer doesn't have any preferences, we will also provide some recommendations for them based on the tag given them.



West End
sxy house111
$50 per night
☆☆☆☆☆

56 High Street
Warm Little House
$50 per night
☆☆☆☆☆

You may like to choose

Darling Harbour Sydney New South Wa...
Sydney Darling Harbour & C...
$148 per night
★★★★☆

Zetland, New South Wales, Australia
Stylish Executive Apartment ...
$100 per night
☆☆☆☆☆

Allambie Heights, New South Wales, Au...
Quiet and Private Guest Suit...
$120 per night
☆☆☆☆☆

Sydney Olympic park
Amazing apartment sky
$120 per night
☆☆☆☆☆

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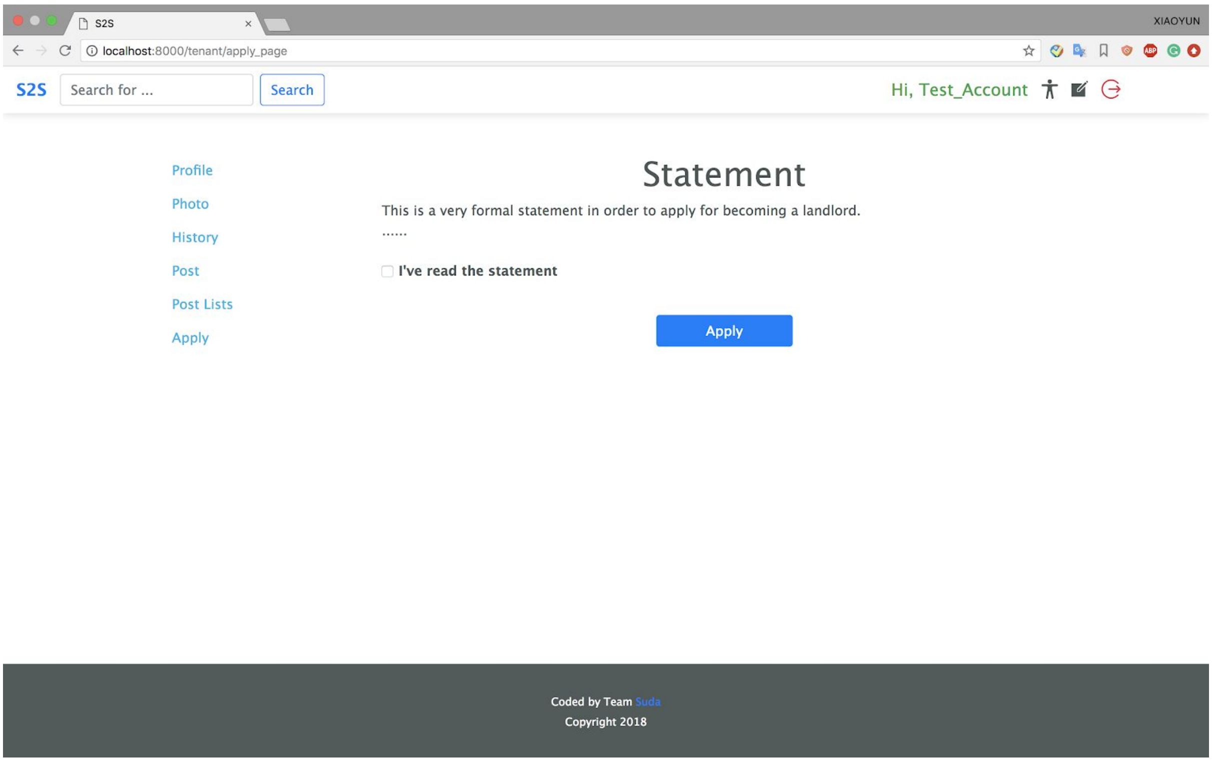
2.13 Website Management System

In this part, we are trying to do is that make the two modules can actually both work smoothly. Therefore, in this part, we develop the function such as 'SignUp' and 'LogIn', which helps to manage the user account and connect them with the back-end database. Moreover, in this part we will provide different appearance for tenant and landlord even though in the same page, which highly improves the page efficiency and minimise the cost the page maintain. Therefore, this function build a border between the landlord and tenant, make these two roles can work properly in our website.



S2S

XIAOYUN

localhost:8000/tenant/apply_page

S2S Search for ... Search

Hi, Test_Account

Profile

Photo

History

Post

Post Lists

Apply

Statement

This is a very formal statement in order to apply for becoming a landlord.

......

□ I've read the statement

Apply

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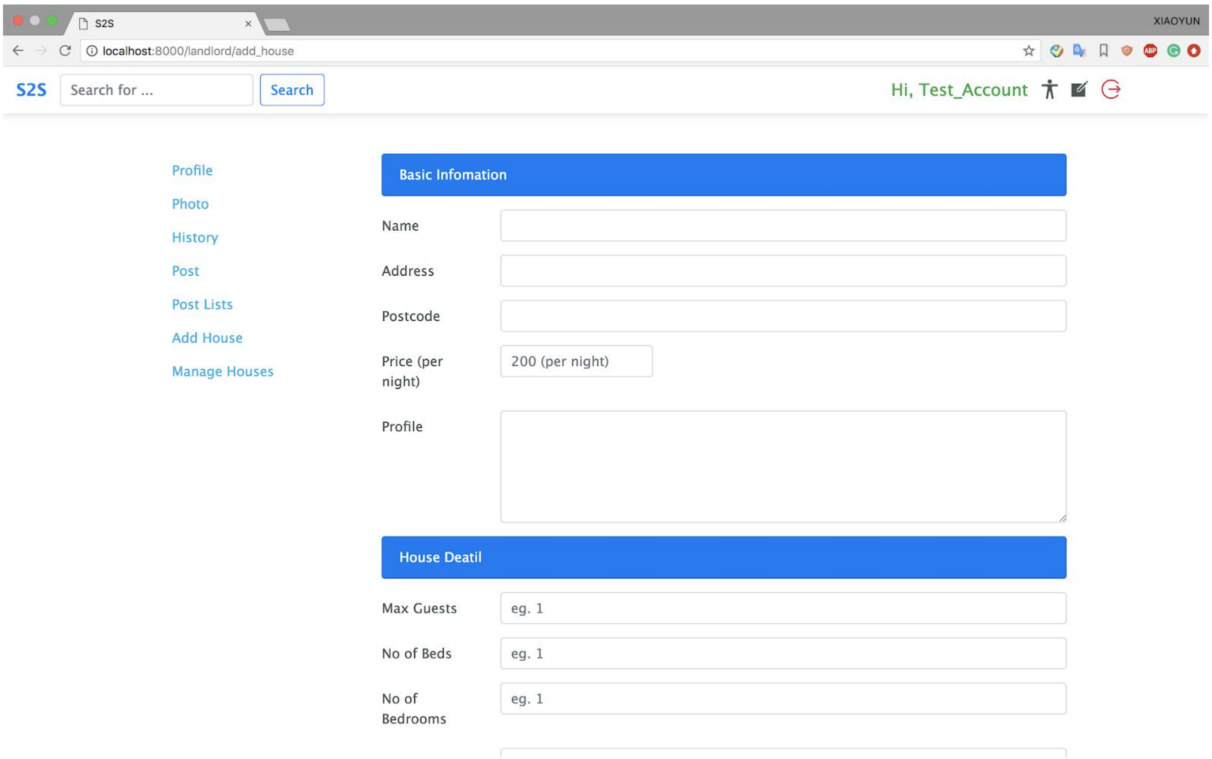


S2S

XIAOYUN

localhost:8000/landlord/add_house

S2S Search for ... Search

Hi, Test_Account

Profile

Photo

History

Post

Post Lists

Add House

Manage Houses

Basic Infomation

Name	
Address	
Postcode	
Price (per night)	200 (per night)
Profile	

House Deatil

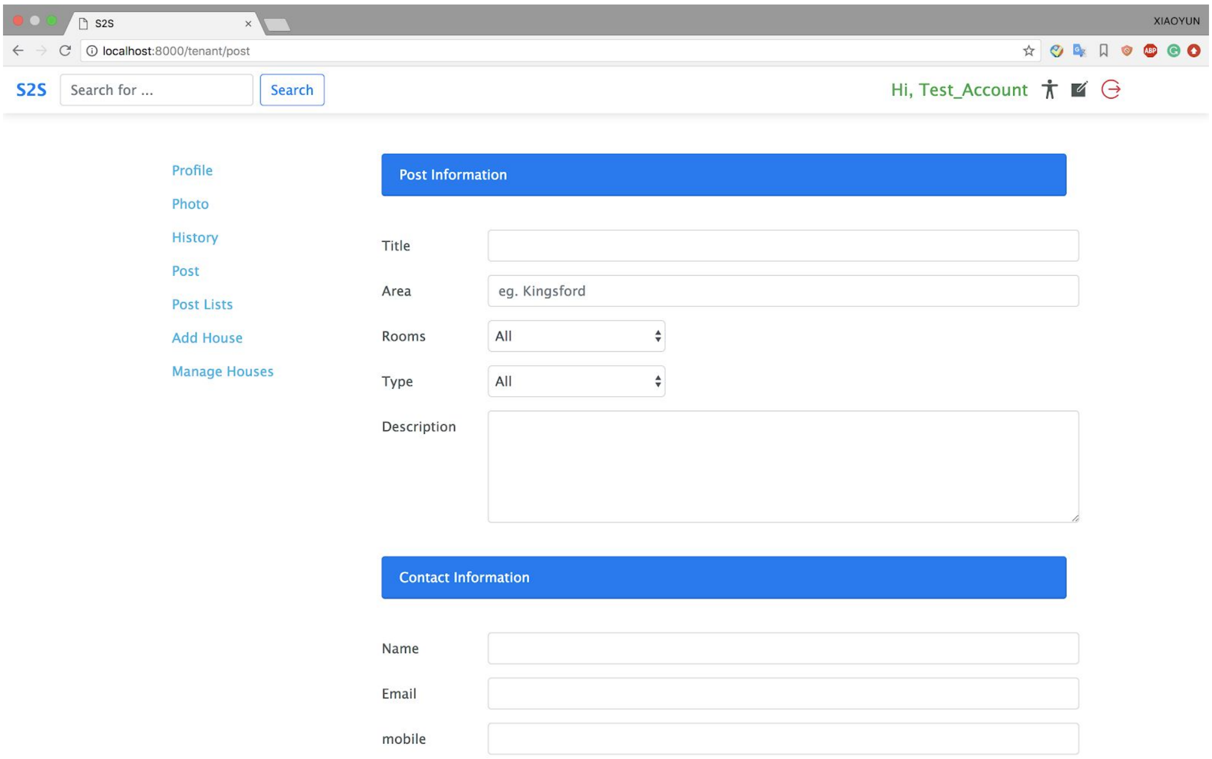
Max Guests	eg. 1
No of Beds	eg. 1
No of Bedrooms	eg. 1

2.2 The achieved function not mentioned in proposal

First I will mention some functions that different from the proposal. As we discussed in the proposal part we agreed that give the landlord and tenant to add tags for themselves. But by the time of formal programming, we realized that if we let users add tags by themselves, it will make the tags a lot of messy and not very accurate. So we decided to give them ‘tag’ through the system and implement our recommendation system based on these tags.

Secondly, I will explain some functions we did but not mentioned in the proposal. The customer sign up in our website, and the customer can become a landlord by apply function. In this part, the landlord can access to the function of add house and modify the information of their house(clearly clarified in the former ‘Landlord Module’). Moreover, the landlord also can book house like a tenant.

Besides, we also add a function for the tenant that not be mentioned in the proposal. The tenant can post information about which type of house they prefer. In this part, the user can type into the detail information of which type of house they like rather than just retrieving the house provided by someone else, this feature gives tenants the opportunity to get the most suitable house. The landlord can see this post information and click into to see the details, if they have the desired house, they can contact the tenant by the contact method provided in the page.



Post Information

Title

Area: eg. Kingsford

Rooms: All

Type: All

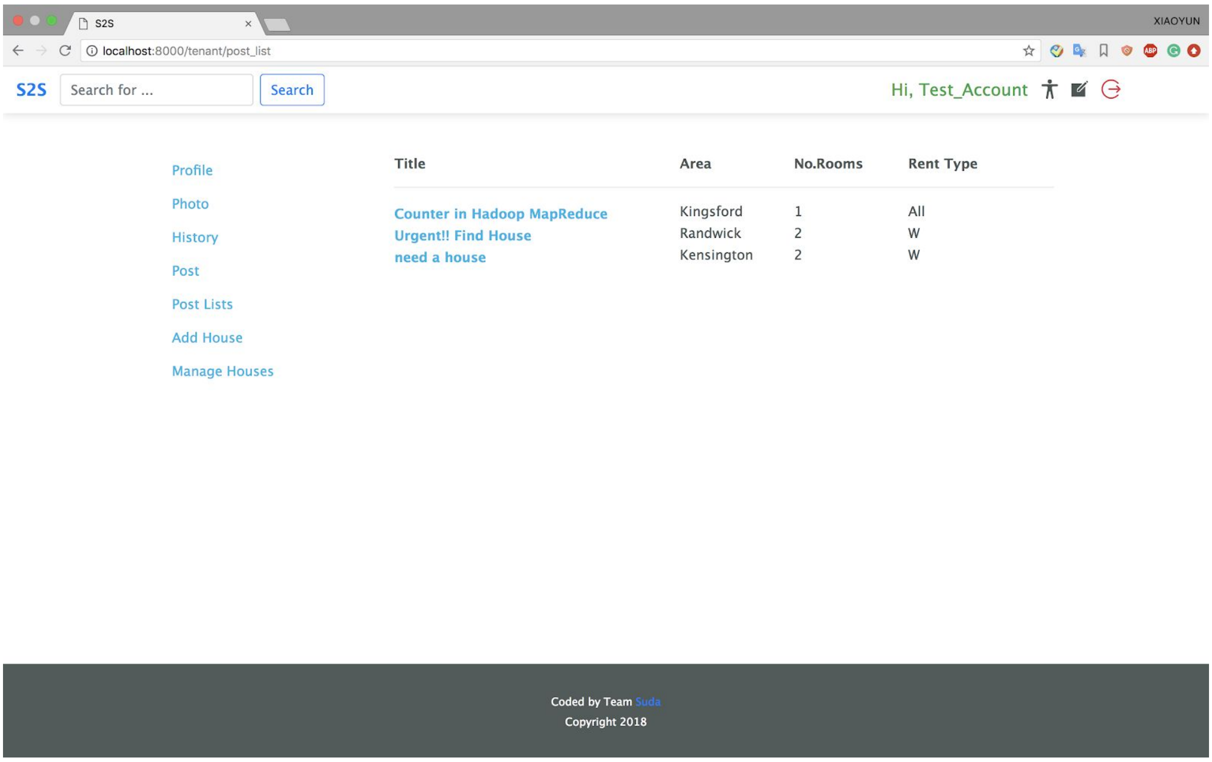
Description

Contact Information

Name

Email

mobile



Title	Area	No.Rooms	Rent Type
Counter in Hadoop MapReduce	Kingsford	1	All
Urgent!! Find House	Randwick	2	W
need a house	Kensington	2	W

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3 Challenge

3.1 Review system for landlord

In the original design of our basis website, we have considered a review system for tenant to comment and mark start for every house that they have check out. This can give feedbacks for other users thinking of these houses. This function we can also get from Airbnb company. It also has this function for users referencing.

To make it different, we consider about the insufficiency of this function that is needed to be improved. Because the process of landlord renting house to tenants and tenants choosing where to live is mutual. Landlords, in this stage, also should have rights to see how good their tenants are. In the result of this, a landlord can have the feedbacks of the tenant from other landlords' comments. Then this landlord may want to ignore or refuse the tenants who got bad reviews from other landlords.

In our achievement, we put this function into the landlords' properties. This mean that when landlord go to the page of managing their properties, they not only can edit house information and photos, but also can check the history that record the tenants booking their houses. In this page, they can add comment to the tenants who have already checked out. We only have one evaluation standard for landlords commenting tenants, which is reputation. In subsequent operations of our website, evaluation standard will be changed or added more standards according to landlords' feedback by market research. So we think this challenge function can be a good method for landlords' properties safety. and then it may attract more users to be landlords.

3.2 Recommendation system

For providing users with a good experience when they are searching their travel destination, our team design a recommendation system in display page to give them a good guide. In this function we aim to recommend some houses that are related to users' booking history in record. In this function we have used sklearn KNN model to predict the result.

For our training data, We have classified different class for every house, which help to determine what kind of houses users like. Also there classification is Associated to different feature we store in database by tags. For example, we have a Class A, which contains New tag, High price tag and house completion tag. So in the feature matrix, we will get a matrix that these tags are set to 1 and all remaining features that are not used will be zero. In this case we get a Class A training data. We can use this theory to get other Class for training data.

For our test data, we collect all Class of houses from users' history. Then calculate the weight that each feature in all features of one users. So we can get a user matrix that contains weights for each feature. And we give model to learn.

For prediction, we may think of high weight features can dominate the prediction. In the other word, The prediction would choose three more dominated feature for final result. and we can get which Class the model predict. Then we can get all houses in this Class to show on the page.

4 User Documentation

Software and Environments:

Python version: Python3.6.0
Django version: 2.1
MySQL version: 5.7.19
OS: MacOS or Linux

First of all, create a python virtual environment wherever you want:

```
python3 -m venv virtualenv
```

Go into this directory and activate this virtual environment:

```
source bin/activate
```

Then install Django into this virtual environment. If you want to get a specific Django version, you should type the second command, or the latest version will be chosen by the first command:

```
pip install django
pip install django==2.1
```

Mysqlclient, the driver, is needed for connecting Mysql databse in python:

```
pip install mysqlclient
```

Then install pillow for picture objects:

```
pip install pillow
```

As sklearn is used to implement a simple KNN recommandation system, so install sklearn as well:

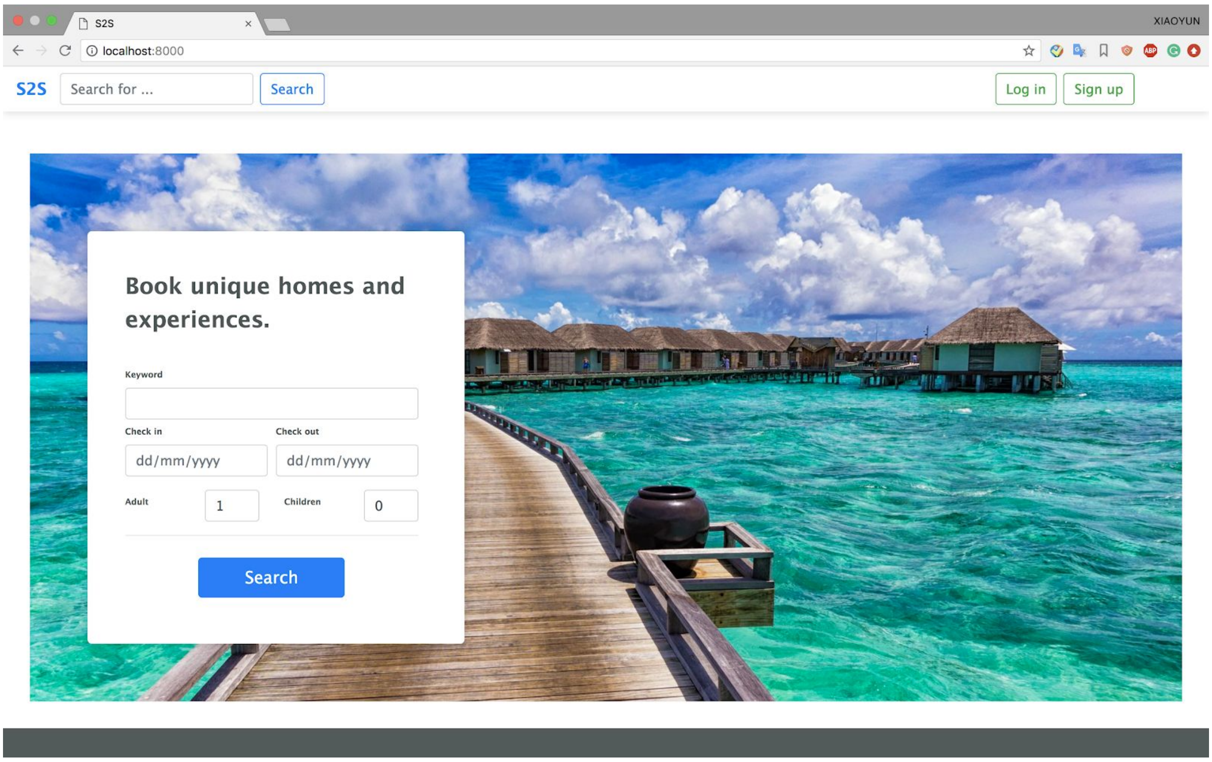
```
pip install sklearn
```

By now, you should have already finished setting up the environment. Then copy the project into this virtual environment and go into the directory which has the file called manage.py. Finally, you can test this project by starting up the Django development server with following commands. You could add a specific port number at the end if you wish, otherwise it will run in the port 8000 by default:

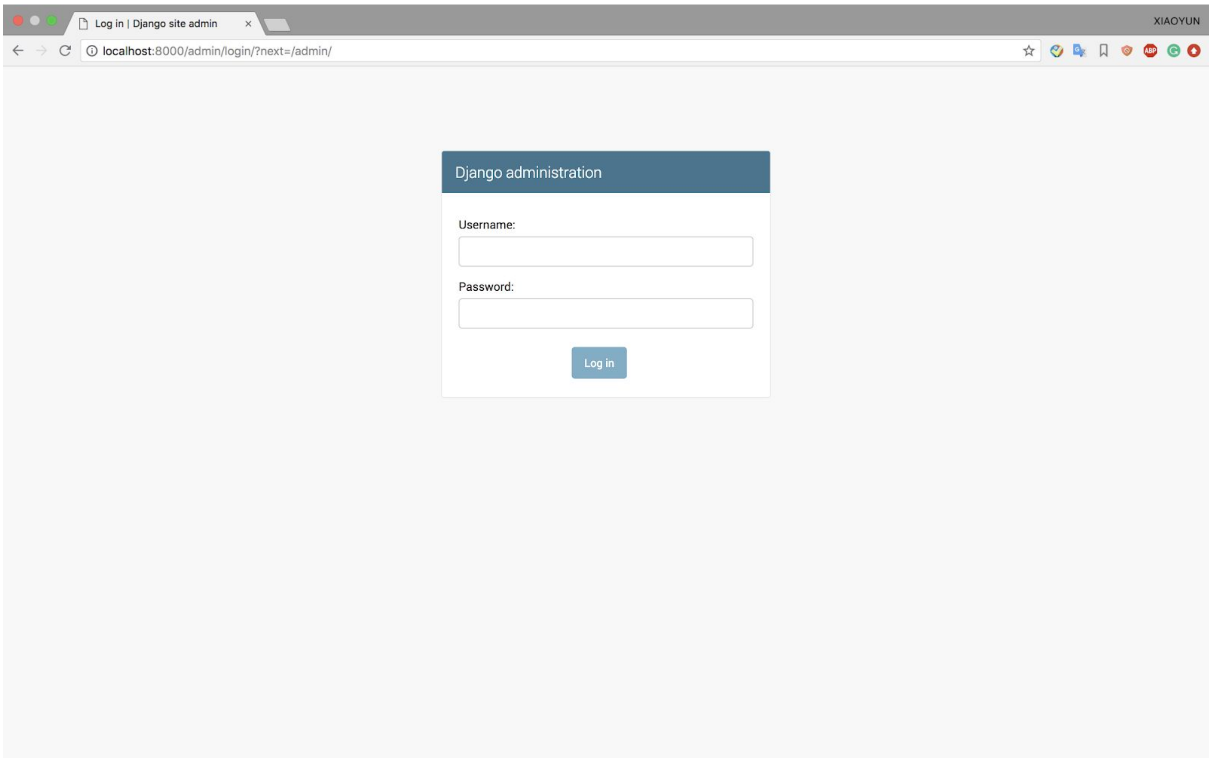
```
python manage.py runserver
python manage.py runserver 9000
```

At last, you should see the default Django index page by typing the URL in the address bar in your browser. You should also be able to login the admin system with the superuser you have just created just now if you append /admin to the end of the URL.

```
http://localhost:8000
http://localhost:8000/admin
```



Book unique homes and experiences.



Log in | Django site admin
XIAOYUN
localhost:8000/admin/login/?next=/admin/
Django administration
Username:
Password:
Log in

5 References

5.1 Django(version=2.1)

Django is an advanced Python web framework for quickly developing secure and maintainable websites. Django is built by experienced developers with a good and rich documentation and it is free and open source. Django uses MVC design pattern where M is model, V is view and C is controller.

urls.py: Although requests from each URL can be handled by a single function, writing separate view functions to handle each resource is more maintainable. The URL mapper is used to redirect HTTP requests to the corresponding view based on the request. The URL mapper can also match a particular pattern of strings or numbers that appear in the URL and pass it as data to the view function.

views.py: A view is a request handler that receives an HTTP request and returns an HTTP response.The view accesses the data from database and response the result to the template.

models.py: Models are Python objects that define the application's data structure and provide mechanisms for managing (adding, modifying, deleting) and querying records in the database.

templates: Templates are text files that define the structure or layout of a file, such as an HTML page, and are used to represent placeholders for the actual content. A view can use an HTML template to dynamically create an HTML page model according to the data.

admin.py: The admin module is the most awesome part in Django. Because a powerful backend could be constructed a small amount of simple codes. It also provides many useful functions which makes it easy for administrators to manage data, for instance, adding, updating and deleting records.

settings.py: The setting file of this whole Django project. Some import information is contained in this file, for example, database connecting configuration, media and static files path.

5.2 Database(MySQL)

MySQL is used for constructing database and character set is utf8mb4. And this database is deployed on a Digital Ocean server so database will keep all the same for all group members when developing.

5.3 Sklearn

KNN.py: The training model for recommendation we have used knn from sklearn api, which is sklearn.neighbors.KNeighborsClassifier.

5.4 Picture Source

All pictures are found from the Internet, some of the house information are copy from the Airbnb randomly.