

# **Final Project for SW Engineering**

## **CSC 648/848**

**Section 01 Fall 2017**

**Team 10**

**Future Homes Real Estate**

*Team Lead:* Raymie Michael

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**Sohaib Syed**

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**Mrinalini Garre**

**Demo URL:** <https://sfsuse.com/fa17g10/>

**Date:** 12/18/2017

# Product Summary

1. **Product Name: Future Homes**

2. **All major committed functions:**

- a. Guests shall be prompted to enter a city or zip code into the search bar to look for the listings in the area.
  - b. If a guest enter an invalid address, then the search bar shall provide the guest suggestions based on a corrected version of the entered address.
  - c. Guests shall have access to a features bar which will further sort the listed homes.
  - d. Guest shall have access to our contact page, which lists team member names and their details.
  - e. Guests shall be able to sort the homes from lowest to highest price, highest to lowest price, and from most to least amount of rooms.
  - f. Guests shall be able to access to information about the listings' real estate agent.
  - g. Guests shall be able to view details about the houses such as: house picture, address, and value of the house.
  - h. Sellers shall have access to a message inbox, which contains messages from potential home buyers.
  - i. Sellers shall be able to contact the buyers who are interested in their listings by sending them a form.
  - j. The admin shall have the ability to delete any property listings.
  - k. Sellers are required to register before uploading any sort of listings.
  - l. Our website shall provide property details and property location on a map.
  - m. Our website shall have a login and signup option for buyers and sellers.
  - n. Guests and registered sellers shall be able to contact real estate agents.
  - o. Future Homes' website shall provide a list of homes, rooms for rent, pieces of land, condominiums, apartments, and townhomes that are available or have been recently sold.
3. Our website is called Future Homes, and what makes our website special is that it is user friendly. Our website is about browsing for homes and exploring the property details
4. **URL:** <https://sfsuse.com/fa17g10/>

SW Engineering CSC648/848 Section 01 Fall 2017

***Milestone 1- Team 10***  
***Future Homes***

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October 3, 2017

## **Executive Summary**

Our new product, Future Homes, is a real estate website that allows users to buy, sell, and rent houses and apartments. Users have the capability to browse local listings for local homes and apartments sale/rent, add listings to their favorites list (which can be viewed at any time), and contact local real estate agents and landlords to inquire about listings. Future Homes works with actual real estate agents and landlords in several locations with the purpose of bringing users a pain-free home purchasing/renting experience.

The main features of our site include: a search bar that shall prompt the user to enter an area (city/zip code) to search for homes; a features bar which shall provide additional features for the user to specify which listings they would like to see; and a sorting bar, which shall allow the user to sort based on price/bedrooms/bathrooms/features. Each individual listing shall have a map showing the location of the property relative to the search area, as well as pictures of the actual property.

Here at Future Homes, we pride ourselves on providing our users features that are not available with other competing services. For example, Craigslist has listings that do not always have pictures of the property, nor is there a feature for comparing your top choices. On the Future Homes website, users will be able to select up to four houses and receive a side by side comparison of the specs of each home. This will allow users to easily decide which listing they like best.

Future Homes' Team is comprised of senior Computer Science students at San Francisco State University. The team lead and CEO is Raymie Michael. The lead back-end developer is Justin Zhu, and the backend developer is Peter Cruz. The lead front-end developer is Sohaib Syed, and the front-end developer is Dilraj Singh. The Senior Developer is Mrinalini Garre. Together, they created Future Homes with the purpose of filling a need in the real estate market that is not found nowadays - a product that displays local housing, backed by local real estate agents and local landlords.

## Use Cases

1. ***Seller***: Sally is a real estate agent. She wants an easy and convenient way to advertise her houses for sale. Using an online platform such as Future Homes for her listings will widen her clientele. Since she is an agent from a reputable firm, she can log on by following the simple ***step-by-step guide*** to create an ***account***. She now has the ability to upload images and edit information about her property listings to Future Homes' website. Now, if a potential buyer uses a search engine to look for houses for sale in his or her desired area, Future Homes' listings will appear and the buyer is aware of Sally and her firm. When she logs onto her account, she notices a new message in her inbox. She reads the message and calls the interested buyer.
2. ***Unregistered User***: David is on the market for a new home that will be large enough for his family of four. He uses Future Homes' diverse ***features bar*** to sort through the many homes in his area. After David has searched for his desired city, he then increases the ***minimum number of rooms*** in order to limit his search to homes with the right number of bedrooms. Now David does not need to look at unnecessary homes. David's family tells him that they really want a pool in their new home, and with Future Homes' website, he can search through homes that have a pool.
3. ***Registered User***: Tom is a transfer student at SFSU; he is new to San Francisco so he is searching for a house to rent. He searched through the Future Homes' website ***search bar*** for a room to rent near campus. As the search results provided many homes near SFSU, he ***sorted*** the search by number of rooms. Tom wants to make sure if he will meet his expenses and filtered the search by adding the range of his budget. According to his search the houses appeared in an increasing order with minimum number of rooms and which are of low price. Tom had his priorities so he finalized one by searching a house with lease length of 1 year. Tom cannot decide between three rooms, so he makes a ***side-by-side comparison*** on the Future Homes' website. If Tom is interested in a home, he can submit a form providing his name, number and email.

4. **Administration:** Sara is a software engineer at Future Homes' company. She is the one in company who has all the permissions for the Future Homes' website. She manages the accounts of sellers, buyers, renters by providing the necessary **permissions** to them. Sara is busy every Wednesdays working on the maintenance of website and checking accounts. The manager of the Future Homes' company asked Sara to secure the website from frauds who are posting fake information about the houses. Sara found a way by allowing users to **flag** an inappropriate post so she will be notified about post. Whenever Sara gets notified about a post she removes the permissions for the account holder to access the website.

## Data Definitions

- a. **account:** Real estate agents, real estate firms, and buyers/browsers are able to create an account which will include features unavailable to those without an account (i.e. contact agent if you are a buyer or upload photos if you are a seller)
- b. **administration:** the hired administration of our site will have the ability to view flagged listings and remove them if necessary
- c. **buyer:** a user who is looking to potentially buy/rent a listing on our website
- d. **clean-up:** if a listing is inappropriate, then there will be a removal of the inappropriate listing
- e. **features bar:** allows the user to specify the type of homes that will appear in a more detailed way
- f. **flag:** any user will be able to flag a listing if he or she deems it inappropriate
- g. **guests:** a registered or unregistered user.
- h. **maximum price:** Another feature of the search tools which will allow the user to choose from some list of prices making it the maximum price the list of homes will have.
- i. **minimum number of rooms:** A feature of the search tools which can prompt the user to add or subtract the minimum number of rooms.
- j. **permissions:** depending on if a user is registered or not, there will be special features available to each.
- k. **search bar:** shown when the website is initially launched; used for entering a city or zip code.
- l. **property listings:** this website will list many different types of property such as homes, apartments, condos, town homes, homes for rent, and land.
- m. **registered user:** a user with an account (see use case number three)
- n. **seller:** a registered user who can be either a licensed real-estate agent or individual landlord
- o. **side-by-side comparison:** a feature of Future Homes which consists of a specs page of up to four favorited homes of a registered or unregistered user. The user will be shown the price, square footage, address, number of rooms, number of bathrooms, and year built of every home side-by-side to easily choose their future home.

- p. ***step-by-step guide***: when a user is making an account, there will be a set of instructions to follow. This guide is integrated into the steps of signing up; a description for each step is only written when the user can actually do the step.
- q. ***unregistered user***: a user is allowed to browse through all of our listings without creating account; however, they will not have the ability to contact the real-estate agent or landlord



### **Initial List of Functional Requirements**

1. Guests shall be prompted to enter a city or zip code into the search bar.
2. Guests shall have access to a features bar which will further sort the listed homes.
3. Guests shall specify their desired minimum number of rooms of a home and see those homes first.
4. Guests shall specify their desired maximum or minimum price of a home and see those homes first.
5. Guests shall be able to sort the homes from lowest to highest price, highest to lowest price, most recently added, or most to least amount of rooms.
6. Guests shall have access to information about the listing's real estate agent.
7. Registered users shall be able to submit a form providing their name, phone number or email, and additional comments if preferred in order to send to a real estate agent.
8. Sellers shall have an inbox of forms submitted by potential buyers.
9. Future Homes' website shall list homes, rooms for rent, pieces of land, condominiums, apartments, and town homes that are available or have been recently sold.
10. Future Homes' website shall enable guests to register for an account if desired.
11. Future Homes' website shall provide additional features for a registered user such as a save-for-later feature, pictures of sold homes, and more.
12. Sellers shall be required to register before uploading listings.
13. Users shall have the ability to flag an inappropriate listing.
14. Admins shall have the ability to view flagged listings and take them down if necessary.
15. Users shall use the side-by-side comparison feature to compare specs/previews of up to four homes all on one page.

## **List of Non-Functional Requirements**

1. Application shall be developed and deployed using class provided deployment stack.
2. Application shall be developed using pre-approved set of SW development and collaborative tools provided in the class. Any other tools or frameworks must be explicitly approved by Anthony Souza on a case by case basis.
3. Application shall be hosted and deployed on Amazon Web Services as specified in the class.
4. Application shall be optimized for standard desktop/laptop browsers e.g. must render correctly on the two latest versions of all major browsers: Mozilla, Safari, Chrome.
5. Application shall have responsive UI code so it can be adequately rendered on mobile devices but no mobile native app is to be developed.
6. Data shall be stored in the MySQL database on the class server in the team's account.
7. Application shall provide real-estate images and optionally video.
8. Maps showing real-estate location shall be required.
9. Application shall be deployed from the team's account on AWS.
10. No more than 50 concurrent users shall be accessing the application at any time.
11. Privacy of users shall be protected and all privacy policies will be appropriately communicated to the users.
12. The language used shall be English.
13. Application shall be very easy to use and intuitive. No prior training shall be required to use the website.
14. Google analytics shall be added.
15. Messaging between users shall be done only by class approved methods and not via e-mail clients in order to avoid issues of security with e-mail services.
16. Pay functionality (how to pay for goods and services) shall not be implemented.
17. Site security: basic best practices shall be applied (as covered in the class).
18. Modern SE processes and practices shall be used as specified in the class, including collaborative and continuous SW development.
19. The website shall prominently display the following text on all pages *"SFSU Software Engineering Project, Fall 2017. For Demonstration Only"*. (Important so as to not confuse this with a real application).

## Competitive Analysis

website feature	<i>Future Homes</i>	Realtors	New Home Source	KBHome	See Bay Area Houses
Rental	✓	✓	×	×	×
Side-by-Side Comparison	✓	×	×	×	×
Communication	✓	✓	✓	✓	✓
News	×	✓	×	×	×
Home-Value Estimator	×	✓	×	✓	×
Maps	✓	✓	✓	✓	✓
Unregisters browsing	✓	✓	✓	×	×
Featured Listings	✓	✓	✓	×	✓
Mortgage Calculator	×	✓	×	✓	×

✓	Indicates that the feature is available on specified website.
×	Indicates that the feature is not available on specified website.

## **High-Level System Architecture**

### *Tools:*

Git, (version 2.7.4)

GitHub

### *API:*

Google Maps

Google Analytics

### *Front End:*

AngularJS (version 1.6.6)

HTML

CSS

SASS (481)

LESS (3.4.21)

Bootstrap (version 4.0.0)

### *Back End:*

node.js, (v8.4.0)

Express (4.16.1)

npm (3.5.2)

pm2 (2.6.1)

Host: Amazon Cloud

Operating System: Ubuntu Server, (version  
16.04)

NGINX, (version 1.12.1)

database: MySQL, (version 5.7.19)

### *Supported Browsers:*

Most recent two versions of the following:

Google Chrome, Mozilla Firefox, Apple

Safari

## **Team**

*Team Lead:* Raymie Michael

*Front End Lead:* Sohaib Syed

*Front End Developer:* Dilraj Singh

*Back End Lead:* Justin Zhu

*Back End Developer:* Peter Cruz

*Front/Back End Developer:* Mrinalini Garre

## Checklist

- ❖ Team decided on basic means of communications - DONE
- ❖ Team found a time slot to meet outside of the class- ON TRACK
- ❖ Front and back end team leads chosen- DONE
- ❖ Github master chosen- DONE
- ❖ Team ready and able to use the chosen back and front end frameworks- ON TRACK
- ❖ Skills of each team member defined and known to all- DONE
- ❖ Team lead ensured that all team members read the final M1 and agree/understand it before submission- DONE

# SW Engineering CSC648/848 Section 01 Fall 2017

## *Milestone 2* *Future Homes* *Local Team 10*

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Sohaib Syed  
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Peter Cruz  
Mrinalini Garre

<b>Date Submitted</b>	October 27, 2017
<b>Date Revised</b>	

## 1. Data Definitions

- a. *property listings*: Future Homes' shall list many different types of property, including:  
homes, apartments, condominiums, townhomes and homes for rent.
- b. *account*: Real estate agents, real estate firms, and buyers/browsers shall be able to create an account, which shall include features unavailable to those without an account (i.e. contact agent, save listings).
- c. *step-by-step guide*: When a user is undergoing account creation, there shall be a set of instructions for the user to follow for successful account creation. Each step shall have a specific description, and each specific description shall be displayed at the appropriate step of account creation.
- d. *search tools*: Allows the user to specify the type of homes that shall appear in a more detailed way.
- e. *primary search bar*: An input bar which prompts the user to enter a city or zip code.
- f. *minimum number of rooms*: A feature of the search tools which shall prompt the user to add or subtract the minimum number of rooms.
- g. *guests*: a registered or unregistered user.
- h. *features bar*: another input bar which shall accept additional features of a home if applicable.
- i. *maximum price*: Another feature of the search tools which shall allow the user to choose from a range of prices, making the displayed homes the ones with maximum price.



- j. *user dashboard*: Users with an account shall have access to a dashboard, where they shall be able to: view their inbox communications; and view property listings that they have saved.
- k. *seller dashboard*: Sellers shall have access to a dashboard, where they shall be able to: view their inbox communications; view property listings that they have posted; and edit or archive their past property listings.
- l. *comparisons*: If any user would like to compare listings, they can select up to four listings to be viewed side by side. This will enable them to easily compare their top choices.

## **2. Functional Requirements**

- 1.1 Guests shall be prompted to enter a city or zip code into the search bar. Priority 1.
- 1.2 If guests enter an invalid address then the search bar will give the user suggestions of the correct addresses which is similar to the invalid address. Priority 1.
- 1.3 If the user enters address with spelling errors then the search bar will give options of correct addresses with the similar spellings. Priority 1.
  
- 2.1 Guests shall have access to a features bar which will further sort the listed homes. Priority 1.
- 2.2 Guests shall have access to view the listings in a grid or list view. Priority 3.
- 2.3 Guests shall specify their desired minimum number of rooms of a home and see those homes first. Priority 2.
- 2.4 Guests shall specify their desired maximum or minimum price of a home and see those homes first. Priority 3.
- 2.5 Guests shall be able to sort the homes from lowest to highest price, highest to lowest price, most recently added, or most to least amount of rooms. Priority 1.
  
- 3.1 Guests shall be able to enter specific keywords such as “pool” or “ranch style” and only see those homes. Priority 3.
- 3.2 Guest shall be able to enter keywords such as “pets allowed” to only view the listings which allows the pets. Priority 3.
  
- 4.1 Guests shall have access to information about the listing’s real estate agent. Priority 1.

4.2 Guests shall have details about the house such as: house picture, address, and value of the house. Priority 1.

5.1 Registered users shall be able to submit a form providing their name, phone number or email, and additional comments if preferred in order to send to a real estate agent. Priority 2.

5.2 Registered users will be able to get in contact with the seller when the seller initially contacts the registered user. Priority 3.

6.1 Sellers shall have an inbox of forms submitted by potential buyers. Priority 1.

6.2 Sells shall be able contact the buyers who are interested in their listings. Priority 1.

7.1 Future Homes' website shall list homes, rooms for rent, pieces of land, condominiums, apartments, and townhomes that are available or have been recently sold. Priority 1.

8.1 Future Homes' website shall enable users to register for an account if desired. Priority 2.

9.1 Future Homes' website shall provide additional features for a registered user such as a save-for-later feature, pictures of sold homes, and more. Priority 2.

10.1 Sellers shall be required to register before uploading any sort of listings. Priority 1.

11.1 Guests shall have the ability to flag an inappropriate listing. Priority 2.

11.2 Guests can flag houses due to multiple reasons, if they see and duplicate listing, listing for a sold house, and etc. Priority 3.

12.1 Admins shall have the ability to view flagged listings and take them down if necessary.  
Priority 2.

12.2 Admins shall have the ability to view the message of the listings to see why it was flagged.  
Priority 3.

13. Users shall use side-by-side comparison feature to compare specs/previews of up to four homes all on one page. Priority 3.

### 3. UI Mockups and Storyboards

Case 1: A realtor, David, is using our website to list their new homes in the area. Upon entering the website, he presses the “sign in” button on the upper right hand corner.












A hand-drawn UI mockup of a website homepage. At the top, there is a header bar with a house icon, the text 'Future homes', and navigation links 'BUY SELL RENT'. In the top right corner, there is a 'sign in' button. The main content area features the text 'SEARCH FOR YOUR FUTURE...' above a search input field. The input field contains the placeholder text 'enter a city or zip code' and a 'SEARCH' button with a magnifying glass icon.

David then enters his email and presses submit. He is then prompted to create a password and he will check the box since he wants to create an account as a realtor.

A hand-drawn UI mockup of a 'Login or Register' dialog box. The dialog box has a title bar with 'Login or Register' and a close button (X). It contains an input field with the placeholder text 'enter your email' and a 'Submit' button.

A hand-drawn UI mockup of a password creation dialog box. The dialog box has a title bar with 'enter a password' and a close button (X). It contains an input field for the password, a checkbox with the label 'click the box if you are a realtor.', and a 'create account' button.

Now, as a registered realtor, David can upload his listings. After going to his seller dashboard, he presses “upload.”

Future Homes		Buy Sell RENT		user 	
mail   listings   edit info		upload			
Messages		<u>Listings.</u>			
<div> name@mail.com This is a message about the ...</div>		<div> 123 main street daly city, CA</div>			
<div> man@mail.com Hello...</div>		<div> 543 Holloway san Francisco, CA</div>			
<div> anon@mail.com Hello...</div>		<div> 123 2nd ave san Francisco, CA</div>			
<div> someone@mail.com Hello...</div>		<div> 123 2nd ave san Francisco, CA</div>			
<div> random@mail.com Hello...</div>					
<div> ...</div>					

Upon pressing upload, David can enter the information of his listing and submit it to the database.

Future Homes

BUY

SELL

RENT

user ⓘ

mail

listings

edit info

upload

address:

city:

zip:

state:

type:

number of bedrooms:

number of bathrooms:

square footage:

price:

upload images:

upload from computer

submit

Case 2: Jack is a registered user who wants to go back to the listings that he has favorited. He enters Future Homes website and signs into his existing account.

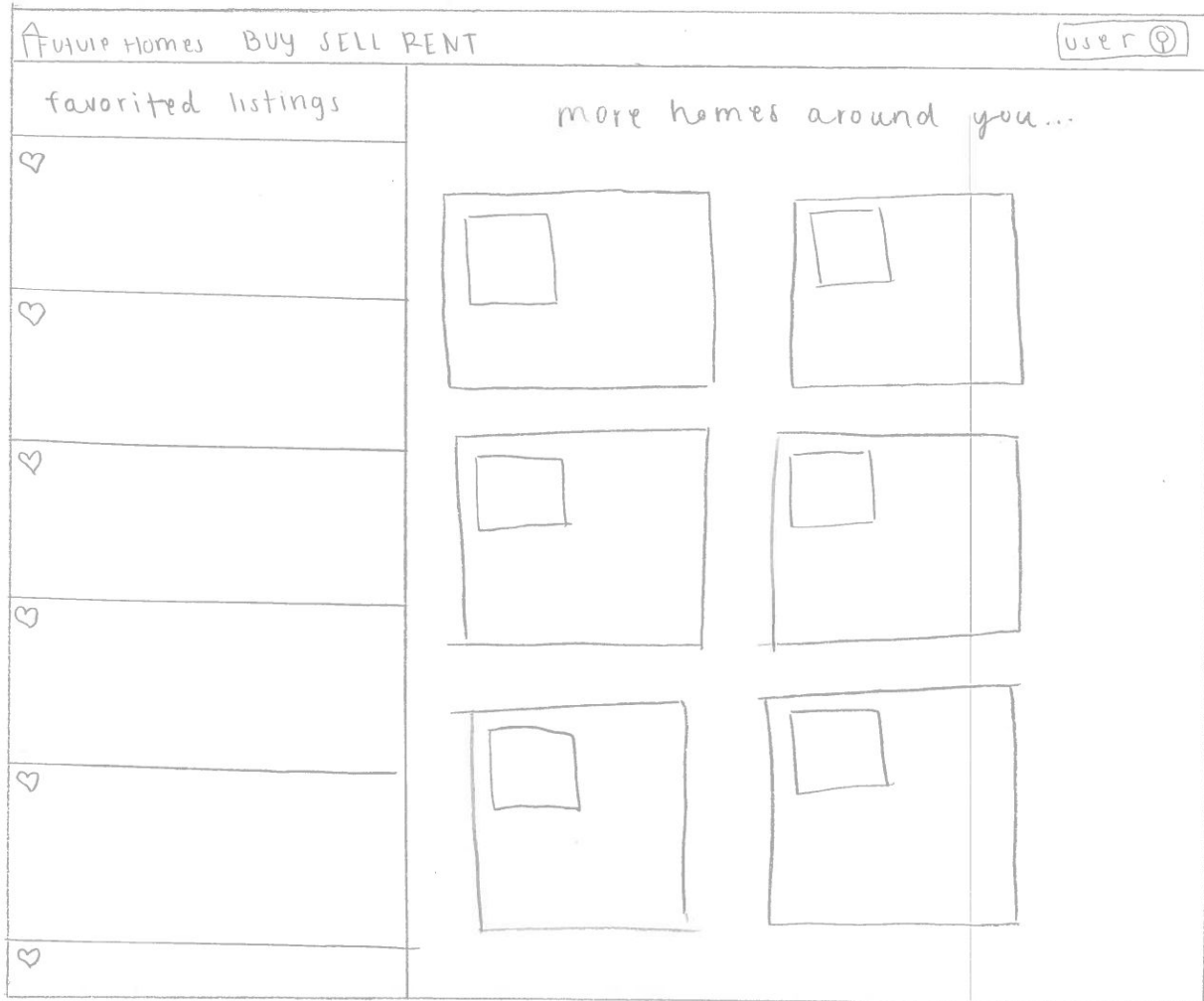
The image shows two hand-drawn wireframes of a web browser window, illustrating a login process. Both windows have a header bar with the text "Future Homes" on the left, "BUY SELL RENT" in the center, and a "sign in" button on the right.

The top window displays a modal dialog titled "Login or Register" with a close button (X) in the top right corner. Inside the dialog, there is a text input field labeled "enter your email" and a "submit" button below it.

The bottom window displays a second modal dialog with the text "welcome back!" at the top. Below this text is a text input field labeled "enter your password" and an "Enter" button below it.



Jack can see his previously selected favorite listings upon pressing on the upper right hand corner on the button that will be labeled “Jack.”



Jack sees that he really likes this home on 9th avenue. Since he is a registered user, upon filling out his information on the contact user section of a listing, his form will be sent to the realtor.

Future Homes

BUY SELL RENT


sign in

San Francisco, CA

back to search results

save this home

add for comparisons



contact Agent

full name

email

phone number

additional comments

send form

\$900,000

4 bedrooms 3.5 bathrooms 2,100 square feet

711 9th Avenue

San Francisco

California, 94109

map

continued on next page

Case 3:


A potential buyer Lisa stumbles upon our website, and is asked to “enter a city or zip code”; in order to search for homes that are on the market in her specified city. Immediately after pressing the search icon to the right of search bar, she will be redirected to the Listing Page.

Home page

The sketch shows a browser window with a header bar. On the left of the header is a home icon followed by the text "Future homes:". To the right of this are the words "BUY", "SELL", and "RENT" spaced out. On the far right of the header is a button labeled "sign in". Below the header, the main content area contains the text "SEARCH FOR YOUR FUTURE..." centered. Underneath this text is a search bar. The search bar is a rectangle divided into two parts. The left part contains the placeholder text "enter a city or zip code". The right part contains the word "SEARCH" followed by a magnifying glass icon.

While on the listing page Lisa will be able to use filters in order to customize her search. For example there will be tabs on the top of the page in order for Lisa to specify price range, number of beds/bathrooms, type of listing, and whether to sort in ascending or descending order. Lisa then browses through the homes listed below based on the parameters she specified.

11/11/93

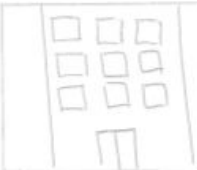
 FUTURE HOMES

BUY SELL RENT

San Francisco, CA

Any PriceAny BedsAny BathsAny Typesort

77 Listings




\$500,000

123 main st  
San Francisco  
CA, 94109

2 bd • 1 ba • 1,300 sq ft

contact agent

♥




\$675,000

345 main st  
San Francisco  
CA, 94109

3 bd • 4 ba • 1,700 sq ft

contact agent

♥




\$900,000

777 9th Ave  
San Francisco  
CA, 94109

4 bd • 3.5 ba • 2,100 sq ft

contact agent

♥



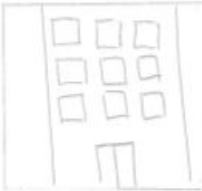



\$455,000

310 Hill Dr

Case 4:

A potential buyer Sarah has selected a home from the Listing's page. She is redirected to a page that gives further details regarding the home selected.

listings

FUTURE HOMES		BUY SELL RENT		sign in	
San Francisco, CA		Any price	Any Beds	Any baths	Any Type
77 Listings					
	\$500,000 123 main st San Francisco CA, 94109 2 bd • 1 ba • 1,300 sq ft	<a href="#">Go to your Comparisons</a>			
	\$675,000 345 main st San Francisco CA, 94109 3 bd • 1 ba • 1,700 sq ft				
	\$900,000 711 9th Ave San Francisco CA, 94109 4 bd • 3.5 ba • 2,100 sq ft				
	\$455,000 310 Hill Dr				

Sarah then decides to add the selected home to her personalized “comparisons” by pressing the “add to comparison +” button on the top right of the page. This is the fourth house Sarah has added to her “comparisons”.

clicking a listing continued ...



Future Homes

BUY SELL RENT

sign in

San Francisco, CA

Back to search results

Save this home

add for comparisons

111 1st Avenue

San Francisco

California, 94109

Map

Featured nearby homes

101 Julie Ln








888 Juniper St

310 Allen St



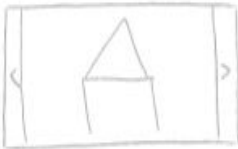

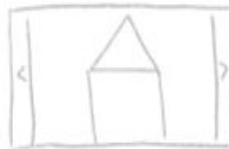





Sarah goes back to the Listing's page and presses "See your Comparisons" which redirects her to the her personalized comparisons page.

LISTINGS

FUTURE HOMES		BUY SELL RENT		sign in	
San Francisco, CA		Any price	Any Beds	Any Baths	Any Type
Sort					
77 Listings					
	\$500,000 123 main st San Francisco CA, 94109 2 bd • 1 ba • 1,300 sq ft	CONTACT AGENT 			
	\$675,000 345 main st San Francisco CA, 94109 3 bd • 4 ba • 1,700 sq ft	CONTACT AGENT 			
	\$900,000 777 9th Ave San Francisco CA, 94109 4 bd • 3.5 ba • 2,100 sq ft	CONTACT AGENT 			
	\$455,000 310 Hill Dr				

Sarah then sees a side by side comparison of the four homes she has selected. The homes are compared by price, number of bedrooms and bathrooms, and any other special attributes such as having a tennis court, or pool, etc. Sarah will also view four separate maps of showing the relative location of each separate house

Comparisons

Future Homes BUY SELL RENT <span>sign in</span>			
Your side-by-side comparison			
A	B	C	D
			
\$ 500,000	\$ 600,000	\$ 700,000	\$ 800,000
2 bedrooms	3 bedrooms	1 bedrooms	5 bedrooms
1 bathroom	1.5 bathrooms	2 bathrooms	3 bathrooms
features:	features:	features:	features:
<ul style="list-style-type: none"> <li>• A+ nearby schools</li> <li>• pool</li> </ul>	<ul style="list-style-type: none"> <li>• walking distance to stores</li> </ul>	<ul style="list-style-type: none"> <li>• pool</li> <li>• basement</li> </ul>	<ul style="list-style-type: none"> <li>• 2 car garage</li> <li>• A+ schools</li> </ul>
			

(maps) →



#### 4. High Level Architecture, Data Base Organization

Model – Uses MySQL and BLOBs for data organization

- Real\_state\_agent account
  - Organization name
  - Employee ID
  - Listing
    - Street
    - City
    - zip\_code
    - state
    - image
    - price

View – Uses HTML and CSS for display

- Search Result Page
- Login Page
- Logged in user page
- Contact seller/renter page
- Listing page
- Main Page

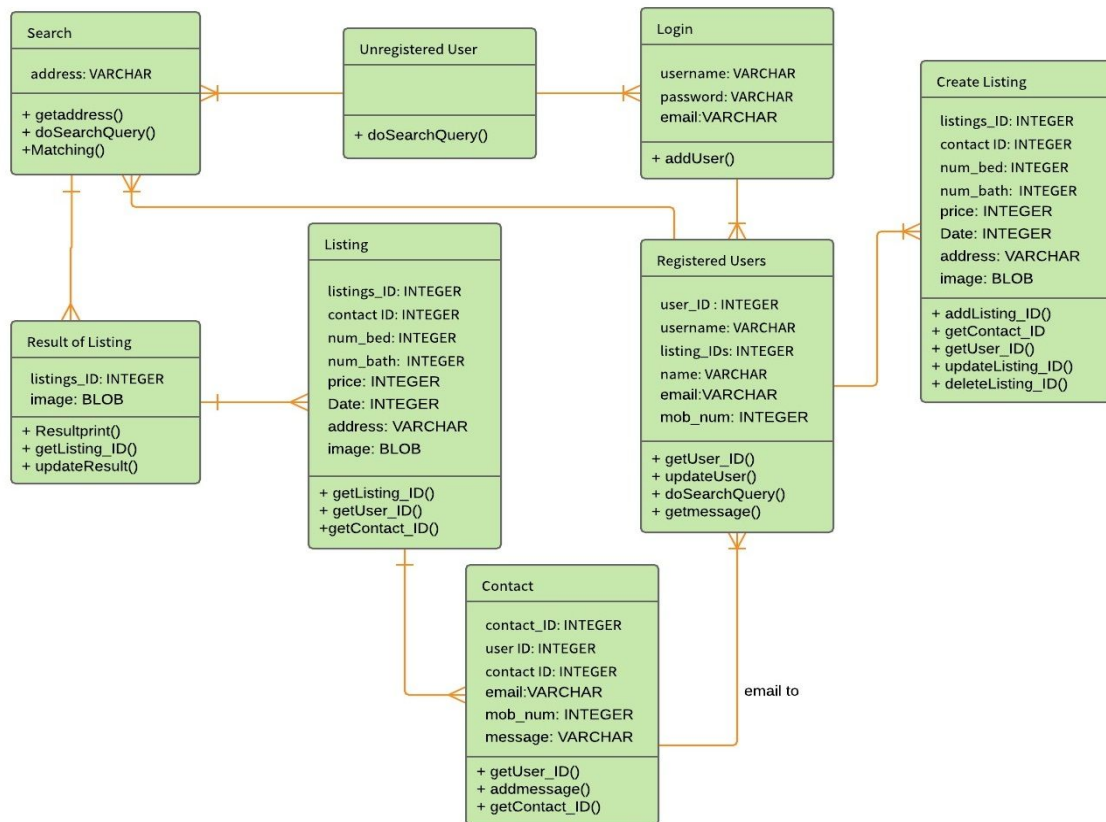
Control – Uses Node.js for control

- Search Module
  - Parse the “name of the location” string and categorize them into ‘street’, ‘city’, ‘zip\_code’ and ‘state’ and search houses based on similar street, city, zip and/or state and information will be sent to “View” section of the codes
  - Will use % wildcard to roughly output result that contains the certain keyword
- Listing Module
  - Generate a new page for the new listing of a house/apartment and the result will be sent to the “View” section of the codes
- Contact Module
  - Email the seller/renter the information given by potential renter/buyer, which the information will be
    - Name
    - Contact e-mail (optional)
    - Contact phone number

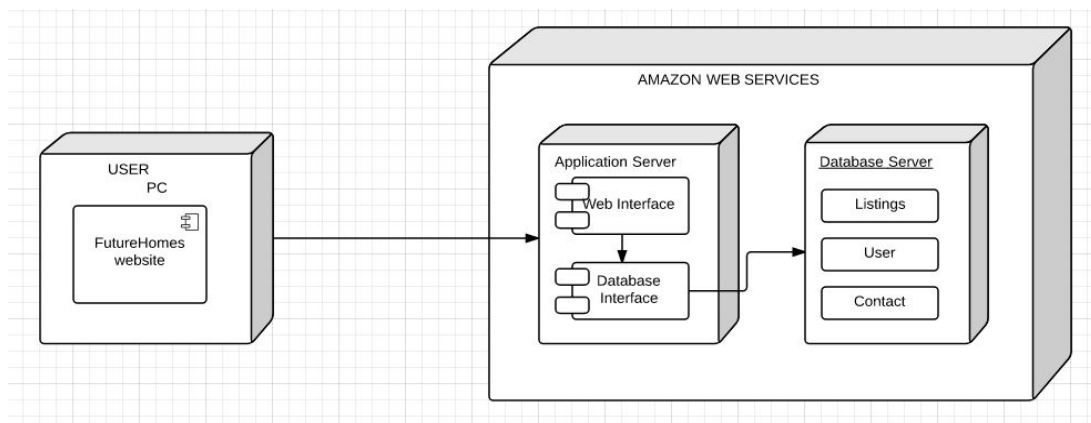
- Message
- Create Login Module
  - Generate an account by the given information
    - User name
    - Password
    - Employee name
    - Organization
    - Employee ID
- Login Module
  - Pulls user information and allows modifications to the user account and send user information to “View”

## 5. High Level UML Diagrams

### a) UML Class Diagram



### b) Component Diagram and Deployment Diagram



## 5. Key Risks

### i. Skills

1. MySQL, BLOBS, and Node.js are all new to our team. We have read about them as much as possible before beginning the development; however, there will always be a learning curve, therefore, a potential risk is being able to properly

### ii. Schedule

1. As long as there are checkpoints and smaller sub-projects each week, the scheduling of this project should have no risks.

### iii. Technical

1. There should be no technical risks unless a third party host is having difficulty with the server (i.e. Amazon Cloud).

### iv. Teamwork

1. It is a difficult task for multiple software engineers to work together on one final product due to the many conflicting opinions that will ensue. As of right now, there is difficulty on getting a prototype to work; therefore, a risk is that team members will try to do a task on their own.

### v. Legal/content

1. There are no huge risks for legality in this project. We will ensure that the pictures of homes are not copyright and/or we have permission to use them. The format of a real estate website does not have a patent on it so we may use the same format as other websites freely.

# Software Engineering CSC 648/848

Section 01 Fall 2017

Future Homes Real Estate

Team 10

*Team Lead:* Raymie Michael

*Email:* rmichael@mail.sfsu.edu

Sohaib Syed

Dilraj Singh

Justin Zhu

Peter Cruz

Mrinalini Garre

## Milestone 4

December 8, 2017

Date Submitted	December 8, 2017
Date Revised	

## **1. Product Summary**

Our website is called Future Homes, and what makes our website special is that, it is user friendly. Our website is about browsing for homes and exploring the property details and these are our P1 functions:

1. All the guests are prompted to enter a city or zip code into the search bar to look for the listings in the area.
2. If guests enter an invalid address then the search bar will give the user suggestions of the correct addresses which is similar to the invalid address.
3. Guests have access to a features bar which will further sort the listed homes.
4. Guest have access to our team names and their details who put the website together, under contact.
5. Guests can sort the homes from lowest to highest price, highest to lowest price, or most to least amount of rooms.
6. Guests can access to information about the listings' real estate agent.
7. Guests can view details about the houses such as: house picture, address, and value of the house.
8. Sellers have an inbox of forms which are submitted by potential buyers.
9. Sellers can contact the buyers who are interested in their listings by sending them a form.
10. The admin have the ability to delete any property listings.
11. Sellers are required to register before uploading any sort of listings.
12. Our website provides property details and location of a map.
13. Our website has a login and signup option for buyers and sellers.

14. Guests and registered sellers will be able to contact real estate agents.
15. Future Homes' website provides list homes, rooms for rent, pieces of land, condominiums, apartments, and townhomes that are available or have been recently sold.

## 2. Usability Test Plan

### Future Homes' Usability Test Plan on Search Function

#### *Test Objectives:*

To obtain constructive user feedback regarding the search for listings function on our website.

To determine if the search by zip code or city feature is correctly working and gathering the relevant results.

To determine if the query has sufficient error checking.

To determine if the correct number of listings that a search required is displayed on the listings page.

#### Test Plan

#### *System setup:*

Laptop computers or desktops with Windows or Mac OS operating systems using latest Chrome and Safari browsers.

#### *Starting point:*

Future Homes is open. ([sfsuse.com/fa17g10/](https://sfsuse.com/fa17g10/))

#### *Tasks to be Accomplished:*

Attempt to enter an invalid zip code.

Attempt to enter an invalid city.

Enter San Francisco and acquire x listings in San Francisco along with listings in similarly named locations.

Enter "Sam Fransisco" and still acquire x listings in San Francisco or similar locations.



Enter 94066 and acquire x listings in San Bruno along with listings in similarly named cities.

Enter “9406” and still acquire x listings in San Bruno or similar locations.

Enter California and acquire all listings in California.

*Intended User:*

There will be six mock users of Future Homes; all of whom have basic computer skills. They will be representing the intended users. The intended users are people wishing to buy real estate and browse real estate.

*Questionnaire:*

1. It was easy to locate and use the search function.

☐ Strongly disagree ☐ Disagree ☐ Neither agree nor disagree ☐ Agree ☐ Strongly agree

2. The displayed results were relevant to my query.

☐ Strongly disagree ☐ Disagree ☐ Neither agree nor disagree ☐ Agree ☐ Strongly agree

3. The search function always understood what I was trying to type.

☐ Strongly disagree ☐ Disagree ☐ Neither agree nor disagree ☐ Agree ☐ Strongly agree

4. If you have any further comments, please write them in the space provided below.

--

### **3. QA Test Plan**

#### Future Homes' Quality Assurance Test Plan on Search Function

##### Test Objectives:

To determine if the search functionality of Future Homes is working properly.

##### Hardware Setup:

Macbook Pro

System Type: macOS Sierra version 10.12.16

Processor: 2.4 GHz Intel® Core TM i5

##### Software Setup:

Google Chrome Browser version 62.0.3202.94

##### Feature to be Tested:

The feature to be tested is searching for listings using the provided search bar on the home page. The intended results are listings which contain the searched city or zip code or a similar interpretation. The results are to be listed on the listings page and it should indicate how many listings have appeared in the search.

	Description	Test Input	Expected Output	Pass/ Fail
1	To test search by zip code (Browser: Safari)	Enter "94016" in the search box and click the search button.	The search page should display searches under "Search Results" 1. 1600 Holloway Ave, San Francisco, CA 94132. Size: 1,200 square feet. 3 bedrooms, 2 bathrooms. Price: \$1,200,000. 2. 2130 Fulton St, San Francisco, CA 94117, Size: 1,900 square feet, 4 bedrooms, 3 ½ bathrooms, \$2,750,000.	Pass
2	To test search by city (Browser: Chrome)	Enter "Palo Alto" in the search box and click the search button.	The search page should display searches under "Search Results" 3. 3330 College Drive, San Bruno, CA 94066. Size: 990 square feet. 2 bedrooms, 1 bathroom. Price: \$1,200,000.	Pass
3	To test search by State (Browser: Safari)	Enter "CA/ California" in the search box and click the search button.	The search page should display searches under "Search Results" 4. 1700 W. Hillsdale Boulevard San Mateo, CA 94402. Size: 1,100 square feet. 3 bedrooms, 2 ½ bathrooms. Price: \$1,300,00	Pass

## 4. Code Review

### Coding Styles

Four space indentation

The opening bracket is to be placed at the end of the first line

The closing bracket is to be placed on a new line, else statements excluded

Commenting throughout simple, smaller pieces of code

A header with short summary in complex pieces of code that serve important role

Camelcase for names and variables

NodeJS:

Short lines are better than lines that are too long

HTML

All tags and attributes should be in lowercase

*Code Review Emails:*

milestone 4 code review



Inbox x



Peter Cruz

to me

=====  
**routes/listingsRouter.js**  
=====

```
const express = require('express')
var router = express.Router();

const listingsController = require('../controllers/listingsController');

router.get('/', (request, response) => {
  response.redirect('/');
});

router.get('/searchResults', listingsController.searchListings);


module.exports = router;
module.exports = router;
```

=====  
**controllers/listingsController.js**  
=====

```
const searchListings = (request, response) => {
  let city = '%' + request.query.searchValue + '%';
  let zipCode = '%' + request.query.searchValue + '%';
  let sql = 'SELECT * FROM all_listings WHERE city LIKE ? OR zip_code LIKE ?';

  connection.query({
    sql: sql,
    values: [city, zipCode]
  }, (error, results) => {
    if(error) {
      throw error;
    } else {
      response.send({results});
    }
  });
};

module.exports = {
  searchListings
};
```

**Raymie Michael** <raymiemichael96@gmail.com>

4:52 PM (1 hour ago) ☆ ↶ ▼

to Peter ▾

Hello Peter,

Thank you for sending me your code for review. The format looks good and follows our coding standards. The naming of variables is clear, the opening and closing brackets are in the correct places. One thing is just that there should be a brief description about what this code is doing in the header.

...

-Raymie

*Edited Code:*

---

---

**routes/listingsRouter.js**

**This performs the action of displaying the listings page after a search.**

---

---

```
const express = require('express')
var router = express.Router();

const listingsController = require('../controllers/listingsController');

router.get('/', (request, response) => {
  response.redirect('/');
});

router.get('/searchResults', listingsController.searchListings);

module.exports = router;
```

---

---

**controllers/listingsController.js**

**This will fetch listings from the database that are similar to user's query.**

---

---

```
const searchListings = (request, response) => {
  let city = '%' + request.query.searchValue + '%';
  let zipCode = '%' + request.query.searchValue + '%';
```

```
let sql = 'SELECT * FROM all_listings WHERE city LIKE ? OR zip_code LIKE ?';
```

```
connection.query({  
  sql: sql,  
  values: [city, zipCode]  
}, (error, results) => {  
  if(error) {  
    throw error;  
  } else {  
    response.send({results});  
  }  
});  
};
```

```
module.exports = {  
  searchListings  
};
```

## 5. Self-Check: Best Practices for Security

List major assets you are protecting

- We are protecting the realtor's account information, including their first name, last name, username, and password.
- We are protecting the listings that are currently in the database.
- We are protecting the dashboard that the realtor can view. This is to ensure that no one but the realtor can view the listings and messages that they have with prospective homeowners.
- The privacy of all users shall be protected.

Confirm that you encrypt PW in the DB

- We have encrypted the password in the database.

Confirm Input data validation (list what is being validated and what code you used) –  
we request you validate search bar input;

- We have validated the input data.

## **6. Self-Check: Adherence to Original Non-Functional Specs**

Copy all original non-functional specs as in high level application document published at the very beginning of the class and then for each say DONE if it is done (which is expected and required); ON TRACK if it is in the process of being done and you are sure it will be completed on time; or ISSUE meaning you have some problems and then explain it.

Note: you must adhere to all original non-functional specs as published in the original high level specification document. Failure to do so may cause reduced grade

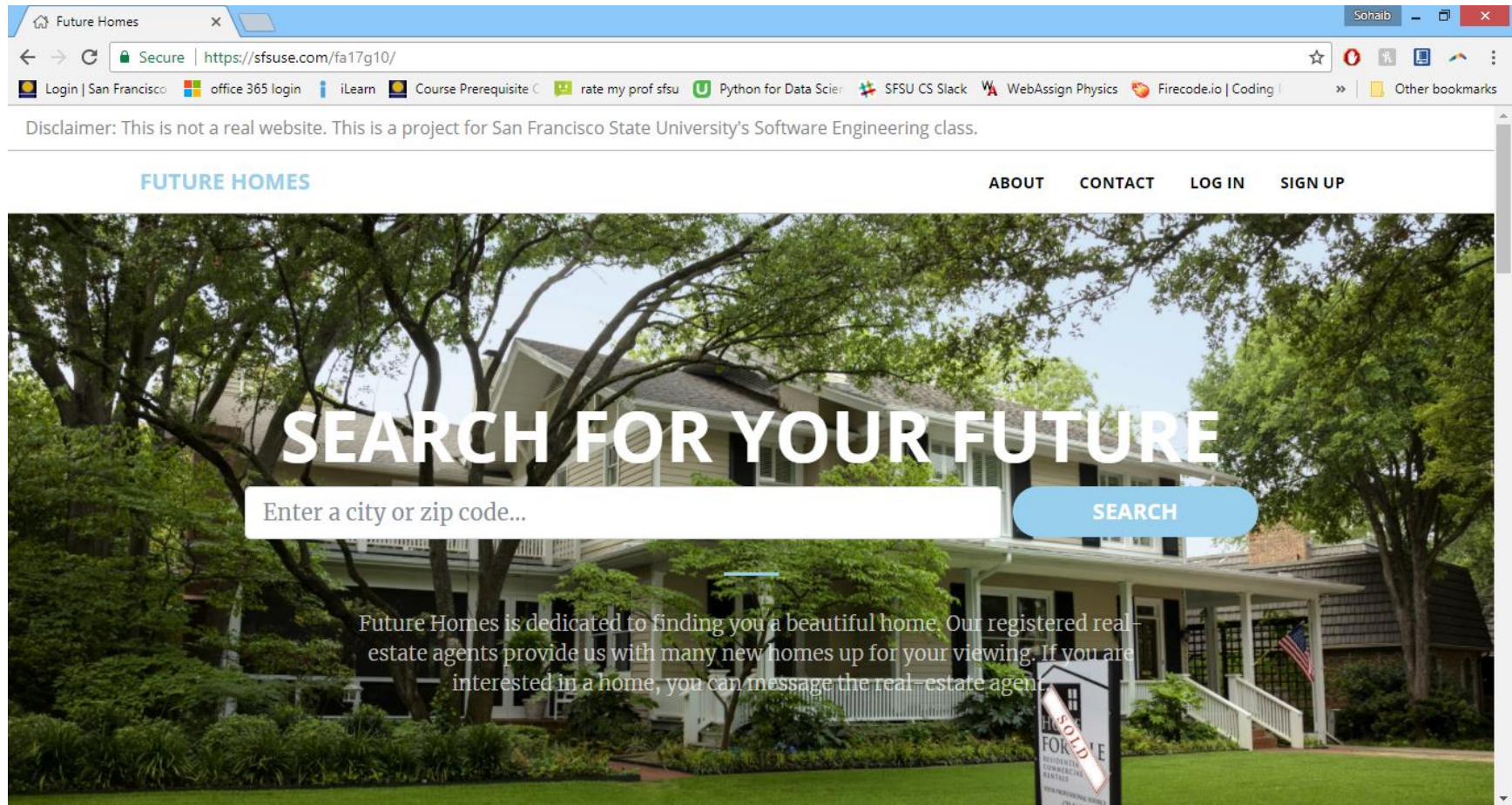
1. Application shall be developed and deployed using class provided deployment stack: ON TRACK.
2. Application shall be developed using pre-approved set of SW development and collaborative tools provided in the class. Any other tools or frameworks must be explicitly approved by Anthony Souza on a case by case basis: DONE.
3. Application shall be hosted and deployed on Amazon Web Services as specified in the class: ON TRACK.
4. Application shall be optimized for standard desktop/laptop browsers e.g. must render correctly on the two latest versions of all major browsers: Mozilla, Safari, Chrome: ON TRACK.
5. Application shall have responsive UI code so it can be adequately rendered on mobile devices but no mobile native app is to be developed: DONE.
6. Data shall be stored in the MySQL database on the class server in the team's account: DONE.
7. Application shall provide real-estate images and optionally video: DONE.



8. Maps showing real-estate location shall be required: ON TRACK.
9. Application shall be deployed from the team's account on AWS: ON TRACK.
10. No more than 50 concurrent users shall be accessing the application at any time: ON TRACK.
11. Privacy of users shall be protected and all privacy policies will be appropriately communicated to the users: DONE.
12. The language used shall be English: DONE.
13. Application shall be very easy to use and intuitive. No prior training shall be required to use the website: ON TRACK.
14. Google analytics shall be added: ON TRACK.
15. Messaging between users shall be done only by class approved methods and not via email clients in order to avoid issues of security with e-mail services: ON TRACK.
16. Pay functionality (how to pay for goods and services) shall not be implemented: DONE
17. Site security: basic best practices shall be applied (as covered in the class): ON TRACK.
18. Modern SE processes and practices shall be used as specified in the class, including collaborative and continuous SW development: ON TRACK.
19. The website shall prominently display the following text on all pages *"SFSU Software Engineering Project, Fall 2017. For Demonstration Only"*. (Important so as to not confuse this with a real application): DONE.

# Screenshots of actual final product

## Home Page:



# Search Results Page

Future Homes-Listings

Sohaib

Secure

https://sfsuse.com/fa17g10/listings/searchResults?searchValue=San+Francisco

☆

🔍

📄

🌐

⋮

Login | San Francisco

office 365 login

iLearn

Course Prerequisite

rate my prof sfsu

Python for Data Scier

SFSU CS Slack

WebAssign Physics

Firecode.io | Coding |

»

Other bookmarks


Disclaimer: This is not a real website. This is a project for San Francisco State University's Software Engineering class.

FUTURE HOMES

LOG INSIGN UP

## Search Results

your search resulted in 10 listings



### Alcatraz Island, San Francisco, CA 94133


3707 square feet

6 bedrooms

6 bathrooms

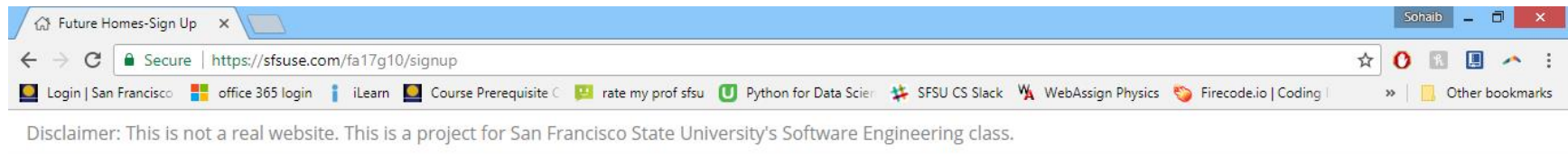
\$5000000

[VIEW DETAILS](#)



### 55 Music Concourse Dr. San

# Sign-Up Page



FUTURE HOMES

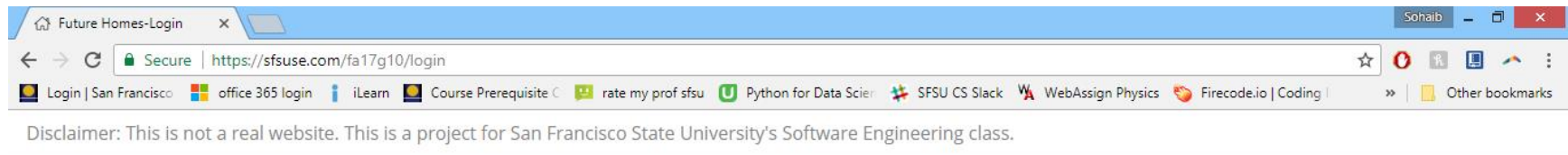
LOG IN

A sign-up form is centered on the page, overlaid on a blurred background image of a two-story house with a green lawn. The form consists of the following elements:

- The word "WELCOME!" in bold, white, uppercase letters.
- A white rectangular input field with the placeholder text "Name".
- A white rectangular input field with the placeholder text "Username".
- A white rectangular input field with the placeholder text "Password".
- A light blue rounded rectangular button with the text "SIGN UP" in white, uppercase letters.

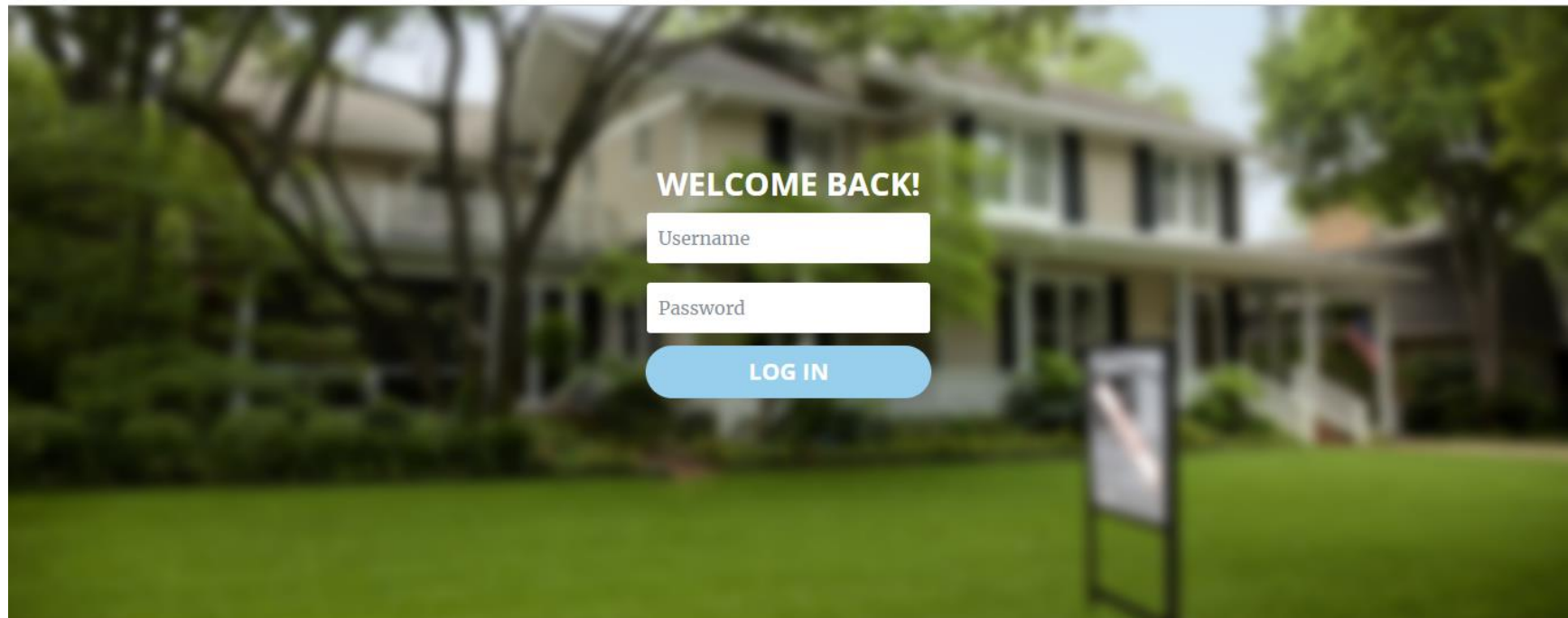


# Sign-In Page



FUTURE HOMES

SIGN UP



# Account Overview Page

Future Homes-Dashboard

Secure | https://sfsuse.com/fa17g10/dashboard/1?

Login | San Francisco office 365 login iLearn Course Prerequisite C rate my prof sfsu Python for Data Scier SFSU CS Slack WebAssign Physics Firecode.io | Coding | Other bookmarks

Disclaimer: This is not a real website. This is a project for San Francisco State University's Software Engineering class.

FUTURE HOMES

Messages

Peter

peter@peter.com

Hi, I would like more information.

Raymie

raymie@raymie.com

Hi, I would like to see the house.

Justin

justin@justin.com

Your Listings

UPLOAD

Alcatraz Island

VIEW DETAILS

240 California St

VIEW DETAILS

2889 Mission St

VIEW DETAILS

# Workbench Screenshots of Your Actual DB

## Workbench User Account

The screenshot displays the MySQL Workbench interface. The 'Navigator' pane on the left shows the 'fa17g10' database with tables including 'all\_listings', 'image\_table', 'listings', 'messages', and 'user\_accounts'. The 'Schemas' pane shows the 'fa17g10' database. The 'Table: all\_listings' is selected, and its columns are listed: id, belong\_to\_user\_id, street, city, state, zip\_code, price, bedrooms, bathrooms, and square\_footage. The 'Table: user\_accounts' is selected, and its columns are listed: id, account\_name, pass, first\_name, and last\_name. The 'Columns' tab is active, showing the table structure for 'fa17g10.user\_accounts'.

Column	Type	Default Value	Nullable	Character Set	Collation	Privileges	Extra	Comments
id	int(11) unsigned		NO			select,insert,update,references	auto_increment	
account_name	varchar(255)		NO	latin1	latin1_swedish_d	select,insert,update,references		
pass	varchar(255)		NO	latin1	latin1_swedish_d	select,insert,update,references		
first_name	varchar(255)		NO	latin1	latin1_swedish_d	select,insert,update,references		
last_name	varchar(255)		NO	latin1	latin1_swedish_d	select,insert,update,references		

Count: 5 Refresh

# Workbench Data Listings

MySQL Workbench

future\_homes x

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHEMAS

Filter objects

fa17g10

- Tables
  - all\_listings
  - image\_table
  - listings
  - messages
  - user\_accounts
- Views
- Stored Procedures
- Functions

Management Schemas

Information

Table: all\_listings

Columns:

id	int(11) UN AI PK
belong_to_user_id	int(11) UN
street	varchar(255)
city	varchar(45)
state	varchar(255)
zip_code	int(11) UN
price	int(11) UN
bedrooms	int(11) UN
bathrooms	int(11) UN
square_footage	int(11) UN

Object Info Session

Query 1 listings all\_listings all\_listings - Table fa17g10.all\_listings x

Info Columns Indexes Triggers Foreign keys Partitions Grants DDL

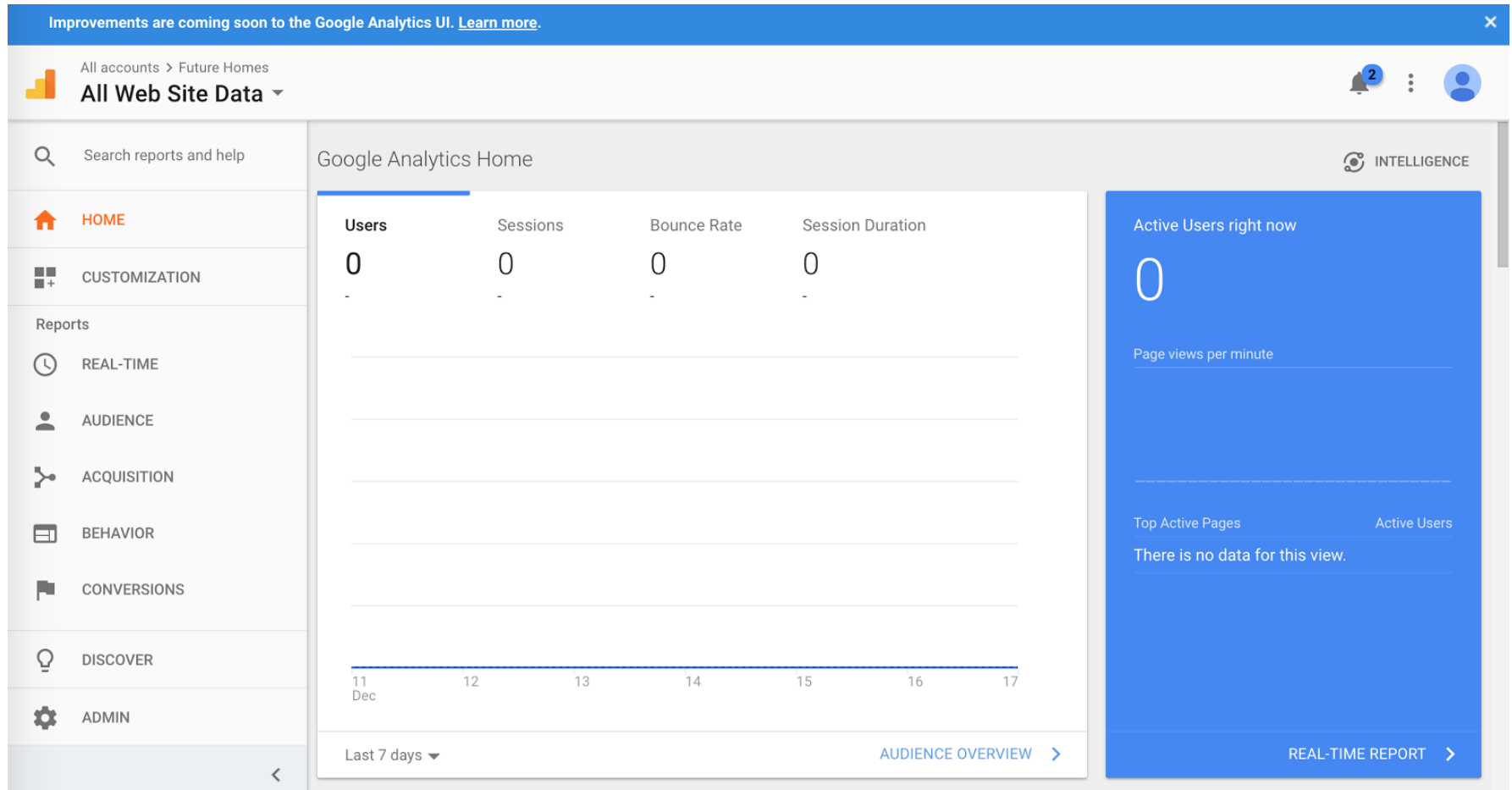
Column	Type	Default Value	Nullable	Character Set	Collation	Privileges	Extra	Comments
id	int(11) unsigned		NO			select,insert,update,references	auto_increment	
belong_to_user_id	int(11) unsigned		NO			select,insert,update,references		
street	varchar(255)		NO	latin1	latin1_swedish_d	select,insert,update,references		
city	varchar(45)		NO	latin1	latin1_swedish_d	select,insert,update,references		
state	varchar(255)		NO	latin1	latin1_swedish_d	select,insert,update,references		
zip_code	int(11) unsigned		NO			select,insert,update,references		
price	int(11) unsigned		NO			select,insert,update,references		
bedrooms	int(11) unsigned		NO			select,insert,update,references		
bathrooms	int(11) unsigned		NO			select,insert,update,references		
square_footage	int(11) unsigned		NO			select,insert,update,references		

Count: 10 Refresh

Windows Taskbar: Type here to search, 14:33, 16-12-2017



# Google Analytics Plot for your WWW Site



# Team Member Contributions



**Raymie Michael**

to Peter, jzhu9, dsingh2, ssyed, Gml ▾

4:04 PM (39 minutes ago) ☆



As Team Lead, I was in charge of keeping everyone moving, although luckily the team members were motivated enough to do so on their own. I was in charge of a lot of the documentation and dividing of tasks. Setting up times to meet, submitting all documents, etc. Since I did not know much about the back end, I did not touch that at all. The front end is where I made all of my contributions. I made a total of 142 commits on Github.

...



**Justin Young Sheng Zhu** <jzhu9@mail.sfsu.edu>

to Raymie, Peter, Dilraj, Sohaib, Gml ▾

4:19 PM (23 minutes ago) ☆



As a backend lead, I feel like I haven't enough to deserve that title. Most of the work are contributed by my backend team member Peter Cruz. I did point out a few a few directions at the beginning of the semester and I programmed milestone 1. I was set up to do the sign up and login back end functionality. Peter, however, connected everything backend and frontend together and also completed searching and upload. He also organized the entire project into model view control. In in all, my contributions were login and signup, and milestone 1.

---

**From:** Raymie Michael <[raymiemichael@gmail.com](mailto:raymiemichael@gmail.com)>

**Sent:** Monday, December 18, 2017 4:04:08 PM

**To:** Peter Cruz; Justin Young Sheng Zhu; Dilraj Singh; Sohaib H Syed; Gml Mrinalini

**Subject:** Peer Reviews

...



**Sohaib Syed** <[sohaibhsyed@gmail.com](mailto:sohaibhsyed@gmail.com)>

to Justin, Raymie, Peter, Dilraj, Sohaib, Gml ▾

4:20 PM (23 minutes ago) ☆



As Front End Lead, I was in charge of the design and implementation of the User Interface and the User Experience of our product. I developed a front end that was suitable for connecting to our back end by the back end team. I also assisted with the documentation of our product development. I made a total of 13 commits on GitHub, and all those commits were for the front end.

...



**Peter Cruz**

to me, Justin, Raymie, Dilraj, Sohaib, Gml ▾

4:29 PM (14 minutes ago) ☆



Hello Team,

### **Built vertical prototype**

#### **Designed overall architecture of the application**

##### **Database**

- Helped design schema
- Configured database on server
- Inserted data into database tables

##### **Implementation - 151 total commits**

- Connected multiple modules into single application
- Express routes
- Search module
- Upload module
- Controller layer
- Model layer
  - Layer that interfaces with database
  - Wrote all SQL queries
- Connected front end to back end
  - Generated dynamic html code, using EJS
  - Data flow from front end to back end to database and back

#### Quality Assurance

- Manual testing of application functionality
- Troubleshoot and fixed bugs
  - Styling and scripting files not loading on server
  - Static files not loading on server (i.e. images)
  - Buttons that did not fire correct route

#### GitHub master

- Managed development branches
- Merged feature development branches
- Resolved merge conflicts

#### Deployment

- Managed deployment of application onto Google Server

-Peter Cruz

---

**From:** Sohaib Syed <[sohaibhsyed@gmail.com](mailto:sohaibhsyed@gmail.com)>

**Date:** Monday, December 18, 2017 at 4:20 PM

**To:** Justin Young Sheng Zhu <[jzhu9@mail.sfsu.edu](mailto:jzhu9@mail.sfsu.edu)>

**Cc:** Raymie Michael <[raymiemichael@gmail.com](mailto:raymiemichael@gmail.com)>, Peter Cruz <[pcruz1@mail.sfsu.edu](mailto:pcruz1@mail.sfsu.edu)>, Dilraj Singh <[dsingh2@mail.sfsu.edu](mailto:dsingh2@mail.sfsu.edu)>, Sohaib H Syed <[ssyed@mail.sfsu.edu](mailto:ssyed@mail.sfsu.edu)>, Gml Mrinalini <[gmlmrinalini@gmail.com](mailto:gmlmrinalini@gmail.com)>

**Subject:** Re: Peer Reviews



**Gml Mrinalini**

4:35 PM (9 minutes ago) ☆



to Raymie, Peter, jzhu9, dsingh2, ssyed ▾

Hi everyone,

I am a backend as well as front end team member. I did my part in milestones according to the work divided by us. I did the messaging part in backend but later peter refactored it according to the architecture. As node is new to me, it was hard for me to implement the coding. I did Google Maps API. I fixed some bugs in the backend. I made a total of 10 commits on Github.

...



**Dilraj Singh**

4:38 PM (6 minutes ago) ☆



to Gml, Raymie, Peter, Justin, Sohaib ▾

As a front end developer, I was responsible for helping out with designing the front end. I mainly worked on documentations and stucked with front end designs such as maps, nav bar and etc. I was responsible for creating listing addresses and perform QA test cases on the website to see, if everything is working properly. I made a total of 13 commits on Github.

---

**From:** Gml Mrinalini <[gmlmrinalini@gmail.com](mailto:gmlmrinalini@gmail.com)>

**Sent:** Monday, December 18, 2017 4:35:32 PM

**To:** Raymie Michael

**Cc:** Peter Cruz; Justin Young Sheng Zhu; Dilraj Singh; Sohaib H Syed

**Subject:** Re: Peer Reviews

...

# **Post Analysis – Lessons Learned**

The development of Future Homes was an extremely difficult task. Mistakes were made, new technologies were explored, friends were formed, and four tedious months later, a product was developed. Indeed, there were many challenges that our team faced, and the hardest part of those challenges was solving them. Perhaps the biggest challenge that we as a team faced was adjusting to each other's work ethics. At the end of it all, the team members developed new qualities that can be used for the rest of their lives. Some of the team members were always pushing for getting the task at hand done as soon as possible, while other team members were prepared to begin working on the assignment the day before the deadline. Indeed, adjusting to each other's work ethic was the hardest part of developing Future Homes. However, without this challenge, we wouldn't have learned how to effectively work as a team. We learned to find a middle ground, where we finished deadlines well before the deadline, leaving us time to troubleshoot errors. Next time, what I would do differently is that I would implement strict deadlines for my group members. If they didn't complete the work in the required time period, I would give them a strike. Once a team member reaches three strikes, I would have a serious talk with them about their work ethic. It was not unusual for one team member to be doing a lot of the work while others were not concerned with the project. At the end of it all, the team members have all learned how to work with a large group and we now have new skills such as mySQL, nodejs, ejs, etc. In the future, it would be wise to check in with the CEO and CTO more often when we have questions. It was usually up to the team leads to resolve issues because we did not take advantage of the great help. Also, it would be wise to speed up the technical aspect of the website. There was a lot of time spent with documentation rather than developing the product. This was helpful, however, in building stronger work ethics and teamwork.