

# Project Requirements Document V2

Sponsor: AppFolio

Team: The Exceptional Null Pointers

Project: R.E.A.L.M.

(Real Estate Application & Listing Manager)

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## Introduction

What is the problem? What is the background of the problem?

Finding a perfect place to live in the Santa Barbara area has become more and more challenging recently. With so many different sites to comb through, people to contact, and other external variables, the process is not made any easier. Clients have to spend time scrolling through pages of rental listings on multiple websites, everything from Zillow to Craigslist to Redfin, usually keeping tabs open for many potential listings, inefficiently comparing them (ranking them manually by rent, location, etc.). In turn, this process then leads to users making multiple, repetitive accounts with redundant information, filling out rental applications for each property, having to individually contact each listing for any further questions, looking for potential matched roommates, creating a messy and unenjoyable rental application process. Ultimately, our goal is to provide a solution that streamlines this process so that users can spend less time doing tedious tasks and more time finding the perfect property.

How is the problem addressed today?

Currently, Zillow seems to have the most direct solution to this problem, where the user can look at a map of the nearby area and see where there are places open to rent. This generally works fine for finding which places have openings, but property managers have to register their listing on Zillow for it to show up; this

reliance on a single website paints an inaccurate view of the rental market, potentially leading to missed opportunities. Listings on Zillow are also often out of date, leading to wasted time. Moreover, once a client finds a listing on Zillow, they can only message the property manager through Zillow to request to apply; it would be much more convenient to simply be able to apply in the same place, without the need to create new accounts on many different websites and then having to remember all the different places they applied to. Apartments.com is another alternative, but faces the same problems as Zillow. Property managers have to register their properties, and prospective renters also have to contact the property managers as well. Our project aims to solve these problems.

## Innovations

We are focused on providing the most convenient experience for our users. To achieve this, we rely extensively on feedback. Weekly we ask prospective users for feedback, where their feedback directly influences our team's planning for the upcoming week and future sprints. Our users will find value from using our application to save time on what would usually be a tedious process. Thus, the core innovation for our application is the real world impact and convenience we offer our users.

## Core Technical Advancement

There are many existing applications allowing users to browse property listings. However, oftentimes properties will only be listed to a few of these applications, forcing users to visit many websites in order to view all available listings in a given area. Our application automates this process, and aggregates this information for the user, allowing users to only have to visit one application to view available properties in a given area. The process of aggregating such data is difficult, as there does not exist a standard for data representation amongst such existing applications. Therefore, aggregated data often has missing information, this is where we step in and find the relevant missing information for a property.

## Objective, Implementation, and Assumptions

What is our objective and who will benefit from it?

We will create a web application, R.E.A.L.M. (Real Estate Application and Listing Manager), which is essentially a one-stop-shop for prospective renters. On R.E.A.L.M., users will be able to view all available listings aggregated from multiple rental listing websites, apply to properties, filter through properties, view properties on a map overlay, and share listings with a group of roommates. Furthermore, our solution will rate various rental listings based on price, location, and offered amenities. Lastly, we will create a universal rental form to collect the most common information so that renters won't have to fill out the majority of a new form for each property that they apply to. Our application will streamline the rental process, for both renters and property managers. We intend to improve the quality of life of everyday users by using APIs to provide the most up-to-date information regarding new houses for rent, their prices, etc.

How will we implement our solution?

R.E.A.L.M. will be implemented with a Ruby on Rails backend and a ReactJS frontend. On the backend, R.E.A.L.M. will aggregate rental listings by combining various APIs that are publicly available. On the front-end, a simple UI will be implemented so that the user can easily browse through the listings. The user will start on the homepage, where they can choose a city to view rental listings from and filter listings from there. R.E.A.L.M. will be hosted on Heroku.

## Assumptions

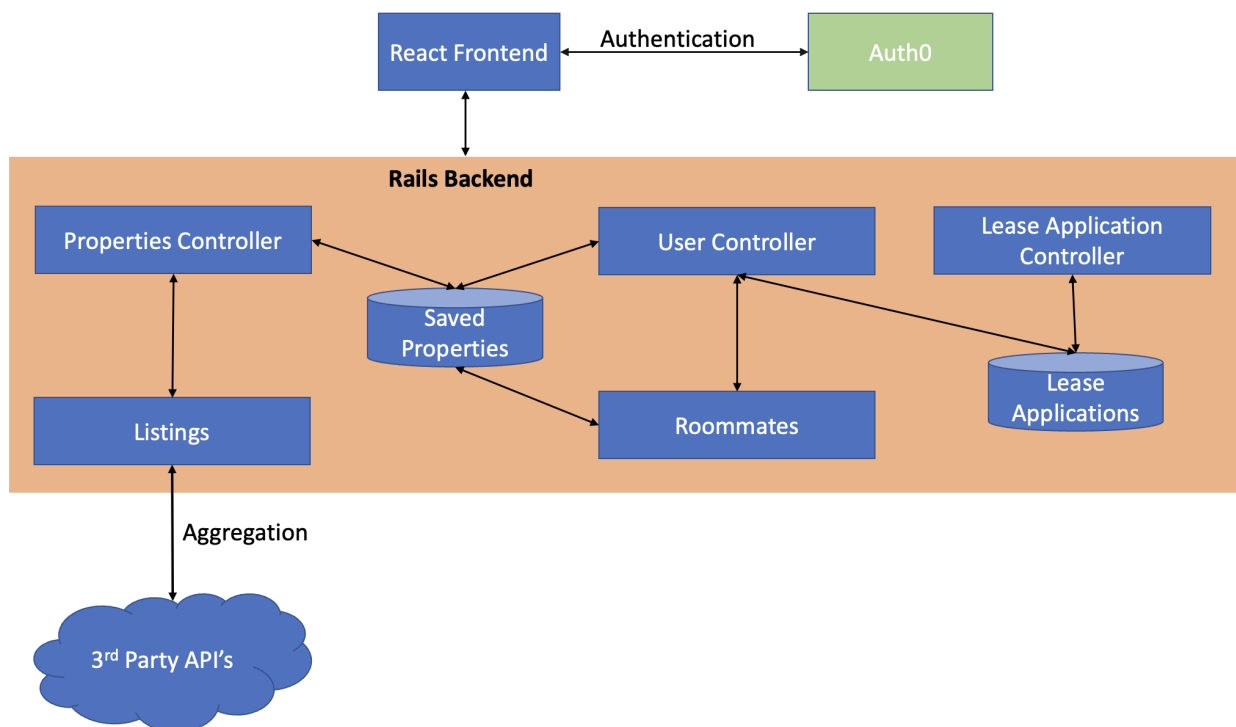
Any user that has internet access will be able to use the application. For now, R.E.A.L.M. will only aggregate data from Santa Barbara, Isla Vista, and Goleta. This is so that we can analyze the local leases that the property management companies have and automatically fill out the data for users. Users must be able to navigate through a simple directory/navigation bar system to locate different services the website provides. Finally, to create groups a user must be able to sign in and have the information of other people they intend to add.

Our application will rely on the assumption that the third-party API's will be up and running close to 100% of the time so that the application will be able to properly aggregate rental listings.

We assume that the user will use the application on a fullscreen desktop window on a recent browser version.

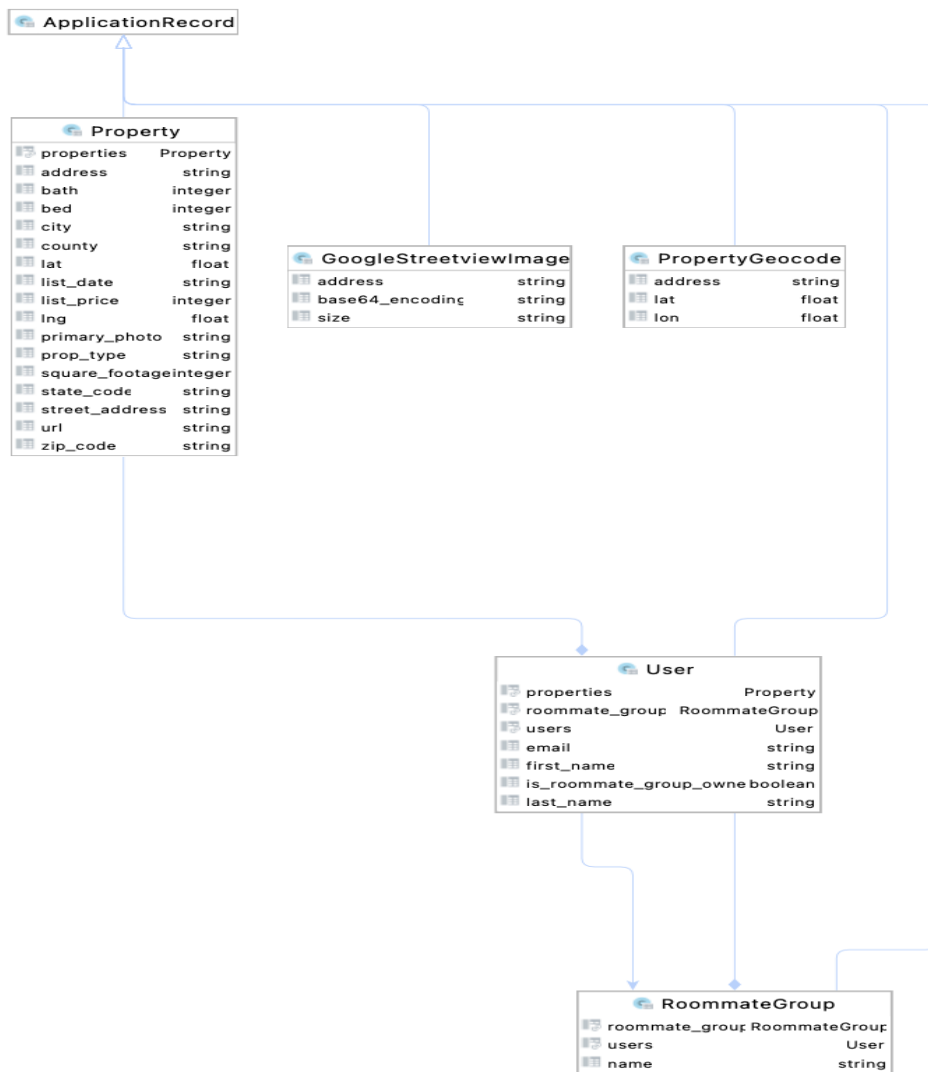
## System architecture overview

The figure below depicts the system architecture employed in our application. The user interacts with the frontend, which is designed to quickly and efficiently deliver data to the user with little to no hoops to jump through. Upon visiting the website, users are able to immediately start searching through aggregated rental listings for Santa Barbara, Goleta, and Isla Vista. All data is publicly available through the website, however, users have the ability to login to the application for a more personalized experience. Such features include saving properties, creating roommate groups, and quickly generating needed files to apply for leases based on user-inputted information.



## UML Diagrams

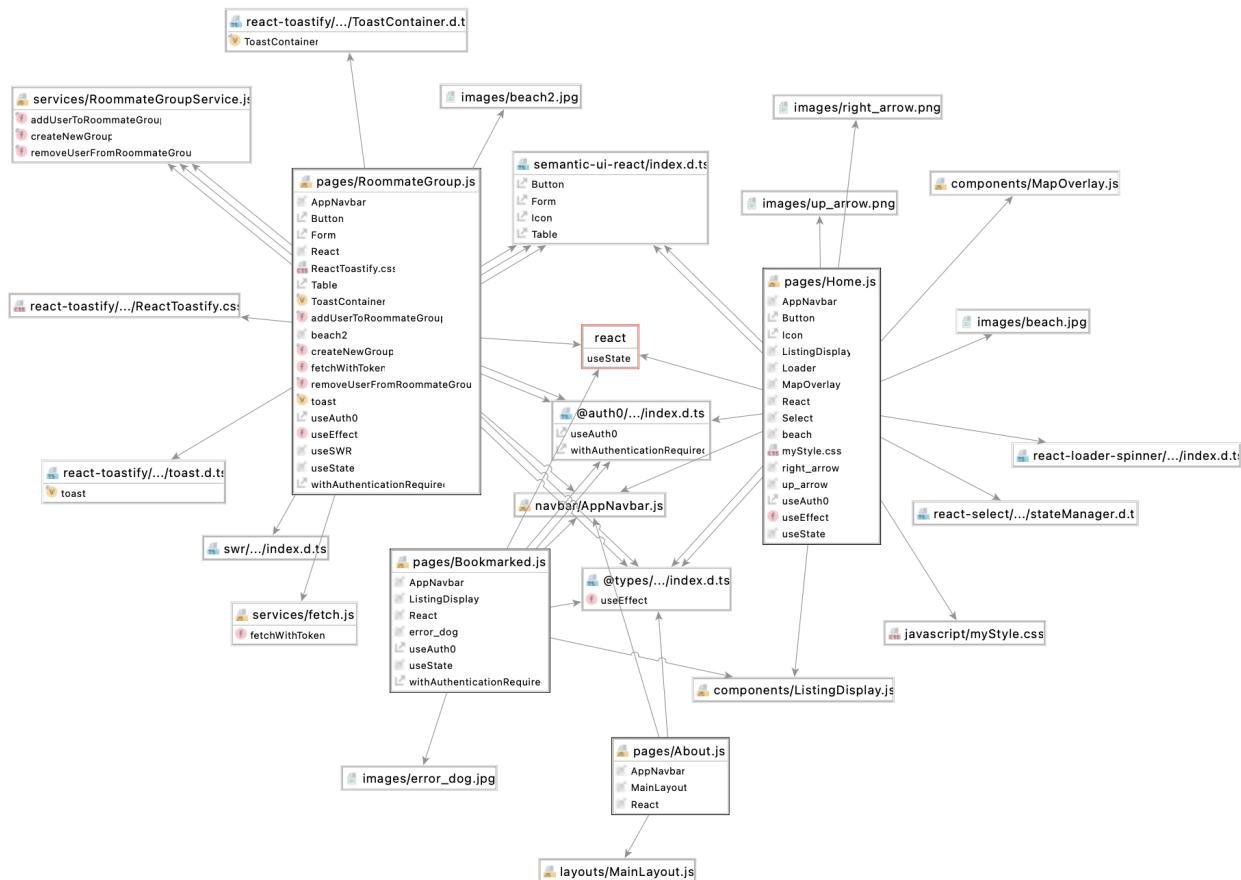
Multiple models are employed within Ruby on Rails to persist various forms of data. The following is a UML diagram outlining the ActiveRecord models currently used.





## Frontend Module Dependencies

Each page on the frontend of the application relies on many components and external libraries in order to provide a reliable and visually appealing user experience. The following is an image of the dependency graph for the various pages within the frontend portion of the application.



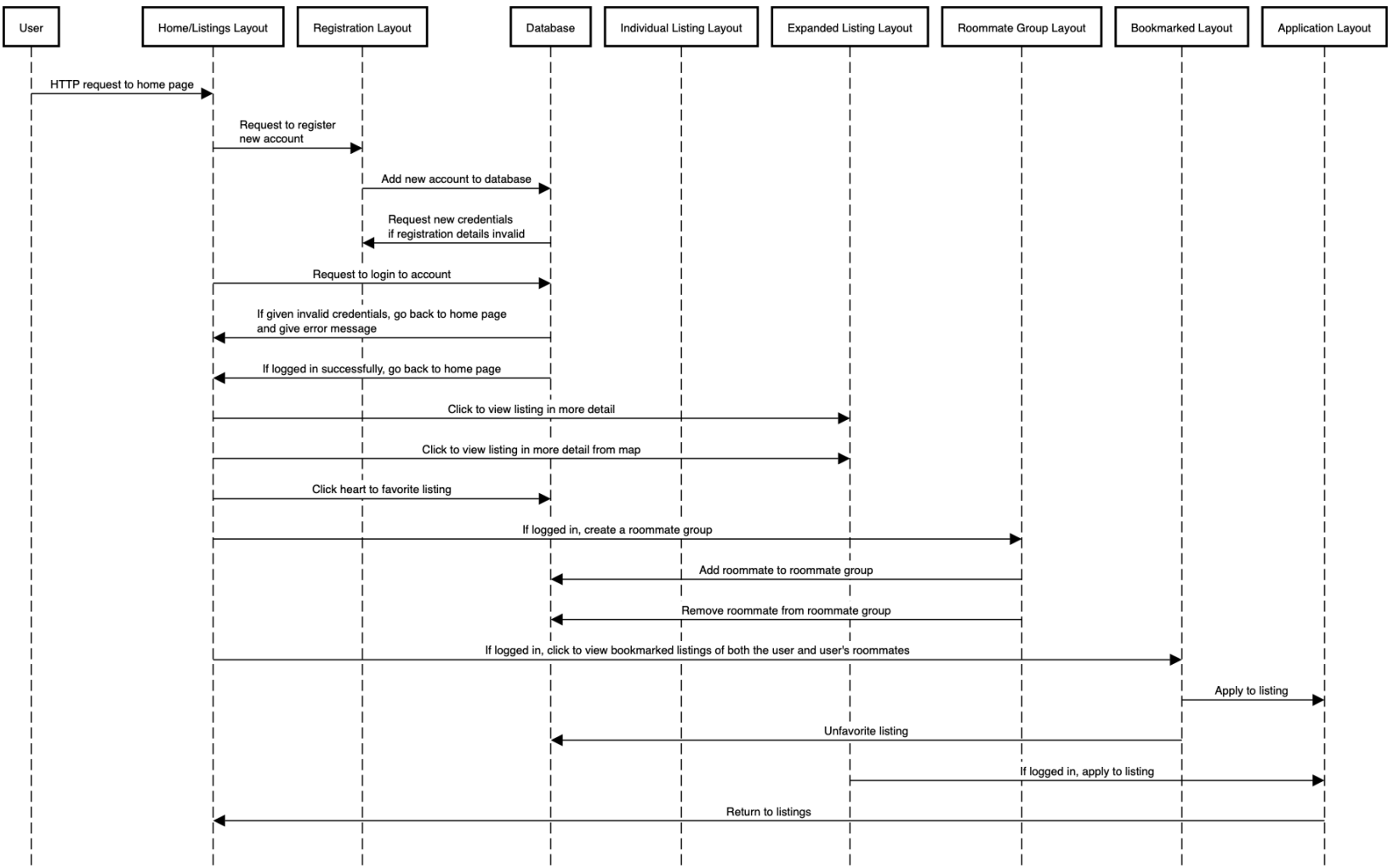
## User interaction and design

Users visit a frontend web interface allowing them to browse through aggregated rental listings in the Isla Vista, Goleta, Santa Barbara area anonymously. Users then have the option to sign into the application to save property listings for viewing later. Users also have the ability to save custom filters, so that they are able to quickly view only the property listings they are interested in. Furthermore, users will have the ability to create roommate groups, so that any saved properties are viewable by all roommates.

The application is designed to support various functions independently of one another, however, upon logging into the application, users are able to view persisted data that is relevant to them, such as saved properties and roommate groups. A stretch goal is to implement a mobile application to support both mobile and desktop users simultaneously.

# Sequential Model

R.E.A.L.M. Sequential Model



## User Stories

As a user, I am able to login to the application by clicking a login button at the top of the page which redirects me to login using my Google credentials.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/25>
- **Scenario 1:** The user clicks on the “Login” button, and the web will allow them to login through their Google account via Auth0. The new homepage has a “Welcome First\_Name\_Of\_User” message for greeting.

As a user, there is an “About” page that gives information about the application when I navigate to it.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/17>
- **Scenario 1:** The user loads the home page and then clicks the “About” tab from the navbar. The user is then able to view extra information about the functionality of the application.

As a user, I can access a toolbar/navbar that lets me navigate different pages of the website.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/19>
- **Scenario 1:** The user clicks the “Home” button or the R.E.A.L.M. logo to navigate to the home/landing page of the website that allows a user to search for listings.
- **Scenario 2:** The user clicks the “About” button to navigate to the website’s about page that allows a user to view more information about the website. I can use the Login/Logout button to do the respective function.

As a logged-in user, I can save listings for myself by clicking on an icon to save listings for myself.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/26>
- **Scenario 1:** The user is able to click on the “save” button to save the listings they want to keep a record for after logging in.

As a user, I can “search” for properties and find all rental properties instantly so that I do not have to visit multiple pages on the site.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/21>

- **Scenario 1:** The user selects a location from the dropdown menu and searches for the respective properties. If there is an error aggregating the information from the backend, the user is displayed an error message.
- **Scenario 2:** The user selects a location from the dropdown menu and searches for the respective properties. If there is no error aggregating the information from the backend, the user is displayed the property information in a styled format.

As a user, I can filter through search results to narrow down properties so that I can focus on properties that are relevant to me.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/20>
- **Scenario 1:** The user clicks on a filter button with different options for filtering properties with different attributes. If there are properties with the attributes they selected, then it displays all the properties with those attributes.

As a logged-in user, I can visit a page to create a roommate group so that I can better coordinate the process of finding a place to rent with my roommates.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/22>
- **Scenario 1:** The user clicks a button to create a group with users that allows them to share/sync properties. If a user tries to create a new roommate group when they are already in one, they encounter an error message saying that they can only be in one roommate group.

As a logged-in user I can fill in a “common application” for renters.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/24>
- **Scenario 1:** The user is able to access a page that generates/fills in a common lease application based on saved information specific to the user.

As a user, I can see the estimated “value” of a rental property, so that I know whether the property is worthwhile applying for.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/23>
- **Scenario 1:** When viewing aggregated rental listings, users are able to see a value indicator for each property or selected property.

As a logged-in user I can see a page of all my saved properties so that I can quickly view properties that interest me later.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/16>
- **Scenario 1:** The user clicks on “Saved Listings” on the navigation bar and visits the saved listings page.

As a user, I can share a link that filters rental properties, so that my roommates and I are able to view properties we are all interested in.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/18>
- **Scenario 1:** The user clicks on a link that brings them to a page that has a list of filtered listings, and the filter is the exact same as the one applied when the other user shared the link with them.

As a user, I can view aggregated properties on a Google map, so that I can see where properties are physically located.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/70>
- **Scenario 1:** After searching for properties, the user is able to see a Google Map with icons for each property.

As a user, when I select a location, the map will change its center and zoom accordingly, so that I can conveniently see the listings for the searched area and easily zoom in for closer examination if needed.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/81>
- **Scenario 1:** When the user selects any of the locations from the drop-down list, the Google Map displayed will roughly show only the selected area with appropriate location center and zoom of the area. It will be easier for the user to identify his/her ideal location through the searched map.

As a user, I am able to visit a link for each property to the original listing, so that I can get more information if needed on a given property.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/74>
- **Scenario 1:** After aggregating the properties, each property has a URL link to the original property listing.

As a user, I can see an image for each property listed in the search results, so that I can understand more about the property I'm considering renting.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/73>
- **Scenario 1:** When the user is searching for properties, they can see a picture of the property.

As a logged-in user in a roommate group, I can remove users from my roommate group.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/77>
- **Scenario 1:** The user clicks a “remove” button on the side of the roommate users view, and the roommate is removed from the group.

As a logged-in user in a roommate group, I can add users to my roommate group with their email.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/71>
- **Scenario 1:** If the user they are trying to add is not signed up on the website, the user will not be added to the roommate group.
- **Scenario 2:** If the user they are trying to add is signed up, but already in another roommate group, the user will not be added to the roommate group.
- **Scenario 3:** If the user they are trying to add is signed up, and is not already in a roommate group, then the user will be added to the roommate group.

As a user, I can view the “rating” of each property so that I can shallowly analyze a property.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/82>
- **Scenario 1:** If the user is scrolling through properties, each one will have a numerical value.

As a user, I can click on a Google Maps icon/marker and see a modal appear with the information of the house so I can see a formatted view of information.

- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/72>
- **Scenario 1:** If the user clicks on an icon that is on the map, a modal will appear with the respective information of the listings, as well as a button to exit the modal.

As a user, I can more easily read and view listings information and be able to sort the queried listings via a formatted table/list system.

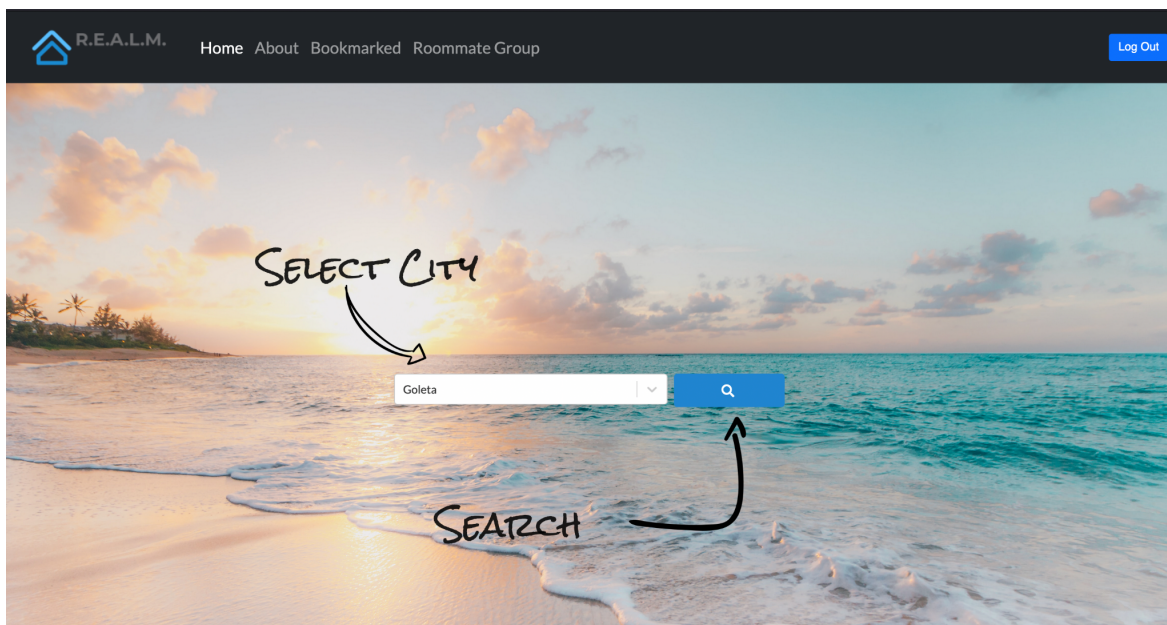
- Github Issue: <https://github.com/Realm-App/R.E.A.L.M./issues/76>
- **Scenario 1:** If a user clicks the “Address Only”, “Rent Price”, “Beds”, or “Bathrooms” option from the dropdown menu, the listings are then sorted according to the respective attribute (i.e. just the rent price, or number of bedrooms).
- **Scenario 2:** If a user clicks the button that reverses the listing order, then the listings (that may or may not already have a filter applied to it) will appear in the reversed order (i.e. ascending → descending).



## User Interface Mockups

The following images are screenshots taken directly from the application. As part of our commitment to a seamless experience for users, these user interfaces are frequently modified in order to provide the best experience for our users.

### Application homepage








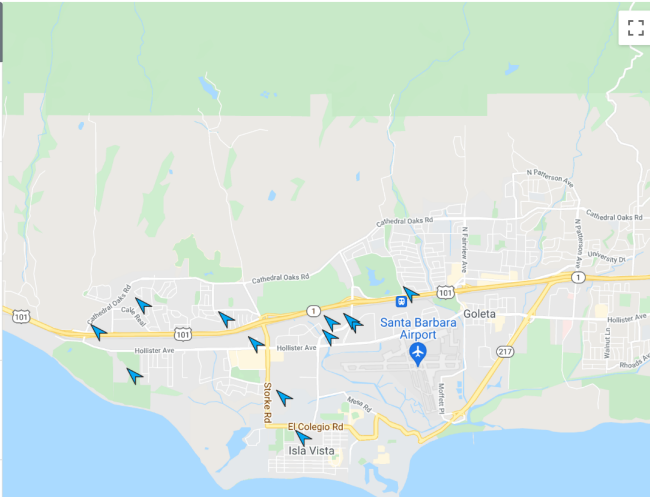
# Search results page

R.E.A.L.M. Home About Bookmarked Roommate Group [Log Out](#)


Goleta

Filter by:  Search Sort by **Address Only** [Change Sort Direction](#)







	0001 Calle Rosales, Santa Barbara, CA 93105	List Price: N/A	Beds: 2	Baths: 1	<input type="button" value="Heart"/>
	100 Baldwin Dr, Goleta, CA 93117	List Price: \$2,435	Beds: 3	Baths: 0	<input type="button" value="Heart"/>
	112 E Ortega St, Santa Barbara, CA 93101	List Price: \$4,150	Beds: 1	Baths: 1	<input type="button" value="Heart"/>
	1220 Cima Linda Ln, Santa Barbara, CA 93108	List Price: \$17,000	Beds: 4	Baths: 3	<input type="button" value="Heart"/>
	1230 Franciscan Ct				<input type="button" value="Heart"/>



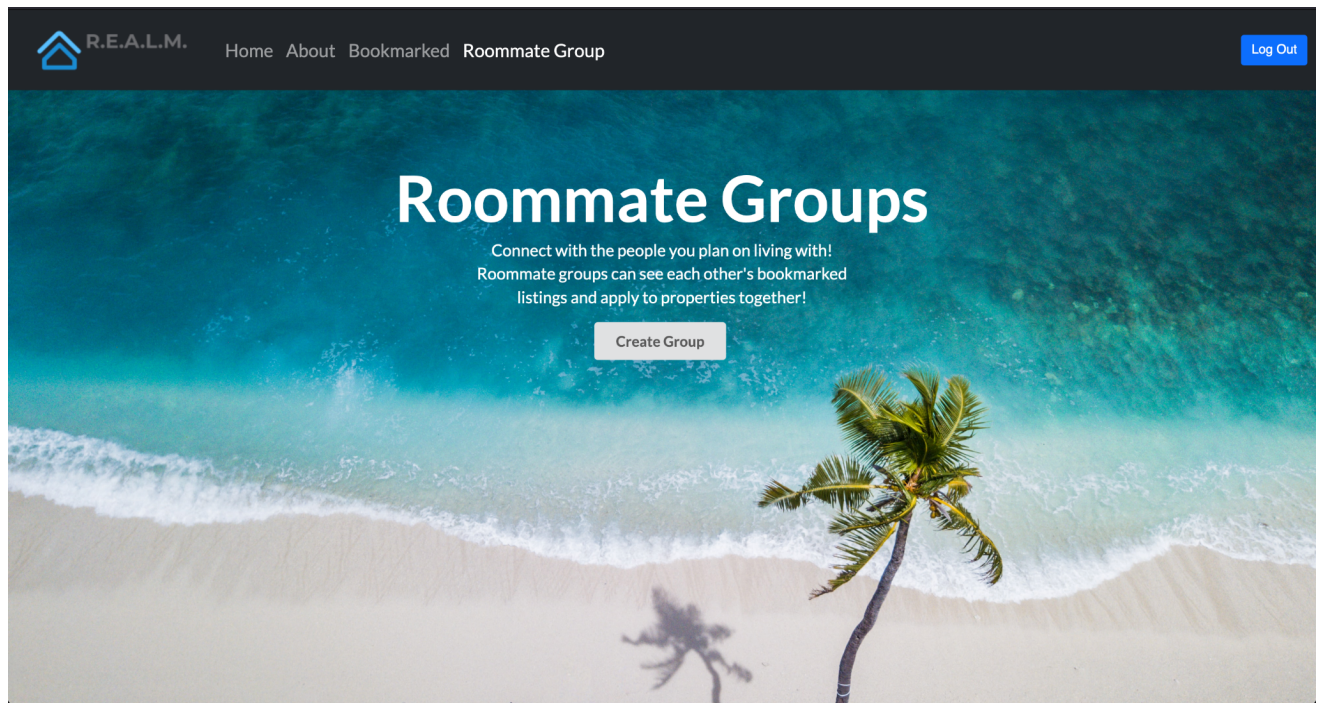
# Bookmarked page

 R.E.A.L.M. [Home](#) [About](#) [Bookmarked](#) [Roommate Group](#) [Log Out](#)

Filter by:  Sort by **Address Only** [Change Sort Direction](#)

	0001 Calle Rosales, Santa Barbara, CA 93105	List Price: N/A	Beds: 2	Baths: 1	
	100 Baldwin Dr, Goleta, CA 93117	List Price: \$2,435	Beds: 3	Baths: 0	
	112 E Ortega St, Santa Barbara, CA 93101	List Price: \$4,150	Beds: 1	Baths: 1	

## Roommate Group creation page



## Roommate Group settings page

 R.E.A.L.M. [Home](#) [About](#) [Bookmarked](#) [Roommate Group](#) [Log Out](#)

Email  [Add User](#)

Name	E-mail address	Remove User
Wade Varesio	wadevaresio@ucsb.edu	<a href="#">✕ Remove</a>
Eric Yuan	zichen_yuan@ucsb.edu	<a href="#">✕ Remove</a>
Noah Pang	noahpang@ucsb.edu	<a href="#">✕ Remove</a>
Kobe Shavolian	kobeshavolian@ucsb.edu	<a href="#">✕ Remove</a>


# About page

R.E.A.L.M. Home About Bookmarked Roommate Group [Log Out](#)

## R.E.A.L.M.


Welcome Wade to R.E.A.L.M., the Real Estate Application and Listing Manager for you!

**View listings with or without filters applied!**




We aggregate the listings and put them all in one website for your convenience. With or without filters, search to your heart's content!

**Apply to listings you like through a common form!**



Fill out a common form to reduce putting in the same boring information on each form, and when you find the special property, just submit an application using the information we already have!

**Create a group and share listings you like among them!**



Add users into a group where anyone can share their favorite listings!

## Appendices

- Frontend
  - React
  - React-bootstrap
  - Semantic UI
- Backend
  - Ruby on Rails
  - PostgreSQL Database
- Miscellaneous
  - Rapid API
  - Amazon AWS
  - Git/Github
  - Heroku