CSC 648-848 Software Engineering Summer 2020
Milestone 1

Freshwater Rentals

Rent, sell, buy housing/apartment website

Available on desktop and mobile.

Team 1

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Table of Contents
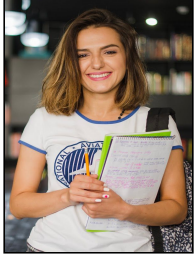
I.   Executive Summary

With the increasing number of SFSU students and the decreasing availability of living spaces, finding a place to live in San Francisco has never been more critical for students. Our website FreshWater Rentals aims to provide users the ability to find housing opportunities in our current fast paced and competitive market. Registered users on our site can advertise living spaces available for sale or for rent. Other features include information on the best locations to visit while in town, along with a detailed map to campus.

We have currently limited our scope to San Francisco State University students and faculty. Having a niche user base allows for a more united and friendly community, along with closer connections between students, faculty, and alumni. It also ensures that users will be able to easily find other students and faculty to share housing with.

Our team is made of computer science programmers from San Francisco State University. While working on this project we delegated tasks based on our strengths and skills. We have taken this project as an opportunity to learn and experience new ideas, with the main purpose of creating a better way for SFSU students and faculty to search for available living spaces.
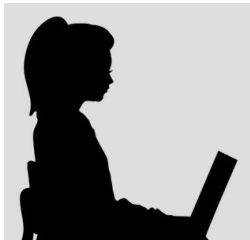
II. Personae and Main Use Cases
A. Personas

Lisa:	About Lisa:
  Photo Courtesy: Freepik SFSU CS Undergraduate student	- Lisa is a 19 year old SFSU Undergraduate Freshman - She just moved to California for higher studies - She is fun loving and loves networking - She is tech-savvy and loves to play games on the computer - She doesn't like to commute on public transportation Goals and Scenario: - As Lisa just moved to California, she is looking for a place to stay near SFSU from where she can walk to University - She is wondering if she can find a place where there are pictures of the property available, along with the rent and other amenities - Also, if she likes a listing, she wants to be able to contact the owner through the site

Jose:	About Jose:
  Photo Courtesy: Freepik SFSU International Journalism student	- Jose is a 21 year old student from Ecuador - He is going to San Francisco to study at SFSU for Spring 2021 - He loves cooking - He has a dog called Chicho Goals and Scenario: - Jose is going to the United States in 2021, his goal is to improve his English while being here - He is interested in finding a pet-friendly place to live. - He is trying to look for other Hispanic roommates since his English is not great

Jane:	About Jane:
  Photo Courtesy: Creative Commons SFSU Graduate/Faculty	• 35 years old • Female • Bachelor's in Political Science • Teacher Assistant at SFSU • 10+ years of using computers and doing desk work • Loud and outgoing, unsure around teaching people Goals and Scenario: • Looking for a new apartment and a new roommate • Hoping to get a degree in education

Bill:	About Bill:
  Photo Courtesy: Freepik Potential Landlord	• Bill is a 52 year old San Francisco business man • He is looking to rent his old house in San Francisco Goals and Scenario: • He is looking for six people to fill his house

Marie:	About Marie:
  Photo Courtesy: pixabay Administrator	• Marie is a 25 year old female SFSU transfer student majoring in Business • Works as a supervisor now, but has management experience • Tech savvy and has some coding skills Goals and Scenario: • Aspiring entrepreneur • Extremely Busy • Wants to create online businesses that generate passive income with minimal maintenance

B. Main Use Cases

Tenant (student): Lisa got admitted to SFSU and is looking for an apartment to rent near the University. She is living in Texas and can't travel to the university to check out the apartments in person. She doesn't like to travel by public transport and is looking for the apartment closest to the university while not spending much. She is tech savvy and while surfing on the internet she finds our website. She uses it to find apartments, sorted by shortest distance to SFSU. She checks the photographs and amenities that the apartments have, and likes one of the apartments. She then sends a message to the landlord for more information.

Tenant (student): Jose is going to San Francisco for a semester as part of an international exchange program in his university in Ecuador. He wants to move into a place at most 5 miles away from SFSU and would like to have a place where he can live for only 6 months. He wants a pet friendly place for his dog; in our application he will be able to select those specific types of search. He also wants to live with other Hispanic roommates as he mainly speaks Spanish, so he will use our find roommate tool to find roommates that fit that requirement.

Tenant (faculty): Jane is a graduate student here at SFSU, she also teaches here part time while sharing an apartment with 3 other roommates. One of her roommates graduated, leaving an availability in her apartment. Using Freshwater Rentals, Jane posts her room availability, and almost immediately gets a response. She no longer needs to look for a roommate, because of Freshwater Rentals.

Landlord: Bill just bought a new house for him and his family and he is not planning to sell his old house yet as real estate in San Francisco keeps going up. He is looking to rent his house to 6 people minimum and 12 people maximum. The house has 6 rooms that can be occupied by one or two people each. He does not want people to smoke but he is ok with pets. At Freshwater Rentals, he will be able to put his house up for rent with his requirements and be able to look at each of his group applicants to communicate with them for approval or further details.

Administrator: Marie is 25 years old, grew up in the Bay Area, still lives at home, and earned an Associates degree in Business at City College of San Francisco as she turned 20. Her college career was interrupted when her father was diagnosed with cancer. She had to put school on pause so she could work to help pay family bills. While dealing with the illness, she bonded more with her father and he taught her how to code. Her father's cancer went into remission which allowed her enough time to enroll at SFSU to get a MBA. At SFSU, she met a team of Computer Science students who built a SFSU-only niche rental website and she asked if she could help so she

could learn more about online businesses. She now works as an administrator on the website approving media posts. She is worried about time management and work-life balance so she needs to be able to approve media postings very quickly and easily, with only a few minutes to spare everyday.

III.   List of Main Data Items and Entities

Entities (Users Grouped by Permissions):

1.   **Guest**: Unregistered Users must be able to:
    1.1.   Search and browse listings
    1.2.   Register an account using a valid email
    1.3.   Use any additional Guest-level features

2.   **Member**: Registered Users must be able to:
    2.1.   Do everything a Guest can do (but shall not be able to register an additional account using the same email)
    2.2.   Login and logout securely with an associated valid email and password
    2.3.   Create a Listing and submit it for Administrator approval
    2.4.   Write and send a contact message to the creator of a listing ONLY if the sender has a valid SFSU email associated with their account. A Member with a valid SFSU email shall also be referred to as a "SFSU Member"
    2.5.   Use any additional Member-level features

3.   **Administrator**: Administrator Users shall be able to:
    3.1.   Do everything a Guest and a Member can do
    3.2.   Approve media associated with submitted listings
    3.3.   Use any additional Administrator-level features

Data Items:

4.   **Listing**: A Listing shall:
    4.1.   Represent a tangible legal property or living space and it's associated information including, but not limited to, photos, price, location, listing type (i.e. house, apt, room), square footage, utilities included, description, links to any Member roommate's profiles, number of people living there currently (if it is a shared space), number of people wanted (if it is a shared space), amenities (i.e. appliances, climate control, parking type, security), restrictions (i.e. no pets, no smoking), and contact details
    4.2.   Have the option to be created, submitted, approved by an Administrator, viewed by all user types, edited by its creator, and deleted by its creator or an Administrator

5.   **Category & Subcategory**: Categories and Subcategories shall:
    5.1.   Function as a way of sorting, filtering, searching, browsing, grouping, and classifying listings in a hierarchical manner by using Listing and Member Profile data and metadata

6. **Media**: Media shall:
    6.1. be securely stored and viewed digitally
    6.2. Include: text, photos, art, videos, animations, audio

7. **Profile**: A Profile shall:
    7.1. Be attached to every Member account
    7.2. Be viewable by every Member
    7.3. Include optional fields for: full name, pronouns, age, major, language/s spoken, religion, interests/hobbies, employment status, personal introduction, what they are looking for in a roommate (if they are looking), what they are looking for in a buyer or tenant (if they are looking), what they are looking for in a listing (if they are looking to rent or buy), if they drink or smoke, if they have pets

8. **Message**: A Message shall be:
    8.1. One-way, meaning from a SFSU Member to any other member that has a currently-publicly-viewable approved listing
    8.2. Senders must have a valid SFSU email
    8.3. Secure, meaning neither Member's contact details shall be revealed unless the sender explicitly reveals their details in a message

IV.   Initial list of functional requirements

1. Guest Services:
    1.1.   Users shall have a basic word matching search
    1.2.   Users shall be able to search via listing data like amenities (pool, number of rooms, etc) (also known as advanced search filters)
    1.3.   Users shall have the ability to view a listing page
    1.4.   Guest users shall have the ability to register to use more features (posting, save profile)
    1.5.   Users shall have the ability to create a draft listing and/or message before registration (lazy registration)
    1.6.   Users shall be able to search and sort by distance from SFSU
    1.7.   Users shall be able to view nearby public transportation
    1.8.   Users shall have the ability to see nearby shopping, restaurants, services (medical, food assistance providers) via map

2. Member Services:
    2.1.   Member users shall have all privileges that guest services users have
    2.2.   Users shall have the ability to securely login and logout
    2.3.   Users with a verified SFSU email address shall have the ability to message other users, specifically buyers can message sellers with contact info
    2.4.   Users when registering will be verified with association to SFSU via user's email
    2.5.   Users shall have the ability to post and manage listings
    2.6.   Users shall fill out a compatibility test and then shall be able to search for housing via roommate compatibility
    2.7.   Users shall be able to search rentals via college majors presently living in the unit
    2.8.   Users shall be able to have a "Favorites List," where they can save their sentiment for a particular posting (Like, Love, Save for Later)
    2.9.   Users renting out units shall be able to perform background checks on applicants
    2.10.   Users shall be able to request a physical tour of a listing and its surrounding neighborhood

3. Administrator Services:
    3.1.   Admin shall have access to all Guest and Member services
    3.2.   Admin shall have the ability to approve media associated with submitted listings
    3.3.   Admin shall have the ability to remove any listings
    3.4.   Admin shall have the ability to remove members' privileges

V.   List of non-functional requirements

1. Application shall be developed, tested and deployed using tools and servers approved by Class CTO and as agreed in M0 (some may be provided in the class, some may be chosen by the student team but all tools and servers have to be approved by class CTO).

2. Application shall be optimized for standard desktop/laptop browsers e.g. must render correctly on the two latest versions of **two major browsers**

3. Selected application functions must render well on **mobile devices**

4. Data shall be stored in the team's chosen database technology on the team's deployment server.

5. No more than 50 concurrent users shall be accessing the application at any time

6. Privacy of users shall be protected and all privacy policies will be appropriately communicated to the users.

7. The language used shall be English (no localization needed)

8. Application shall be very easy to use and intuitive.

9. Google analytics shall be used

10. No e-mail clients shall be allowed. Interested users can only message to sellers vis in-site messaging. One round of messaging (from user to seller) is enough for this application

11. Pay functionality, if any (e.g. paying for goods and services) shall not be implemented nor simulated in UI.

12. Site security: basic best practices shall be applied (as covered in the class) for main data items

13. Media formats shall be standard as used in the market today

14. Modern SE processes and practices shall be used as specified in the class, including collaborative and continuous SW development

15. The website shall prominently display the following exact text on all pages "SFSU Software Engineering Project CSC 648-848, Summer 2020. For Demonstration Only" at the top of the WWW page. (Important so as to not confuse this with a real application).

VI.   Competitive Analysis

Feature	Zillow	Trulia	Realtor	Craigslist	Our Site
Basic Search and Browse Listings	++	++	++	++	++
Google Maps Location Pin Search	++	++	++	+	+
Saved Search, Saved Locations	++	++	++	+	++
SFSU/Community Check	-	-	-	-	++
Distance from SFSU	+	+	+	+	++
Search via Roommate Matching Compatibility/Interests	--	--	--	--	++
Separate search tab as Buy, Rent, Sell.	++	++	++	--	++

-Feature Does Not Exist	+ Feature Exists	++ High Quality Version of Feature Exists

The online real estate market is saturated with many well established competitors (Redfin, Trulia, Zillow, Roofstock, Craigslist and Realtor). Thus, to penetrate this market we must carve out a niche target market with services that no other challenger can provide.While at the same time offering basic services that our clientele expect. Since our target market demographic is the SFSU community (which is largely a younger renter population) we believe a roommate compatibility search can be a powerful function over our competitors. Also verifying that our users are indeed SFSU members provides security and a sense of community no other comparable website offers.

VII. High-level system architecture and technologies used:

Cloud Platform	Google cloud engine f1-micro (1 vCPU Intel Xeon (1) @ 2.3GHz, 0,6 GB of memory, 10gb HDD)
OS	Debian GNU/Linux 10 (buster) x86_64
Web/Proxy Server	NGINX
Database	Google Cloud SQL (MySQL 5.7)

Server-side Language	Python:
	      Flask for REST API
	      Gunicorn for deployment

Front-end design	HTML, CSS, Bootstrap and Javascript, Figma for design

VIII.   Team Roles:

Luis Chumpitaz	Team Lead, Frontend, Backend
Garrett Peuse	Database, Backend
Nathan Hildum	Backend, Discord Manager, Documentation Editor, Sub Team Lead
Zachary Ma	Database, Backend
Gouri Jamakhandi	Frontend
Xinwei Fan	Frontend
Katthak Shah	Full stack, Github master

IX. Checklist:

DONE/OK	So far, all team members are engaged and attending ZOOM sessions when required
DONE/OK	Team found a time slot to meet outside of the class
DONE/OK	Github master chosen
DONE/OK	Team decided and agreed together on using the listed SW tools and deployment server
DONE/OK	Team ready and able to use the chosen back and front end frameworks and those who need to learn are working on learning and practicing
DONE/OK	Team lead ensured that all team members read the final M1 and agree/understand it before submission
DONE/OK	Github organized as discussed in class (e.g. master branch, development branch, folder for milestone documents etc.)