TEAM 1
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BRAIN BUFFS

SW Engineering CSC648-848 Fall 2024

Milestone 1: Use Cases, High Level Requirements, Architecture, and Competitive Study

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1. Executive Summary

Brain Buffs is a tutoring website by SFSU students for SFSU students. We understand what students want, a simple to use website to quickly search for someone who has experienced and excelled at the course that they are currently having trouble with.
Our functions shall be to allow SFSU students to browse for tutors and make it easy to register as a student and/or a tutor on our website. Users shall be able to create booking requests using their name and school email to contact tutors. Tutors shall be able to make tutor posts about what courses they are available to tutor for, which shall require approval from website admins. Tutors shall be able to check their dashboards for booking requests sent by users. These functions are uniquely specialized for SFSU students, only students with SFSU emails will be able to register and all the classes available for tutoring will be SFSU curriculum.
Brain Buffs is made up of SFSU students, Shun Usami, Adharsh Thiagarajan, Devon Huang, Thiha Aung, and Kim Nguyen, all of whom understand the importance of community-led academic success. Our goal for this website is to foster academic growth and collaboration among peers.

2. Personae

Emily Rodriguez (Student)

Age: 20, Undergraduate Computer Science student at SFSU

Pain Points:

- Overwhelmed by complex topics like file systems in CSC415 Operating System
- Unable to find tutor who completed the CSC415 course with the same professor

Goals:

- Find a tutor who is familiar with CSC 415 to improve their understanding and boost midterm grades

Character:

- Balances coursework, part-time job, and social life
- Part time working to pay her tuition, doesn't want to spend extra money

Skills:

- Has basic web browsing, online meeting, email skills on both PC/mobile

Michael Lee (Tutor)

Age: 27, Mathematics graduate student and tutor at SFSU

Pain Points:

- Overloaded with coordinating schedules
- Finished course, cannot find students to tutor

Goals:

- Efficiently manage multiple tutoring sessions
- Provide personalized support to students and earn money

Character:

- Passionate about teaching but overwhelmed with commitments
- Balances tutoring with research and personal projects

Skills:

- Proficient with online communication and scheduling tools on both PC/mobile

Persona: Dr. Sarah Thompson

Age: 45, Biology professor at SFSU

Pain Points:

- Organizing tutoring resources takes too much time;
- Limited insight into the effectiveness of tutoring services.

Goals:

- Enhance student engagement and performance
- Provide reliable tutoring support outside class hours

Character:

- Innovative educator committed to student success
- Embraces new teaching tools

Skills:

- Proficient with educational technologies and data analysis tools

Admin Persona: Prof. Jordan Harris

Age: 50, Senior IT Manager at SFSU

Pain Points:

- Don't want to take responsibility for inappropriate contents unexpectedly published to the platform
- Need for an efficient system to approve or reject postings.

Goals:

- Ensure that only high-quality and appropriate tutor content is approved.
- Maintain the integrity of the platform and prevent misuse.

Character:

- Detail-oriented and committed to maintaining platform standards.
- Balances managing the tutoring platform with overseeing other IT services.

Skills:

- Proficient in IT and dev tools to interact with the system backend including databases.

3. High-level Use Cases

Case 1: Student Schedules a Tutoring Session

Emily Rodriguez, a 20-year-old Computer Science student at SFSU, is struggling to grasp the CSC 415 course content. Unable to find an appropriate tutor on other websites, Emily **searches** on **Brain Buffs**. She **filters** through available **tutor posts** based on her specific class, CSC 415, and finds Michael Lee, who has completed the course with high ratings. She views his availability and submits a **booking request**. Upon submission, she is prompted to log in or register, and then her request is sent to Michael.

Case 2: Tutor Updates Availability and Manages Sessions

Michael Lee, a 20-year-old graduate tutor, logs into **Brain Buffs** to update his availability for the week. He creates a posting offering tutoring in CSC 415, specifying his available time slots. The post requires admin approval before it goes live. Once approved, Michael receives a request from

Emily and manages all session requests through his **dashboard**. He can accept, reschedule, or propose alternate times with just a few clicks.

Case 3: Faculty Recommends Students to Use Brain Buffs for Tutoring Support

Dr. Sarah Thompson, a Biology professor at SFSU, notices her BIO 315 students struggling before midterms. She recommends Brain Buffs, emphasizing its course-specific **tutor search**, tutor profiles with **ratings**, and easy **booking requests.** She also encourages high-performing students to become tutors, promoting peer support. Brain Buffs serves as a supplement to her office hours, helping students access tutoring when she's unavailable.

Case 4: Student Provides Feedback and Rates Tutors

After a successful tutoring session, Emily wants to provide feedback on her experience. She logs into Brain Buffs, navigates to the session history, and leaves a **rating** and review for Michael Lee. This feedback not only helps Michael improve his tutoring methods but also assists other students in selecting the best tutors for their needs. Positive reviews boost Michael's profile, increasing his visibility on the platform.

Case 5: Tutor Shares Educational Resources with Students

During a tutoring session, Michael wants to share additional resources to help Emily further her understanding of algorithms. He uses the resource sharing feature on Brain Buffs to upload relevant study materials, such as lecture notes and practice problems. Emily accesses these resources directly through the platform, enhancing her learning experience and providing her with the tools needed to succeed in her coursework.

Case 6: Admin Approves Tutor Posts and Manages Users

Prof. Jordan Harris, the Senior IT Manager at SFSU, is responsible for maintaining Brain Buffs' integrity. Each day, he reviews multiple tutor submissions to ensure compliance with platform standards. Today, he logs into the **admin dashboard** and sees a new post from Michael Lee for CSC 415. Using the **admin tools**, Jordan quickly checks the post for accuracy and adherence to guidelines, then **approves** it for public viewing.

4. List of Main Data Items and Entities – Data Glossary/Description

Defined Terms:

Guest

- Not Currently logged in.
- Can browse and **search** for tutors, it is not required to **login** for this feature.
- Can **login** or **register**.

User

- Represents anyone who has **registered** on the platform.
- Can be a student, a tutor, or both.
- Can create **booking requests**, browse and **search**.
- Can make a **Tutor posting** that would need to be approved by **Admin**.

Admin

- Manages and oversees the platform.
- Responsible for approving all **tutor postings** before they go live.
- Ensure that the platform's content is appropriate and compliant with the platform's policies.
- Can delete inappropriate **users** and **tutor postings**.
- Doesn't need **login**, manages through workbench.

Tutor Posting

- Application process offered by a **user** who wants to be a tutor.
- applicants can advertise their subjects, services, rates, a detailed description of their offerings, a profile picture for the **tutor posting** (the picture will be a .jpeg image stored in a file system), and their CV(must be uploaded as a .pdf file).
- Are visible to **users** and **guests** searching for tutors and are subject to approval by the **admin**.

Booking Request

- Allows **users** to contact a tutor on the platform.
- Allow students to coordinate meetings.
- Is only seen privately by the tutor being requested.

Dashboard

- Interface for registered **users** (both tutors and students).
- Tutors can view their scheduled sessions, while students can track their **booking requests** with tutors.

Search

- This allows both unregistered and registered **users** to **search** for tutors based on tutor name, class subject, and rates.

Registration

- Enables **guests** to sign up for the platform, providing name and student email to create an account (this information is stored in the database).

Login

- A guest enters valid credentials (usually a student email and password) to access the platform as a **user**.
- After logging in, **users** gain full platform access and can interact with the site's features such as sending **booking requests** to tutors, viewing their **dashboard**, **searching** and browsing.
- Used by a pre-existing registered **user**.

Rating

- **User** can leave a 1-5 star rating for tutor

Data Items:

User

- user id
- email
- password
- name

Tutor Posting

- post id
- user id
- profile picture
- CV (.pdf)
- title
- subject name
- class number
- content
- rate
- approved - status indicating if it was approved by **admin**

Booking Request

- booking id
- sender id
- receiver id
- content
- approved - status indicating if it was approved by **admin**

Subject
- subject id
- subject name

5. List of High-Level Functional Requirements

Guests (Browsing Only)

1. **Search Tutor Postings**

• Guests shall be able to search tutor postings based on subjects, class names, professor names, tutor names, and ratings.

2. **Browse Tutor Postings**

• Guests shall be able to browse and view the search results of tutor postings.

3. **Register**

• Guests shall be able to register an account using their SFSU email and password.

4. **Login**

• Guests shall be able to login using their SFSU email and password.

Users (Students and Tutors)

5. **Inherit Guests Capabilities**

• Users shall be able to do what guests can do except Register and Login.

6. **Send Booking Request**

• Users shall be able to send booking requests to tutor postings.

7. **Create Tutor Postings**

• Users shall be able to create new tutor postings with subjects, availability, rates, custom descriptions, and a PDF document.

8. **Edit Tutor Postings**

• Users shall be able to edit the existing tutor postings.

9. **Delete Tutor Postings**

• Users shall be able to delete the existing tutor postings.

10. **Browse booking requests**

• Users shall be able to browse the booking requests sent to their tutor postings.

11. **Logout**

• Users shall be able to log out from their account.

12. **Unregister**

• Users shall be able to unregister their account.

13. **Schedule Sessions**

• Users shall be able to request sessions integrated into tutor profiles.

14. **Rate Tutors**

• Users shall be able to leave ratings and reviews for tutor postings.

Admins

15. **Approve Tutor Postings**

• Admins shall be required to review and approve created or edited tutor postings before they go live.

16. **Delete Inappropriate Users/Tutor Postings/Booking Requests**

• Admins shall be able to delete users, tutor postings, and booking requests that violate platform policies.

17. **Ban Inappropriate Users**

• Admins shall be able to ban users that violate platform policies.

6. 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
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. All or selected application functions shall render well on mobile devices (no native app to be developed)
4. Posting of tutor information and messaging to tutors shall be limited only to SFSU students
5. Critical data shall be stored in the database on the team's deployment server.
6. No more than 50 concurrent users shall be accessing the application at any time
7. Privacy of users shall be protected
8. The language used shall be English (no localization needed)
9. Application shall be very easy to use and intuitive
10. Application shall follow established architecture patterns
11. Application code and its repository shall be easy to inspect and maintain
12. Google analytics shall be used
13. No e-mail clients shall be allowed. Interested users can only message to sellers via in-site messaging. One round of messaging (from user to seller) is enough for this application
14. Pay functionality, if any (e.g. paying for goods and services) shall not be implemented nor simulated in UI.
15. Site security: basic best practices shall be applied (as covered in the class) for main data items
16. Media formats shall be standard as used in the market today
17. Modern SE processes and tools shall be used as specified in the class, including collaborative and continuous SW development and GenAI tools

18. The application UI (WWW and mobile) shall prominently display the following exact text on all pages "SFSU Software Engineering Project CSC 648-848, Fall 2024. For Demonstration Only" at the top of the WWW page Nav bar. (Important so as to not confuse this with a real application).

7. Competitive Analysis (Functions/Features Only)

Feature/Function	Brain Buffs	Chegg Tutors	Wyzant	TutorMe
SFSU-Specific Search	☑	☐	☐	☐
Tutor Availability Updates	☑	☑	☑	☑

In-app Messaging	☑	☑	☑	☑
Rating System	☑	☑	☑	☑
Resource Sharing	☑	☐	☐	☐

Summary:

Brain Buffs is designed specifically for the SFSU community, making it unique compared to broader tutoring platforms like Chegg Tutors, Wyzant, and TutorMe. Brain Buffs offers features tailored to the needs of SFSU students, such as the ability to search for tutors based on specific SFSU subjects or classes. SFSU students with a university email can sign up to book sessions with tutors or become tutors themselves. While competitors provide general tutoring and messaging features, Brain Buffs adds value by offering SFSU-specific search options and resource-sharing capabilities. Additionally, a built-in rating system ensures high-quality tutoring services, fostering trust within the SFSU community. All tutor content requires admin approval before it goes live, maintaining a high standard for the platform.

8. High-level System Architecture and Technologies Used

Database: MySQL v 8.0.39-0ubuntu

Web Server: NGINX 1.26.2

Operating System: Ubuntu 24.04

Server Server-Side Language: Python

Web Framework: Flask

Deployment cloud servicer: AWS, t2.micro,1vCPU /1GB Mem, x86 , Intel(R) Xeon(R) CPU E5-2686 v4 @ 2.30GHz, 30GiB gp3 storage

Front-end frameworks: Bootstrap (newly added)

Python code formatting: Black (newly added)
HTML/CSS/JavaScript code formatting: Prettier (newly added)
Local development environment: NixOS/devenv
Workbench: MySQL workbench

Browsers:

1. Google Chrome:

   Latest Version: 129.0.6668.89/.90 (October 1, 2024)

   Previous Version: 128.0.6613.137/.138 (September 10, 2024)

   Google Chrome is the most widely used web browser globally. The latest and previous versions ensure to cover the vast majority of Chrome users. These versions include latest security updates, new performance and feature improvements for web application faster and more reliable for users.

2. Mozilla Firefox:

   Latest Version: 131.0 (October 1, 2024)

   Previous Version: 130.0 (September 3, 2024)

   Mozilla Firefox is one of the most popular browsers among users globally. 131.0 and 130.0 are stable releases designed to offer various performance improvements, security updates, and new features to improve user experience. Using the latest versions helps protect against vulnerabilities and ensures compatibility with modern web standards.

Major additional external open source APIs:

1. Google Analytics API: For tracking user interactions and gaining insights into website traffic.
2. Google Maps API: To integrate location features, such as finding tutors and departments' location.

9. Use of GenAI Tools like ChatGPT and Copilot for Milestone 1

Tool Used:
ChatGPT (Version 4, o1 preview)

<u>Tasks and Usefulness:</u>

1. Drafting Documentation
   - Usefulness: HIGH
   - ChatGPT assisted in creating initial drafts for the Executive Summary and Use Cases, saving time and ensuring clarity.

2. Creating the Table for Milestone 1

- Usefulness: HIGH
- ChatGPT efficiently organized the comparison table for Brain Buffs versus competitor platforms, saving time and presenting the features clearly. This allowed the team to quickly identify and refine the unique aspects of Brain Buffs.

3. Brainstorming Features
- Usefulness: HIGH
- Facilitated brainstorming sessions to identify unique SFSU-specific functionalities that differentiate Brain Buffs from competitors.

Examples and Prompts:

- "ChatGPT, help me draft an executive summary for a tutoring website tailored to SFSU students."

- Generate a list of high-level use cases for a student-tutor matching application.

- The usage of ChatGPT in Section 4 helped provide rough ideas of what each term meant. Also helped refine the rough ideas to make them more readable and precise.

- ChatGPT helped organize the competitive analysis by creating a clear comparison table and highlighting Brain Buffs' unique features. It also summarized the platform's advantages concisely, aligning with assignment goals.

- Utilization of ChatGPT, seeking an appropriate browser extension or configuration that is compatible with both Chrome and Firefox to efficiently run the project across different platforms.

- The usage of ChatGPT, primarily employed for conducting comprehensive grammar checks and improving the overall clarity and coherence of written content to ensure it meets professional standards.

Additional Comments:

- GenAI tools significantly enhanced our efficiency in documentation and initial code development. They provided valuable suggestions that the team refined and implemented.

- ChatGPT offered well-organized ideas and suggestions. Copilot ensured consistency across the codebase, making collaboration smoother.

- These tools also served as learning aids, allowing team members to refine AI-generated code and grasp new coding techniques.

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10. Team and Roles

Name	**Role**
Shun Usami	TeamLead
Adharsh Thiagarajan	Frontend Lead
Devon Huang	Backend Lead
Kim Nguyen	Github Master
Thiha Aung	Software Developer

11. Team Lead Checklist

So far all team members are fully engaged and attending team sessions when required	✅
Team found a time slot to meet outside of the class	✅ (Thu. 2pm)
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	✅
Team reviewed **class slides on requirements and use cases** before drafting Milestone 1	✅
Team reviewed **non-functional requirements from "How to start…" document** and developed Milestone 1 consistently	✅
Team lead checked **Milestone 1 document** for quality, completeness, formatting and compliance with instructions before the submission	✅
Team lead ensured that **all team members read the final M1 and agree/understand it** before submission	✅

Team **shared and discussed experience with genAI tools** among themselves	✅
Github is organized as discussed in class (e.g. master branch, development branch, folder for milestone documents etc.)	✅