

Final Project for SW Engineering Class CSC 648-848
Spring 2023

Team 6

ULingual

Jonathan Valadez, jvaladez3@sfsu.edu, Team Lead

Sara Murad Ahmed Seid, sseid1@mail.sfsu.edu, Frontend Lead

Steven Anthony Vasquez, svasquez7@mail.sfsu.edu, Backend
Lead

Nik Shahrul Nafiz Bin Nik Azhan, nnikazhan@mail.sfsu.edu,
Frontend Lead #2

Elias G Yetechalew, eyetechalew@mail.sfsu.edu, Database
Master

John Lee Santiago, jsantiago2@sfsu.edu, Document Editor &
Github Master

Aidan Carl Stivers, astivers@mail.sfsu.edu, Backend Lead #2

<https://50.18.108.83.nip.io>

May 25th, 2023

M5	5/25/23
M4V2	5/25/23
M4V1	5/18/23
M3V2	5/22/23
M3V1	4/27/23
M2V2	4/25/23
M2V1	4/4/23
M1V2	5/18/23
M1V1	3/5/23

Table of Contents

Table of Contents.....	1
Product Summary.....	2
Milestone 1 Version 2.....	7
Executive Summary.....	7
Main Use Cases.....	8
Main Data Items and Entities.....	18
Functional Requirements.....	20
Non-Functional Requirements.....	24
Competitive Analysis.....	26
High-level Architecture and Technologies Used.....	29
Checklist.....	30
List of Team Contributions:.....	31
Milestone 2 Version 2.....	33
Data Definitions.....	33
Prioritized Functional Requirements.....	38
UI Mockups and Storyboards.....	43
Database Architecture and Organization.....	49
APIs and Main Algorithms.....	52
UML Diagram.....	53
Application Network and Deployment Diagrams.....	54

Key Risks.....	55
Project Management.....	57
List of Contributions.....	58
Milestone 3 Version 2.....	60
Data Definitions V3.....	60
Functional Requirements V3.....	66
Wireframes Based on your Mockups/Storyboards V2.....	75
High Level Database Architecture and Organization V2.....	92
High Level Diagrams V2.....	94
List of Contributions.....	96
Milestone 4 Version 2.....	98
Product Summary.....	98
Usability Test Plan.....	104
QA Test Plan.....	108
Code Review.....	113
Self-check on Best Practices for Security.....	122
Self-check: Adherence to Original Non-Functional Specifications.....	124
List of Contributions.....	126
Team member Contributions.....	127
Post Analysis.....	131

Product Summary

A. Name of Product: ULingual

B. Description: The world is built upon languages. Without languages, we would not be able to go about our daily lives. With ULingual not only can you learn a new language by chatting with others through our global forums and connecting with others via our video calls, but you can also learn about the culture. We emphasize learning by listening at ULingual, this is why we have Video Rooms where you can learn with others by speaking and listening. This is also why we offer a recommended content section where we offer you recommendations for

books, videos, and music playlist to further immerse yourself in the culture. We recommend videos and music playlists so you can listen to the language you are learning more frequently, as one of the best ways to learn language is by repetition and phrase remembrance.

C. What is unique in your product:

What makes our product unique is the joint culmination of learning and connecting with ULingual. We offer generated flashcards that get updates for the user to test their language knowledge, as well as recommended content where the user can stay engaged with the language they are learning outside of ULingual. Not only this but we also offer Video Rooms where you can connect either with your friends or with someone you had a discussion with within the forums. What makes us stand out is our combination between learning and connections.

D. URL to product: <https://50.18.108.83.nip.io/>

Itemized P1 List:

- 1) A general user shall be able to register for an account at ULingual.
- 2) A general user shall be able to select the language they want to learn upon registration.
- 3) A general user shall be able to select what language they are native in upon registration.
- 4) A general user shall be able to access our Contact Form to send ULingual an inquiry email.

- 5) A general user shall be able to view the About Us page to see further details revolving around ULingual.
- 6) A general user shall be able to view the Frequently Asked Questions page to see common questions ULingual receives.
- 7) A general user shall be able to view our Terms and Conditions page prior to registering an account.
- 8) A general user shall be able to access our search bar to search for tutors or native speakers by name or language.
- 9) A registered user shall be able to login with a username and password.
- 10) A registered user shall be able to logout of their account.
- 11) A registered user shall be able to access our Contact Form to send ULingual an inquiry email.
- 12) A registered user shall be able to view the About Us page to see further details revolving around ULingual.
- 13) A registered user shall be able to view the Frequently Asked Questions page to see common questions ULingual receives.
- 14) A registered user shall be able to access our search bar to search for other registered users by name or language.
- 15) A registered user shall be redirected upon search submission to the results page for their search.
- 16) A registered user search result shall be filtered by the alphabetic language relation they search to display other registered users who are native in the language searched.
- 17) A registered user search result shall be filtered by alphabetic name relation to other registered users.

- 18)A registered user shall be able to view their own profile.
- 19)A registered user profile shall display the language the registered user is learning.
- 20)A registered user profile shall display the amount of friends the registered user has.
- 21)A registered user profile shall display the language the registered user is native in.
- 22)A registered user profile shall display the description of the registered user.
- 23)A registered user profile shall display the profile picture of the registered user.
- 24)A registered user profile shall display the username of the registered user.
- 25)A registered user shall be able to edit their own profile.
- 26)A registered user profile shall display a “Edit Profile” button that allows registered users to edit their profile.
- 27)A registered user shall be able to upload a photo in place of their profile picture.
- 28)A registered user shall be able to edit the description of their profile.
- 29)A registered user shall be able to change what language they want to learn within their profile.
- 30)A registered user shall be able to edit their username.
- 31)A registered user shall be able to view their friends list.
- 32)A registered user shall be able to view their friends profile.
- 33)A registered user shall be able to access the main dashboard.
- 34)A registered user shall be able to access Global Forums within the dashboard.
- 35)A registered user shall be able to comment under a forum post.
- 36)A registered user shall be able to create a new forum post.

- 37)A registered user shall be able to access Video Rooms within the dashboard.
- 38)A registered user shall be able to create a video room.
- 39)A registered user shall be able to join a video room.
- 40)A registered user shall be able to access our Miscellaneous Content within the dashboard.
- 41)A registered user shall be able to access a list of book recommendations in their desired language they are learning.
- 42)A registered user shall be able to access a list of movie and tv show recommendations in a specified language.
- 43)A registered user shall be able to access playlists of music in relation to the language they desire to learn.
- 44)A registered user shall be able to access our Flashcards within the dashboard.
- 45)A registered user shall be able to access generated flashcards as a small test for their desired language.
- 46)A registered user shall be able to access their inbox within their profile.
- 47)A registered user shall be able to accept or reject friend requests within their inbox.
- 48)A registered user shall be able to see ID codes to join a video room within their inbox.
- 49)The global forums shall display the name of the forum title.
- 50)The global forums shall display the amount of comments within the forum.
- 51)The global forums shall be sorted by relevance based on newest post.
- 52)The global forums shall display a return button per forum to go back to the main global forums page.

- 53)The video rooms shall display a mute/unmute button where registered users can mute/unmute themselves during a video call.
- 54)The video rooms shall display a leave call button where registered users can leave a video call.
- 55)The video rooms shall display a Video On/Off button where registered users can turn their camera off or own in a video call.
- 56)The flashcards shall be viewed by registered users.
- 57)The flashcards shall be formatted into two sides: Word/Phrase & Translation of given Word/Phrase.
- 58)The flashcards shall be structured together by a name for the assortment of cards.
- 59)The miscellaneous content shall be displayed by category of “Books”, “Movies & Shows, and “Music Playlists”.
- 60)The miscellaneous content shall only be accessible by registered users.
- 61)The miscellaneous content shall display links where registered users can access this content to either purchase or enjoy for free.
- 62)The miscellaneous content shall display a title of the content we are suggesting to registered users.
- 63)The inbox shall be displayed within a registered user profile.
- 64)The inbox shall display pending friend requests.
- 65)The inbox shall display ID codes that will allow users to join a video room.
- 66)The inbox shall display messages based on the most recent notification.
- 67)The inbox shall display the time and date a message was received.

Milestone 1 Version 2

Executive Summary

Language is everything; the world has operated and functioned through the notion of language since the beginning of civilization. The world is cultivated off of different languages and ideologies. The world has a vast diversity in cultures and is

grand in landscape—San Francisco is a great example of the world's diversity as this city harbors multiple ethnicities that harbor their own language and dialects. Many people have become eager to learn more about other cultures as well as their own culture themselves. Language is both the barrier and the linkage to interactions and connections with others. Think of all the business opportunities, family connections, and cultural experiences you could expand upon if you have the knowledge of more than just one language under your sleeve. We all only share a single life to enjoy the rare experiences it has to offer. Why not expand your experiences by learning a new language or expanding upon your culture's own language? This is why we introduced ULingual as the next service to connect people together across the world, through language.

ULingual is a language exchange platform that connects native speakers with non native speakers of a given language. Traditional language learning methods without conversational practice can be time consuming and ineffective. Together, users can learn and practice speaking a language with each other over a video streaming connection to experience a more personal and intriguing learning environment. ULingual understands that learning a language is difficult, practicing by speaking is great; however, it's also important to hear the language often. Diving yourself into the language, listening to the language, and connecting with its culture. This is why ULingual recommends music playlists based on the language you are trying to learn. ULingual also recommends movies, television shows, and books based on the language you want to learn so that way you can further envelop yourself and get a better grasp of the language. What makes ULingual stand out from the rest, lies in our alternative learning methods. Speaking the language is half the battle. Here at ULingual we believe it's critical to immerse yourself in the language by getting involved with its culture, whether through music, books, movies, or television. Hearing is just as important as speaking; to be able to identify what someone else is saying is important, as you can then properly know how to respond to them. Learning a language can be daunting and also intimidating, this is why we not only offer services to connect you with native speakers but also offer services that connect you with others who are also trying to learn the same language as you. Being able to practice together, in a judgment free environment, collaborating and improving each other's knowledge and skill.

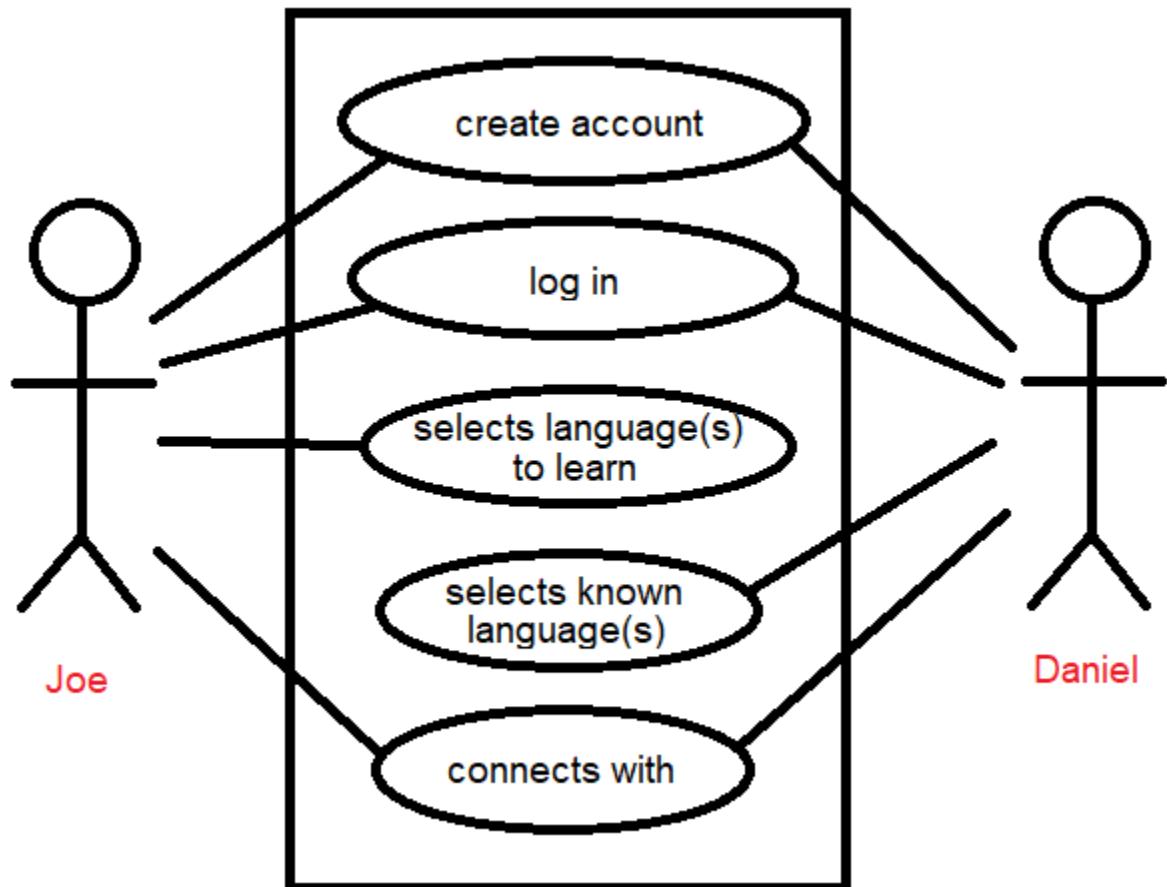
Main Use Cases

Use Case 1: Learning Language Discreetly

Joe is a third generation Mexican who is not very fluent in Spanish. He attempts to speak what little he knows of Spanish to his family and friends but gets teased for not being fluent. Feeling disconnected from his family and friends, Joe sets

out to improve his Spanish in a better learning environment. Joe finds ULingual, creates an account and selects Spanish as the language he wants to learn. Joe is connected with Daniel, a native Spanish speaker, and is able to learn Spanish discreetly with no judgment.

Diagram:

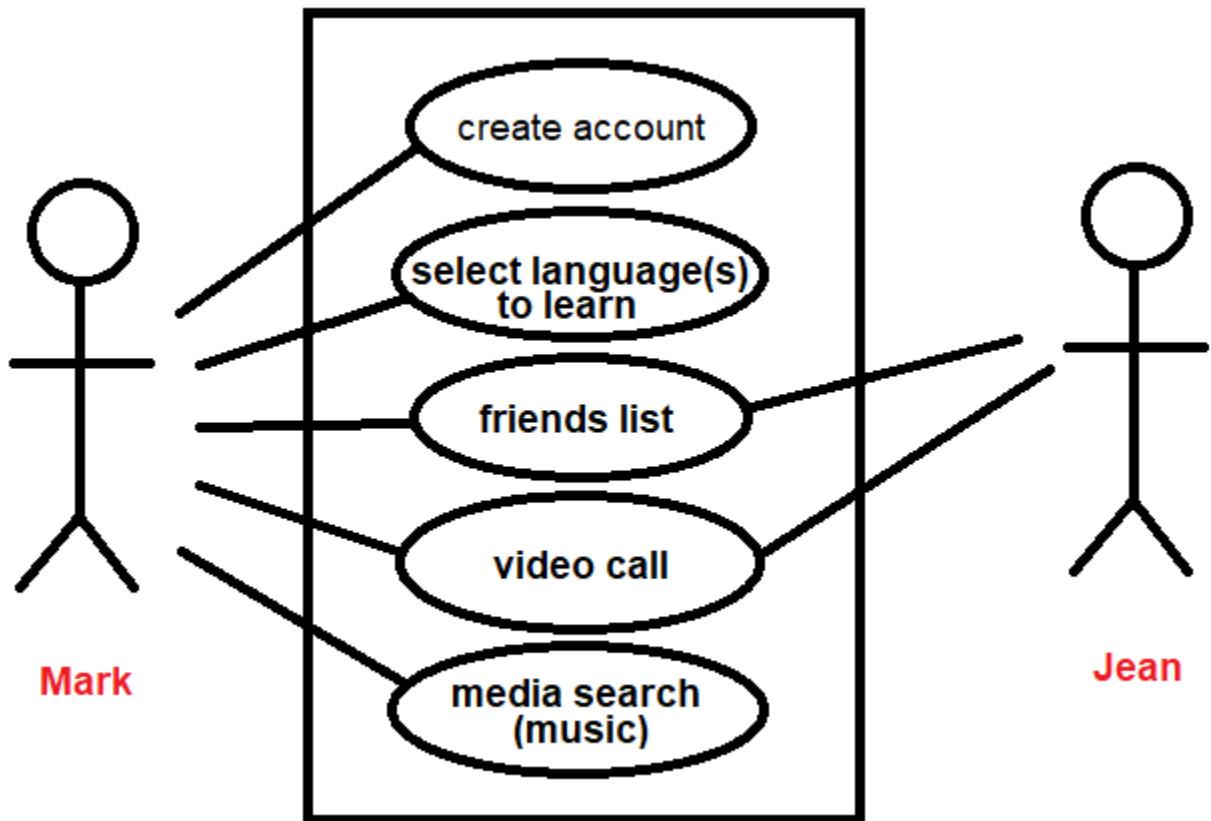


Use Case 2: Interracial/Cultural Relationships

Mark has been dating Jolyne for about 6 months. Jolyne is fluent in French. Mark only speaks English but wants to learn French to better connect with his girlfriend and to also impress her family. Mark finds ULingual, creates an account, selects French as his desired language. He connects with Jean who is fluent in French

and Jean teaches Mark the basic introductions and greetings in French. Mark friends Jean on the website, and they have weekly video calls to improve Mark's French. Mark finds a French playlist for music from ULingual. Mark plays these sounds in front of his girlfriend Jolyne and she's really surprised he knows the songs. Mark is happy he's building a better connection with his girlfriend through language.

Diagram:

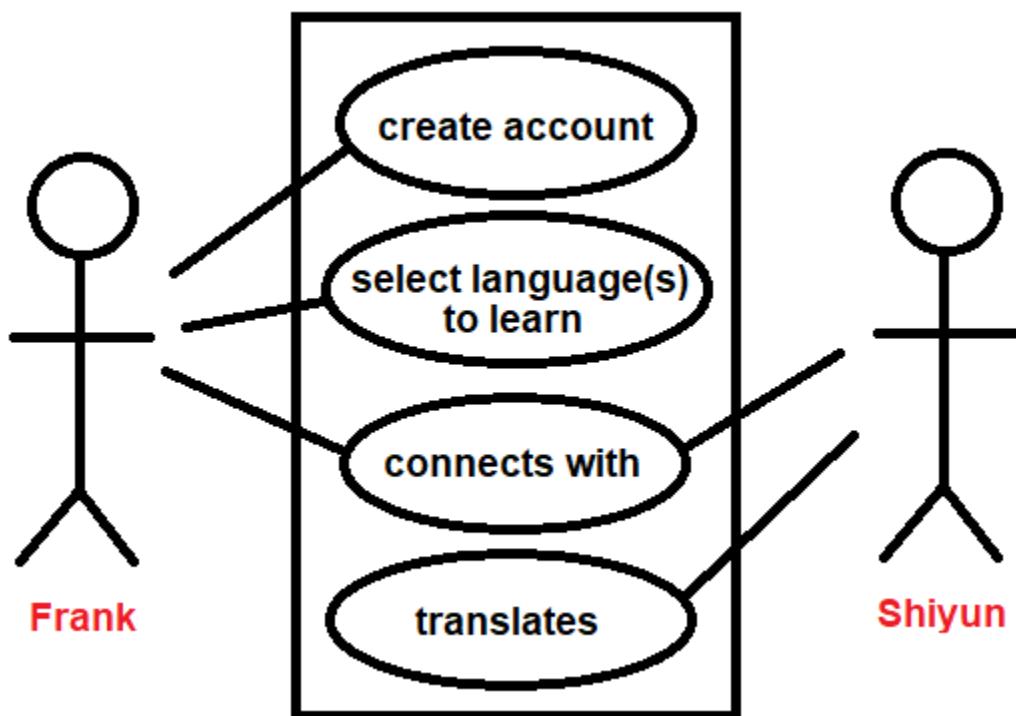


Use Case 3: Global Economy/Business Purposes

Frank is a representative for a biotech company who will be flying to South Korea in a week for a business meeting for a potential partnership. Frank believes it's important he learns basic Korean to further increase his partnership potential

(he'll have a translator but he believes saying some things himself is worth more). Frank finds ULingual, creates an account, selects Korean as the language he wants to learn. Frank connects with Shiyun and they converse; Frank is able to obtain basic introductions to Korean for his business ventures.

Diagram:

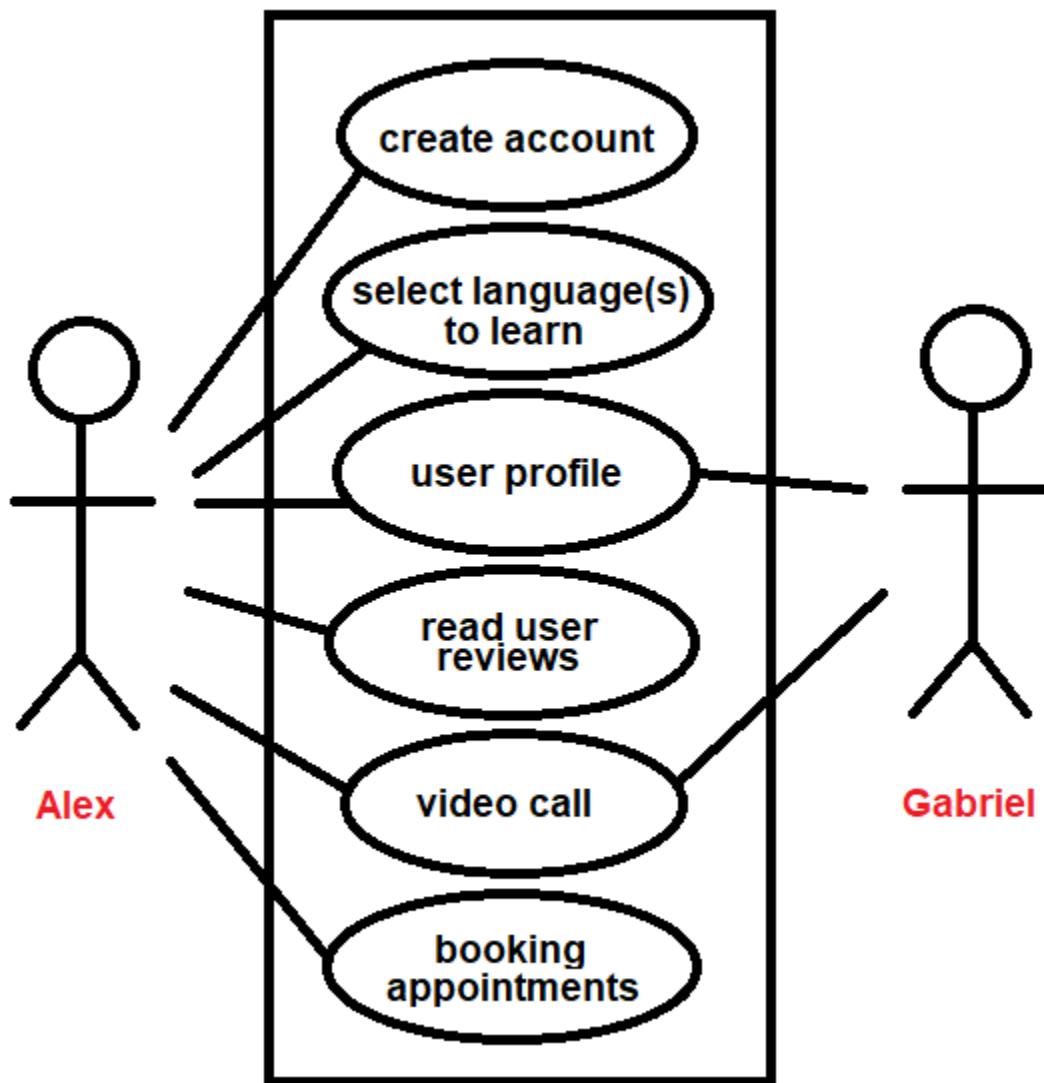


Use Case 4: Traveling/Vacation

Alex plans to travel to France in 4 months and he wants to have at least basic conversational skills before he arrives there. Alex creates an account on ULingual and states that he wants to learn French. He finds Gabriel's profile and

reads reviews claiming that he is an amazing tutor, especially for first time learners of French. Gabriel is known to use visual tools when helping people learn a language, so he requires his sessions to be held over video calls. Alex has always thought of himself as a visual learner so he instantly books multiple appointments with Gabriel, eager to learn a new language.

Diagram:

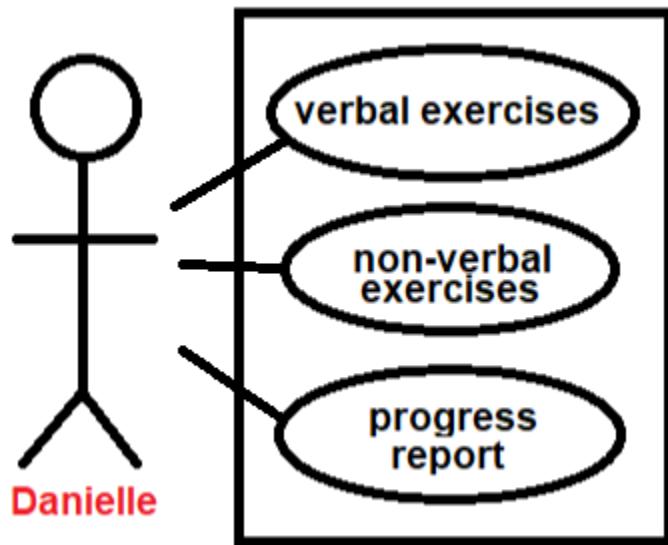


Use Case 5: International Students

Danielle is an international student who just transferred to Spain to pursue her studies. Although she has a basic understanding of the local language, she is not

proficient enough to fully participate in classroom discussions or effectively converse with native speakers. As a result, she frequently feels alone and finds it difficult to engage into the community. ULingual provides verbal and non-verbal exercises to help her learn a language quickly on her own. She can also track how quickly she improves by accessing ULingual's progress report feature.

Diagram:

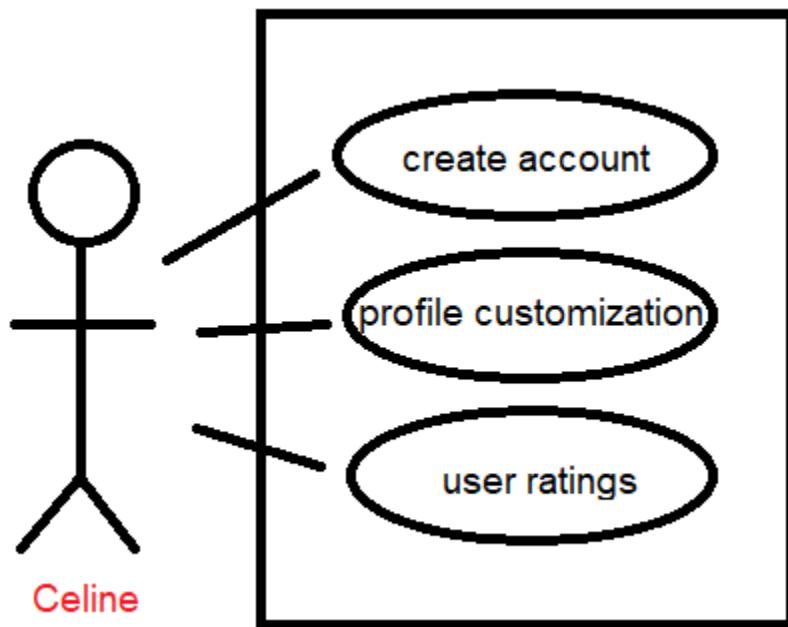


Use Case 6: Tutor/Teacher

Celine is an aspiring foreign language teacher that doesn't have any real experience with teaching others. She finds ULingual and hopes to develop her

teaching skills through helping others learn a language. She creates her account and customizes her profile, listing her availability schedule and known languages. After using the website for a couple months, she reads the user reviews written about her from users that have connected with her through ULingual. She uses this feedback to improve her methods of teaching in the future.

Diagram:

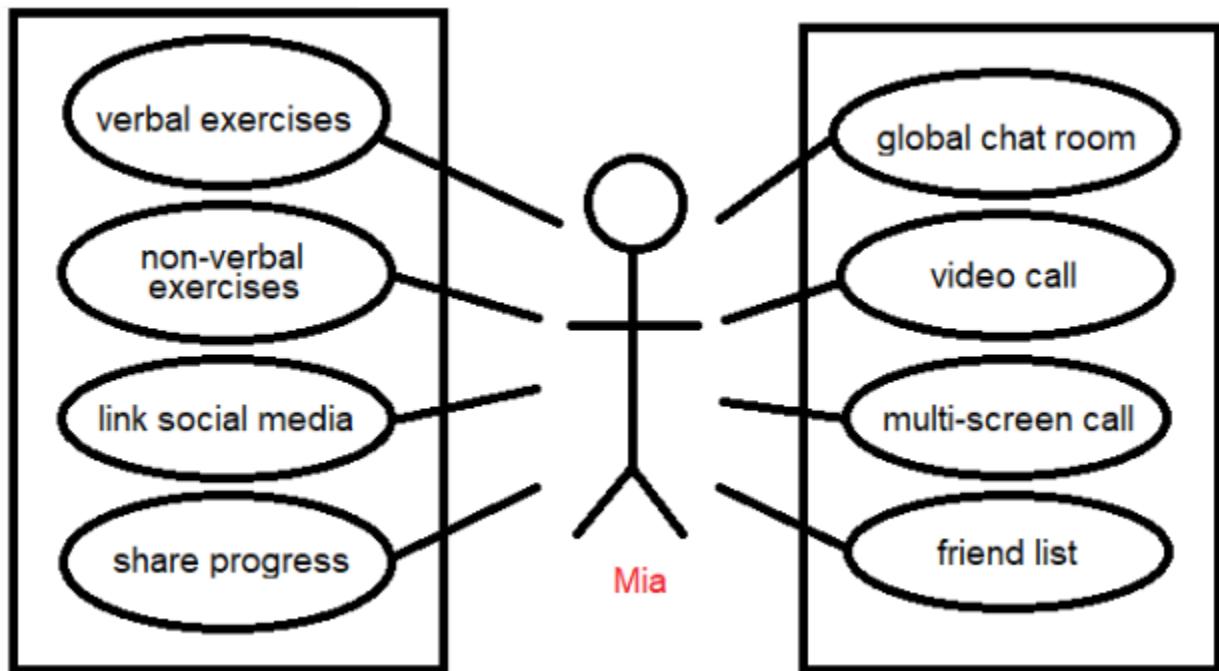


Use Case 7: General Language Learner

Mia is an enthusiastic social butterfly who loves learning new languages and frequents ULingual on a daily basis. On weekdays she likes working on verbal

and non-verbal exercises, often sharing her progress through linked social media websites. On weekends she enjoys spending her time meeting new people in ULingual's global chat room or video chatting with one or more people already on her friends list.

Diagram:

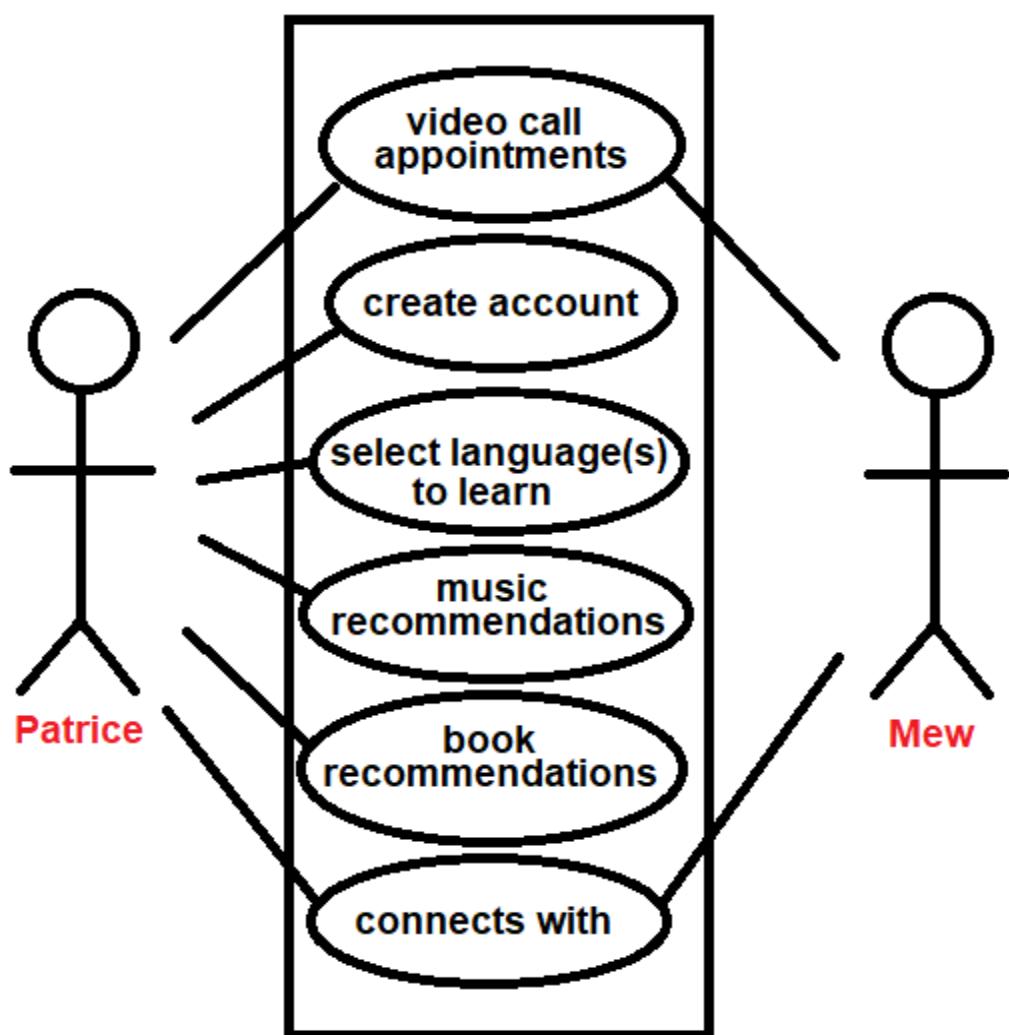


Use Case 8: Language Retention

Patrice learned Japanese about 4 years ago back in college. Patrice has some knowledge of Japanese but wants to brush up and see what he remembers.

Patrice finds out about ULingual and sees it not only provides video connection with a native speaker but also recommendations of media in relation to the language. This interests Patrice so he creates an account and selects Japanese as his language. Patrice goes to the media section and stumbles upon a music playlist, he listens to some music and remembers a lot of the words and what they mean. He then checks out the book section and reads a digit book in hiragana (form of Japanese) not perfectly but very well. He then takes his final test and connects with Mew who is a native speaker; Patrice and Mew converse and at the end of this conversation and overall session with the website Patrice is ecstatic and remembers the language he once got disconnected from.

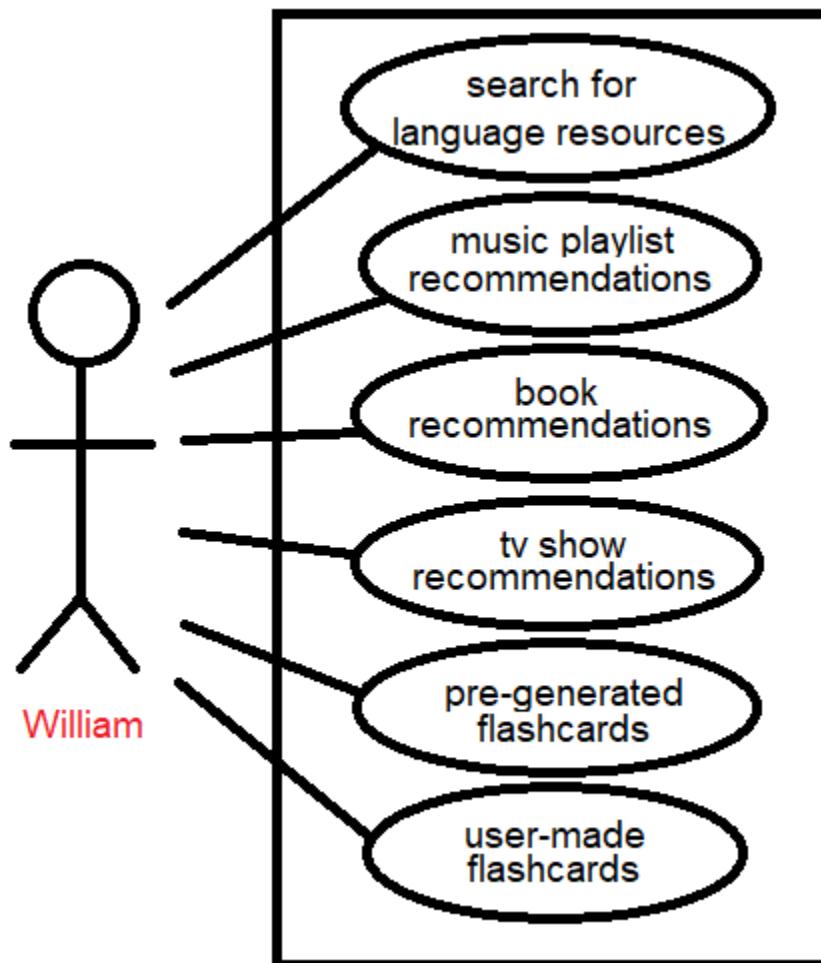
Diagram:



Use Case 9: Studying for Exam

William is a college student looking for more studying resources to help him with his upcoming Spanish exam. William searches for as many Spanish related materials as he can find on ULingual. In his search, he was able to find recommendations for music playlists, books, and TV shows. He also finds a feature that allows users to use pre-generated flashcards and create custom flashcards of their own.

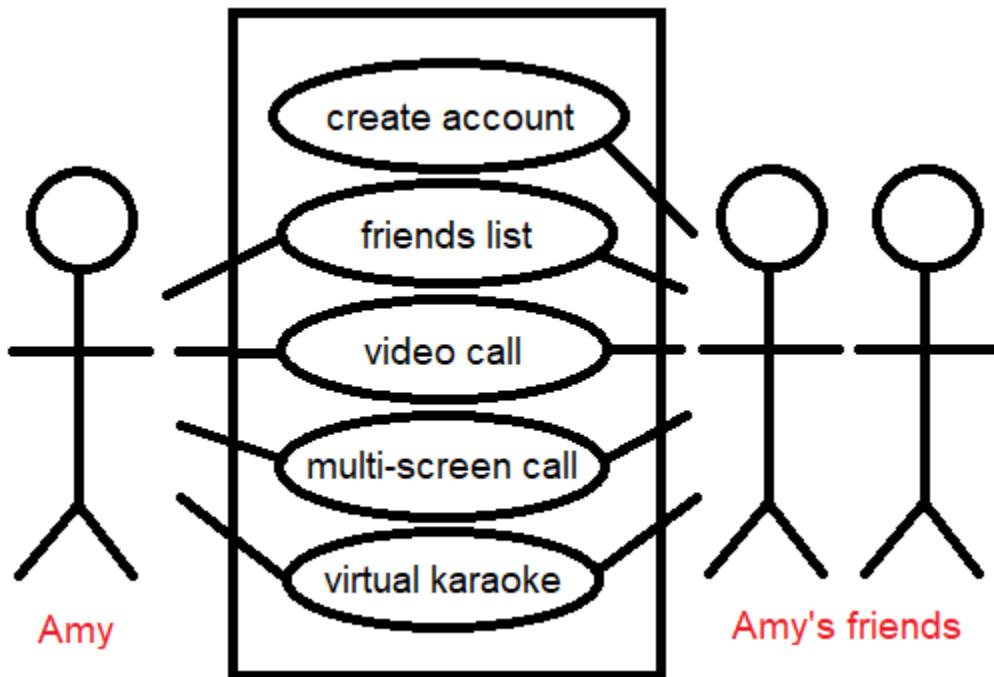
Diagram:



Use Case 10: Remote Activities

Amy is an experienced user of ULingual who is familiar with all the features offered on the website. She had plans to go out with a couple of friends one evening, but found out one of them had tested positive for covid. Instead of canceling their hangout, Amy suggested they do karaoke on ULingual's website instead. She tells her two friends that they only need to create an account on the website and add her to their friends list. From there, she can host a video call, invite both her friends to join, and make use of ULingual's virtual karaoke feature.

Diagram:



Main Data Items and Entities

Main data items:

- 1. Images:**
 - 1.1. Through images many things can be taught, therefore ULingual will also offer images in each language.
- 2. Pages:**
 - 2.1. Users shall scroll down the pages when needed.
- 3. Posts:**
 - 3.1. ULingual shall offer posts according to the languages selected.
- 4. Progress Bar:**
 - 4.1. The ULingual website shall be able to save the users progress.
- 5. Language Title:**
 - 5.1. The name of the language.
- 6. Forum Title:**
 - 6.1. Forum titles are phrases to categorize the content.
- 7. Forum Content:**
 - 7.1. A brief explanation of forum goals and topics that users may use to determine whether to engage in the forum.
- 8. Enrollment:** Indicate if the course is open for enrollment.
- 9. Course and Categorize:** ULingual shall have Courses, Schedules, and a list of enrolled students.

Entities:

- 1. Format:**
 - 1.1. Full Screen, Slideshow, and Horizontal Scrolling
- 2. Users:**
 - 2.1. An individual who makes use of the system, by setting up an account and logging in. Users shall have access with other entities including lessons, exercises, and forums.
- 3. User Type:**
 - 3.1. Shall consist of data that is kept about specific users. For example, if they are students, instructors, or guests.
- 4. Lessons:**
 - 4.1. Shall have text, images, videos, and other material used in lessons.
- 5. Comments:**
 - 5.1. All the users shall be able to leave comments during the session.
- 6. Search bars:**
 - 6.1. Users shall be able to search for languages, books, and videos.
- 7. Chat:**
 - 7.1. Users shall be able to use the chat window during the session.
- 8. User Profile:**

8.1. Users shall be able to customize their profile in this section. Such as profile picture and preferred names, etc.

9. Languages:

9.1. The ULingual shall be offering many languages to its users.

10. Exercises:

10.1. ULingual shall have Interactive exercises that users can complete within a lesson or in a separate time as practice for their language.

11. Forums:

11.1. ULingual shall have a discussion board where users are able to interact with each other. Such as questions and sharing information.

12. Courses:

12.1. ULingual shall have a series of classes where lessons and exercises combined to teach a language.

Functional Requirements

- 1. Camera Connection Between Users:**
 - 1.1. The user shall be able to connect and have a camera connection with other users.
- 2. Audio Connection Between Users:**
 - 2.1. The user shall be able to connect and have an audio connection to speak with other users.
- 3. Chat Box For Video Calls:**
 - 3.1. The user shall be able to text other users during their video calls.
- 4. Booking Video Calls with Native Speakers:**
 - 4.1. The users shall be able to book video call times from a native speaker of their preferred choice.
- 5. Catalog Of Available Appointments with Native Speakers:**
 - 5.1. The user shall be able to see a list of native speakers and their available time slots.
- 6. Booking Appointments with Tutors:**
 - 6.1. The user shall be able to book appointments with specialized tutors with teaching credentials.
- 7. User Ratings:**
 - 7.1. The user shall be able to leave ratings for their experience with their respective speaker—vice versa; out of 5 stars.
- 8. Review Section:**
 - 8.1. The user shall be able to leave a short review of their experience with their respective speaker—vice versa.
- 9. Display Ratings and Reviews:**
 - 9.1. The user shall be able to see their own ratings and reviews on their profile.
 - 9.2. The user shall be able to see others' ratings and reviews on others' profiles.
- 10. Progress Report:**
 - 10.1. The user shall be able to observe their language progress in a graphical way.
- 11. Transcript of Conversations Toggle:**
 - 11.1. The user shall be given the option to select if they want their conversation to be subtitled and written on a document.
 - 11.2. The user shall be able reference this document as support for their studies.
- 12. Create Flashcards:**
 - 12.1. The user shall be able to create digital flashcards to help them review and practice words or phrases of their desired language.

13. Generate Flashcards:

- 13.1. The user shall be able to access ULinguals generated flashcards as a small test for their desired language.

14. Playlists of Music:

- 14.1. The user shall be able to access playlists of music in relation to the language they desire to learn.

15. Language Comprehension Exercises:

- 15.1. The user shall be able to practice precreated exercises as a form of reinforcing their learning.
- 15.2. The user shall be able to complete exercises like filling in the blank of sentences, word matching, and object identification in their desired language.

16. Verbal Translation Exercises:

- 16.1. The user shall have access to verbal translation exercises which will allow them to practice translating between two different languages.

17. Non-Verbal Translation Exercises:

- 17.1. The user shall have access to non-verbal translation exercises which will allow them to practice translating between two different languages.

18. Registering an Account:

- 18.1. The user shall be able to create an account.
- 18.2. The user shall be able to register the account as a learner or native-speaking instructor.

19. Logging in:

- 19.1. The user shall be able to log in to their registered account and use website features.

20. Create a Profile:

- 20.1. The user shall be able to create and manage their own profile page.
- 20.2. The user shall be able to customize their profile theme, wallpaper, and banner.
- 20.3. The user shall be able to select a premade profile picture or upload and use one of their own.
- 20.4. The user shall be able to set roles/tags for their knowledge of a language to be shown on their profile page.

21. Friends List:

- 21.1. The user shall be able to view an organized list of friends on the website.
- 21.2. The user shall be able to edit their username that is shown to others on the friends list.
- 21.3. The user shall be able to search for other users by username or user ID.
- 21.4. The user shall be able to send and accept friend requests to and from other users.

- 21.5.** The user shall be able to set their status to Available, Busy, or Offline/Invisible.
- 21.6.** The user shall be able to view the status of other users on their friends list.
- 22. Linking Social Media:**
- 22.1.** The user shall be able to link their account to their accounts on other social media websites.
- 23. Recommendation List of Books:**
- 23.1.** The user shall have access to a list of book recommendations in a specified language.
- 24. Recommendation List of Films/Shows:**
- 24.1.** The user shall have access to a list of movie and tv show recommendations in a specified language.
- 25. Call Statistics:**
- 25.1.** The user shall be able to view their own video call history.
- 25.2.** The user shall be able to view who they have had video calls with.
- 25.3.** The user shall be able to view the duration of video calls.
- 25.4.** The user shall be able to view the dates of when video calls occurred.
- 26. Multi-Screen Call:**
- 26.1.** The user shall be able to host or join a video call with multiple users.
- 27. Certification of Completion:**
- 27.1.** The user shall be given a digital certificate of completion after the user has completed a language program.
- 28. History of Language:**
- 28.1.** The user shall be able to read about the history of available languages offered on the website.
- 29. Recommended Travel Locations:**
- 29.1.** The user shall have access to a list of recommended traveling locations based on their language roles/tags.
- 30. Global Chat Room:**
- 30.1.** The user shall be able to join the global chat room.
- 31. Language Difficulty System:**
- 31.1.** The user shall be able to view a list of languages rated by difficulty according to other users on the website.
- 32. Age System:**
- 32.1.** The user shall be provided course content relevant to their age.
- 33. Virtual Karaoke:**
- 33.1.** The user shall be able to activate a live karaoke feature during video calls.
- 34. Custom Newsletter:**
- 34.1.** The user shall have the option to receive monthly emails of current events around the world related to their language roles/tags.

35. Donation to Others:

35.1. The user shall have the option of donating to other users on the website.

36. Friends Count:

36.1. The user shall have the option of displaying how many other users they have connected with.

37. Distinguished Teaching Symbols

37.1. The user shall be able to display distinguished symbols on their profile indicating their level of teaching ability for a specific language.

38. Weekly Quiz Competition:

38.1. The user shall be able to participate in weekly quizzes.

38.2. The user shall be able to view weekly quiz scores of other users on their friends list.

39. Sharing Progress to Social Media:

39.1. The user shall have the option of posting personal course progress to linked social media websites.

40. User Recommendations:

40.1. The user shall be given a list of recommended users to follow related to their language roles/tags.

41. Test to Verify Native Speakers:

41.1. The user shall be required to pass a test to confirm their mastery of the specified language.

Non-Functional Requirements

- 1. System Requirements:**
 - 1.1.** Operating System Minimums: System shall support operating systems running Windows 7, Mac OS 10.8 or newer.
- 2. Performance:**
 - 2.1.** Server Uptime: The server shall be run through the day for 24 hours a day.
 - 2.2.** Minimal Message Delay: The server shall be able to process and display live texts within 3 seconds.
 - 2.3.** Minimal Page Load Delay: The server shall load pages for the user within 2 seconds.
- 3. Storage:**
 - 3.1.** Server Storage Capability: ULingual's server shall be run on 8GiB Volume.
- 4. Security:**
 - 4.1.** Data Privacy: The user's password information shall be protected and encrypted within ULingual's database.
 - 4.2.** Secure Password: The user shall have a secure password that includes an uppercase, lowercase, special symbol, a numerical value, and be a length of at least 8 characters.
 - 4.3.** Username Uniqueness: There shall be no duplicate usernames within the database of ULingual.
- 5. Environmental:**
 - 5.1.** Safe Space Environment: The user shall experience a judgment free zone while using ULingual services.
- 6. Marketing:**
 - 6.1.** ULingual shall have an easy to identify logo that distinguishes itself from others.
- 7. Legal:**
 - 7.1.** Acceptance of Policies & Services: The user must accept our policies and terms of service prior to creating a ULingual account.
- 8. Content:**
 - 8.1.** Immersive & Interactive Content: The user shall experience content that's both enjoyable and also interactive.
- 9. Look and Feel:**
 - 9.1.** Smooth User Experience: The user shall experience the services of ULingual in an easy and smooth way, mitigating confusion and frustration.
 - 9.2.** Smooth Customer Support: The system shall provide a form system where the user shall be able to contact us regarding inquiries, feedback, and issues they are facing regarding the software.

10. Usability:

- 10.1.** Accessibility: ULingual shall be accessible to anyone with a general internet connection and the minimum required operating system requirements.
- 10.2.** Efficiency: The ULingual system shall be efficient for the users.
- 10.3.** Username Changes: The user shall be able to change their username whenever they please, granted it isn't taken already.

11. Privacy:

- 11.1.** Data Encryption: The system shall encrypt and protect all user password data.
- 11.2.** Data Privacy: The user's data shall not be spread elsewhere outside the bounds of the systems database.

12. Compatibility:

- 12.1.** ULingual shall be dynamic and be able to scale to the proper size of web content in relation to a device's screen size.

13. Organizational:

- 13.1.** Form Branch: ULingual shall have dedicated personnel to respond to and review all form responses sent to ULingual.

14. Coding Standards:

- 14.1.** Naming Conventions: ULingual shall follow standard naming conventions for variables, i.e meaningful and understandable variable names.
- 14.2.** Documentation: ULingual shall follow adequate documentation protocol; comments in regard to code should be easily understandable.

Competitive Analysis

Feature/ Company	Verbling	Lingoda	Italki	Mango Languages	Busuu	ULingual
Pricing	* Tutoring sessions charge by tutor per hour	<ul style="list-style-type: none"> * Can enroll in individual classes/lessons. * Purchase classes by package (5, 10, 20, etc). Cost per class decreases as the number of classes purchased in a package increases. 	<ul style="list-style-type: none"> * Can purchase by lesson for 1 on 1 tutoring or group classes * Purchasing more lessons at once may include a discount * Purchase lesson by time period (30, 45, 60 mins) 	<ul style="list-style-type: none"> *Free through public libraries, colleges, and universities *\$18/month for access to all 70+ languages and up to 5 family profiles *\$8/month for one language and its content 	<ul style="list-style-type: none"> *\$14/month, less if you buy multiple months in advance for Premium *Free if you do not want all content and lessons 	<ul style="list-style-type: none"> * Basic features (tbd) are free * Monthly (\$5) subscription to access more advanced, personalized features. * Tutoring sessions prices vary by tutor
Tutoring	<ul style="list-style-type: none"> * Tutors with prior teaching experience. * Tutors must be at a C2 CEFR language proficiency level. 	<ul style="list-style-type: none"> * Group classes with proper lesson plans. * Can schedule based on your learning level (defined by Lingoda) and topic. 	<ul style="list-style-type: none"> * Can schedule lessons customized by the teacher on the platform. Pricing varies by lesson and by teacher. *Live classes *Offers group classes and 1 on 1 lessons 	n/a, no tutors	n/a, no tutors	<ul style="list-style-type: none"> *Tutors must have prior teaching experience in a given language. *Tutors have creative control over their lesson plan, but must accurately advertise this before users purchase sessions. * Tutors can offer group sessions with an enrollment limit.
Solo study/practice tools offered?	No	No	No	Yes	Yes	Yes

Additional (non-tutoring) learning resources offered	n/a (primary service is video tutoring)	<ul style="list-style-type: none"> * Provides suggested courses and basic grammar articles under resources. 	<ul style="list-style-type: none"> * Offers purchasable language proficiency tests * Podcasts, practice quizzes * Community forums 	<ul style="list-style-type: none"> * Individualized lessons based on topics for learning. Different learning strategies used * Mango Movies * Resource articles in target language * Translation under Tools tab 	<ul style="list-style-type: none"> * Page to review what you have learned * Has structured lessons based on relevant topics * Lessons for pronunciation * Has a placement so you can start at your current level 	<ul style="list-style-type: none"> * Verbal/non-verbal translation exercises, flashcards * Recommended music, movies, books
Onboarding incentive	'Try a free lesson' button, must sign up	Free 7 day trial, purchase classes ahead of time after signing up	n/a, 'Start now' button with no incentive	<ul style="list-style-type: none"> * Free access through public libraries, colleges, and universities. 	<ul style="list-style-type: none"> * After signing up, take a placement test * Student discount * Larger plans offer up to 50% discount * 14-day money back guarantee 	<ul style="list-style-type: none"> * 2 week free trial for premium subscription benefits (not tutoring)
# of languages offered	70+	4 (business english included would be 5)	150+	70+	13	<p>2-5 Definitely: (English, Spanish)</p> <p>Possibly: (Arabic, French, Korean)</p>

+ feature exists; ++ feature superior; - does not exist

Features	Verbling	Lingoda	Itaki	Mango Languages	Busuu	ULingual
Pricing	+	+	+	+	+	+
Tutoring	+	+	+	-	-	+
Solo study/practice tools offered?	-	-	-	+	+	+
Additional (non-tutoring) learning resources offered	-	+	++	++	++	++
Onboarding incentive	+	+	-	+	++	+
# of languages offered	++	+	++	++	+	+

High-level Architecture and Technologies Used

Server Host: Amazon AWS 1vCPU 8 GiB Volume

Operating System: Ubuntu Server 22.04 LTS

Database: MySQL 8.0.32

Web Server: Node.js v16.19.1

Server-Side Language: Javascript

Additional Technologies

- **Web Framework:** React 18
- **IDE:** Visual Studio

Checklist

- Team found a time slot to meet outside of the class
DONE
- Github master chosen
DONE
- Team decided and agreed together on using the listed SW tools and deployment server
DONE
- 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
- Team lead ensured that all team members read the final M1 and agree/understand it before submission
DONE
- Github is organized as discussed in class (e.g. master branch, development branch, folder for milestone documents etc.)
DONE

List of Team Contributions:

Sara Murad Ahmed Seid:

- Contribution Score: 5

Sara attended meetings but her microphone was off and she rarely spoke during our meetings. Sara contributed to user case ideas but never finished the description of the user cases. Sara hasn't been collaborative in discussion. I assigned Sara some tasks for this milestone. She was given the task of filling out the Main Data Entities section along with Elias and Nik. She was also given the task of creating a server for us to deploy our code on along with Elias and Nik. I gave Sara a deadline for this, and she neither had Main Data Entities or the server complete by the date I assigned. She along with Elias and Nik eventually completed the Main Data Entities but a few days after the due date I assigned it for. I hope for future milestones she improves her contribution and collaboration.

Steven Anthony Vasquez:

- Contribution Score: 10

Steven has been a great help through the entire process of milestone one. He was always there for all the meetings, even short notice emergency meetings. He was very collaborative and gave great feedback during our zoom meetings. Steven helped with user cases, competitive analysis, ideas regarding functional requirements, nonfunctional requirements, and also helped with the structure and follow of the executive summary. Him and Aidan did a great job on research for the competitive analysis and gave us a thorough and in depth comparison of our competitors to what we have in mind. Steven also helped with the initialization of the react.js application launch for our website.

Nik Shahrul Nafiz Bin Nik Azhan:

- Contribution Score: 6

Nik has attended all meetings we've had and has been collaborative. He has his microphone both on and off but is definitely collaborative either through microphone and via text. Nik helped with nonfunctional requirement ideas, and functional requirement ideas. I assigned Nik as well as Sara and Elias the task of the Main Data Entities section and server deployment. Although Nik, Sara, and Elias didn't finish the tasks on time. Nik was the first one to reach out and ask about his task, he made an effort and tried—which goes a long way for me. He also always asked questions during our meetings for clarification which shows he's interested in our product. Nik as well as Sara and Elias submitted the Main Data Entities section a few days after the due date I assigned them, but again Nik was the first one to make an effort and reach out to me with questions.

Elias G Yetechalew:

- Contribution Score: 4

Elias attended meetings but his microphone was off and he rarely spoke during meetings. Elias hasn't been collaborative in discussion. It takes me a lot to get into contact with Elias, I not only have to ping him on discord but I also have to send him an additional email to grab his attention at times. I assigned Elias along with Sara and Nik the tasks of the Main Data Entities section and server deployment. I gave Elias and them a deadline for this, and he as well as them didn't have the Main Data Entities and server deployment complete by the due date I assigned. They completed the due Main Data Entities a few days after the due date I assigned. What really displeased me was the lack of communication from Elias—as well as Sara. Especially with the server deployment, if they were unable to do the task they should have asked me for help; instead they stayed silent and didn't tell me a thing. I was left with the task of establishing the server deployment on a shorter time frame than anticipated because of their lack of communication and participation. I hope that Elias in future milestones is more collaborative and participates in a timely manner.

John Lee Santiago:

- Contribution Score: 8

John has been there to all the meetings, even the short notice ones. He also gives collaborative feedback and ideas. He has made great contribution to the user cases and made all the diagrams for the user cases, helped with functional requirements and also reformatting the structure and formality of our requirements to match business presentation, overlooked formatting of document, and also always double checked with me on issues he was concerned about whether it be in terms of our repository or our ideas.

Aidan Carl Stivers:

- Contribution Score: 8

Aidan has also been to all the meetings, including the short notice emergency meetings. Aidan, like Steven, is great in terms of participating in our meetings, always spreading ideas and giving feedback towards our discussion in regards to functional requirements, use cases, and executive summary. Aidan also contributed to the competitive analysis section like Steven and gave great information regarding our competitors.

Jonathan Valadez:

Worked on Executive Summary, Functional/Non-Functional requirements, and the main data items and entities. Within M1V2 I revised some of the Non-Functional requirements to adjust to the current state of our website.

Milestone 2 Version 2

Data Definitions

Main data items:

1. Images:

- 1.1. This main data item shall be a component that is used in user profiles—where the user can upload images of themselves, a component that is used in courses where part of the lessons shall have images where the user shall have to identify what the image is in translation to their given learning language.
- 1.2. Images relative to user profiles via phone shall display 110x110 pixels, on desktop it shall be 180x180 pixels. Upon uploading profile pictures, the

image shall be at least 320x320 pixels—but shall be scaled down to fit the circle template profile picture.

- 1.3. Images relative to lessons where the user shall identify a given image in the language they are trying to learn shall be at least 500x500 pixels.

2. Pages:

- 2.1. This main data item shall be a component that the user will scroll through and iterate through different subsections of our service. The user shall be able to scroll down these given pages and interact and iterate through other pages within our service, given the users desired subsection choice.
- 2.2. Pages shall encapsulate the entire screen of the user—relative to the size of the user's device. Pages shall be scaled properly for both mobile and desktop devices.

3. Posts:

- 3.1. This main data item is a component that shall give users access to write and publicly post their experience of their engagement with other users via posting a review or posting their rating experience. This data shall give users a good idea of how other users interact.

4. Progress Bar:

- 4.1. This main data item shall be a component that shows the users progress in regards to their course learning for a given language. The more they learn and the farther they are into their course made by ULingual, the further their progression bar shall be.

5. Language Title:

- 5.1. This main data item shall be a component that gives the user information regarding their language choice.

6. Forum Title:

- 6.1. This main data item shall be a component that gives the user information regarding the title of a given forum where the user can decide if they want to click on the forum title and participate in the given discussion. Forum titles shall contain phrases that categorize content upon user discussion.

7. Forum Content:

7.1. This main data item shall be a component that has all the users' comments in relation to a given forum title. Within the forum content the user shall be able to view and comment on other users' discussions and make their own comments and questions in the forum so that others shall be able to comment on it as well.

8. Enrollment:

8.1. This main data item shall be a component that shows whether a user is enrolled in one of the courses offered by ULingual. These courses shall be initially created by ULingual but aren't exclusively made by ULingual. If tutors want to create more curated content, ULingual shall anticipate to support this as well as providing availability for course capacity-based on the tutors course direction (asynchronous work/synchronous work).

9. Course Index:

9.1. This main data item shall be a component that shows what type of courses ULingual shall offer. This data item shall also show who is enrolled in the given course as well as a count of how many. Each course has progression, this data item shall show the individual users progression bar as well.

10. Miscellaneous Content:

10.1. This main data item shall be a component that contains and stores ULingual's miscellaneous alternatives for users to learn; via music playlists, book recommendations, and show/movie recommendations. These forms of content shall be relative to the user's choice of language they desire to learn or improve upon.

Entities:

1. Tutors:

1.1. An entity that created an account and is a verified personnel that excels in a given language.

- 1.2. This entity can sign in from different devices.
 - 1.3. This entity shall have a unique username and password.
 - 1.4. This entity shall have a unique tutor badge assigned to them.
 - 1.5. This entity shall have their first and last name listed within their profile as they are verified personnel.
- 2. Users:**
 - 2.1. An entity that created an account and can sign in from different devices.
 - 2.2. This entity shall have a unique username and password.
 - 2.3. This entity shall have an optional choice to list their first and last name within their profile.
 - 2.4. This entity shall have access to courses provided within ULingual.
 - 2.5. This entity shall have the ability to book an appointment with a tutor.
 - 2.6. This entity shall have access to playlists, books, & shows recommended by ULingual in relation to the language the user desires.
- 3. Native Speakers:**
 - 3.1. This entity shall be able to connect with other users who want to learn their language.
 - 3.2. An entity that created an account and can sign in from different devices.
 - 3.3. This entity shall have a unique username and password.
 - 3.4. This entity shall have an optional choice to list their first and last name within their profile.
 - 3.5. This entity shall have access to courses provided within ULingual.
 - 3.6. This entity shall have the ability to book an appointment with a tutor.
 - 3.7. This entity shall have access to playlists, books, & shows recommended by ULingual in relation to the language the user desires.
- 4. Lessons:**
 - 4.1. This entity shall have an array of lessons that each the users the general structure of a language.
- 5. Exercises:**
 - 5.1. This entity shall have tests that the user can complete. These tests from the exercises can include completing given sentences, matching pictures

to words, and listening to a phrase and identifying what the phrase means in the user's given language choice.

6. Forums:

- 6.1. This entity shall be accessible by all users and tutors where they are able to interact with each other via text chat threads. Here is where users and tutors can answer questions, share information regarding language, and potentially make new friends.
- 6.2. This entity shall have text chat threads that are broken down into sections. Based on these sections, the user can access different information that other users and tutors publicly post and share.

7. Reviews:

- 7.1. This entity is a section under a tutor's profile where other users can leave comments about the tutor based on their experience in a video call with them.
- 7.2. This entity is a section under a tutor's profile, where other users can leave a rating out of 5 stars to summarize their experience with the tutor on a video call. This can be done independently from comments, where a user can either leave a rating out of 5 without commenting or also leave a rating and a comment.

8. Video Rooms:

- 8.1. This entity is a place where users can either connect with another user or a tutor to exchange and learn a language of their desire. This shall also be a space where users can also have a potential karaoke party with other users.

9. Search bars (Weak Entity):

- 9.1. This entity shall be able to be used by the user to search for courses related to their language, books, and videos. This entity will filter through ULinguals database to find specifically what the user wants in relation to what we have in our server database.

10. Chat Box:

10.1. This entity shall be accessed and used by the user during a video session to be able to text with the other user just in case they are unable to use their microphone.

11. User Profiles:

11.1. This entity shall be customizable by the user for public display. Some customizable features shall include: banner customization, description of profile, language preferability, language knowledge, profile picture, optionally date of birth, optionally age, and preferred name/nickname.

12. Language (Weak Entity):

12.1. This entity shall contain all the languages that ULingual offers that the user can access and learn.

13. Music Playlists:

13.1. This entity shall contain music playlist recommendations in relation to the user's desired language choice. Here the user can see and browse music that people are listening to in their respective language learning choice.

14. Books:

14.1. This entity shall contain book recommendations in relation to the user's desired language choice. Here the user can view popular books written by authors whose natural language is in relation to the user's respective language learning choice.

15. Movies & Shows:

15.1. This entity shall contain movies and show recommendations in relation to the user's desired language choice. Here the user can view popular shows and movies that were made in the natural language that's in relation to the user's respective language learning choice.

Prioritized Functional Requirements

Priority 1:

- 1. Audio Connection Between users**
 - 1.1. The user shall be able to connect and have an audio connection to speak with other users.
- 2. Camera Connection Between Users:**
 - 2.1. The user shall be able to connect and have a camera connection with other users.
- 3. Booking Video Calls with Native Speaking tutors**
 - 3.1. The users shall be able to book video call times from a native speaker of their preferred choice.
 - 3.2. The users shall be able to view future appointments they have booked.
- 4. Catalog Of Available Appointments with Native Speaking tutors**
 - 4.1. The user shall be able to see a list of native speakers and their available time slots.
 - 4.2. The user shall be able to filter available appointments to meet their needs.
- 5. Registering Appointments by Tutors:**
 - 5.1. The tutor users shall be able to set up appointments for users to book within a timeframe.
- 6. Booking Appointments with Tutors:**
 - 6.1. The user shall be able to book appointments with specialized tutors with teaching credentials.
- 7. Open Live Chat by Native Speakers:**
 - 7.1. Native speakers shall be able to host open live chats for users to connect to.
 - 7.2. Users will be able to connect to calls with native speakers to practice conversational skills.
- 8. Registering an account:**
 - 8.1. The user shall be able to create an account.
 - 8.2. The user shall be able to register the account as a learner, native speaker, or native-speaking instructor.
 - 8.3. The user must verify their age during registration. Users must be 18+ years old.
- 9. Logging in:**
 - 9.1. The user shall be able to log in to their registered account and use website features.
- 10. Create a Profile:**
 - 10.1. The user shall be able to create and manage their own profile page.

- 10.2.** The user shall be able to select a premade profile picture or upload and use one of their own.
- 11. User Availability:**
- 11.1.** The user shall be able to set their status to Available, Busy, or Offline/Invisible.
- 12. Chat Box For Video Calls:**
- 12.1.** The user shall be able to text other users during their video calls.
- 13. Generate Flashcards:**
- 13.1.** The user shall be able to access ULinguals generated flashcards as a small test for their desired language.
- 14. Create Flashcards:**
- 14.1.** The user shall be able to create digital flashcards to help them review and practice words or phrases of their desired language.
- 15. Language Comprehension Exercises:**
- 15.1.** The user shall be able to practice precreated exercises as a form of reinforcing their learning.
- 15.2.** The user shall be able to complete exercises like filling in the blank of sentences, word matching, and object identification in their desired language.
- 16. Distinguished Teaching Symbols:**
- 16.1.** The user shall be able to display distinguished symbols on their profile indicating their level of teaching ability for a specific language.
- 17. Non-Verbal Translation Exercises:**
- 17.1.** The user shall have access to non-verbal translation exercises which will allow them to practice translating between two different languages.
- 18. Recommendation List of Books:**
- 18.1.** The user shall have access to a list of book recommendations in a specified language.
- 19. Recommendation List of Films/Shows:**
- 19.1.** The user shall have access to a list of movie and tv show recommendations in a specified language.

20. Playlists of Music:

- 20.1.** The user shall be able to access playlists of music in relation to the language they desire to learn.

21. Tutor Reviews:

- 21.1.** The user shall be able to leave a comment review on their experience with other users in a call.
- 21.2.** The user shall be able to leave a rating out of 5 stars on their experience with other users in a call.
- 21.3.** Their comments and star rating shall be shown on a given user's profile as well as the date it was posted.

22. Global Forums:

- 22.1.** The user shall be able to join the global forum discussion.

23. Friends List:

- 23.1.** The user shall be able to view an organized list of friends on the website.
- 23.2.** The user shall be able to edit their username that is shown to others on the friends list.
- 23.3.** The user shall be able to search for other users by username or user ID.
- 23.4.** The user shall be able to send and accept friend requests to and from other users.
- 23.5.** The user shall be able to view the status of other users on their friends list.

Priority 2:

1. Verbal Translation Exercises:

- 1.1.** The user shall have access to verbal translation exercises which will allow them to practice translating between two different languages.

2. Multi-Screen Call:

- 2.1.** The user shall be able to host or join a video call with multiple users.

3. Customize a Profile:

- 3.1.** The user shall be able to customize their profile theme, wallpaper, and banner.

3.2. The user shall be able to set roles/tags for their knowledge of a language to be shown on their profile page.

4. Recommended Travel Locations:

4.1. The user shall have access to a list of recommended traveling locations based on their language roles/tags.

5. Linking Social Media

5.1. The user shall be able to link their account to their accounts on other social media websites.

6. Sharing Progress to Social Media:

6.1. The user shall have the option of posting personal course progress to linked social media websites.

7. Structured Lesson Plans

7.1. The user shall be able to follow a self-guided lesson plan for learning basic topics using various language exercises defined above.

7.2. The user shall be able to observe their language progress in a graphical way.

8. Tips to Tutors:

8.1. The user shall have the option of tipping tutors after lessons based on their performance in the tutoring session.

9. Direct messaging

9.1. Users shall be able to directly message other users from their friends list.

10. Test to Verify Native Speakers

10.1. The user shall be required to pass a test to confirm their mastery of the specified language.

11. Report User Option

11.1. The user shall be able to report other users' misconduct.

12. Friends Count:

12.1. The user shall have the option of displaying how many other users they have connected with.

Priority 3:

1. Transcript of Conversations Toggle:

- 1.1. The user shall be given the option to select if they want their conversation to be subtitled and written on a document.
- 1.2. The user shall be able reference this document as support for their studies.

2. Certification of Completion:

- 2.1. The user shall be given a digital certificate of completion after the user has completed a language program.

3. History of Language:

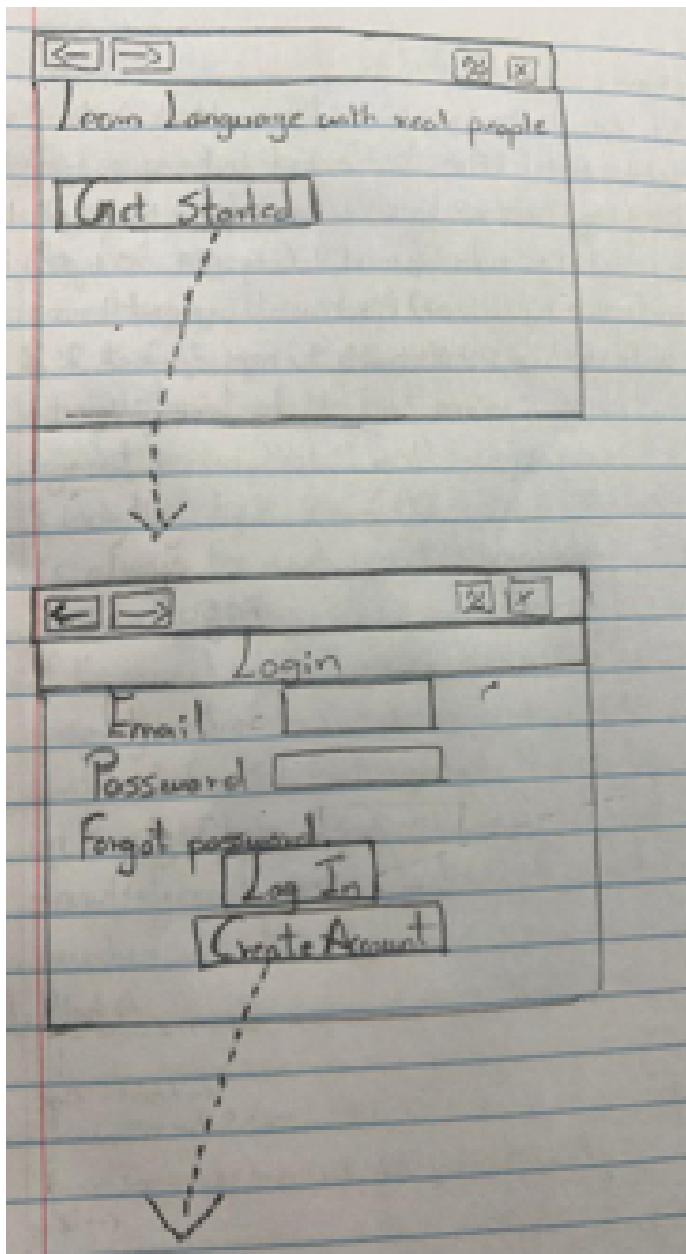
- 3.1. The user shall be able to read about the history of available languages offered on the website.

4. Weekly Quiz Competition:

- 4.1. The user shall be able to participate in weekly quizzes.
- 4.2. The user shall be able to view weekly quiz scores of other users on their friends list.

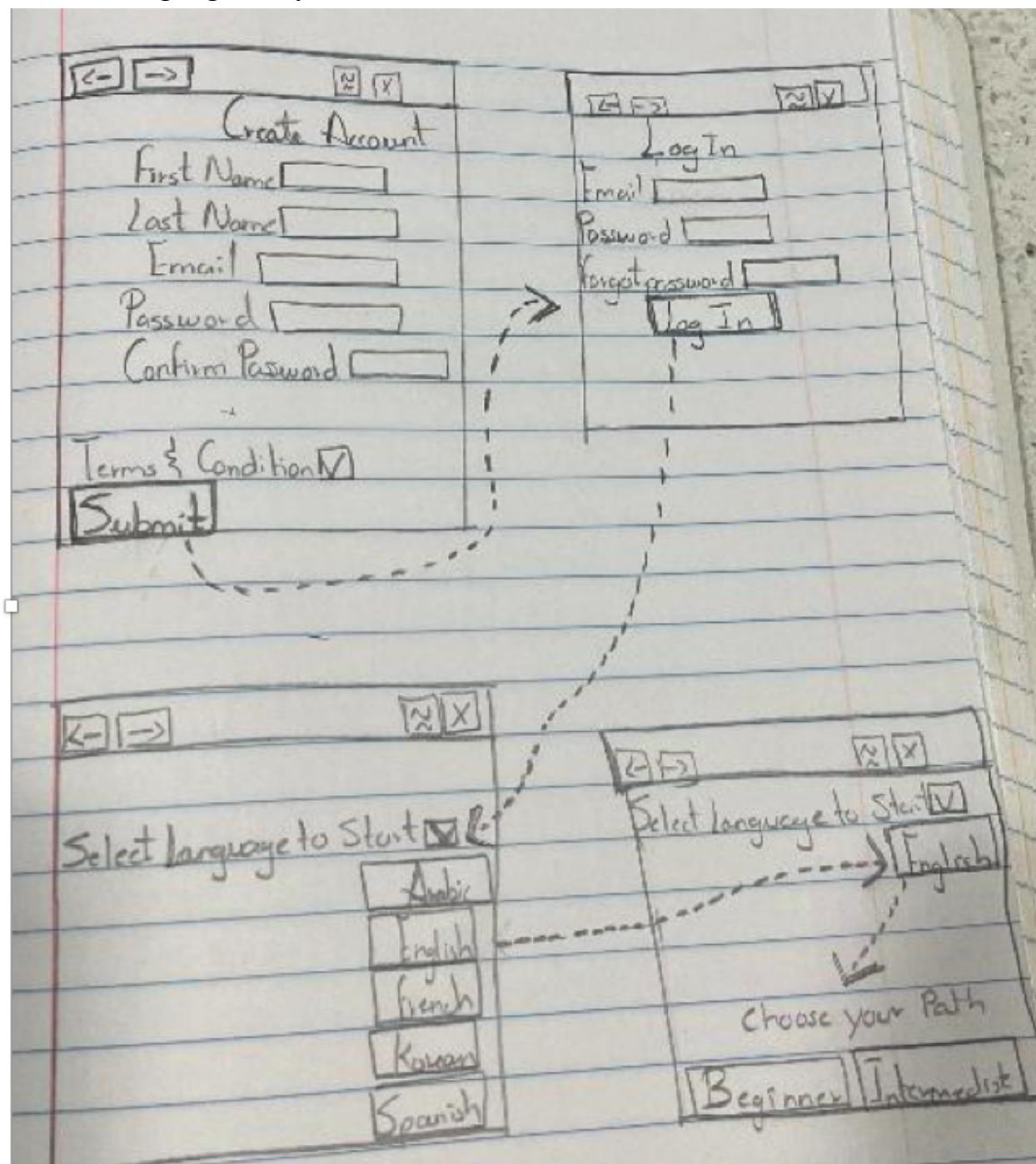
UI Mockups and Storyboards

1. This is the first page that the user shall see when first going to the ULingual website. As we see in the picture there is **Get Started** to help users start.
2. The second page shall appear after the **Get Started** button was selected for someone who doesn't have an account shall click the **Create Account** button.



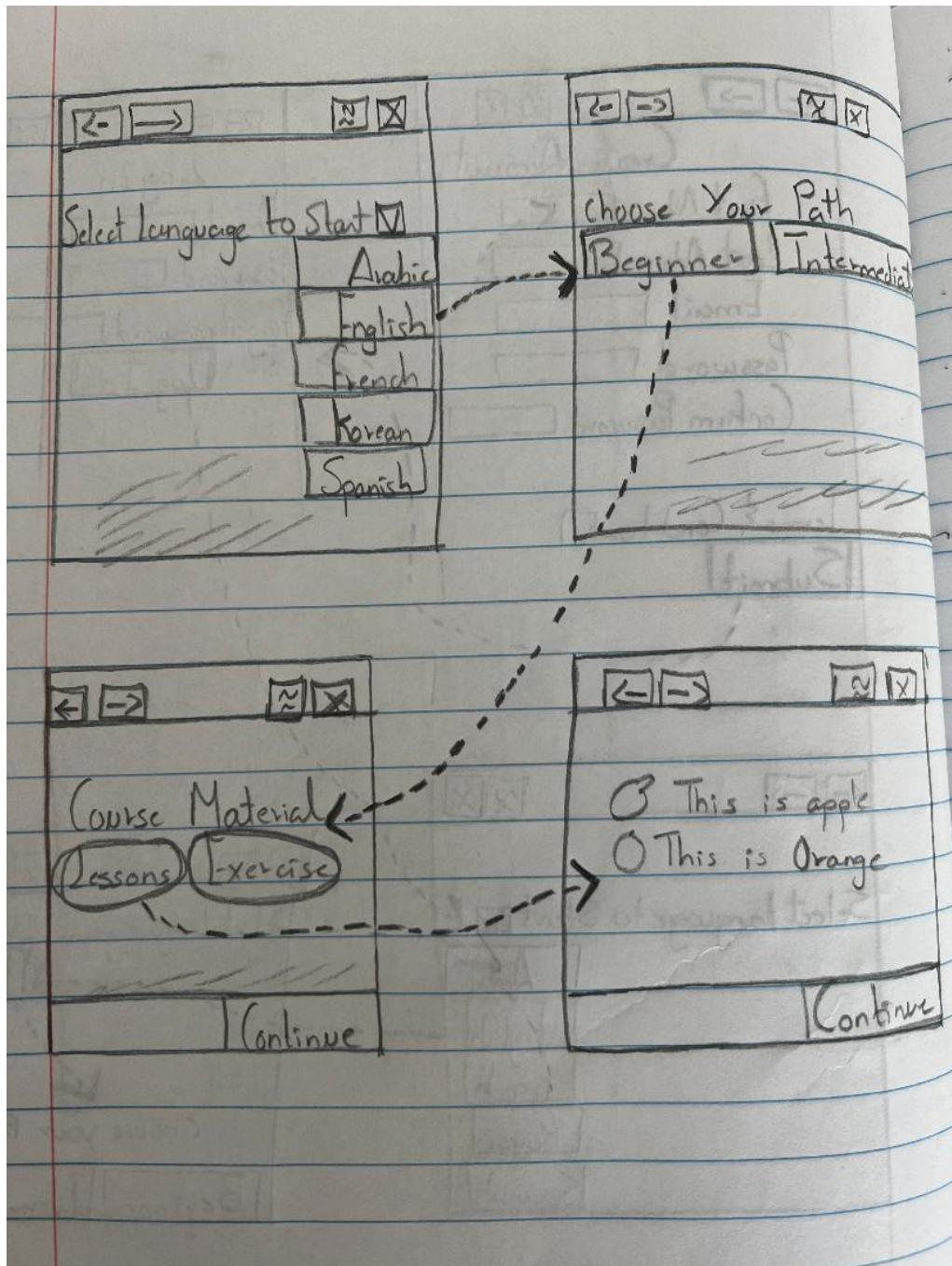
3. This page shall appear when the **Create Account** button is selected to help the user create their account after the **Terms and Conditions** are being checked.

4. This user shall see this from either after login or creating an account, and that is to select the **languages** they want to learn.



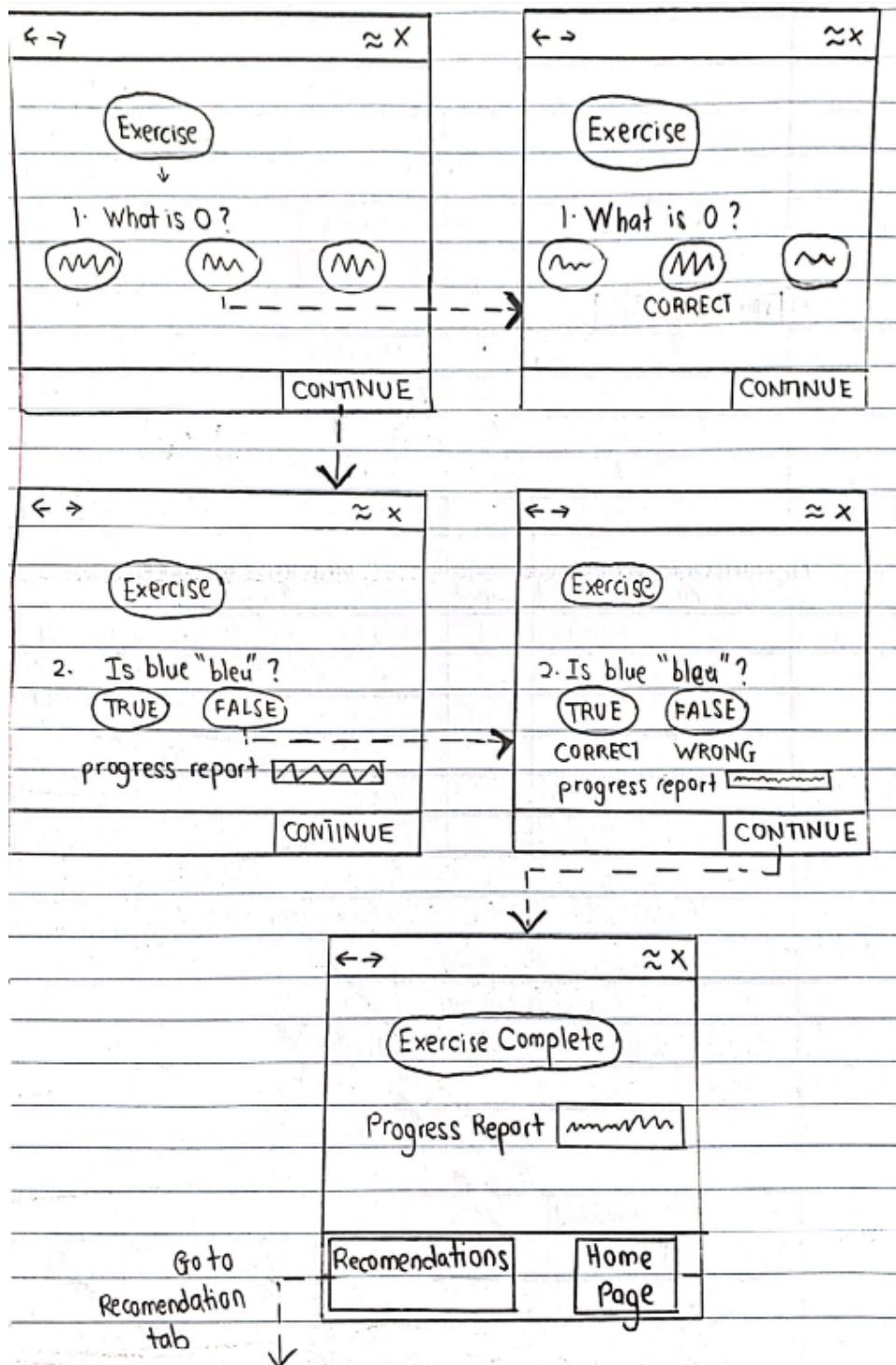
5. The user shall see this, when they select **English** as language to learn they shall be asked to choose their level from beginner and intermediate.

6. When the user selects as **Beginner**, they shall see a course material assigned to it like **lessons** and **exercise**.

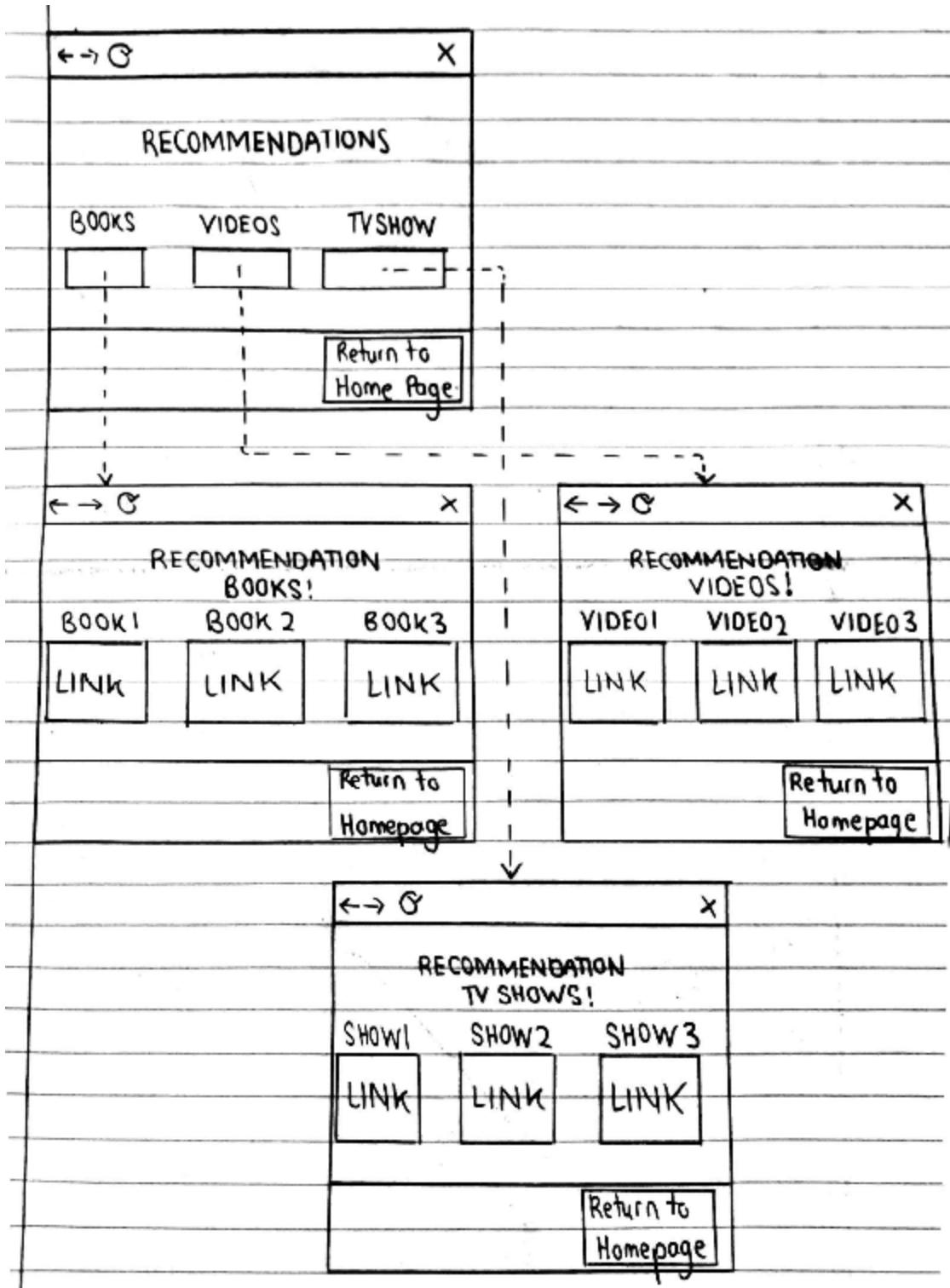


9. While the user is engaged with the **Exercise** and **lessons** there shall be a progress report at the bottom showing their progress.

10. The website shall recommend some books, videos etc.. according to the progress report.



11. Recommend some books, videos etc..
 12. Also, if the user selected books from the recommended button, this shall show up.



Database Architecture and Organization

Entities & Relationships:

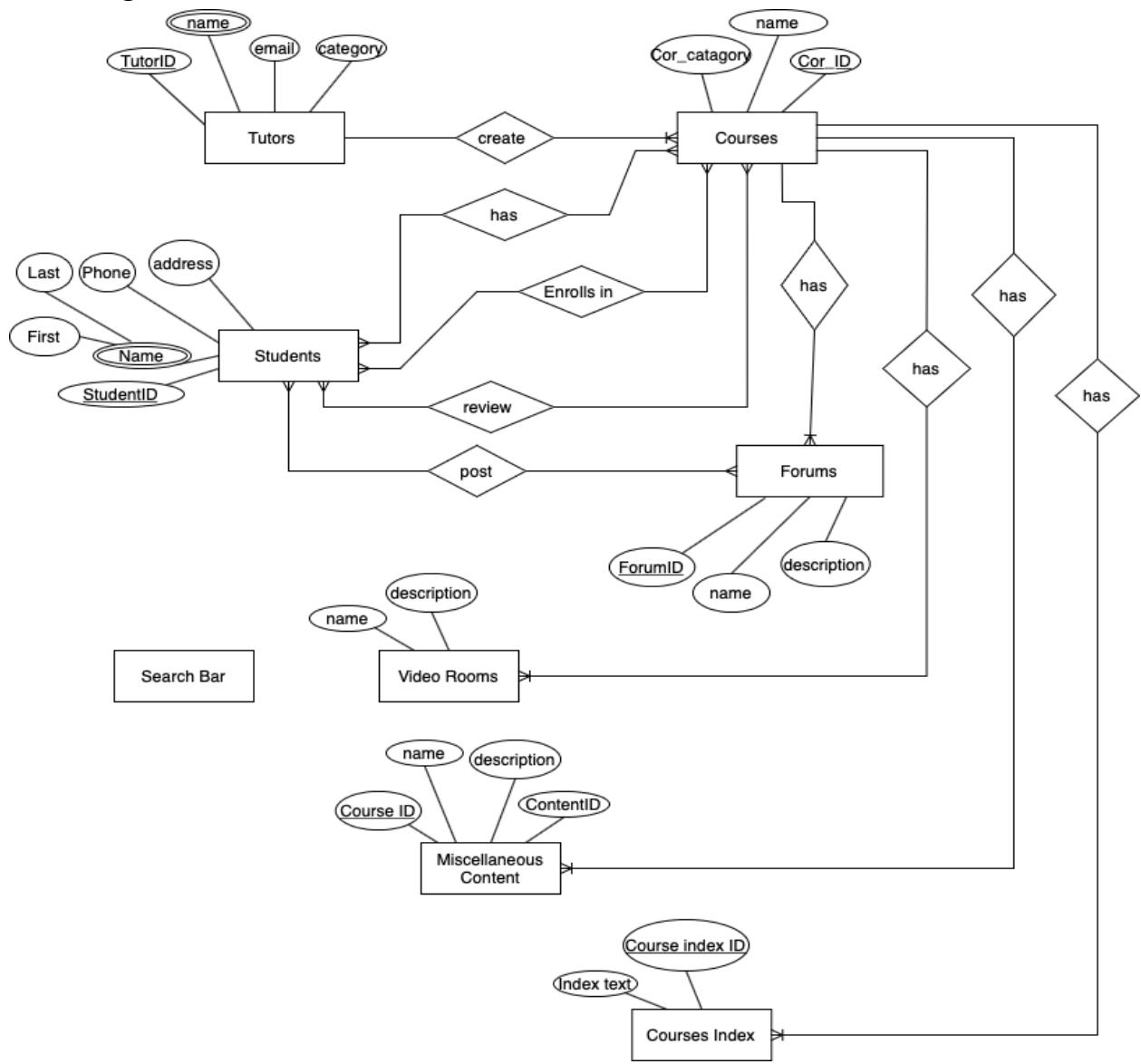
- 1. Students:**
 - 1.1. Shall enroll One-to-more courses(1:M)
 - 1.2. Write One-to-more reviews (1:M)
 - 1.3. Shall have access One-to-more video rooms(1:M)
 - 1.4. Shall use search bar to search courses
 - 1.5. Shall access Miscellaneous Contents
- 2. Tutors:**
 - 2.1. Shall teach one or more courses(1:M)
 - 2.2. Shall participate in one or more forums(1:M)
 - 2.3. Shall have access for one or more video call(1:M)
 - 2.4. Shall have access to write one or more review (1:M)
- 3. Courses:**
 - 3.1. Shall be given by one or more tutors
 - 3.2. Shall have one or more students enrolled
 - 3.3. Shall have one or more forums
 - 3.4. Shall have one or more video rooms
 - 3.5. Shall have one more miscellaneous contents
- 4. Forums :**
 - 4.1. (1:M) linked one or more courses
 - 4.2. (1:M) participated by one or more tutors and students.
- 5. Reviews:**
 - 5.1. Review can be connected to one course.
 - 5.2. Can be written by one tutor or student
- 6. Video Rooms:**
 - 6.1. Video room shall connect to one course
 - 6.2. Shall be accused by one or more students and tutors
- 7. Search bar:**
 - 7.1. Shall be accessed by one or more users
- 8. Enrollment:**
 - 8.1. Connect to one courses
 - 8.2. Connect to one student
- 9. Course Index:**
 - 9.1. Shall be linked to one or more courses
 - 9.2. Shall be accused by one or more
- 10. Miscellaneous Content:**
 - 10.1. (1:M) one or more courses

10.2. (1:M) student or tutors access it

Entity Domain

1. Student ID: INT, unique identifier, primary key,
name: varchar(32), not null
email: varchar(32), not null, unique
Course: varchar(32)
2. Tutor ID: INT, unique identifier, primary key
name: varchar(32), not null
email: varchar(32), not null, unique
category: varchar(32)
3. Course ID: INT, unique identifier, primary key
name: varchar(100), not null
category: text
4. Forum ID: INT, unique identifier, primary key
name: varchar(100), not null
description: text
5. Review ID: INT, unique identifier, primary key
Review text: text, not null
rating: decimal(2,1), not null
6. Video Room ID: INT, unique identifier, primary key
name: varchar(100), not null
description: text
7. Enrollment ID: INT, unique identifier, primary key
Course ID: integer, foreign key referencing Course entity
Student ID: integer, foreign key referencing Student entity
8. Course Index ID: INT, unique identifier, primary key
ID: integer, foreign key referencing Course entity
Course Index text: text
9. Content ID: INT, unique identifier, primary key
ID: integer, foreign key referencing Course entity
Content name: varchar(100), not null
Content type: varchar(20), not null
10. Miscellaneous Content;
Content ID: INT, unique identifier, primary key
Course ID: integer, foreign key referencing Course entity
name: varchar(100), not null
type: varchar(20), not null

ERD Diagram



In this project MySQL database management system(**DBMS**) chose to create the database. Why? Because, MySQL store supports relational database systems, stores data across multiple tables and it's a good fit for our applications that meets our required high performance.

- Media storage: Images and video/audio will be stored in a file system on the server.
- search/filter architecture and implementation: Depending on how me and the team implement the application we should use one of this search/filter architectures
 - Search by Course name or Course ID.
 - Filter by Tutor, Course Level, Course category.

APIs and Main Algorithms

Functional Requirements that will require API/algorithms:

Priority 1:

1. **Audio Connection Between Users (API)**
 - 1.1. Twilio, free "[Video WebRTC Go](#)" tier for 1 on 1 calls. We plan to use this API to allow for video connection between user and tutors. Twilio also offers video call transcription, a feature we plan to implement.
2. **Camera Connection Between Users (API)**
 - 2.1. Twilio, free "[Video WebRTC Go](#)" tier for 1 on 1 calls
3. **Catalog of Available Appointments with Native Speakers (Algorithm)**
 - 3.1. Algorithm to display appointments that are able to be booked from the database

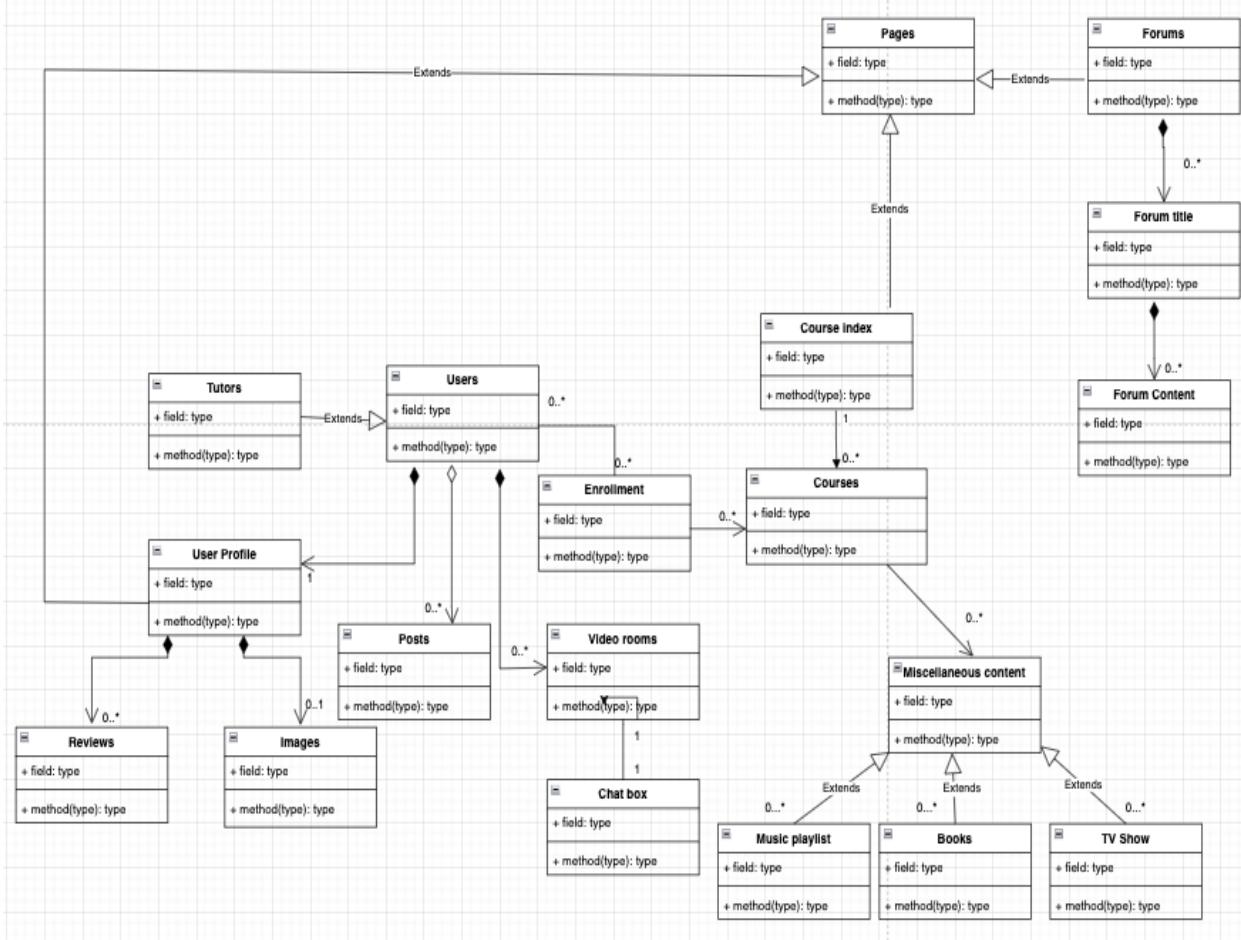
Priority 2:

1. **Chat Box for Video Calls (API?)**
 - 1.1. Custom API for sending, receiving, and displaying text chat between users. Live chat will be displayed during video calls.
2. **Generate Flashcards (Algorithm)**
 - 2.1. Algorithm to generate or access a set of language practice cards flash cards.
3. **Language Comprehension Exercises (Algorithm)**
 - 3.1. Algorithm to verify correct answers to language comprehension exercises.
4. **Verbal Translation Exercises (API)**
 - 4.1. API to verify correct answers to verbal translation exercises.
5. **Non-Verbal Translation Exercises (Algorithm)**
 - 5.1. Algorithm to verify correct answers to non-verbal translation exercises.
6. **Multi-Screen Call (API)**
 - 6.1. API to maintain calls between more than two users. Twilio API free version limits to 2 users.
7. **Book Recommendations (Algorithm)**
 - 7.1. Sorting algorithm to list books in a to be determined order.
8. **Movie>Show Recommendations (Algorithm)**
 - 8.1. Sorting algorithm to list movies/shows in a to be determined order.

Priority 3:

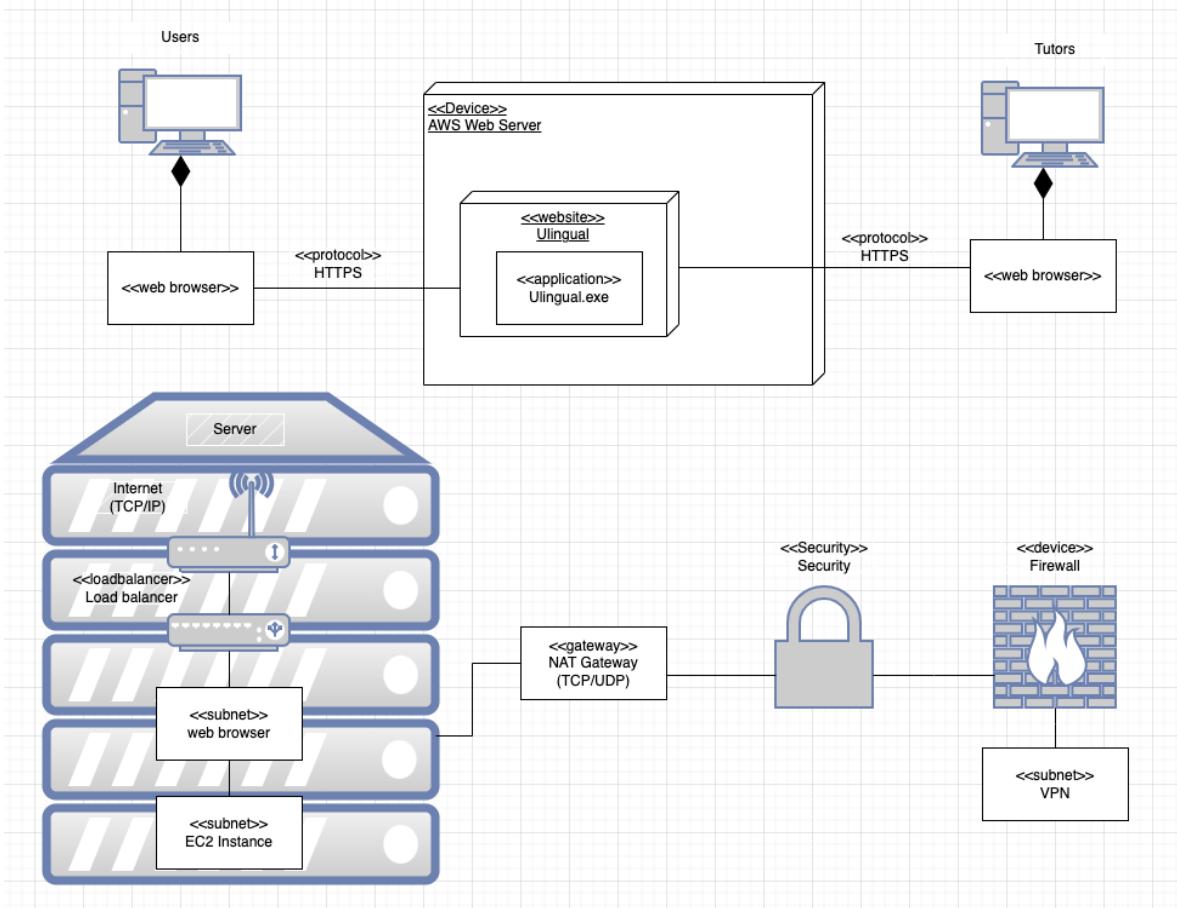
1. **Google Translate (API)**
 - 1.1. For general translation.
2. **Social Media (API)**
 - 2.1. Using Social Media APIs for linking and sharing progress.
3. **Language Difficulty (Algorithm)**
 - 3.1. Sorting algorithm to rank by difficulty according to other users.

UML Diagram

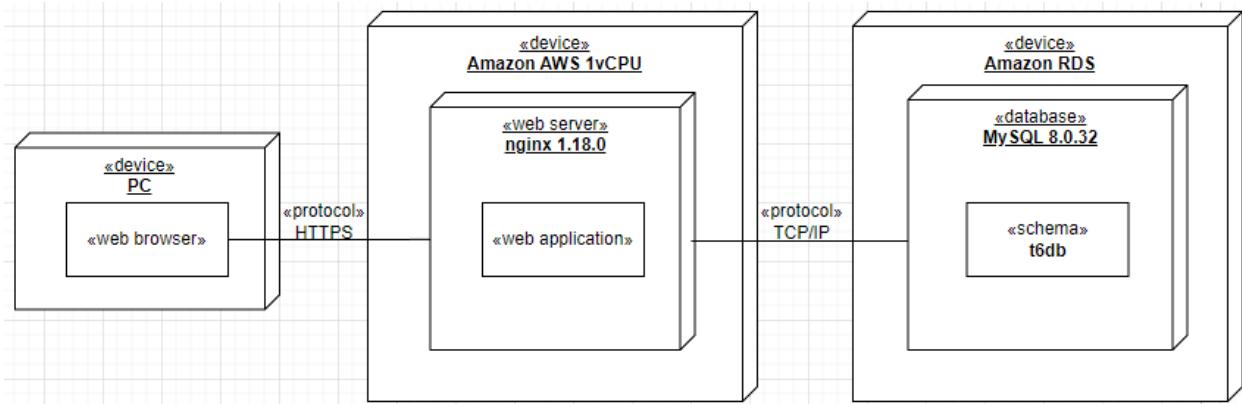


Application Network and Deployment Diagrams

Application Network Diagram



Deployment Diagram



Key Risks

1. Skill Risks:

- 1.1.** We all know a bit of javascript, our framework is React.js which is somewhat different from javascript. Although not impossible, it will be more effort to learn and improve our skills within React.js through the project.

The majority of the team does know a bit of javascript which is great; our only obstacle is using javascript and connecting it with React.js utilizing both of their capabilities to help advance our product. The resolution to this risk is simple but is great, there are plenty of resources and communities online that help assist with understanding React.js. Sending each other these resources and being helpful towards each other can help resolve this risk.

2. Schedule Risks:

- 2.1.** We all currently attend our meetings via Zoom on Tuesday afternoons; however, as the team lead I feel we should definitely meet more than once a week especially as we get further into development and need more things to complete.

The majority of the team can meet on Tuesdays after 4:00pm, I'm going to introduce the idea of also meeting on Thursdays from 5:00 to 6:00 based on the form information I was provided based on my team's schedule input. If we all agree to this we can have more time to speak with each other, collaborate, and help each other through our development.

3. Technical Risks:

- 3.1.** Creating a proper and efficient pipeline system for our product. A proper system architecture, where everything interlinks properly from our github, to our server instance, to our github information.

We anticipate that we will learn in class how to create a proper pipeline connection for our product. If we don't, we anticipate getting assistance via office hours through our professor (CTO). Our final option will be to search the web for assistance to assist with proper system architecture (pipeline).

4. Teamwork Risks:

- 4.1.** In the previous milestone we did encounter some inactive teammates who did not complete given tasks assigned and if they did it was past the assigned due date. This potentially could occur within this milestone as well.

I anticipate that the teamwork risks experienced in milestone 1 will not be present in milestone 2. I expressed to the professor(CTO) the teamwork issues experienced and I believe he spoke with them. I as the team lead am always here to help my team, they just need to ask questions and reach out in proper due time. I will be here to assist but I will also reach out to them more to check in on everyone's progress to make sure they are up to date with their work.

5. Legal/Content Risks:

- 5.1.** We do have intentions to have ULingual be subscription based. We also have intentions to have users pay exclusively for certain tutors. The main issue is developing or using the proper licensed technology to process these transactions securely.

We anticipate to do further research as we further reach the end of our structural build of ULingual. We will definitely go to the professor when it comes to this feature and ask for his input in regards to how to go about this feature. There are resources online that can help us with this issue we potentially face as well; however, we much rather would go the route our professor (CTO) prefers.

Project Management

In terms of the documentation portion of milestone 2, work was disbursed based on two factors: balanced workload & relative role in relation to assigned work. Each member within the team has at least 2 sections to work on whether it's independent with themselves or dependent in collaboration with another teammate. I assigned tasks and notified my team via Discord initially just to give everyone a heads up. I also created a Trello dashboard to display each person's tasks to complete within the team—Trello is visually much more pleasing when it comes to seeing what tasks need to be done. Not only is it visually more appealing but I'm able to see the status of my team's progression for the task. I plan to continue to use Trello in future milestones as an additional tool for management because it's very smooth and easy to use.

In terms of the Vertical Software Prototype, the work was distributed upon the back-end developers and the front-end developer. Upon progression within this milestone near the end, our ec2 instance was giving us issues where we could not log back into ec2 via ssh. With this in mind, I—the lead found an alternative method to deploy our project via aws amplify. This connects our github repository in its respective branch to a hosting and deployment server via aws amplify. AWS Amplify automatically updates our application with the pushes we make to the github. It was me and the back-end devs that created a rough template layout for the homepage setup. It was nice to get a good start with the react framework, we actually enjoyed a lot of the features it had; making it easier to code certain things.

List of Contributions

Sara Murad Ahmed Seid:

- Contribution Score: 7

Sara attended all meetings but one meeting for milestone 2s meetings. The one meeting she missed was quite an important meeting though as I discussed the Vertical Prototype and what needed to be done—especially being the front-end developer. Sara did Section 3(UI Mockups and Storyboards) and also helped brainstorm with Section 1 (Data Definitions). Sara was in the transition of moving to a different apartment so I was more lenient towards her in this milestone; however, when it came to the coding section for the Vertical Prototype Sara didn't code much—especially as a front-end developer. It partially wasn't her fault as our ec2 instance ran into issues and it was hard to communicate how to collaborate together. I tried reaching out to tell her to communicate with the back-end developers for assistance but she did not do so until the very last minute when it wasn't helpful. Within version 2, Sara was able to nicely revise our UI Mockups and storyboards section.

Steven Anthony Vasquez:

- Contribution Score: 9

Steven has been a great help again to this milestone. He's attentive during meetings and always gives great feedback. Additionally he was assigned Section 2 (Prioritized Functional Requirements) and Section 5(High Level APIs and Main Algorithms). Steven contributed a great effort to these sections. In addition, Steven also helped me with the formatting and structure of our home page Vertical Prototype for this milestone. Steven also helped with routing on the homepage. Since we are within the react framework, routing works a bit differently, and Steven helped set up these routes. Overall, his contribution was very much appreciated.

Nik Shahrul Nafiz Bin Nik Azhan:

- Contribution Score: 8

Nik has been a great help to the team. He's always positive and willing to help—even if it's outside the scope of his assigned role. Nik always attends meetings and asks questions when he doesn't understand something—which is appreciated. Nik was assigned Section 6 (High Level UML Diagrams) and Section 7 (High Level Application Network and Deployment Diagrams) with John. They created very elaborate and nice diagrams that well described our progression and architecture setup. Nik also assisted in some of the style and formatting within our homepage layout. Overall his positivity and assistance outside the scope of his role is much appreciated.

Elias G Yetechalew:

- Contribution Score: 7

Elias attended all the meetings for this milestone. He did not speak much during the meetings but he did assist with ideas in relation to Section 1(Data Definitions). Elias was also responsible for Section 4(High level database architecture and Organization). I set an initial deadline and it was not met, I set another second and final deadline for this section to be added to the document and it wasn't met as well. I'm hoping Elias takes deadlines more seriously in the future because it's not fair to me or the team to work hard to meet deadlines and Elias doesn't—especially with no external circumstances occurring. Within version 2, Elias revised his database diagrams as specified per request of feedback with the diagrams as well as adding the rest of his details for his section about relationship entities.

John Lee Santiago:

- Contribution Score: 10

Johns has also been a great help, giving me reminders about things and little details I may miss within the milestone. He's always there during meetings and provides feedback. John as the document editor does a great job making sure documentation is nice and formatted. He also was assigned Section 6 (High Level UML Diagrams) and Section 7 (High Level Application Network and Deployment Diagrams). He as well as Nik created very elaborate and nice diagrams that well described our progression and architecture setup. John also helped resolve ec2 instance issues that were occurring and created a completely new instance that was linked to rds that had mysql linked within it. He helped debug issues resolving dependencies surrounding our frontend and backend for the website.

Aidan Carl Stivers:

- Contribution Score: 7

Aidan was helpful, he would attend all the meetings that we had. He gave great feedback and inputs towards our discussion and progress towards milestone 2. Aidan along with Steven was responsible for Section 2 (Prioritized Functional Requirements) and Section 5(High Level APIs and Main Algorithms). Aidan and Steven did a great job on the sections. Aidan did not contribute much code to the Vertical Prototype in comparison to Steven—as a back-end developer this shouldn't be the case. This is why I'm taking away one point from Aidan in comparison to Steven.

Jonathan Oscar Valadez:

Within Milestone 2, I was responsible for Section 1: Data Definitions within the documentation. I also worked on the Key Risks section within the documentation. Besides that for the documentation I mainly put most of my focus within the Vertical Prototype. For the Vertical Prototype, I made the navigation bar—not including the search bar, the logo for the website, the home page—“dummy” landing page. I made the footer for the Vertical Prototype. I made the login page, and the create an account page. I routed a lot of the navigation bar, for example the login button, tutors button, faq button, and results page. I set up the “dummy” page for the results page using a search bar but we weren’t able to implement the data pull using the search bar in time.

Milestone 3 Version 2

Data Definitions V3

Main data items:**1. Images:**

- 1.1. This main data item shall be a component that is used in registered user profiles—where the user can upload images of themselves, a component that is used in courses where part of the lessons shall have images where the registered user shall have to identify what the image is in translation to their given learning language.
- 1.2. Images relative to registered user profiles via phone shall display 110x110 pixels, on desktop it shall be 180x180 pixels. Upon uploading profile pictures, the image shall be at least 320x320 pixels—but shall be scaled down to fit the circle template profile picture.
- 1.3. Images relative to lessons where the registered user shall identify a given image in the language they are trying to learn shall be at least 500x500 pixels.

2. Pages:

- 2.1.** This main data item shall be a component that the registered user will scroll through and iterate through different subsections of our service. The registered user shall be able to scroll down these given pages and interact and iterate through other pages within our service, given the registered users desired subsection choice.
- 2.2.** Pages shall encapsulate the entire screen of the registered user-relative to the size of the user's device. Pages shall be scaled properly for both mobile and desktop devices.

3. Posts:

- 3.1.** This main data item is a component that shall give registered users access to write and publicly post their experience of their engagement with other registered users via posting a review or posting their rating experience. This data shall give users a good idea of how other registered users interact.

4. Progress Bar:

- 4.1.** This main data item shall be a component that saves the registered users progress in regards to their course learning for a given language. The more they learn and the farther they are into their course made by ULingual, the further their progression bar shall be.

5. Language Title:

- 5.1.** This main data item shall be a component that gives the registered user information regarding their language choice.
- 5.2.** This main data item shall be a component that gives the registered user information regarding their native language they speak.

6. Forum Title:

- 6.1.** This main data item shall be a component that gives the registered user information regarding the title of a given forum where the user can decide if they want to click on the forum title and participate in the given discussion. Forum titles shall contain phrases that categorize content upon registered user discussion.

7. Forum Content:

- 7.1. This main data item shall be a component that has all the registered users' comments in relation to a given forum title. Within the forum content the registered user shall be able to view and comment on other registered users' discussions and make their own comments and questions in the forum so that others shall be able to comment on it as well.

8. Miscellaneous (Recommended) Content:

- 8.1. This main data item shall be a component that contains and stores ULinguals miscellaneous alternatives for registered users to learn; via music playlists, book recommendations, and show/movie recommendations. These forms of content shall be relative to the registered user's choice of language they desire to learn or improve upon.

9. Registered User Profile:

- 9.1. This main data item shall be a component that contains a registered user's information in terms of friend count, description, language learning, native language, and profile picture.
- 9.2. This main data item shall be edited by the registered user to update their profile.

10. Messages:

- 10.1. This main data item shall be a component that stores a conversation between two registered users.
- 10.2. This main data item shall be within the Inbox section of a user's profile.

Entities:

1. Tutors:

- 1.1. An entity that created an account and is a verified personnel that excels in a given language.
- 1.2. This entity can sign in from different devices.
- 1.3. This entity shall have a unique username and password.
- 1.4. This entity shall have a unique tutor symbol assigned to them.

- 1.5. This entity shall have their first and last name listed within their profile as they are verified personnel.

- 2. Registered User:**

- 2.1. An entity that created an account and can sign in from different devices.
 - 2.2. This entity shall have a unique username and password.
 - 2.3. This entity shall have access to courses provided within ULingual.
 - 2.4. This entity shall have the ability to book an appointment with a tutor.
 - 2.5. This entity shall have access to playlists, books, & shows recommended by ULingual in relation to the language the user desires.
 - 2.6. This entity shall have access to flashcards, global forums, exercises, and video rooms.
 - 2.7. This entity shall have friends, where a registered user can become friends with another registered user.
 - 2.8. This entity shall have an inbox section within their profile that allows them to view incoming friend requests, and new video room invites via unique id.
 - 2.9. This entity shall be able to customizable their profile for public display.
Some customizable features shall include: description of profile, language learning, language knowledge, and profile picture

- 3. General User:**

- 3.1. This entity shall be able to view a limited amount of pages within the site.
 - 3.2. This entity shall have the ability to register for an account.
 - 3.3. This entity shall have the ability to view our terms and conditions prior to registering for an account.

- 4. Exercises:**

- 4.1. This entity shall have exercises that the user can complete independently of video connection with other users. These exercises can include completing given sentences, matching pictures to words, and listening to a phrase and identifying what the phrase means in the user's given language choice.

5. Global Forums:

- 5.1. This entity shall be accessible by all users and tutors where they are able to interact with each other via text chat threads. Here is where users and tutors can answer questions, share information regarding language, and potentially make new friends.
- 5.2. This entity shall have text chat threads that are broken down into sections. Based on these sections, the user can access different information that other users and tutors publicly post and share.

6. Video Rooms:

- 6.1. This entity shall be a place where users can either connect with another registered user or a tutor to exchange and learn a language of their desire. This shall also be a space where users can also have a potential karaoke party with other users.
- 6.2. This entity shall be accessible via a unique ID code for a registered user to join a video room.
- 6.3. This entity shall have a chat box section where registered users within a given video call room can message each other in case they are unable to use their microphone.

7. Miscellaneous(Recommended) Content:

- 7.1. This entity shall contain music playlist recommendations in relation to the user's desired language choice. Here the user can see and browse music that people are listening to in their respective language learning choice.
- 7.2. This entity shall contain book recommendations in relation to the user's desired language choice. Here the user can view popular books written by authors whose natural language is in relation to the user's respective language learning choice.
- 7.3. This entity shall contain movies and show recommendations in relation to the user's desired language choice. Here the user can view popular shows and movies that were made in the natural language that's in relation to the user's respective language learning choice.

8. Flashcards:

- 8.1. This entity shall contain digital cards where the user can add a word and its translation to the language they are learning on the back, as a form of learning for the user.

9. Inbox:

- 9.1. This entity shall allow users to send each other messages to obtain video room IDs to join a video call.
- 9.2. This entity shall contain the title of the message being received.
- 9.3. This entity shall contain the content of the message being received.
- 9.4. This entity shall contain the date & time the given message was received.

10. Appointments:

- 10.1. This entity shall allow registered users to book a select time slot with a tutor to have a greater learning experience within their given language they are learning.
- 10.2. This entity shall be accessible to registered users.

Functional Requirements V3

Priority 1:

1. General User:

- 1.1.** A general user shall be able to register for an account at ULingual.
 - 1.1.1.** A general user shall be able to select the language they want to learn upon registration.
 - 1.1.2.** A general user shall be able to select what language they are native in upon registration.
- 1.2.** A general user shall be able to access our Contact Form to send ULingual an inquiry email.
- 1.3.** A general user shall be able to view the About Us page to see further details revolving around ULingual.
- 1.4.** A general user shall be able to view the Frequently Asked Questions page to see common questions ULingual receives.
- 1.5.** A general user shall be able to view our Terms and Conditions page prior to registering an account.
- 1.6.** A general user shall be able to access our search bar to search for tutors or native speakers by name or language.

2. Registered User:

- 2.1.** A registered user shall be able to login with a username and password.
- 2.2.** A registered user shall be able to logout of their account.
- 2.3.** A registered user shall be able to access our Contact Form to send ULingual an inquiry email.

- 2.4.** A registered user shall be able to view the About Us page to see further details revolving around ULingual.
- 2.5.** A registered user shall be able to view the Frequently Asked Questions page to see common questions ULingual receives.
- 2.6.** A registered user shall be able to access our search bar to search for other registered users by name or language.

 - 2.6.1.** A registered user shall be redirected upon search submission to the results page for their search.
 - 2.6.2.** A registered user search result shall be filtered by the alphabetic language relation they search to display other registered users who are native in the language searched.
 - 2.6.3.** A registered user search result shall be filtered by alphabetic name relation to other registered users.
- 2.7.** A registered user shall be able to view their own profile.

 - 2.7.1.** A registered user profile shall display the language the registered user is learning.
 - 2.7.2.** A registered user profile shall display the amount of friends the registered user has.
 - 2.7.3.** A registered user profile shall display the language the registered user is native in.
 - 2.7.4.** A registered user profile shall display the description of the registered user.
 - 2.7.5.** A registered user profile shall display the profile picture of the registered user.

- 2.7.6.** A registered user profile shall display the username of the registered user.
 - 2.8.** A registered user shall be able to edit their own profile.
 - 2.9.** A registered user profile shall display a “Edit Profile” button that allows registered users to edit their profile.
 - 2.9.1.** A registered user shall be able to upload a photo in place of their profile picture.
 - 2.9.2.** A registered user shall be able to edit the description of their profile.
 - 2.10.** A registered user shall be able to change what language they want to learn within their profile.
 - 2.11.** A registered user shall be able to edit their username.
 - 2.12.** A registered user shall be able to view their friends list.
 - 2.13.** A registered user shall be able to view their friends profile.
 - 2.14.** A registered user shall be able to access the main dashboard.
 - 2.15.** A registered user shall be able to access Global Forums within the dashboard.
 - 2.15.1.** A registered user shall be able to comment under a forum post.
 - 2.15.2.** A registered user shall be able to create a new forum post.
 - 2.16.** A registered user shall be able to access Video Rooms within the dashboard.
 - 2.16.1.** A registered user shall be able to create a video room.
 - 2.16.2.** A registered user shall be able to join a video room.
 - 2.17.** A registered user shall be able to access our Miscellaneous Content within the dashboard.

- 2.17.1.** A registered user shall be able to access a list of book recommendations in their desired language they are learning.
 - 2.17.2.** A registered user shall be able to access a list of movie and tv show recommendations in a specified language.
 - 2.17.3.** A registered user shall be able to access playlists of music in relation to the language they desire to learn.
 - 2.18.** A registered user shall be able to access our Flashcards within the dashboard.

 - 2.18.1.** A registered user shall be able to access generated flashcards as a small test for their desired language.
 - 2.18.2.** A registered user shall be able to create their own flashcards within the flashcard page.
 - 2.19.** A registered user shall be able to access their inbox within their profile.

 - 2.19.1.** A registered user shall be able to accept or reject friend requests within their inbox.
- 3. Global Forums:**
- 3.1.** The global forums shall display the name of the forum title.
 - 3.2.** The global forums shall display the amount of comments within the forum.
 - 3.3.** The global forums shall be sorted by relevance based on newest post.
 - 3.4.** The global forums shall display a return button per forum to go back to the main global forums page.
- 4. Video Rooms:**
- 4.1.** The video rooms shall display a mute/unmute button where registered users can mute/unmute themselves during a video call.
 - 4.2.** The video rooms shall display a leave call button where registered users can leave a video call.

- 4.3. The video rooms shall display a Video On/Off button where registered users can turn their camera off or own in a video call.

- 5. Flashcards:**

- 5.1. The flashcards shall be viewed by registered users.
 - 5.2. The flashcards shall be formatted into two sides: Word/Phrase & Translation of given Word/Phrase.
 - 5.3. The flashcards shall be displayed based on registered users selected language choice upon registration.

- 6. Miscellaneous Content:**

- 6.1. The miscellaneous content shall be displayed by category of “Books”, “Movies & Shows, and “Music Playlists”.
 - 6.2. The miscellaneous content shall only be accessible by registered users.
 - 6.3. The miscellaneous content shall display links where registered users can access this content to either purchase or enjoy for free.
 - 6.4. The miscellaneous content shall display a title of the content we are suggesting to registered users.

- 7. Inbox:**

- 7.1. The inbox shall be displayed within a registered user profile.
 - 7.2. The inbox shall display pending friend requests.
 - 7.3. The inbox shall display messages based on the most recent notification.
 - 7.4. The inbox shall display the time and date a message was received.

Priority 2:

- 1. General User:**

- 1.1. A general user shall be able to view the Tutors page to see the list of Tutors we offer.

- 2. Registered User:**

- 2.1. A registered user shall be able to view the history of a given language they are learning within the dashboard.

- 2.2.** A registered user shall be able to access the lessons page within the dashboard.
 - 2.2.1.** A registered user shall be able to go access the structured lessons categorized by “Basics”, “General Phrases”, “General Greetings”, “Advanced Phrases”, “Corporate Conversations”, “Family Conversations”, “Ordering Food Conversation”, “Past Tense”, “Present Tense”, and “Future Tense”
 - 2.2.2.** A registered user shall be able to view their lessons progression through a graphical visualization.
- 2.3.** A registered user shall have access to a list of recommended traveling locations based on their language selection.
- 2.4.** A registered user shall be able to view the Tutors page to see the list of Tutors we offer.
- 2.5.** A registered user shall be able to view a tutors profile.
- 2.6.** A registered user shall be able to book an appointment with a tutor within the tutors profile.
- 2.7.** A registered user shall be able to leave a review on their experience with tutors.
 - 2.7.1.** A registered user shall be able to leave a rating out of 5 stars .
 - 2.7.2.** A registered user shall be able to leave a comment as part of the review.
- 2.8.** A registered user profile shall display a “report user” button to report a registered user's misconduct.
- 2.9.** A registered user profile shall display a twitter icon and instagram icon to allow registered users to link their social media to their account.
- 2.10.** A registered user shall be able to access Exercises within the dashboard.

- 2.10.1.** A registered user shall be able to test their language knowledge by taking ULinguals custom word matching exercises in their desired language.
- 2.10.2.** A registered user shall be able to test their language knowledge by taking ULinguals custom object identification exercises in their desired language.
- 2.10.3.** A registered user shall be able to test their language knowledge by taking ULinguals custom fill in the blank sentence exercises in their desired language.
- 2.10.4.** A registered user shall be able to edit the status of their profile to either, Online, Offline, or Do Not Disturb.

3. Exercises:

- 3.1.** The exercises shall be displayed into the categories of “Fill in the Blank”, “Word Matching”, and “Object Identification”.
- 3.2.** The exercises shall display whether the registered user selected the correct or incorrect answer.
- 3.3.** The exercises shall display the amount of questions that are within the categories of “Fill in the Blank”, “Word Matching”, and “Object Identification”.
- 3.4.** The exercises shall be retaken by the registered user as many times as the registered user wants.
- 3.5.** The exercises shall display a progress bar to visually help registered users see their progress in the categories of “Fill in the Blank”, “Word Matching”, and “Object Identification”.

4. Tutor:

- 4.1.** A tutor shall be able to register for an account at ULingual.
- 4.2.** A tutor shall be able to login with a username and password.

- 4.3.** A tutor shall be able to logout of their account.
- 4.4.** A tutor shall be able to view their own profile.
- 4.5.** A tutor shall be able to edit their own profile.
 - 4.5.1.** A tutor shall be able to upload a photo in place of their profile picture.
 - 4.5.2.** A tutor shall be able to set up their pricing costs for tutoring within their profile.
 - 4.5.3.** A tutor shall be able to describe their teaching style and what languages they teach within their profile.
- 4.6.** A tutor shall be able to set up their availability to tutor others within their profile.
- 4.7.** A tutor shall be able to access our Contact Form to send ULingual an inquiry email.
- 4.8.** A tutor shall be able to view the About Us page to see further details revolving around ULingual.
- 4.9.** A tutor shall be able to view the Frequently Asked Questions page to see common questions ULingual receives.
- 4.10.** A tutor shall be able to access the main dashboard.
 - 4.10.1.** A tutor shall be able to access Video Rooms within the dashboard.
 - 4.10.2.** A tutor shall be able to access Global Forums within the dashboard.

5. Appointments:

- 5.1.** The appointments shall be displayed within a tutors profile page.
- 5.2.** The appointments time slot and date slots shall be editable by a tutor within their profile.

- 5.3.** The appointments shall be booked by a registered user within a tutors profile.
- 5.4.** The appointments shall generate a unique ID that will give tutors and the registered users who booked the appointment access to their video room.

6. Video Rooms:

- 6.1.** The video rooms shall display a chatbox where registered users in a video room call can text each other.
 - 6.1.1.** The video rooms chat box shall only be accessible with a video room call.
- 6.2.** The video rooms chat box shall be refreshed if a registered user leaves and rejoins a given video room call.

7. Flash Cards:

- 7.1.** The flashcards shall be sorted based on alphabetic order.

8. Miscellaneous Content:

- 8.1.** The miscellaneous content shall display a short description of the content we are suggesting to registered users.

Priority 3:

1. Video Rooms:

- 1.1.** The video rooms shall display a “Toggle Transcript” button that shall transcribe the entire conversation in a video room call to a downloadable document.
- 1.2.** The video rooms shall be able to connect more than two registered users to a given video call.

2. Registered Users:

- 2.1.** The registered users shall be able to participate in weekly quizzes.
- 2.2.** The registered users shall be able to view weekly quiz scores of other registered users on their friends list.

- 2.3. The registered users shall receive a certificate of completion once they complete all lessons and exercises.
- 2.4. The registered users shall be able to take a Native Language Mastery test to obtain a special icon to display on their profile.
- 2.5. A registered user profile shall display a wallpaper.
- 2.6. A registered user profile shall have an “Edit Theme” button that will allow registered users to change the template of their wallpaper and banner.

3. Tutor:

- 3.1. A tutor shall be able to receive tips from registered users.
- 3.2. A tutor shall be assigned a custom badge next to their username to distinguish themselves in the forums.

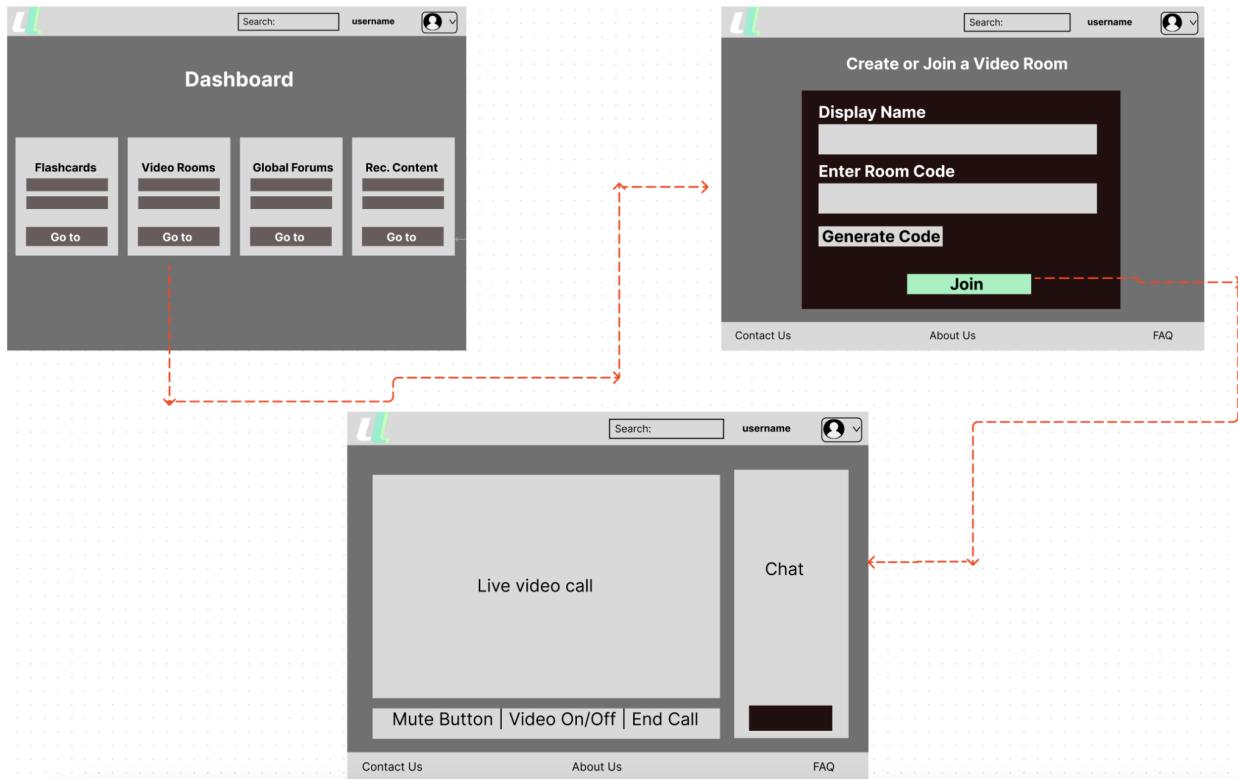
Wireframes Based on your Mockups/Storyboards V2

1.) Creating a ULingual Account:



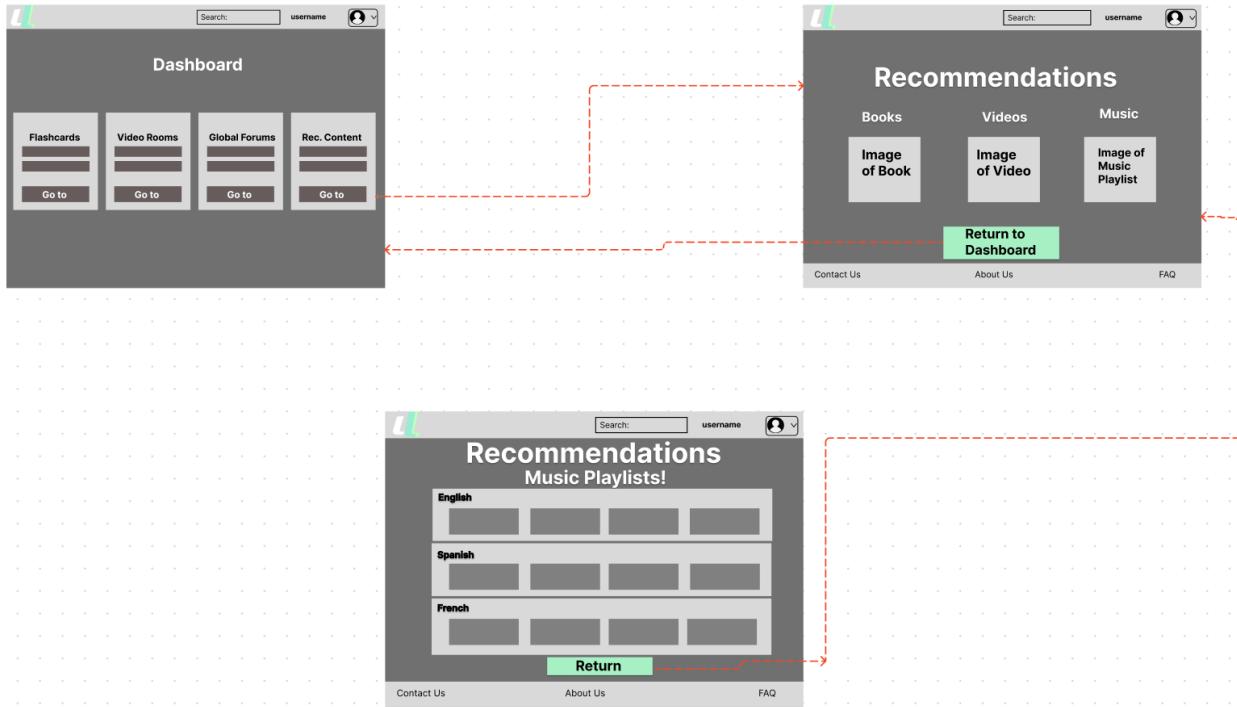
A general user interested in ULingual shall be able to create an account to have access to our dashboard features. The general user can create an account by either clicking the sign up button on the home page or either the sign up button within the navigation bar. They will both redirect the general user to the registration page to create an account and become a registered user. Upon complete registration, the registered user shall be redirected to the login page to enter their credentials and then get access to our dashboard.

2.) Joining a Video Room:



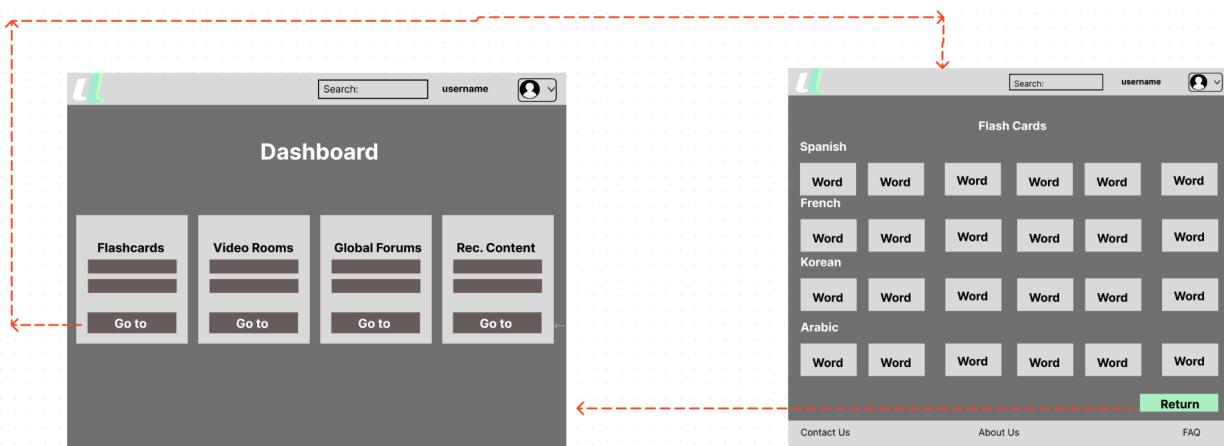
Once the registered user logs in, they shall be redirected to the dashboard where they can access all of ULinguals main features. To join a video room, the registered user shall click on the “Go To” button under the video rooms section of the dashboard which shall redirect the registered user to the video room lobby page. Within the video room lobby page a registered user can enter a room code their friend has created to join that given room, or generate a room code to create for the registered user and their friends to join. Upon clicking the join button, the registered user shall be redirected to the video room call page where they will be in a live video call with another registered user/i.e their friend.

3.) Access Recommended Music Playlists:



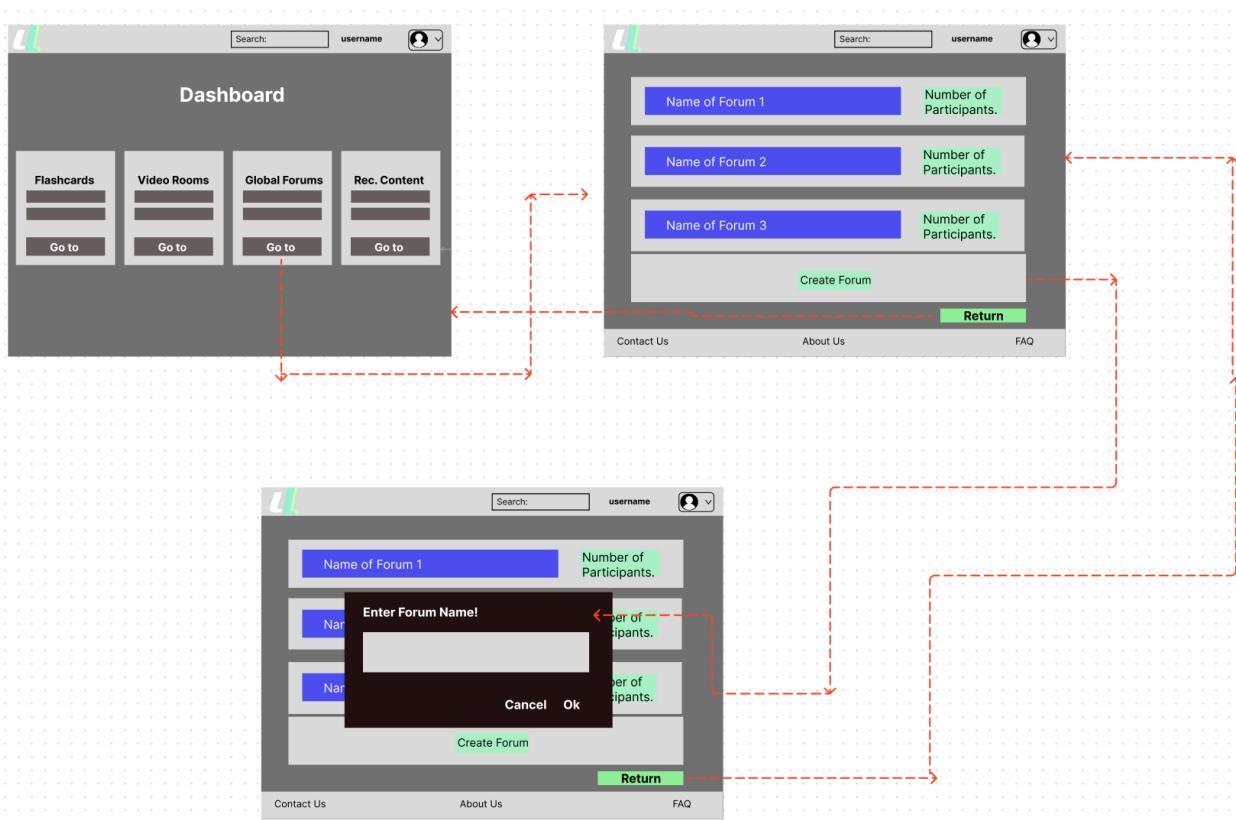
Once the registered user logs in, they shall be redirected to the dashboard where they can access all of ULinguals main features. To access music playlists, the registered user shall click on “Go To” under the Rec. Content section and this shall redirect the registered user to the recommendations page. Within the recommendations page, the registered user shall have access to recommended books, videos, and music playlists. In this specific case, when the registered user clicks on the “Music” Section within our recommendations page, it shall redirect the registered user to a few recommended playlists in the language they are learning to help them further get used to the language they are learning. If the registered user wants to go back to the recommendations page, they shall click the return button and it shall direct them back to recommendations. If the registered user wants to go back to the dashboard, they shall click the “return to dashboard” button that shall redirect them to the dashboard.

4.) Accessing Flashcards:



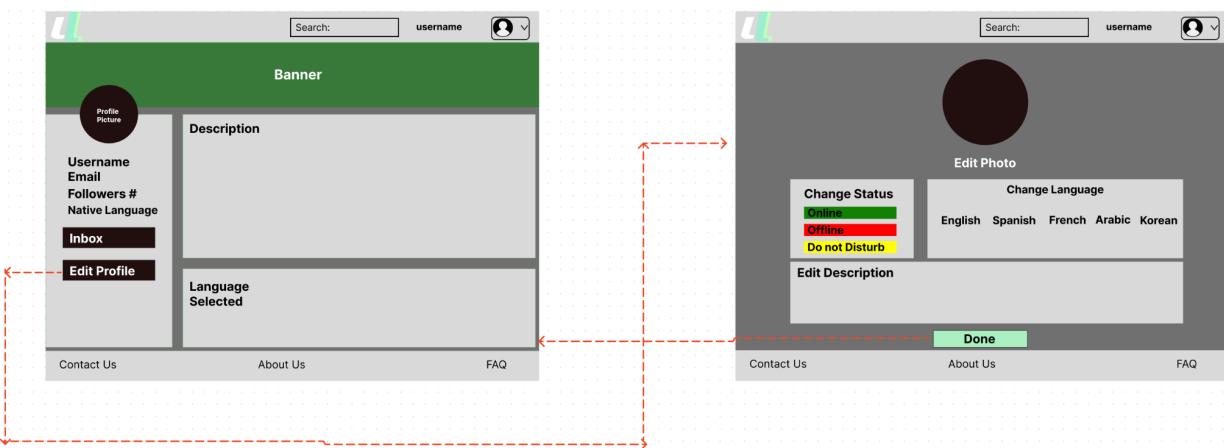
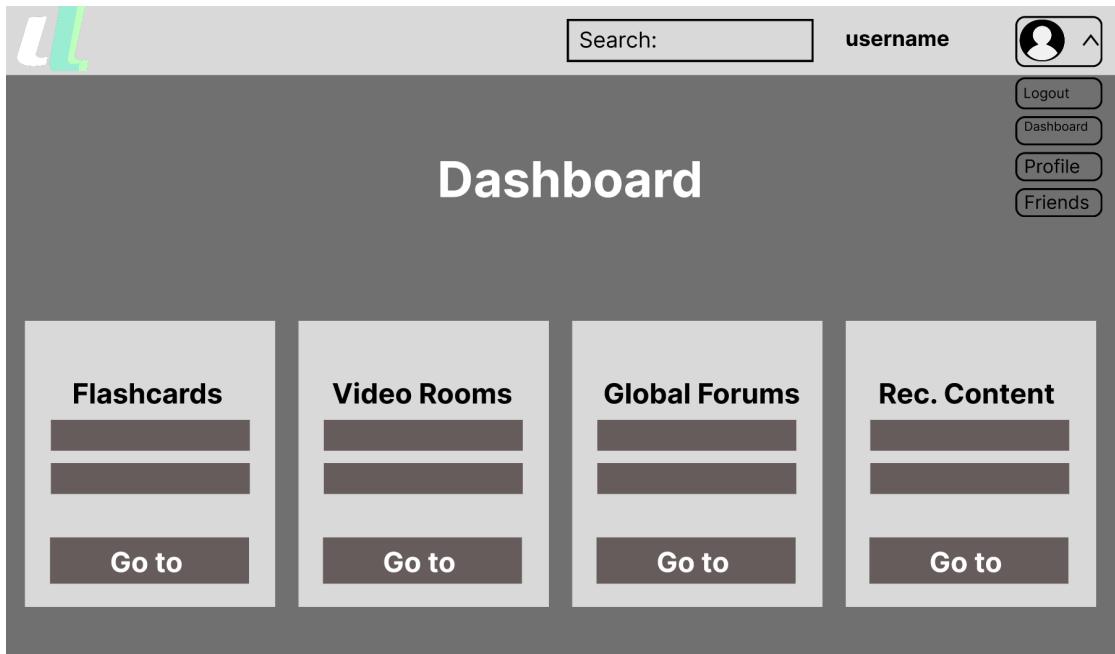
Once the registered user logs in, they shall be redirected to the dashboard where they can access all of ULinguals main features. To access flashcards the registered user shall click the button “Go To” under the clashcards section, and it shall redirect the registered user to the flashcards page. Within the flashcards page, the registered user shall be able to view words and phrases in the form of flash cards, allowing the user to practice the language they are learning as well as viewing other languages. If the registered user wants to return back to the dashboard, they shall click on the “return” button and it shall redirect the registered user to the dashboard.

5.) Creating a Forum:



Once the registered user logs in, they shall be redirected to the dashboard where they can access all of ULingual's main features. To create a forum, the user shall click on the "Go To" button within the global forums section of the dashboard. This shall redirect the registered user to the global forums page where they can view all the forums posted within ULingual. To create a forum, the registered user shall click on the "Create Forum" button. When the registered user does this, a pop-up shall appear asking the registered user to enter the name of the forum to be created. Once the registered user clicks "Ok", their forum shall be added to the global forums page. If the registered user wants to go back to the dashboard, they shall be able to do so by clicking the "Return" button within the global forums page, and this shall take the registered user back to the dashboard.

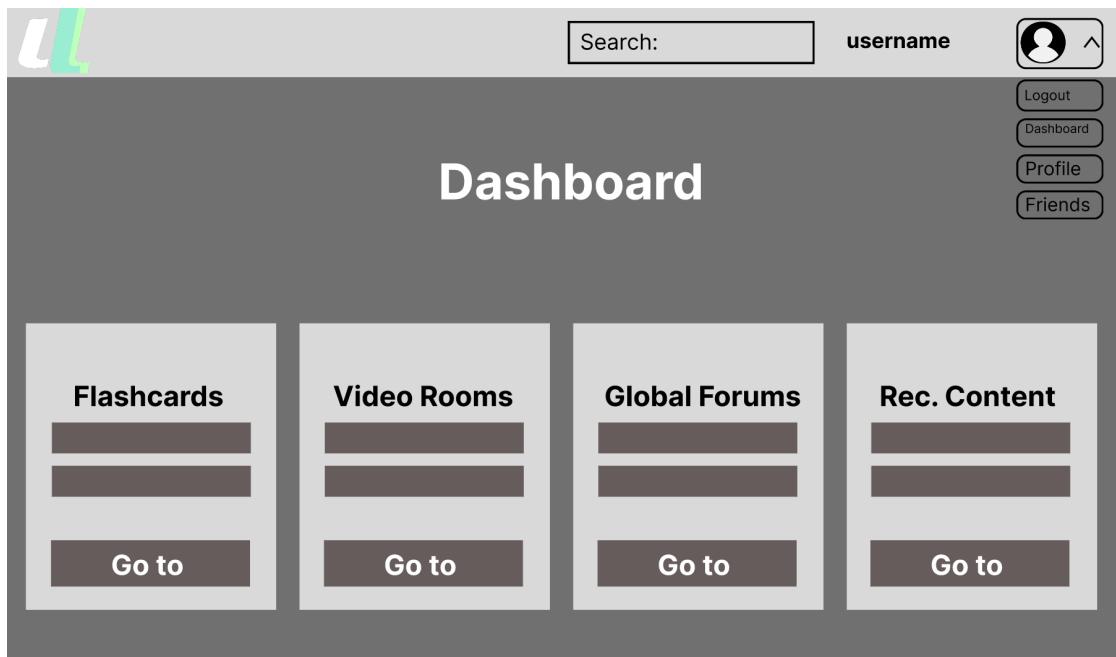
6.) Editing Your Profile:

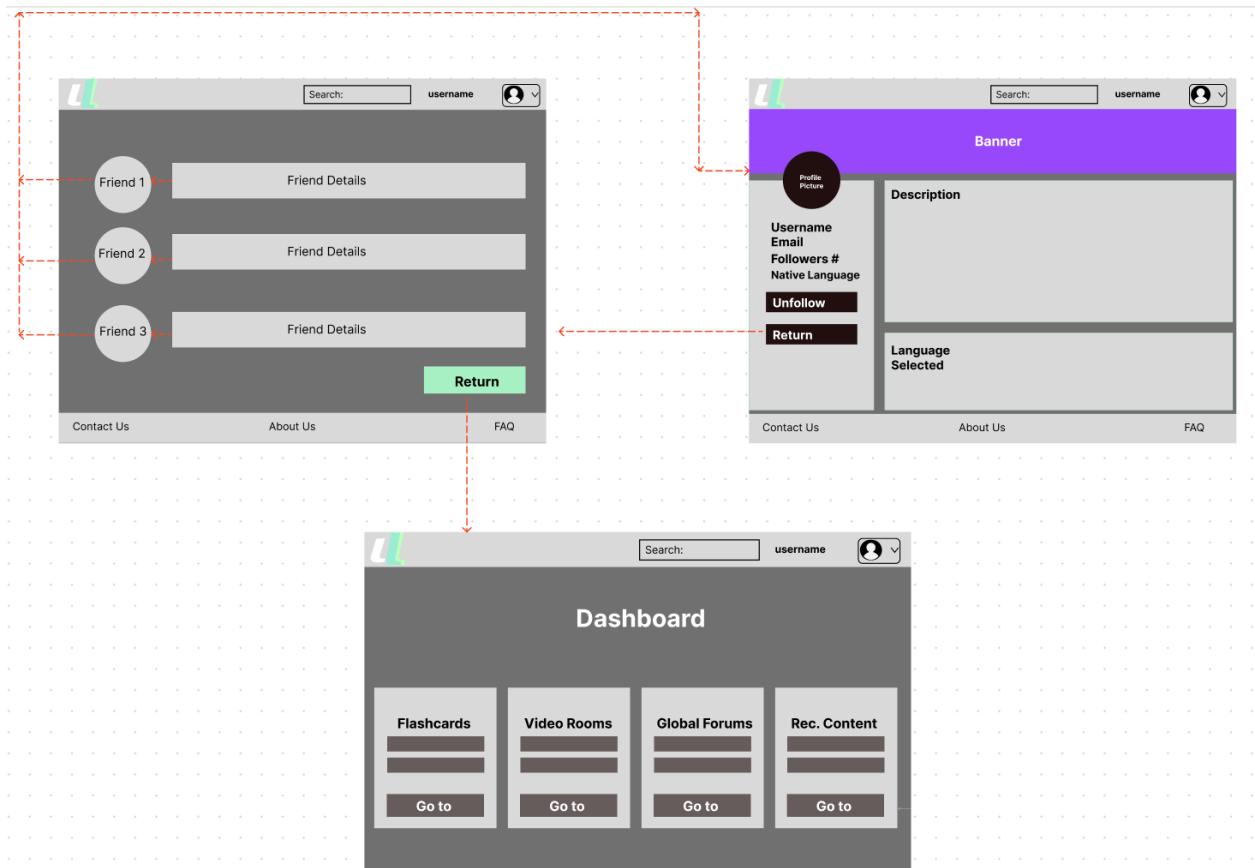


Once the registered user logs in, they shall be redirected to the dashboard where they can access all of ULinguals main features. Upon logging in, a registered user can access the drop down menu within the navigation bar next to their username. When the registered user clicks on the “Profile” section of the drop menu, it shall redirect registered users to their profile page where they can see their profile picture, description, language selected, username, email, follower count, and their native language they speak. They also shall be able to click on the “Edit Profile” button which shall redirect the registered user to their edit profile page. On this page the registered user shall be able to edit their description, language learning choice, profile picture, and profile status. Once the registered user completes these changes they shall hit the

“Done” button and it shall save their changes and redirect the registered user back to their profile page.

7.) Viewing a Friends Profile:

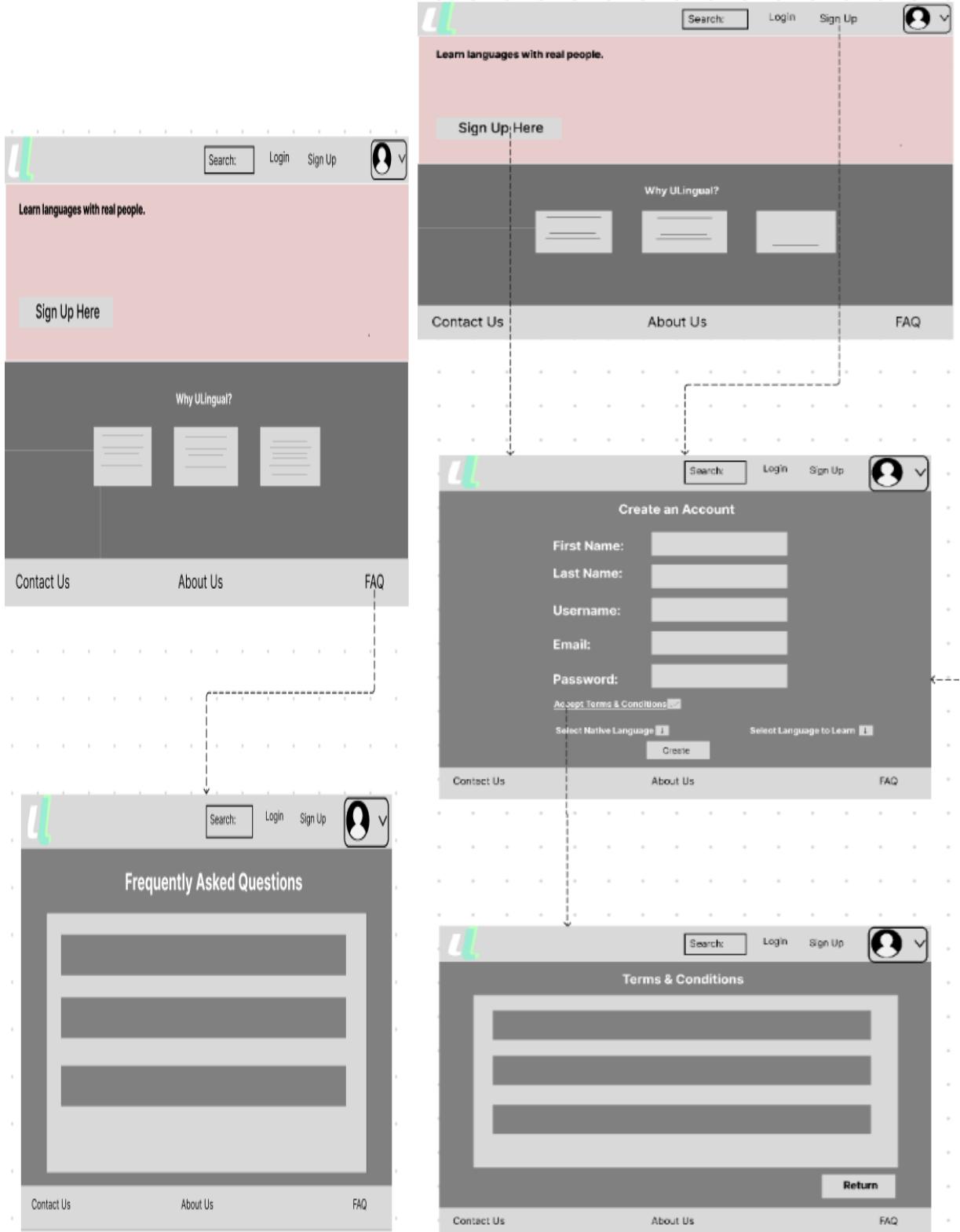


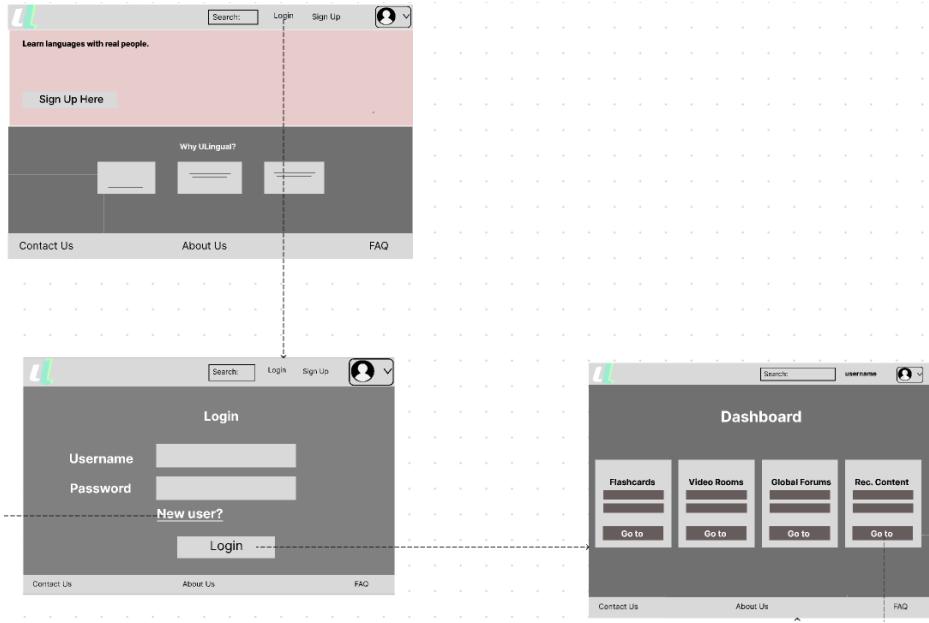


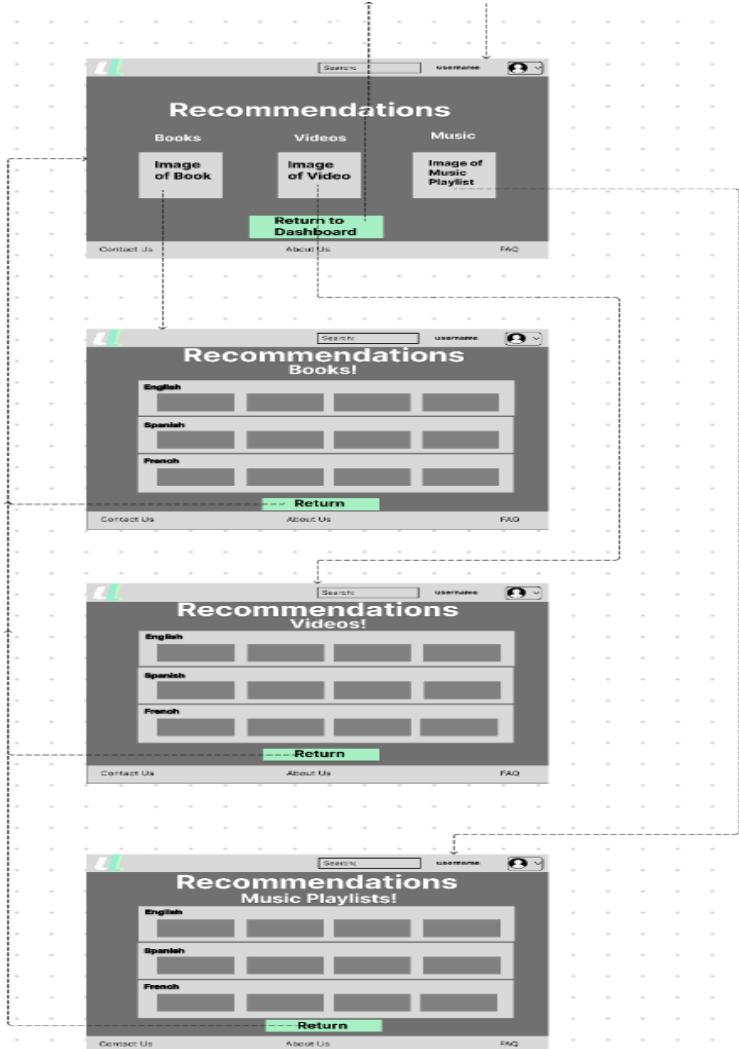
Once the registered user logs in, they shall be redirected to the dashboard where they can access all of ULinguals main features. Upon logging in, a registered user can access the drop down menu within the navigation bar next to their username. When the registered user clicks on “Friends” from the drop down menu, it shall direct them to their friends list page that shows their friends profile picture as well as their friends username. When a registered user either clicks on their friends profile picture or username it shall redirect the registered user to their friends profile page. If the registered user wants to return to their friends list from a friends profile page, the registered user shall hit the “Return” button and it shall redirect them to their friends list. If the registered user wants to go back to their dashboard, the user shall hit the “Return” button from their friends list page, and it shall redirect them back to the dashboard.

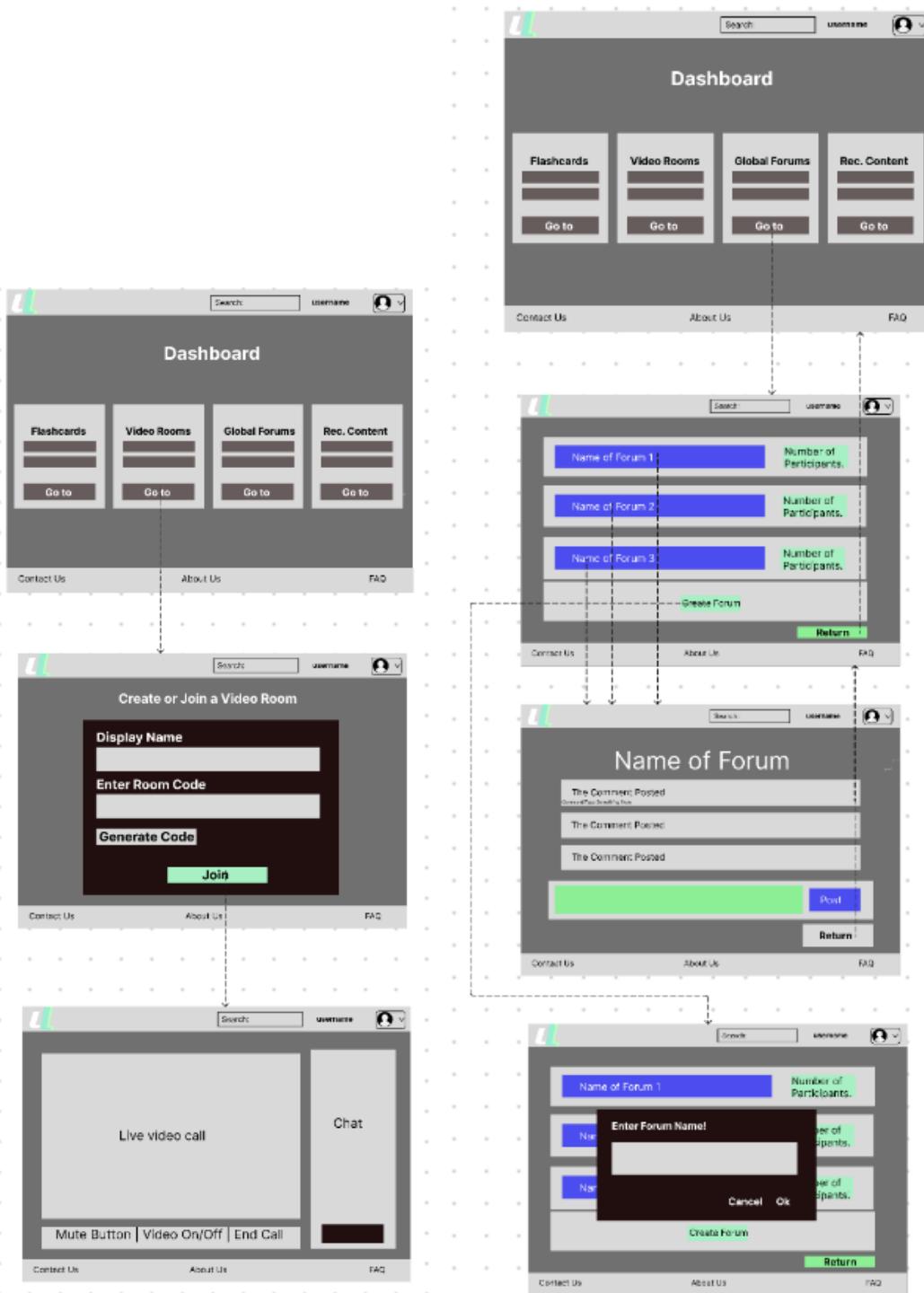
Wireframes





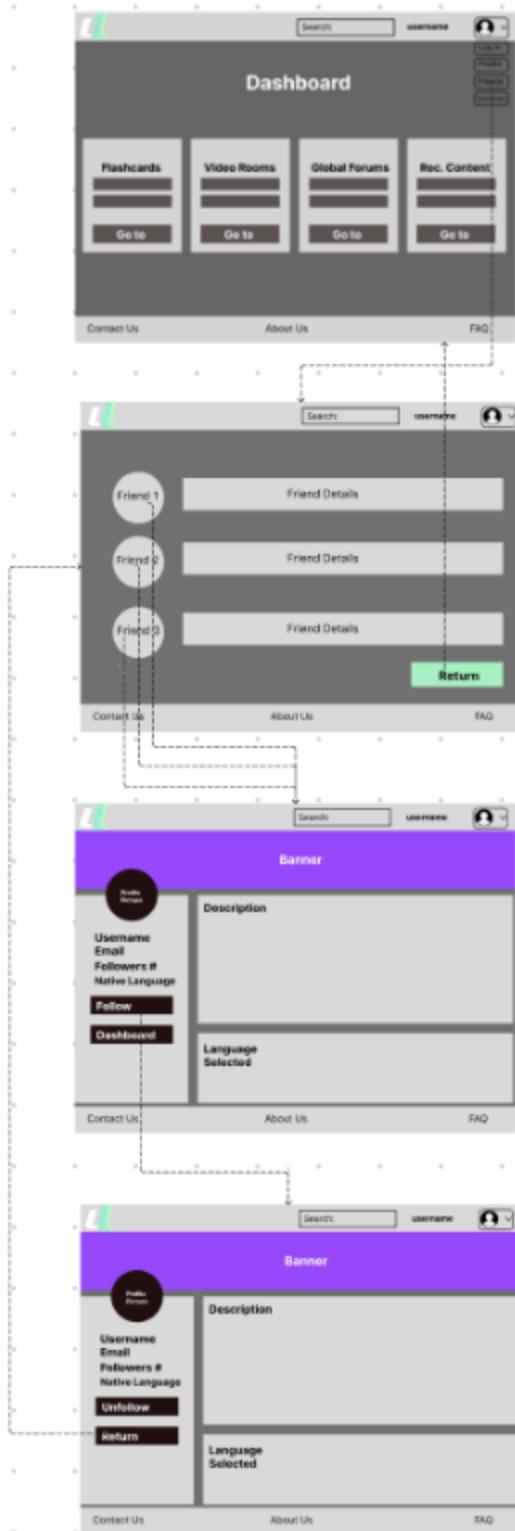


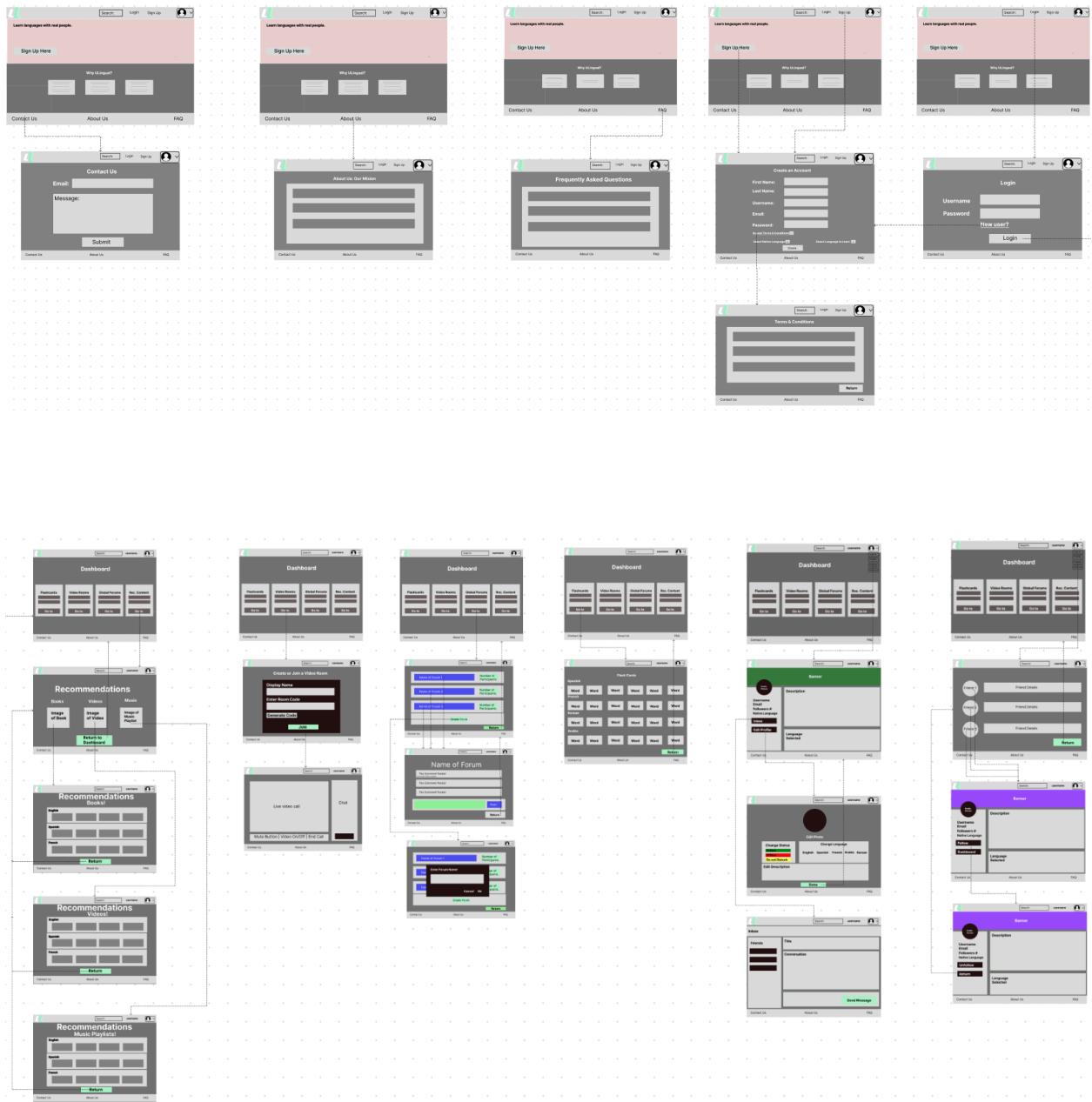




The image displays five wireframe screens arranged in a grid, connected by dashed lines indicating navigation flow.

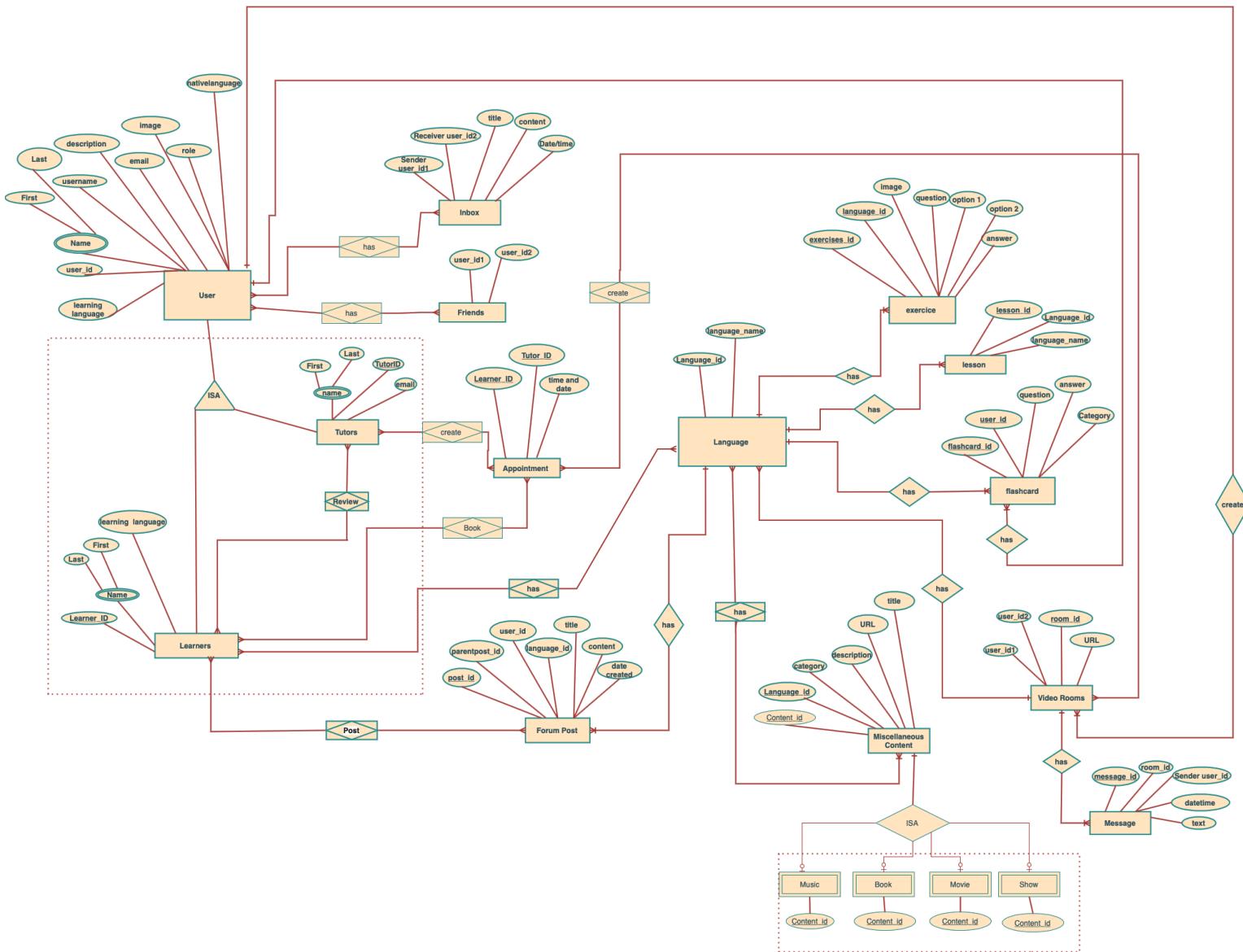
- Dashboard:** A main page with a search bar, a user icon, and a "username" dropdown. It features a "Dashboard" title and four cards: "Flashcards", "Video Rooms", "Global Forums", and "Rec. Content", each with a "Go to" button. At the bottom are links for "Contact Us", "About Us", and "FAQ".
- Banner:** A profile page with a green header containing a user icon and "username". It shows a "Profile Picture" placeholder, a "Description" field, and a sidebar with "Username", "Email", "Followers #", and "Native Language" fields, along with "Inbox" and "Edit Profile" buttons. At the bottom are links for "Contact Us", "About Us", and "FAQ".
- Flash Cards:** A page titled "Flash Cards" showing language categories: Spanish, French, Korean, Arabic, and English. Each category has a grid of six "Word" buttons. At the bottom is a "Return" button and links for "Contact Us", "About Us", and "FAQ".
- Edit Photo:** A page titled "Edit Photo" with a large circular placeholder. It includes "Change Status" buttons (Green, Orange, Red) and a "Change Language" section with "English", "Spanish", "French", and "Arabic" buttons. There is also an "Edit Description" input field and a "Done" button at the bottom. At the bottom are links for "Contact Us", "About Us", and "FAQ".
- Inbox:** A messaging page with a search bar, a user icon, and a "username" dropdown. It shows a "Friends" list and a "Conversation" area with a "Send Message" button. At the bottom are links for "Contact Us", "About Us", and "FAQ".



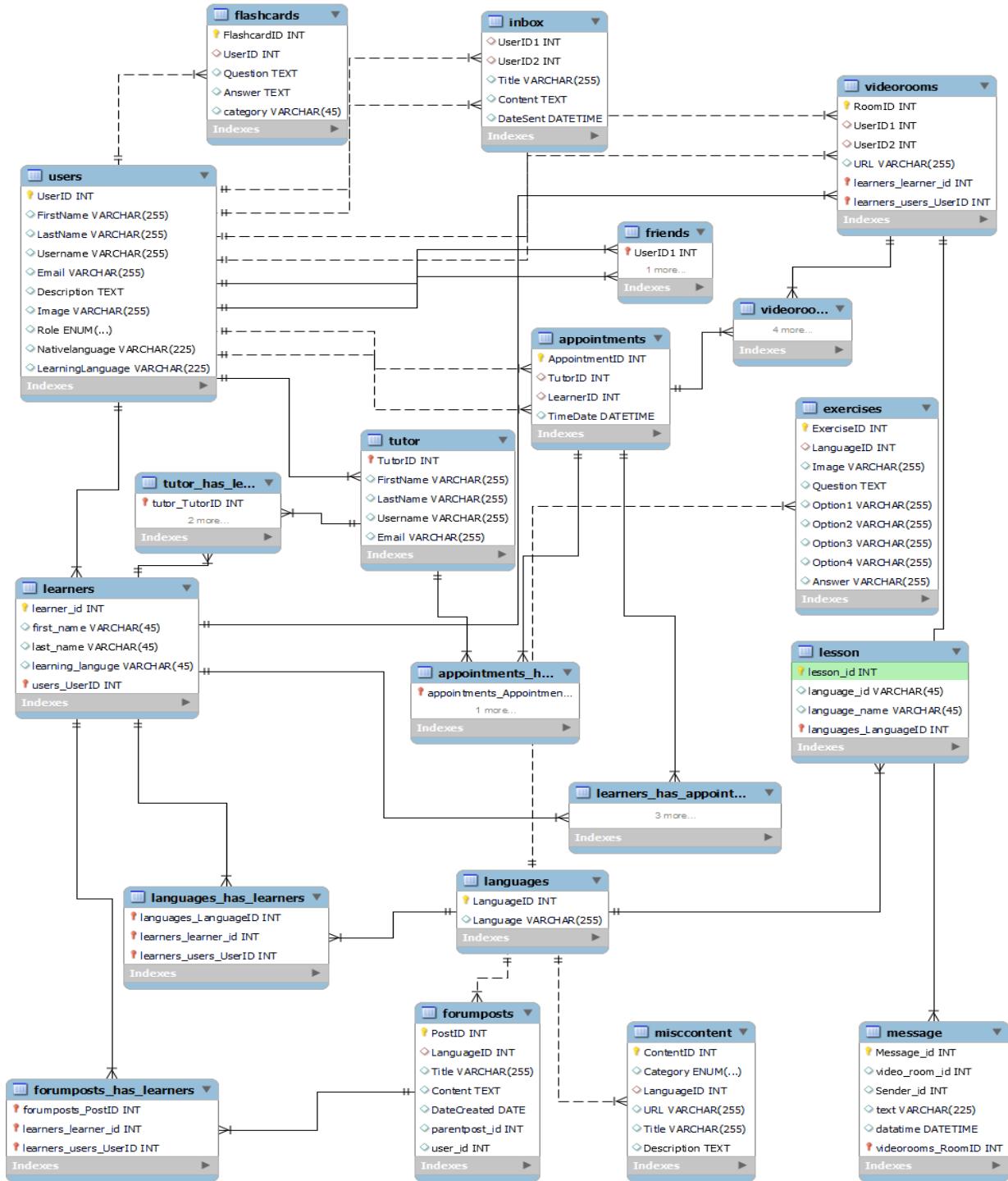


High Level Database Architecture and Organization V2

ER Diagram

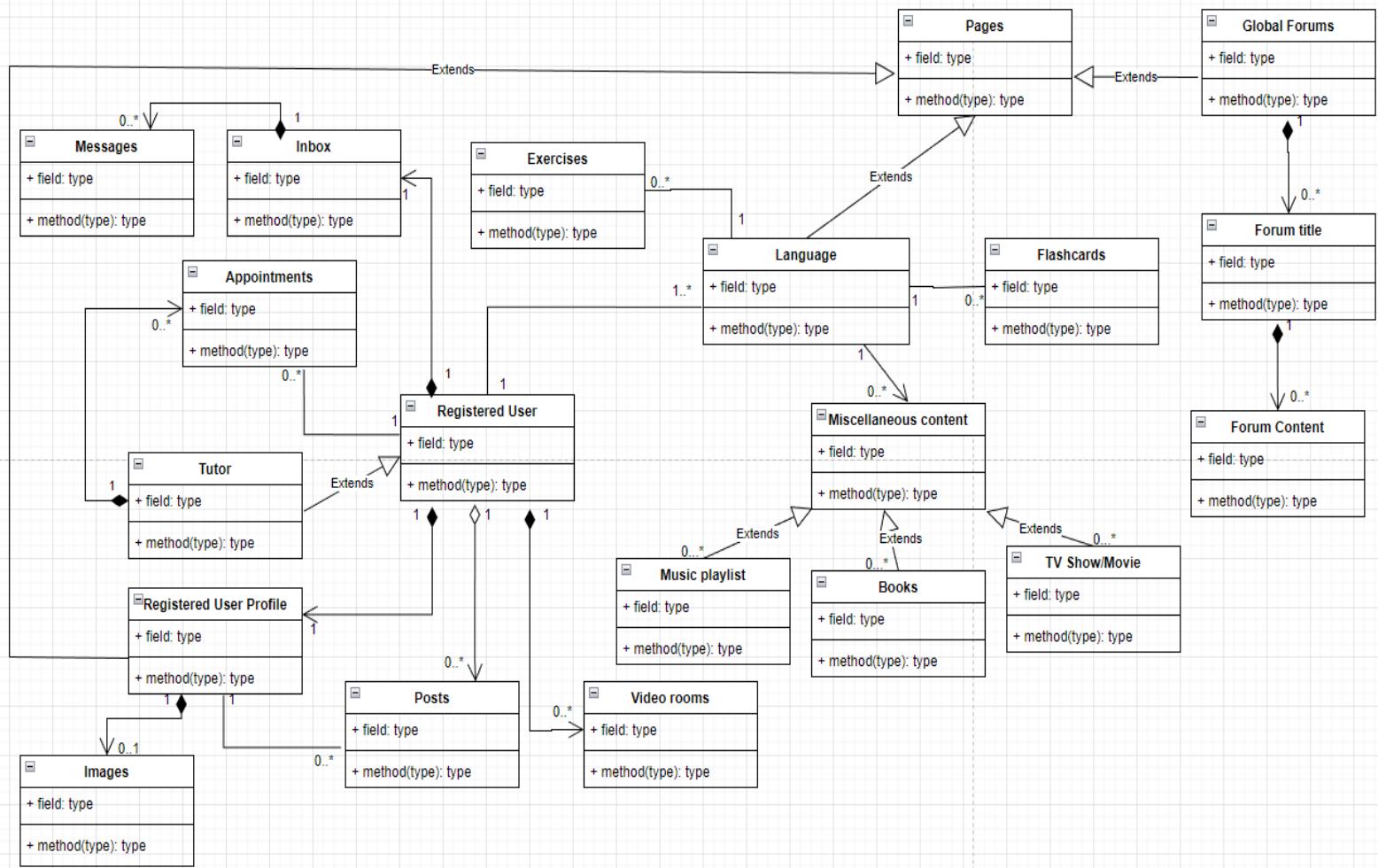


EER Diagram

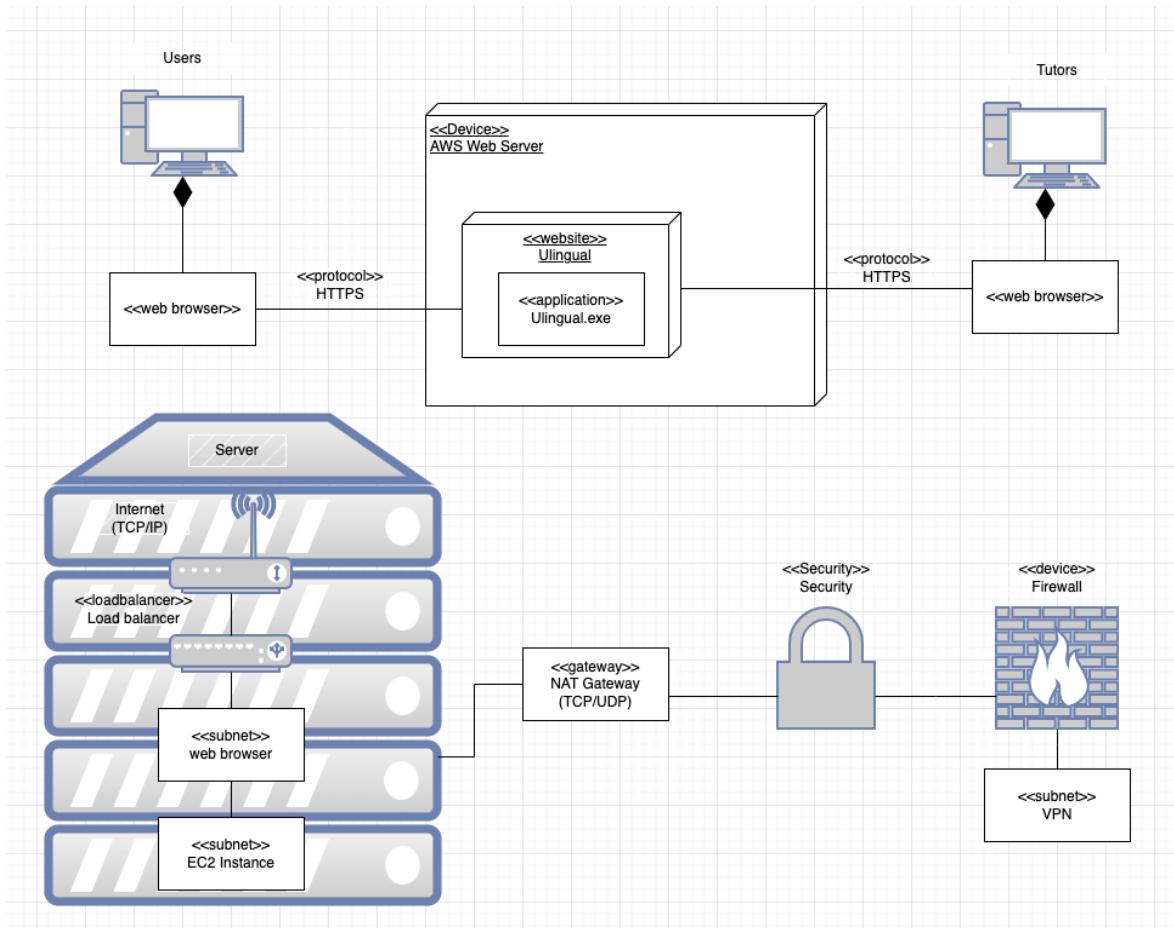


High Level Diagrams V2

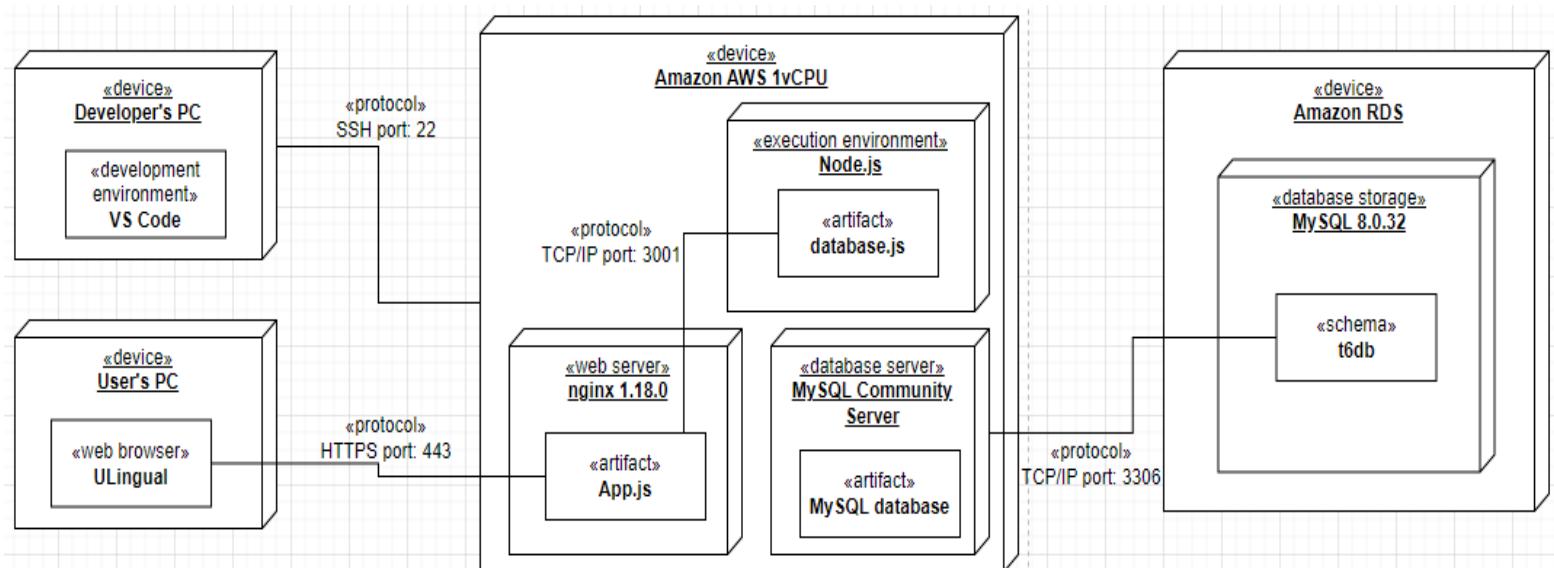
UML Diagram



Application Network Diagram



Deployment Diagram



List of Contributions

Sara Murad Ahmed Seid

Contribution Score: 6

Sara contributed to the wireframes and I really appreciate her effort; however, I had to revise her wireframes because they weren't presentable. I was okay with revising though and it wasn't a big issue. Sara also did some template code for a couple of front-end pages. These pages were templates and I had to revise them to make them more presentable. I do appreciate her effort. For version 2, Sara didn't do much documentation adjustments for this section. I initially had her work on the wireframes but they were not very clear in visibility, especially the use case examples.

Steven Anthony Vasquez

Contribution Score: 8

Steven helped with the initialization and progression of the backend for our website. Since we didn't get to complete that in M2 we did revise and solve this in M3 thanks to Steven's help. Steven also pointed out and requested a group meeting early on so everyone was on the same page towards our functional requirements as well as our priority towards them.

Nik Shahrul Nafiz Bin Nik Azhan

Contribution Score: 10

Nik was a huge help to the front-end of M3, not only did he help with the wireframes but he also put in so much effort into coding the front-end template pages for our website—and a lot of these templates look really good. He's definitely been a team player for this milestone and contributed the most work. In version 2, Nik also helped me work on the figma files of the wireframes for the mockups and storyboards section. Nik also helped revise the section of the UML diagram as well.

Elias G Yetechalew

Contribution Score: 8

Elias made good revisions to the database diagrams that weren't initially done correctly—which is okay because he fixed them now. Elias also shared

good thoughts and was good with communication in terms of moving forward with the database and making sure we as a team are on the same page for certain aspects of the website moving into M3V2. For version 2, Elias completely redid the entire database format to match better in alignment with what the website represents. Completely fixing the ERD and EER diagrams.

John Lee Santiago

Contribution Score: 10

John has also been a huge help to M3, he's very helpful when it comes to pull/merge conflicts that we as a team run into sometimes because of delayed pushes and not getting into the habit of always pulling. Either way he's a great help with that and also he contributed a lot to the backend code to allow us to connect our mySQLworkbench database to the server. He also is trying his hardest, which I appreciate the most, especially when it comes to issues that arise from the ec2 instance. In version 2, John helped revise the section of the UML diagram as well as updating the deployment diagram.

Aidan Carl Stivers

Contribution Score: 8

Aidan also helped with the initialization and progression of the backend for our website. As stated earlier, we didn't get to complete the backend part of M2 so we fixed this and solved it in M3 thanks to Aidans help as well. Aidan also pointed out and requested a group meeting early on so everyone was on the same page towards our functional requirements as well as our priority towards them. The functional requirements were a big component of the project moving forward so I appreciate both Aidans and Stevens' drive to make sure we are all on the same page.

Jonathan Oscar Valadez

Helped with front-end pages including home page, login page, create account page, nav bar, footer, tutors page, tutor profile, price and plans, faq page, form page, about us page, and terms and conditions. Also helped

with documentation and revision section 1 of documentation. I further helped with the drop down menu that routed us to a lot of major pages we use: i.e dashboard, user profile, log in, and friends. Within version 2, I completely reformatted the functional requirements list by entities. I also completely redid the entire storyboards/mockups section making the use case flows more visible and clear.

Milestone 4 Version 2

Product Summary

A. Name of Product: ULingual

B. Description: The world is built upon languages. Without languages, we would not be able to go about our daily lives. With ULingual not only can you learn a new language by chatting with others through our global forums and connecting with others via our video calls, but you can also learn about the culture. We emphasize learning by listening at ULingual, this is why we have Video Rooms where you can learn with others by speaking and listening. This is also why we offer a recommended content section where we offer you recommendations for books, videos, and music playlist to further immerse yourself in the culture. We recommend videos and music playlists so you can listen to the language you are learning more frequently, as one of the best ways to learn language is by repetition and phrase remembrance.

C. What is unique in your product:

What makes our product unique is the joint culmination of learning and connecting with ULingual. We offer generated flashcards that get updates for the user to test their language knowledge, as well as recommended content where the user can stay engaged with the language they are learning outside of ULingual. Not only this but we also offer Video Rooms where you can connect either with your friends or with someone you had a discussion with within the forums. What makes us stand out is our combination between learning and connections.

D. URL to product: <https://50.18.108.83.nip.io/>

Itemized P1 List:

- 1) A general user shall be able to register for an account at ULingual.
- 2) A general user shall be able to select the language they want to learn upon registration.
- 3) A general user shall be able to select what language they are native in upon registration.
- 4) A general user shall be able to access our Contact Form to send ULingual an inquiry email.
- 5) A general user shall be able to view the About Us page to see further details revolving around ULingual.
- 6) A general user shall be able to view the Frequently Asked Questions page to see common questions ULingual receives.
- 7) A general user shall be able to view our Terms and Conditions page prior to registering an account.

- 8) A general user shall be able to access our search bar to search for registered users by name or language.
- 9) A registered user shall be able to login with a username and password.
- 10) A registered user shall be able to logout of their account.
- 11) A registered user shall be able to access our Contact Form to send ULingual an inquiry email.
- 12) A registered user shall be able to view the About Us page to see further details revolving around ULingual.
- 13) A registered user shall be able to view the Frequently Asked Questions page to see common questions ULingual receives.
- 14) A registered user shall be able to access our search bar to search for other registered users by name or language.
- 15) A registered user shall be redirected upon search submission to the results page for their search.
- 16) A registered user search result shall be filtered by the alphabetic language relation they search to display other registered users who are native in the language searched.
- 17) A registered user search result shall be filtered by alphabetic name relation to other registered users.
- 18) A registered user shall be able to view their own profile.
- 19) A registered user profile shall display the language the registered user is learning.
- 20) A registered user profile shall display the amount of friends the registered user has.

- 21)A registered user profile shall display the language the registered user is native in.
- 22)A registered user profile shall display the description of the registered user.
- 23)A registered user profile shall display the profile picture of the registered user.
- 24)A registered user profile shall display the username of the registered user.
- 25)A registered user shall be able to edit their own profile.
- 26)A registered user profile shall display a “Edit Profile” button that allows registered users to edit their profile.
- 27)A registered user shall be able to upload a photo in place of their profile picture.
- 28)A registered user shall be able to edit the description of their profile.
- 29)A registered user shall be able to change what language they want to learn within their profile.
- 30)A registered user shall be able to edit their username.
- 31)A registered user shall be able to view their friends list.
- 32)A registered user shall be able to view their friends profile.
- 33)A registered user shall be able to access the main dashboard.
- 34)A registered user shall be able to access Global Forums within the dashboard.
- 35)A registered user shall be able to comment under a forum post.
- 36)A registered user shall be able to create a new forum post.
- 37)A registered user shall be able to access Video Rooms within the dashboard.
- 38)A registered user shall be able to create a video room.
- 39)A registered user shall be able to join a video room.
- 40)A registered user shall be able to access our Miscellaneous Content within the dashboard.

- 41)A registered user shall be able to access a list of book recommendations in their desired language they are learning.
- 42)A registered user shall be able to access a list of movie and tv show recommendations in a specified language.
- 43)A registered user shall be able to access playlists of music in relation to the language they desire to learn.
- 44)A registered user shall be able to access our Flashcards within the dashboard.
- 45)A registered user shall be able to access generated flashcards as a small test for their desired language.
- 46)A registered user shall be able to create their own flashcards within the flashcard page.
- 47)A registered user shall be able to access their inbox within their profile.
- 48)A registered user shall be able to accept or reject friend requests within their inbox.
- 49)The global forums shall display the name of the forum title.
- 50)The global forums shall display the amount of comments within the forum.
- 51)The global forums shall be sorted by relevance based on newest post.
- 52)The global forums shall display the date that a post was created.
- 53)The global forums shall display the time that a post was created.
- 54)The global forums shall display the username of the person that created the post.
- 55)The global forums shall display a return button per forum to go back to the main global forums page.
- 56)The video rooms shall display a mute/unmute button where registered users can mute/unmute themselves during a video call.
- 57)The video rooms shall display a leave call button where registered users can leave a video call.

- 58)The video rooms shall display a Video On/Off button where registered users can turn their camera off or own in a video call.
- 59)The flashcards shall be viewed by registered users.
- 60)The flashcards shall be formatted into two sides: Word/Phrase & Translation of given Word/Phrase.
- 61)The flashcards shall be displayed based on registered users selected language choice upon registration.
- 62)The miscellaneous content shall be displayed by category of “Books”, “Movies & Shows, and “Music Playlists”.
- 63)The miscellaneous content shall only be accessible by registered users.
- 64)The miscellaneous content shall display links where registered users can access this content to either purchase or enjoy for free.
- 65)The miscellaneous content shall display a title of the content we are suggesting to registered users.
- 66)The inbox shall be displayed within a registered user profile.
- 67)The inbox shall display pending friend requests.
- 68)The inbox shall display messages based on the most recent notification.
- 69)The inbox shall display the time and date a message was received.

Usability Test Plan

Test Objectives: What is being tested.

1. Post a Comment on a Forum Thread:
 - a. In order for users to communicate with each other, they will need to be able to post a comment. This is being tested to figure out whether a user can find where to comment as well as being able to post the comment
2. Find a Book Recommendation:
 - a. One of our features is recommendations of various content so that you can enjoy content from the language you learned. This is tested to make sure users are able to find and receive recommendations.
3. Edit Your Profile Description
 - a. Being a website where you're likely to meet people, it is important to be able update a description of yourself so that people can understand you a bit more
4. Join a Video Room
 - a. Language is meant to be spoken, so video rooms are an important part of this site. This is being tested because users should know where to find and how to create video rooms.
5. Flip a Flashcard
 - a. Flashcards will allow users to re-study things they have learned

Test Descriptions:

Post a Comment on a Forum Thread:

- System Setup: Windows 11, Chrome Browser, Testers actions being watched over a video call
- Starting Point: [ULingual \(nip.io\)](#) when Logged in.
- Intended Users: Any Registered Users who want to connect with other users and potentially add each other as friends to participate in video calls with.
- URL being tested: [ULingual \(nip.io\)](#)
- Task Steps: Click on Get Started or Profile Icon, go to Dashboard, Click on Global Forums, Click on a Forum, Write in the Text box, Click Submit.

Find a Book Recommendation:

- System Setup: Windows 11, Chrome Browser, Testers actions being watched over a video call
- Starting Point: [ULingual \(nip.io\)](#) when Logged in.
- Intended Users: Any Registered Users, People who Enjoy Reading
- URL being tested: [ULingual \(nip.io\)](#)
- Task Steps: Task Steps: Click on Get Started or Profile Icon, go to Dashboard, Click on Go to Recommendations, Click on Book Recommendations

Edit Your Profile Description:

- System Setup: Windows 11, Chrome Browser, Testers actions being watched over a video call
- Starting Point: [ULingual \(nip.io\)](#) when Logged in.
- Intended Users: Any Registered Users
- URL being tested: [ULingual \(nip.io\)](#)
- Task Steps: Task Steps: Click on the Profile Icon, go to Profile, Click on Edit Profile, Add Text to the text box, Click done.

Join a video room:

- System Setup: Windows 11, Chrome Browser, Testers actions being watched over a video call
- Starting Point: [ULingual \(nip.io\)](#) when Logged in.
- Intended Users: Any Registered Users who want to see and speak with others in their own or other languages.
- URL being tested: [ULingual \(nip.io\)](#)
- Task Steps: Click on Get Started or Profile Icon, go to Dashboard, Click on Go To Video Rooms, Click Generate Room Code, Enter required information, Click Join.

Flip a Flash Card:

- System Setup: Windows 11, Chrome Browser, Testers actions being watched over a video call
- Starting Point: [ULingual \(nip.io\)](#) when Logged in.

- Intended Users: Any Registered Users
- URL being tested: [ULingual \(nip.io\)](https://ULingual.nip.io)
- Task Steps: Click on Get Started or Profile Icon, go to Dashboard, Click on Go To Flashcards, Click on a flashcard.

Usability Test Table: Effectiveness:

Test/Use Case	% Completed	Errors	Comments
Post a Comment on a Forum Thread	100%	N/A	Weird Layout
Find a Book Recommendation	100%	N/A	N/A
Edit Your Profile Description	100%	N/A	Good design
Join a Video Room	75%	Video Room not created	Not finished
Flip a Flash Card	100%	N/A	Liked how each language had its own row. Feedback when clicking cards was nice

Usability Test Table: Efficiency:

Test/Use Case	Avg Time	# of pages navigated to accomplish task	Comments
Post a Comment on a Forum Thread	16s	4	Quick
Find a Book Recommendation	14s	4	Quick/easy to find
Edit Your Profile Description	22s	3	Quick/easy to find
Join a Video Room	28s	5	Unfinished

Flip a Flash Card	12s	3	Quick
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User Satisfaction Questionnaire:

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Where to comment to a forum thread was clearly marked.	<input type="radio"/>				
Adding a comment to a forum thread was intuitive.	<input type="radio"/>				
In a real application, I would comment to forum posts to connect with other users	<input type="radio"/>				
I was able to find a Book Recommendation quickly.	<input type="radio"/>				
I was satisfied with the variety of book recommendations offered.	<input type="radio"/>				
In a real application, I would explore the books being recommended.	<input type="radio"/>				
Editing my Profile Description was intuitive.	<input type="radio"/>				
Finding where to edit my profile was quick.	<input type="radio"/>				
Editing my profile was an enjoyable experience.	<input type="radio"/>				
Navigating to join a video room was easy.	<input type="radio"/>				
The process of joining a video room was straightforward.	<input type="radio"/>				
The video room joining	<input type="radio"/>				

process should be changed.					
Flipping flashcards is an enjoyable experience.	o				
Flashcards make it easier for me to study the things I've learned.	o				
It is easy to flip Flash Cards.	o				

QA Test Plan

Test Objectives: what is being tested.

a. **Security**

- **Test objectives:** The system's ability to protect information and resources from illegal access.
- **HW and SW setup (including URL):** <https://50.18.108.83.nip.io/> Testing setting with security tools and fake attack scenarios.
- **Feature to be tested:** User identification, validation and access control.
- **QA Test plan:**

Test #	Test title	Test Description	Test Input	Expected correct output	Pass/Fail
Test 1	User Password	Testing make sure the password is correct	Test with incorrect password	Incorrect input must denies access and show error	Pass
Test 2	Email validation	Testing if an email field containing a domain or not	sami@yahoo.com	sami@yahoo.com	Pass
Test 3	Password encryption	Testing if the password is encrypted	123456	Pass

b. Performance

- **Test objectives:** Checking the speed of loading test, response time and scalability test.
- **HW and SW setup (including URL):** <https://50.18.108.83.nip.io/> Tools for server and network monitoring, as well as tools for creating messages and web browsers.
- **Feature to be tested:** Accessibility to the server performance, loading test, response time and scalability test.
- **QA Test plan:**

Test #	Test title	Test Description	Test Input	Expected correct output	Test Results
Test 1	Loading test	Monitor the website response time, resource utilization	Brows different pages, submitting forms.	Our website handle the loads without degradation	Pass
Test 2	Response Time	Test the responsiveness of the website by measuring the time it takes to respond.	User request to login to the website and access lecture	The response takes a second	Pass
Test 3	Scalability Testing	Test the website's ability to handle the scale effectively.	Test the website performance by increasing traffic to the website.	The website performs effectively during high traffic.	Pass

c. Storage

- **Test objectives:** the storage test is to evaluate the system's capacity.

- **HW and SW setup (including URL):** <https://50.18.108.83.nip.io/> SW requirement setup requirement for operating system.
- **Feature to be tested:** storage test
- **QA Test plan:**

Test #	Test title	Test Description	Test Input	Expected correct output	Test Results
Test 1	capacity	Verify storage capacity	The software it reserves a sufficient amount of storage space so that unexpected termination does not occur due to lack of space	Testing the maximum capacity of the system in terms of traffic. Not able to test because users were only limited to 5.	Fail
Test 2	Backup	Recovery testing the system when the storage capacity is reached or exceeded	It test of creating a copy of the data on the system that can use recovery in case the original data is lost	Run test to recover deleted	Fail
Test 3	Storage testing	Test the system ability to	It is testing to verify how the system	Testing which is used to	Pass

		scale the storage capacity to accommodate increasing data volumes	will react when hardware device is replaced	ensure that the software program saves necessary data in correct folder	
--	--	---	---	---	--

d. Privacy

- **Test objectives:** To check that data is protected and encrypted.
- **HW and SW setup (including URL):** <https://50.18.108.83.nip.io/>
- **Feature to be tested:** Testing the system's performance by accessing various data, checking if data is stored via cookies, and seeing how it manages users data.
- **QA Test plan:**

Test #	Test title	Test Description	Test Input	Expected correct output	pass/Fail
Test 1	Data Collection	It store personal information while protecting individual privacy right	Testing the system capability performance by access different data	Not able to access the data	Fail
Test 2	Data encryption	It test the security of data transmission over networks	It verify that sensitive data is encrypted during transmission protocol such as HTTPS is used to	https://50.18.108.83.nip.io/	Pass

			protect users privacy		
Test 3	Privacy policy	It checks that the system provides clear privacy policy and disclosure to its user	How the company collects and handle data from site visitors	checking the button of website policy before signing up	Pass

e. **Compatibility**

- **Test objectives:** Verification of ULingual ability to browse in different web browsers, devices and modify content to fit various screen sizes.
- **HW and SW setup (including URL):** <https://50.18.108.83.nip.io/> Test website with different platforms such as desktop, laptop, and screen sizes. Also with different browsers.
- **Feature to be tested:** Adaptability and flexibility of the website, browser compatibility, operating system and device compatibility.
- **QA Test plan:**

Test #	Test title	Test Description	Test Input	Expected correct output	Test Results
Test 1	Testing browser compatibility	Test browser compatibility in different web browser and all features are functional	Validate the website on different browsers. Such as Safari, Chrome, Firefox	Website functions correctly on all browser	pass
Test 2	Screen resolution	Test screen resolution in different device	Launch website to ensure all elements are displayed correctly in	The website must display in different screen resolutions without	pass

			different device	cutting information.	
Test 3	Device compatibility	Test website in different devices and operating systems. such as Desktop,laptops, tablets.	Verify that all functionality are accessible and working correctly in different devices	Our website works on different devices and operating system	pass

Code Review

We follow the general coding Standard i.e:

1. **Proper naming conventions relative to React:** Where all our files names relate to the content of code written.
2. **Proper convention of Files:** Where all our files have proper extensions relative to our React Project.
3. **Proper commenting and layout:** Where we properly comment highly important code making it easier for team members to understand what's going on within a given code section.
4. **Limiting Usage of Global Variables:** Where we mitigate our usage of global variables and rather take advantage of react's component features.
5. **Proper Exception Handling:** Where we set parameters to return appropriate errors based on certain exception handles. As well as providing proper handling of issues—for example registration validation.
6. **Mitigation of Problematic Loops:** Where we mitigate usage of potential loop conventions that can cause issues, i.e do...while.
7. **Indentation:** Where we do proper indentation to make our code clean and clear to understand in especially dense sections.

Team Member- John Code Review:

Files reviewed:

Maincontent.js
Maincontent.css

(Maincontent.js)

```

1  import React from 'react'
2  import './stylesheets/Maincontent.css'
3  import americanFlag from '../images/americanFlag.png'
4  import spanishFlag from '../images/spanishFlag.png'
5  import frenchFlag from '../images/frenchFlag.png'
6  import arabLeagueFlag from '../images/arabLeagueFlag.png'
7  import koreanFlag from '../images/koreanFlag.png'
8  import { Link } from 'react-router-dom'
9  import LandingPage from '../images/Designer-girl.jpg'
10 // import { FcGraduationCap, FcPicture, FcReading, FcFilmReel } from "react-icons/fc";
11 // import { FaUserFriends, FaRegLaughBeam } from "react-icons/fa";
12 // import { MdVideoCall, MdOutlineForum } from "react-icons/md";
13 // import { GiTeacher } from "react-icons/gi";
14 // import { BiMusic } from "react-icons/bi";
15 // import { ImBooks } from "react-icons/im";
16
17
18
19 function MainContent(props) {
20     const {loggedIn} = props;
21     //const languages = {}
22
23     return(
24         <div className='maincontender'>
25             <div id="banner" className='sec-1'>
26                 <div className='content-one'>
27                     <div className='inter-1'>
28                         <h1 className='title-inter-1'>ULingual</h1>
29                         <h2 className='title-inter-1'>
30                             Learn languages with people globally.</h2>
31                         <div className='descript-1'>
32                             <p>
33                                 Connect with native speakers from around the world
34                                 with a click of a button.
35                             </p>
36                             {loggedIn ? (
37                                 <div className='sign-up'>
38                                     <Link to="/Dashboard">
39                                         <label className='sign-up-btn'>
40                                             Get Started!
41                                         </label>
42                                     </Link>
43                                 </div>
44                             ) : (
45                                 <div className='sign-up'>
46                                     <Link to="/register">
47                                         <label className='sign-up-btn'>
48                                             Sign Up Here!
49                                         </label>
50                                     </Link>
51                                 </div>
52                             )}
53                         </div>
54                     </div>
55                     <div className='land-page-image-1'>
56                         <img src={LandingPage} alt="image of person"></img>
57                     </div>

```

```

57     </div>
58     </div>
59   </div>
60   <div id="info-1" className='sec-2'>
61     <div className='content-two'>
62       <h2 className='hp-title'>Join a supportive community</h2>
63       <p>At ULINGUAL we understand learning a language can be difficult,
64           this is why we emphasize creating a supportive community where any one
65           can feel welcome to learn without judgment.
66     </p>
67   </div>
68 </div>
69 <div id="offerings" className='sec-3'>
70   <div className='content-three'>
71     <h2 className='hp-sec3-title'>ULINGUAL Dashboard</h2>
72     <div className='hp-sec3-info'>
73       <p>Get access to our dashboard that offers
74           Flashcards, Global Forums, Video Rooms, and Recommended
75           Content.
76     </p>
77   </div>
78   <div className='card-setup'>
79     <article className='hp-card'>
80       <h3 className='hp-card-title'>Flashcards</h3>
81       <p>Access our array of flashcards that test your knowledge
82           in the language you're learning!
83     </p>
84   </article>
85   <article className='hp-card'>
86     <h3 className='hp-card-title'>Global Forums</h3>
87     <p>Want to chat globally? Access our global Forums
88           and connect with users from around the world.
89   </p>
90   </article>
91   <article className='hp-card'>
92     <h3 className='hp-card-title'>Video Rooms</h3>
93     <p>Tired of learning and not practice? Access our video
94           rooms and connect with someone to practice with!
95   </p>
96   </article>
97   <article className='hp-card'>
98     <h3 className='hp-card-title'>Rec. Content</h3>
99     <p>
100       Access our recommended content including custom books, tv shows, and
101           music playlist to expand your learning outside of ULINGUAL.
102     </p>
103   </article>
104 </div>
105 </div>
106 </div>
107 );
108 );
109 }
110 }
111
112 export default MainContent

```

(Maincontent.css)

```
1 ∵ .maincontender{
2     z-index: 0;
3     position: relative;
4 }
5
6 ∵ #banner{
7     position: relative;
8     overflow: hidden;
9     padding: 6.0vw 0;
10    display: flex;
11    align-items: center;
12 }
13
14 ∵ #banner .content-one{
15     position: relative;
16     z-index: 2;
17     height: auto;
18     padding: 0;
19     width: 92%;
20     display: flex;
21 }
22
23 ∵ .sec-1 .content-one {
24     margin: 0 auto;
25     text-align: center;
26 }
27 ∵ #banner .content-one .inter-1 {
28     position: relative;
29     margin-top: 0;
30     margin-right: 0;
31     text-align: center;
32 }
33
34 ∵ #banner .content-one .title-inter-1 {
35     position: relative;
36     display: block;
37     color: □#000;
38     text-align: left;
39     margin: 0;
40     font-weight: 700;
41     width: 100%;
42     padding-right: 0;
43     right: 0;
44     opacity: 1;
45     transform: translate(0,0);
46 }
47 ∵ #banner .content-one .title-inter-1 h1{
48     margin-bottom: 10px;
49 }
50
51 ∵ .inter-1 h1{
52     font-size: 60px;
53 }
54 ∵ .inter-1 h2{
55     font-size: 33px;
56 }
57
```

```
58 #banner .content-one .descript-1 {
59   text-align: left;
60   width: 100%;
61   max-width: 850px;
62   margin: 30px 0 0;
63 }
64 #banner .content-one .descript-1 p {
65   color: □#1d1d1f;
66   font-size: 23px;
67   font-weight: 400;
68   line-height: 1.2em;
69   letter-spacing: .08em;
70   font-family: 'Comme', sans-serif;
71 }
72 .sec-1 p{
73   margin-bottom: 1rem;
74   font-family: 'Comme', sans-serif;
75 }
76
77 #banner .content-one .descript-1 .sign-up{
78   margin: 0;
79   text-align: left;
80 }
81
82
83 #banner .content-one .descript-1 label.sign-up-btn {
84   display: inline-block;
85   padding: 0;
86   margin: 0 auto;
87   color: □black;
88   background: var(--mint-green);
89   height: 48px;
90   line-height: 48px;
91   width: 256px;
92   text-align: center;
93   text-transform: uppercase;
94   cursor: pointer;
95   border-radius: 5px;
96 }
97 #banner .content-one .descript-1 label.sign-up-btn:hover {
98   background: □black;
99   color: □white;
100 }
101
102
103 .sec-1 label.sign-up-btn {
104   font-size: 16px;
105   font-weight: 600;
106   min-width: 256px;
107   letter-spacing: .2em;
108 }
109
110 .sec-1 span.spn{
111   color:□black;
112   margin-left: 1rem;
113   font-family: 'Comme', sans-serif;
114 }
```

```
115 }
116 /* NEED to work on image responsiveness*/
117 #banner .land-page-image-1 img{
118     position: absolute;
119     background-size: contain;
120     max-width: 375px;
121     max-height: 350px;
122     margin: auto 0;
123     top: 0;
124     bottom: 0;
125     display: flex;
126     object-fit: cover;
127     margin-left: 5em;
128 }
129 }
130 @media only screen and (max-width: 1350px){
131     #banner img{
132         left: 770px;
133     }
134 }
135 @media only screen and (max-width: 1180px){
136     #banner img{
137         left: 680px;
138     }
139 }
140 @media only screen and (max-width: 980px){
141     #bannerimg{
142         overflow: hidden;
143     }
144 }
145 }
146
147
148 #info-1{
149     background: var(--primary);
150 }
151
152 #info-1 .content-two {
153     width: 100%;
154     padding: 5rem 0 3rem;
155     text-align: center;
156 }
157
158 #info-1 .hp-title {
159     margin-top: 0;
160     margin-left: auto;
161     margin-right: auto;
162 }
163
164 #info-1 h2{
165     font-size: 52.5px;
166     font-family: 'Comme', sans-serif;
167 }
168 }
169
170
```

```

170
171   #info-1 p{
172     font-size: 21px;
173     letter-spacing: .010em;
174     line-height: 1.13em;
175     width: 100%;
176     font-weight: 600;
177     margin-bottom: 1rem;
178     font-family: 'Comme', sans-serif;
179   }
180
181   #offerings{
182     background: ■whitesmoke;
183   }
184
185   #offerings h2{
186     margin-top: 0px;
187     text-align: center;
188     color: var(--primary);
189     font-size: 50px;
190     font-family: 'Comme', sans-serif;
191   }
192   .content-three .hp-sec3-info p{
193     text-align: center;
194     color: var(--primary);
195     font-size: 30px;
196     font-family: 'Comme', sans-serif;
197   }
198
199   .card-setup{
200     display: grid;
201     grid-template-columns: repeat(auto-fit, minmax(250px,1fr));
202     gap: 1em;
203     margin-left: 1em;
204     margin-right: 1em;
205     margin-top: 2em;
206   }
207
208   .hp-card{
209     background: □black;
210     border-radius: 5px;
211     margin-bottom: 10px
212   }
213
214   .hp-card h3{
215     text-align: center;
216     background:var(--mint-green);
217     border-radius: 5px;
218     border-bottom-left-radius: 0px;
219     border-bottom-right-radius: 0px;
220     color:□black;
221     font-weight: 800;
222     font-family: 'Comme', sans-serif;
223   }
224
225   .hp-card p{
226     text-align: center;
227     color: ■white;
228     text-decoration: solid;
229     font-weight: 500;
230     font-family: 'Comme', sans-serif;
231     font-size: 22px;
232   }

```

These files were chosen as its the main landing page for our website and the structure holds great value to get people's attention.

“Proper use of import statements.

Some imports are not being used and could be removed from the code.

Some code is commented out. These can also be removed to avoid confusion.

Structure of the main function is well organized and consistent with indentations.

Uses CSS classes to apply styling to the content.

Naming conventions for classes are mostly consistent.
All styling is done within the imported CSS file; no in-line styling.
Lack of comments, but they're not really necessary in this case. The code is pretty self-explanatory and sectioned nicely.”

Team 4 Lead Saru Code Review:

File reviewed:

videoIndex.js

```
1 // File to contain all video-related API calls
2 const express = require('express');
3 const bodyParser = require('body-parser');
4 const config = require('./config');
5 const { videoToken } = require('./tokens');
6
7 // Create a new instance of the Express application
8 const app = express();
9
10 // Use body-parser middleware to parse incoming request bodies
11 app.use(bodyParser.urlencoded({ extended: false }));
12 app.use(bodyParser.json());
13
14 // Function to send the Twilio Access Token as a JSON response
15 const sendTokenResponse = (token, res) => {
16   res.set('Content-Type', 'application/json');
17   res.send(
18     JSON.stringify({
19       token: token.toJwt()
20     })
21   );
22 };
23
24 // API route for generating a Twilio Access Token for a GET request
25 app.get('/video/token', (req, res) => {
26   // Get the identity and room parameters from the query string of the request
27   const identity = req.query.identity;
28   const room = req.query.room;
29
30   // Generate a new Twilio Access Token with the videoToken function
31   const token = videoToken(identity, room, config);
32
33   // Send the token as a JSON response
34   sendTokenResponse(token, res);
35 });
36
37
38 // API route for generating a Twilio Access Token for a POST request
39 app.post('/video/token', (req, res) => {
40   // Get the identity and room parameters from the request body
41   const identity = req.body.identity;
42   const room = req.body.room;
```

```
38 // API route for generating a Twilio Access Token for a POST request
39 app.post('/video/token', (req, res) => {
40   // Get the identity and room parameters from the request body
41   const identity = req.body.identity;
42   const room = req.body.room;
43
44   // Generate a new Twilio Access Token with the videoToken function
45   const token = videoToken(identity, room, config);
46
47   // Send the token as a JSON response
48   sendTokenResponse(token, res);
49 });
50
51 module.exports = app;
```

This file was chosen as its the structure for how our video rooms are implemented—which is one of our key features within the website.

“The standard naming convention has been followed.

The name of the file is descriptive to reflect the content inside the file.

Added comments add quality to the understanding of the code.

There is limited use of global variables and functions indicating good coding practice.

The indentations are placed properly increasing readability of the code.

Cannot confirm if there are exception handlers for functions in the provided code snippet. Adding exception handlers is recommended for code to run smoothly and to get the desired result.

The statements are clear and comprehensive.”

Self-check on Best Practices for Security

Protected Assets:

Passwords

After validating the user's information during account creation, passwords are encrypted using the bcrypt module and stored in our database. For testing purposes, several of these passwords were intentionally made the same during registration. However, since bcrypt's encryption algorithm is probabilistic, the encrypted passwords will always be different even if the unencrypted passwords are the same. During login, bcrypt is also used to validate the user's information. The user's unencrypted password is never saved anywhere on our website.

Password encryption during registration:

```
bcrypt.hash(Upassword, salt, (err, hash) => {
```

Password decryption during login:

```
bcrypt.compare(Upassword, foundUser.Upassword, (err, response) => {
```

Encrypted passwords in the database:

Username	Upassword
1234	\$2b\$10\$YdIA/gbMa5q0L.x42kX9l.t1L7FHUsQSK...
123123	\$2b\$10\$yExQCNb0t1fn0jNl5GQOFuzwAbbRy4y...
asdasdasdasd	\$2b\$10\$eyZhqQ8qS5z/pa3jUvBd/epoS0j/VwiDI...
111111	\$2b\$10\$hZEfr.10rmHezxYN9Inf.BZKD3MYHvl...
usertest	\$2b\$10\$ZDvhIeSaRyi0pDvssN5/Aeyqwpd4nuip...
jaylor	\$2b\$10\$A8Hf89jNjs.pXGSCLajd.DTMMnHL6Ny...
curry30	\$2b\$10\$SnXS.IE6T0qDEeR/LY4sc.3M4U2PLe2xR...
qwee	\$2b\$10\$9EW3CKbh2QWWZYgo1nOhMOiWWO...
mj23	\$2b\$10\$dmHuPsJMdnsC12DT4xRNpOlF/BY9YBy...
Tbros	\$2b\$10\$UFFwdUoBQmAdK8MGWOXlz.CQkNcfS...
PGriffin	\$2b\$10\$8LrLVkrL2LY7h59nTYnToeEU8HbfAAw...
12345	\$2b\$10\$FX6VXcGi42qxmk9RsYn4lurNG8jVVIW7...
BBongo	\$2b\$10\$8TONp79/AK0CC4Pl1cMi.OUTpZqTAfjYr...
KD35	\$2b\$10\$IWON8x1qYTSE0KzcILOX/O.D/MHS/g4...
douglasyaoo	\$2b\$10\$et7whAEEdXBx7swlBZc.buuglk9ubCRftfy...
testing	\$2b\$10\$7EwfIOKxsLjxp35/4Lc.f.59s/PInpgBOdu...
test	\$2b\$10\$QrwdFX0KHq.ilEBTop4AVuYwPT6.bcEx...
jojokai	\$2b\$10\$OTevdAICbal5r2GaHxIMrOwNI.3XZ0Vtt...
prathiba	\$2b\$10\$pemMMgUEwRSW9L1rT445ye.mM8ubG...
nique	\$2b\$10\$nJZpgn8etwG4B.ixWse7qe4ZfAJTOXch...
PrettyGood	\$2b\$10\$OJWy9W6jrq5cX3YU8.SKLuepKwj0TKp...
NULL	NULL

Input Data Validation:

All forms of input by the user are validated and visual feedback is provided when the user does not satisfy the input requirements. This includes registering an account, logging in, posting to the forum, sending messages to other users, and using the search bar.

Example of invalid input:

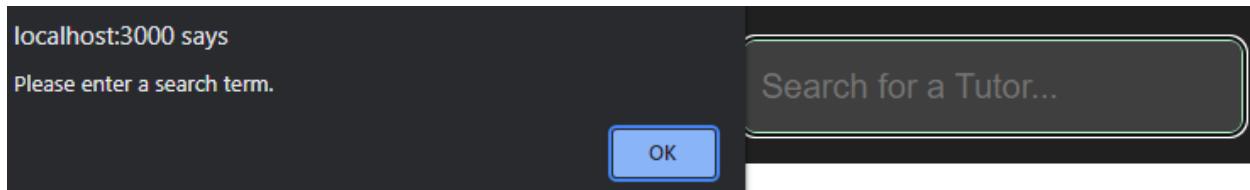
Email:

Valid Format: valid@email.com

For the search bar we're only making sure that the user doesn't try to search with an empty query.

```
if(searchQuery.length == 0) {
    alert("Please enter a search term.");
```

Example of empty field submission:



Self-check: Adherence to Original Non-Functional Specifications

- 1. System Requirements:**
 - 1.1. Operating System Minimums: System shall support operating systems running Windows 7, Mac OS 10.8 or newer. **(DONE)**
- 2. Performance:**
 - 2.1. Server Uptime: The server shall be run through the day for 24 hours a day. **(DONE)**

- 2.2.** Minimal Message Delay: The server shall be able to process and display live texts within 3 seconds. **(DONE)**
 - 2.3.** Minimal Page Load Delay: The server shall load pages for the user within 2 seconds. **(DONE)**
 - 3. Storage:**
 - 3.1.** Server Storage Capability: ULingual's server shall be run on 8GiB Volume. **(DONE)**
 - 4. Security:**
 - 4.1.** Data Privacy: The user's password information shall be protected and encrypted within ULingual's database. **(DONE)**
 - 4.2.** Secure Password: The user shall have a secure password that includes an uppercase, lowercase, special symbol, a numerical value, and be a length of at least 8 characters. **(DONE)**
 - 4.3.** Username Uniqueness: There shall be no duplicate usernames within the database of ULingual. **(DONE)**
 - 5. Environmental:**
 - 5.1.** Safe Space Environment: The user shall experience a judgment free zone while using ULingual services. **(DONE)**
 - 6. Marketing:**
 - 6.1.** ULingual shall have an easy to identify logo that distinguishes itself from others. **(DONE)**
 - 7. Legal:**
 - 7.1.** Acceptance of Policies & Services: The user must accept our policies and terms of service prior to creating a ULingual account. **(DONE)**
 - 8. Content:**
 - 8.1.** Immersive & Interactive Content: The user shall experience content that's both enjoyable and also interactive. **(DONE)**
 - 9. Look and Feel:**
 - 9.1.** Smooth User Experience: The user shall experience the services of ULingual in an easy and smooth way, mitigating confusion and frustration. **(DONE)**
 - 9.2.** Smooth Customer Support: The system shall provide a form system where the user shall be able to contact us regarding inquiries, feedback, and issues they are facing regarding the software. **(DONE)**
 - 10. Usability:**
 - 10.1.** Accessibility: ULingual shall be accessible to anyone with a general internet connection and the minimum required operating system requirements. **(DONE)**
 - 10.2.** Efficiency: The ULingual system shall be efficient for the users. **(DONE)**

10.3. Username Changes: The user shall be able to change their username whenever they please, granted it isn't taken already. (**DONE**)

11. Privacy:

11.1. Data Encryption: The system shall encrypt and protect all user password data. (**DONE**)

11.2. Data Privacy: The user's data shall not be spread elsewhere outside the bounds of the systems database. (**DONE**)

12. Compatibility:

12.1. ULingual shall be dynamic and be able to scale to the proper size of web content in relation to a device's screen size. (**ON TRACK**)

13. Organizational:

13.1. Form Branch: ULingual shall have dedicated personnel to respond to and review all form responses sent to ULingual. (**DONE**)

14. Coding Standards:

14.1. Naming Conventions: ULingual shall follow standard naming conventions for variables, i.e meaningful and understandable variable names. (**DONE**)

14.2. Documentation: ULingual shall follow adequate documentation protocol; comments in regard to code should be easily understandable. (**DONE**)

List of Contributions

John Santiago Contribution Score : 9

John was very helpful through the entire process of M4 helping with validation for registration pages, loading data to user profiles, setting up https for our website, updating our search results data pulls, and helping update our server with pulls when needed. Great help! In version 2, John helped revise sections of documentation especially for self check.

Sara Murad Ahmed Seid Score: 4

Sara helped with documentation within M4, I asked her to style a few pages but she couldn't do it and gave up on styling and rather focused on documentation. Sara did help me with flashcards by sending me phrases in Arabic for me to use as data.

Steven Anthony Vasquez Score: 7.5

Steven helped set up the video rooms which is a critical component of our website. Where the user can mute/unmute themselves and turn the camera on and off. He also implemented the code to generate a room for registered users to allow them to join a given room. He also contributed to the documentation of M4

Nik Shahrul Nafiz Bin Nik Azhan Score: 9

Nik made a vast amount of changes to the website that were really nice like user profiles, editing user profiles, the inbox, recommended content update, and as well as work on documentation. Nik's dedication and participation helped tremendously for this milestone.

Elias G Yetechalew Score: 4

Elias revised the database structure again for us. It took him a while to send the updated diagrams for us to update within previous documentations and I wish he sent them earlier. Elias helped with documentation as well within M4.

Aidan Carl Stivers Score: 8

Aidan helped with the progression of global forums, where a user can create a forum and comment on a forum; however, the code where this is saved in the database is still not yet complete. Aidan did help with documentation for M4. In version 2, Aidan revised documentation, especially in the Usability Test Plan section. Aidan also helped style the video calls page which was very helpful!

Jonathan Valadez Contribution:

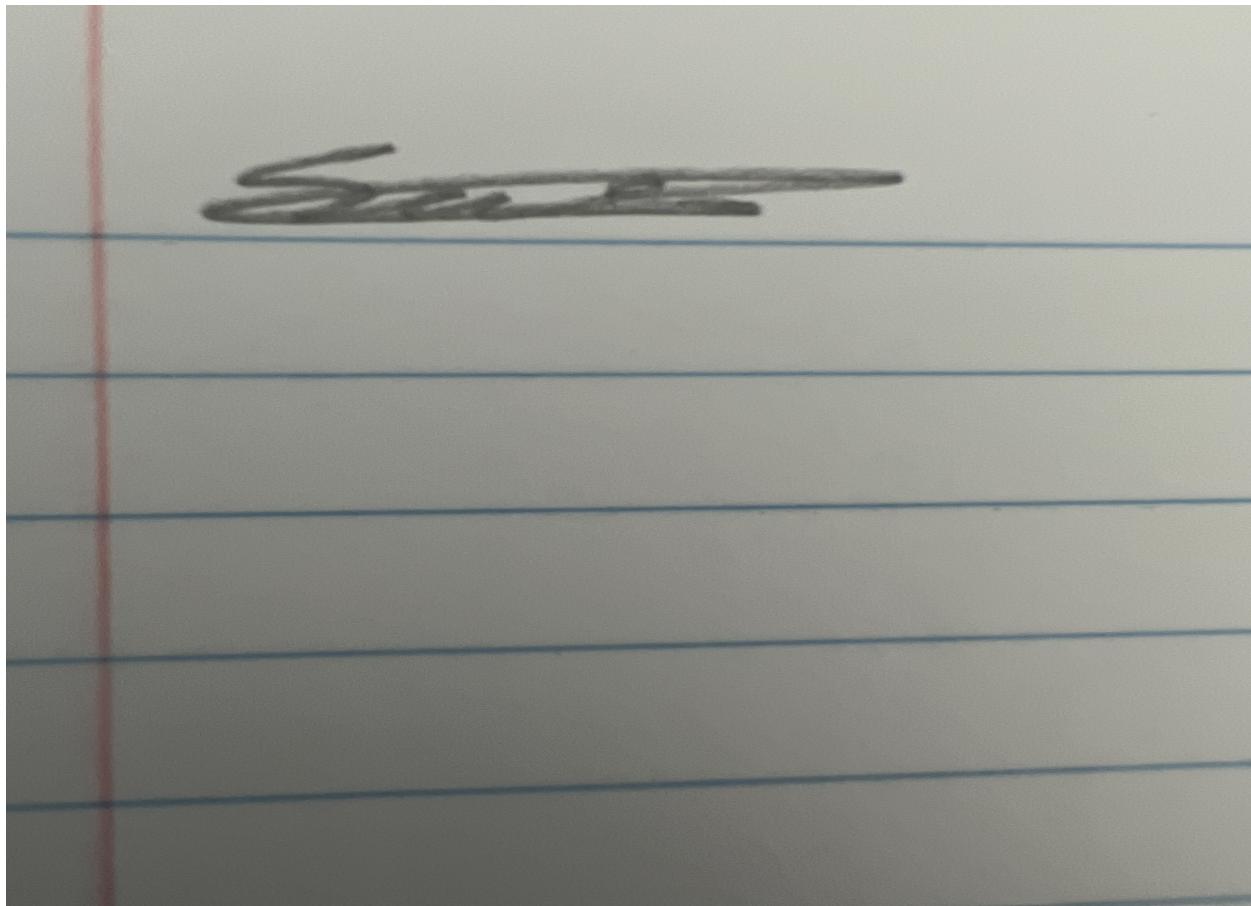
Completely revised M1V2 for our self-check section of M4V1, as well as reformat and restructure M3V3 functional requirements to reference within M4V1. Redid the format for dashboard, adjusted the footer, styled the page in the video room where the user enters their credentials prior to joining a room, changed the appearance of navbar based on if user is logged in or not, added drop down selection to registration for user to add their native language and language learning, updated home page information, and FAQ page information, set up flashcards page and flashcard templates, helped with documentation for M4. In version 2, I updated the code review section.

Team member Contributions

Sara Murad Ahmed Seid: Score of 5

Sara attended most of the meetings and did her part when it came to most of her documentation assignments; however, when it came to coding her participation was rather sparse. Some of the work she did I had to revise and fix as it wasn't optimal for production appearance. There was also the issue where she was getting compilation errors trying to run locally. Overall I think 5 is a fair contribution score when evaluating both her github commits and also her contribution to documentation and ideas to the overall project.

Signature:

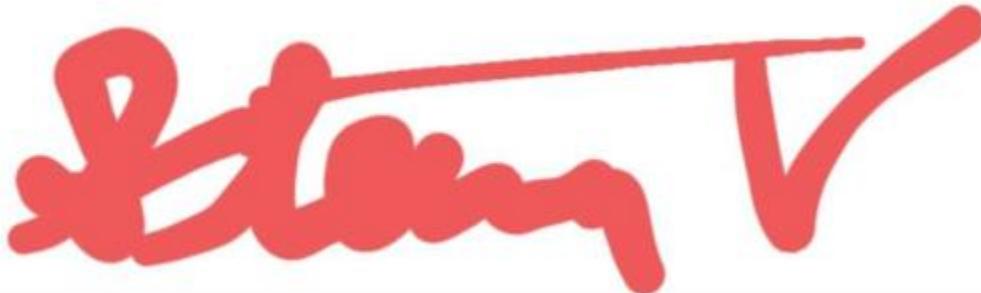


Steven Anthony Vasquez: Score of 8

Steven is a very helpful team member. During our meetings he would always give great feedback on ways to approach certain components of the website. Steven's main input and production to the website was through registration validation and also as well as the videos section of our website. Steven was also

always on top of documentation! Overall he was a very good member to have on the team.

Signature:

A red ink signature in a cursive, flowing style. The signature reads "Nik Shahrul Nafiz Bin Nik Azhan". A horizontal line is drawn underneath the signature.

Nik Shahrul Nafiz Bin Nik Azhan: Score of 10

Nik is an extremely helpful member to our team. He has always been to our meetings and taken care of his documentation—if there were issues he would fix them. Nik was very helpful for the frontend aspects of this website, his layouts and his design implementations were very nice and useful when implementing important pages like profiles, forums, friends lists, and recommended content. Overall his effort and contribution to the team was extremely important to making this project possible.

Signature:



Elias G Yetechalew: Score of 5

Elias attended most meetings. We did have some issues in the beginning with his diagram creations being the database master. He was able to revise them; however, there was some confusion surrounding what his database represented and what we were going towards with the website. So he had to redo the entire database again. He took quite a bit of time to complete this as well as send out diagrams. There were a few instances where I asked him for help in other areas but he would not respond—for example asking to assist with the backend. Overall I think this contribution score is fair with his contribution over the entire semester we've been working on this project.

What Elias thinks his score should be: 7

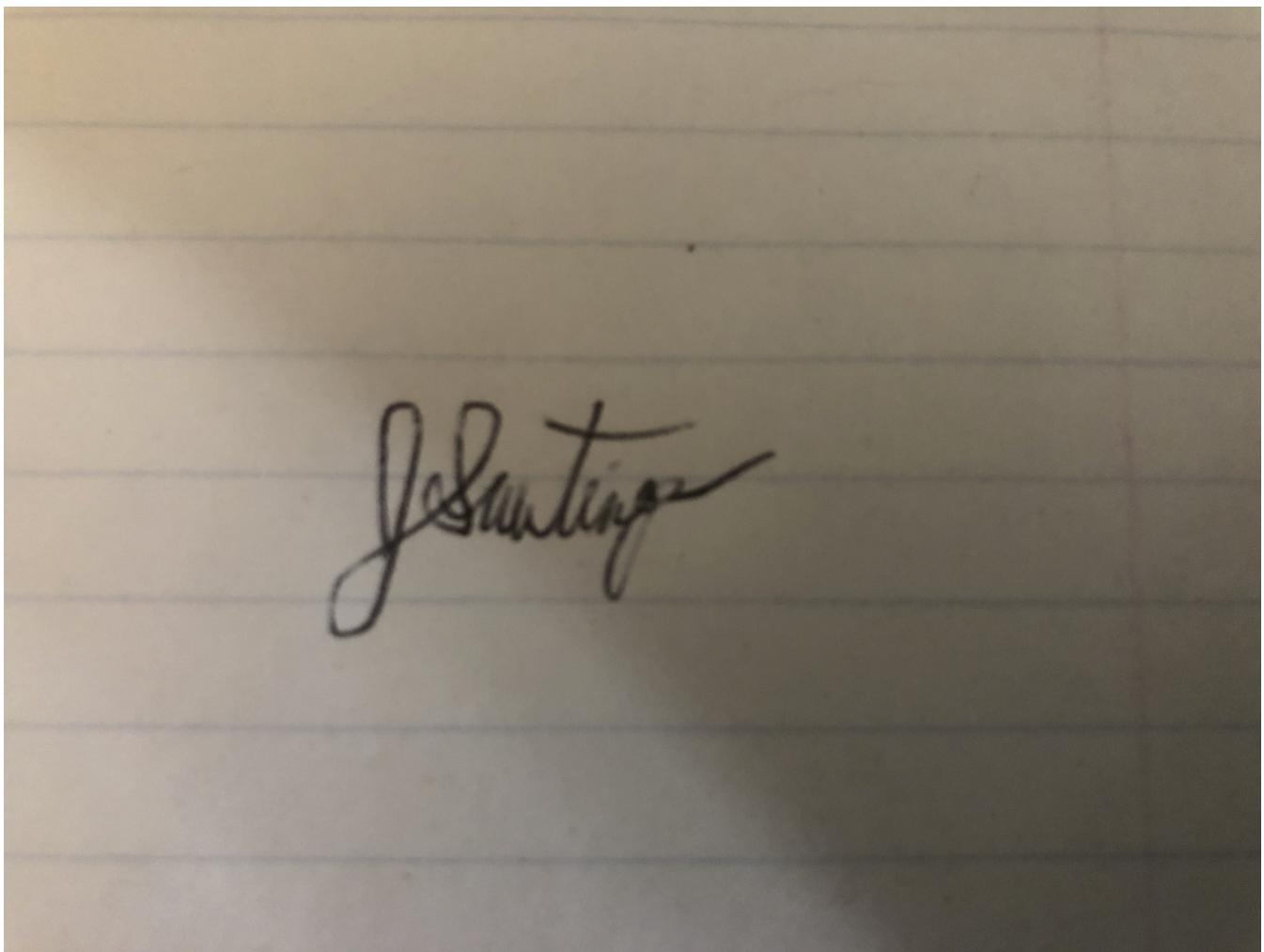
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John Lee Santiago: Score of 10

John is an extremely helpful member to the team. He's been the one to properly establish piping for our server and database. He's always been on top of documentation as well as being to the meetings and providing feedback. He's also been a great help to documentation, and issues revolving around github conflicts. He's also been a great help to the backend of the website, helping us create multiple essential components of the website. Overall he's been a key member to the team to make this project possible.

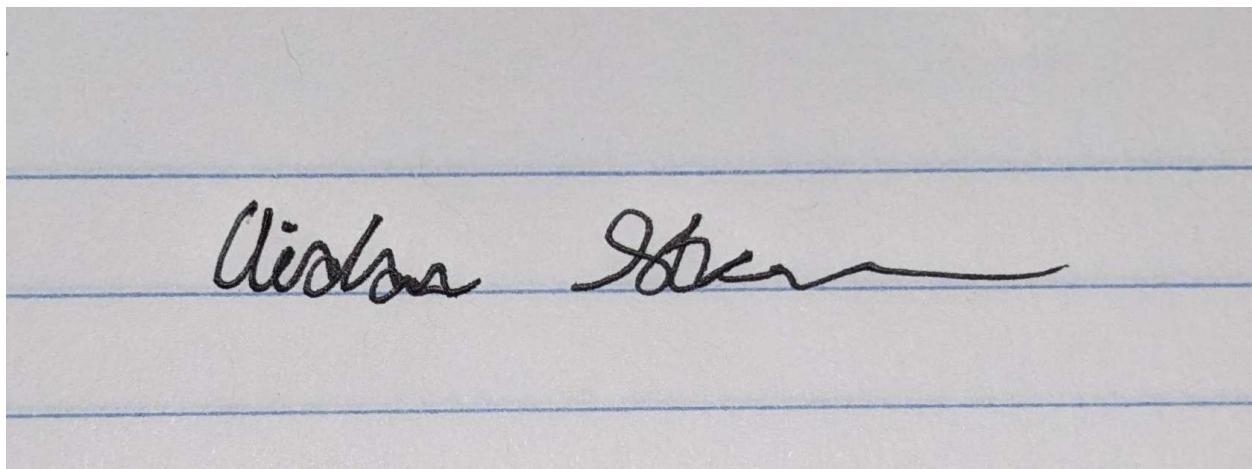
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Aidan Carl Stivers: Score of 8

Aidan is a very helpful team member. He would attend the majority of the meetings we would hold, as well as asking questions whenever he needed clarification. He has been on top of documentation he was assigned and whenever revisions needed to be made he would make them in a timely manner. Aidans main input to production of the website includes validation for registration as well as the functionality of global forums and individual forums post (with the assistance of John Lee Santiago as well). Overall he's been a great member to have on the team.

Signature:



Post Analysis

Main Challenges:

It goes without saying this semester has definitely been a tough one. One main challenge that was faced was truly recognizing everyone's technical skills. Initially I asked people what they were strong and weak with and based the roles off that; however, in the beginning it wasn't fully transparent what everyone's skills were. I had Nik as Github master and John as Document editor initially, and from the contribution feedback you can see how big of a mistake that was, as I switched their roles and they ended up being some of the most important members to this team and to this project overall.

Another challenge faced was initially setting up the stack for our website, what server we'd use, what language we'd use, what front-end framework we'd use, what backend stuff we would use, what database we would use. This was

both new to me and my members so it took some time to create a stable and fully functional stack for our server to be held and deployed.

Another challenge that was faced was team management. This was my first time being a team lead so assigning tasks was kind of new to me. I was initially using Discord to assign tasks to my team; however, discord was the most efficient way of displaying tasks to my members. It's a good form of communication but for displaying tasks it definitely wasn't the best. I ended up transitioning to Trello for better team management and making tasks more clear to my members either based on roles or individual documentation sections.

What Would Be Done Better Next Time:

One thing I would do better managing a team for a website is having everyone take a small coding test to assess everyone's skills so I know everyone's actual strengths and weaknesses so I can properly assign roles from the very beginning of the project initialization.

Another thing that would be done better is knowing how to set up a stack quicker for a project initialization. There was a lot that went into it, but now with a little more knowledge that process can somewhat be sped up.

Another thing that I would do better is properly managing a team. Using Trello from the start to make tasks more visible upfront. I would also know next time sections of a project that require more time than others. I think we spent a lot of time in theory of the website, when we could have used that time rather to focus on backend implementations that are important.