SW Engineering CSC648/848 Spring 2021

SYNC

Team 06

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Milestone 1

03/04/2021

History Table

date	note

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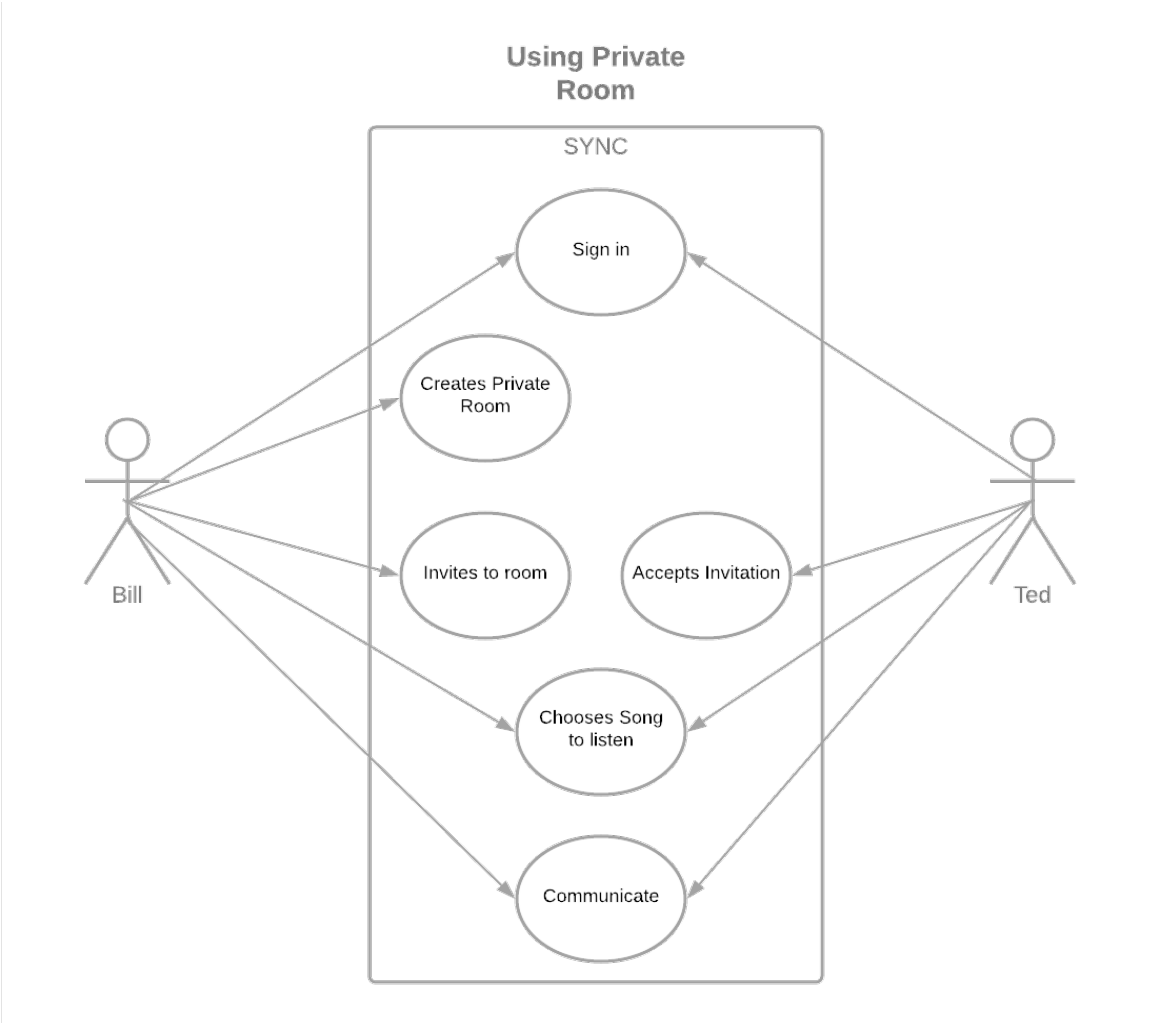
1. Executive Summary

The inception of the internet was brought with the idea of bringing people together. The effort towards such means is ever pursued, and we intend to continue this endeavor. A device for bringing together individuals has often been music; be it concerts and shows alike. We took a look at the current music offerings on the internet, and there are plenty, but they don't offer quite the focus on connecting people and communities. More often than not they just slap together a playlist and a chatroom and leave it at that. Our web application, aptly named Sync, seeks to give users a more interconnected experience where they can control together what is being played and make their experience a more evolving one, not just limiting them to a specified category and allowing them to easily group together or splinter off to their own desired areas.

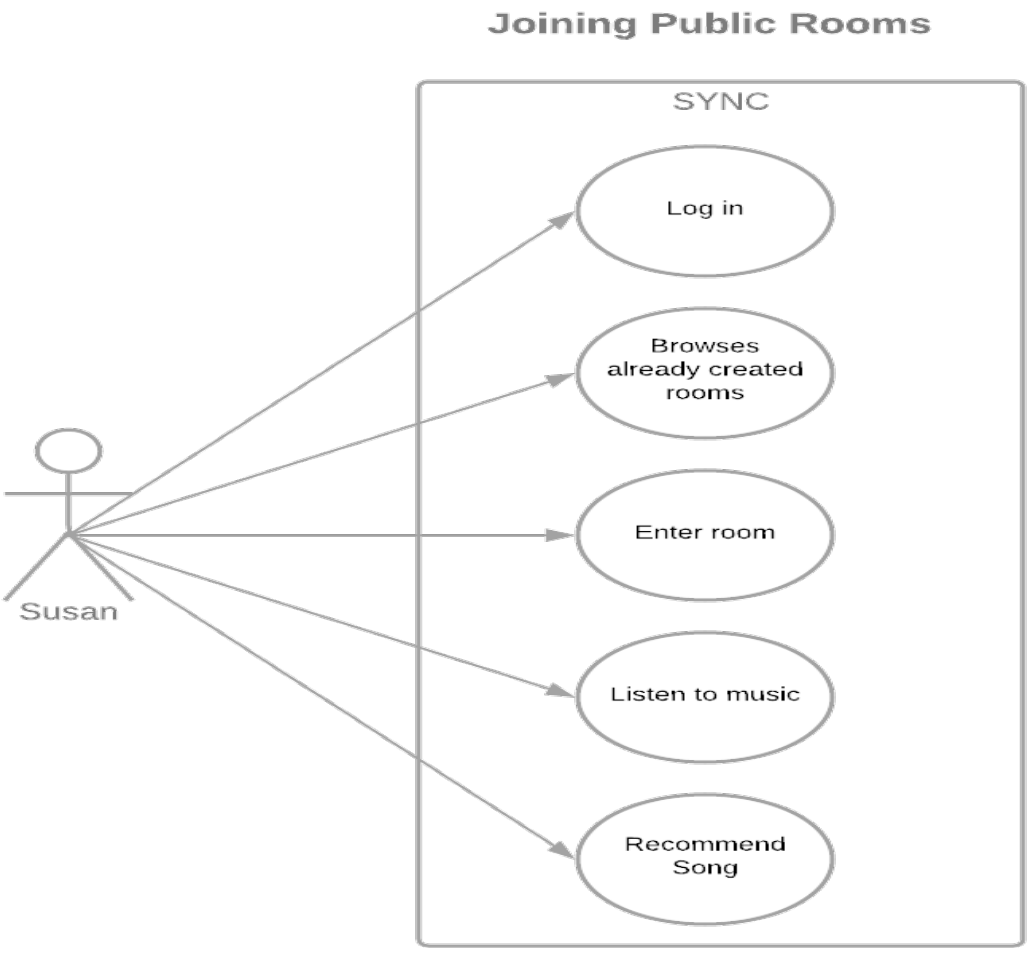
Now, you might be wondering, what does this mean exactly? Simply put, we put the control in the hands of the users. Most often the case with these types of web applications, is the control is often put in the hands of a single "DJ" while others in the room must simply idly sit as a single person chooses what is played. What we propose with Sync is that instead there is a more communal effort in song selection. This we believe will create a more accurate depiction of the tastes of those within the listening room, as well as create a more active participative experience due to the allowance of suggesting and voting for music that will be played. No more will they only sit around, but now they can be in control. This provides a n avenue for those to also share music that may be considered more "niche", or past songs that don't get the attention deserved anymore. Along with this we intend to give users the ability to connect with each other through means of commenting with the music room as well as personal messaging. Though not a unique feature, but an important one to keep people connected. The creation of rooms will be easily accessible and dynamic to follow with the evolving nature of the rooms themselves. With these features combined we believe that we can bring people together through their music preferences.

2. Main Use Cases

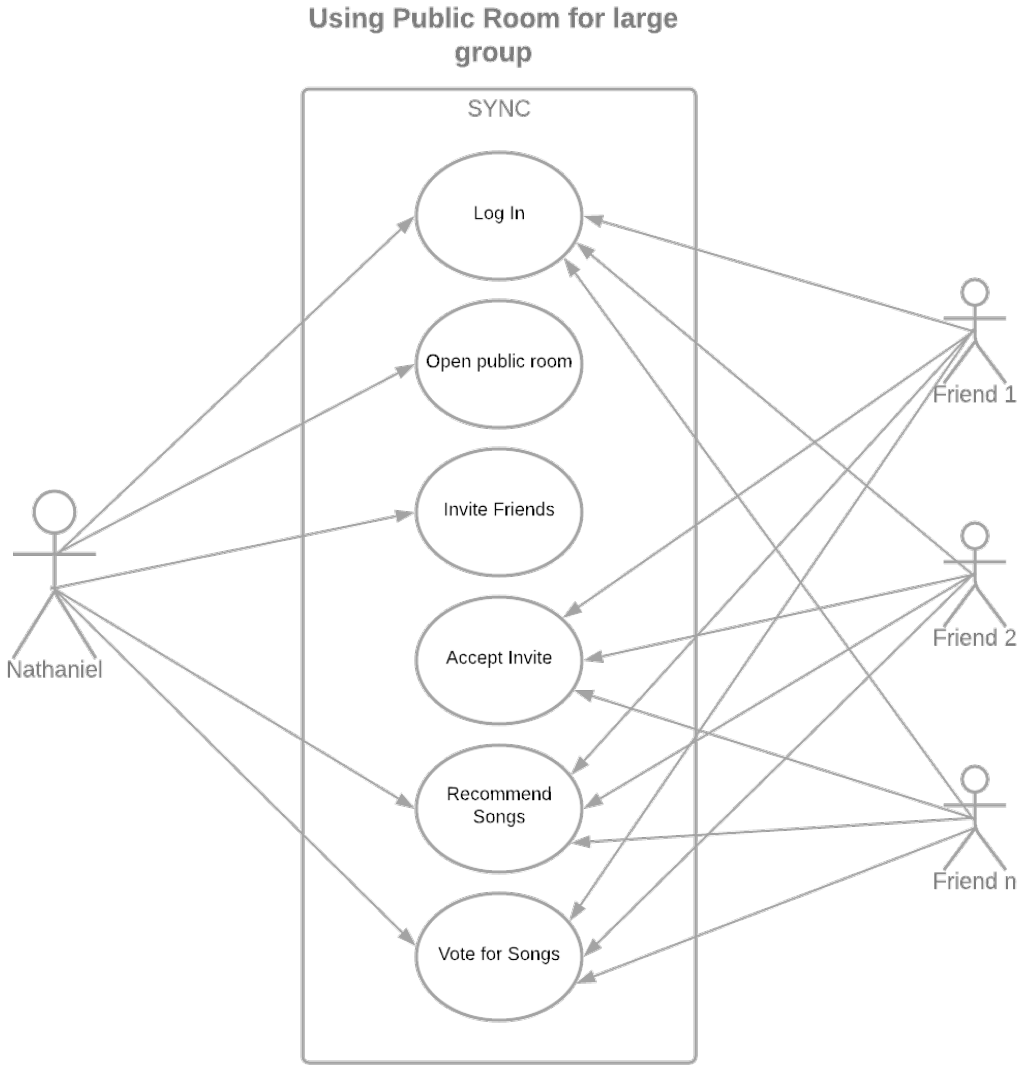
Title:	Using Private Rooms
Actors:	Bill and Ted (Friends who share similar music preferences)
Description:	Bill and Ted both want to listen to music together and are unable to spend time together in person. To remedy this, they both sign into SYNC using their Spotify accounts. Bill creates a private room and invites his friend Ted into it. Here they choose various songs to listen to while using the included commenting system to communicate with each other and talk about the music they are listening to.



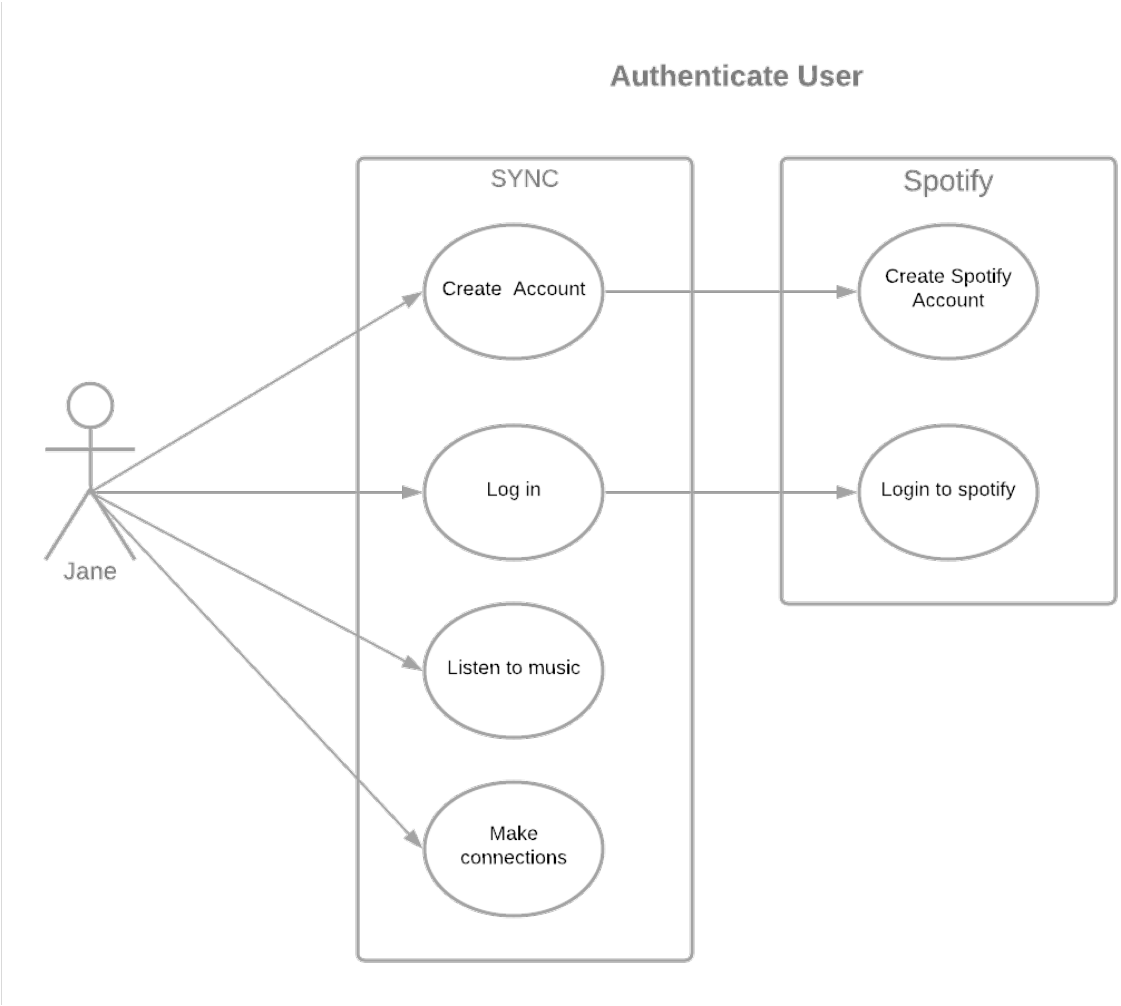
Title:	Joining public rooms
Actors:	Susan (Lonely music enthusiast)
Description:	After spending months home alone due to COVID-19 stay at home restrictions, Susan decides that she needs to fulfill her desire for social interaction. As a fan of music, she logs into SYNC using her Spotify account and browses the currently created rooms. Susan spots a room that has been playing songs from one of her favorite genres, and she chooses to enter the room. Here she enjoys the music shared by others in the room and also recommends songs of her choice to be played.



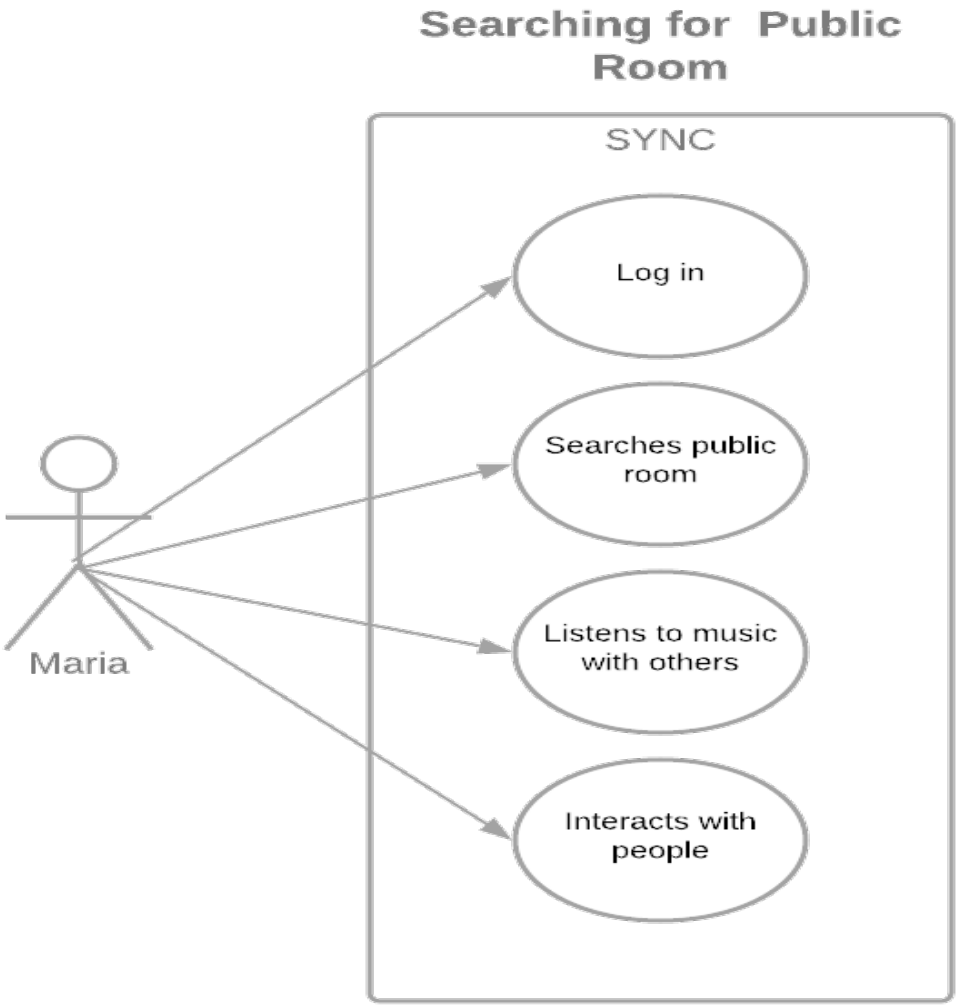
Title:	Using public room for large number of users
Actors:	Nathaniel and friends (Party friends)
Description:	COVID-19 is over, everyone has their vaccines. Now Nathaniel wants to throw a party at his parents' house while they are out of town. He invites all his friends to the house, and for music he decides to hook up his computer to the house sound system and loads up SYNC. He opens up a public room and lets everyone at the party join the room. Now everyone at the party can recommend and vote on the songs being played at the party easily catering to those in attendance and keeping the vibes flowing.



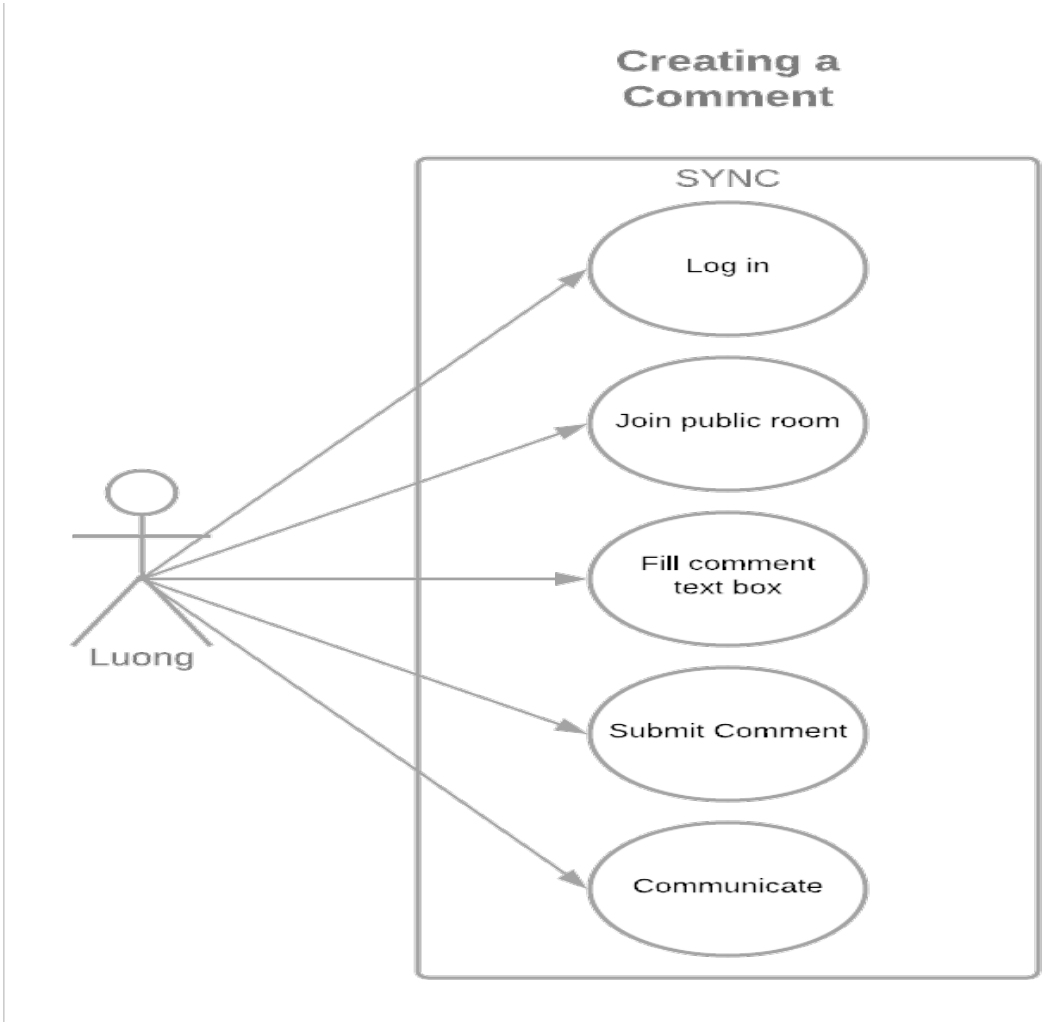
Title:	Authenticate user
Actors:	Jane (New user)
Description:	Jane wants to be able to create an account with SYNC so she can meet new people and listen to music together. After finding out that she needs a Spotify account to use SYNC, she creates a Spotify account. Once she has all the prerequisites, a Spotify account, she is able to navigate to the login page of SYNC to login in with her Spotify account. Login in now allows her to use SYNC, allowing her to listen to music with others and creating connections.



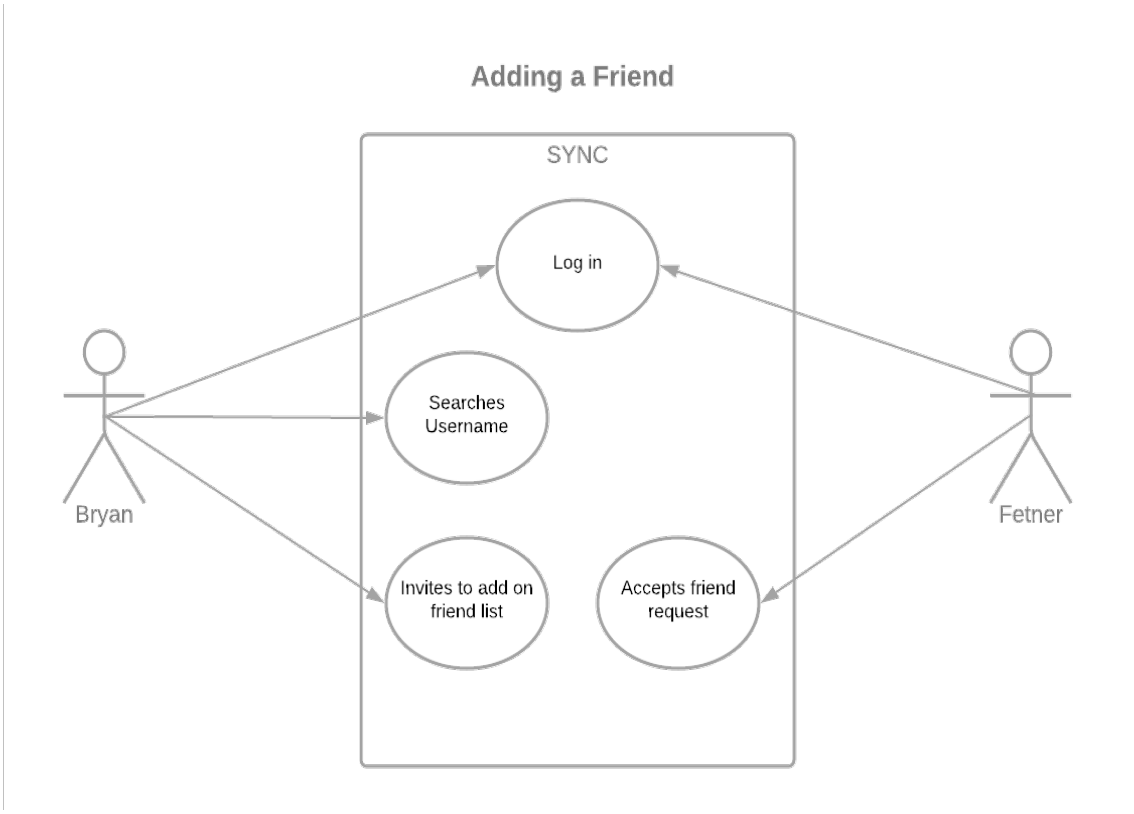
Title:	Searching for a public room
Actors:	Maria (Registered user)
Description:	Maria is a student who enjoys listening to music while studying. She would usually listen to live music streams on YouTube but she wants to make friends she can message and interact more with. When discovering SYNC she came to a realization that she can join public rooms allowing her to listen to music with others in real time. Maria searches for public rooms playing music to study to. She then interacts with other people in the room and gets to know them and their classes.



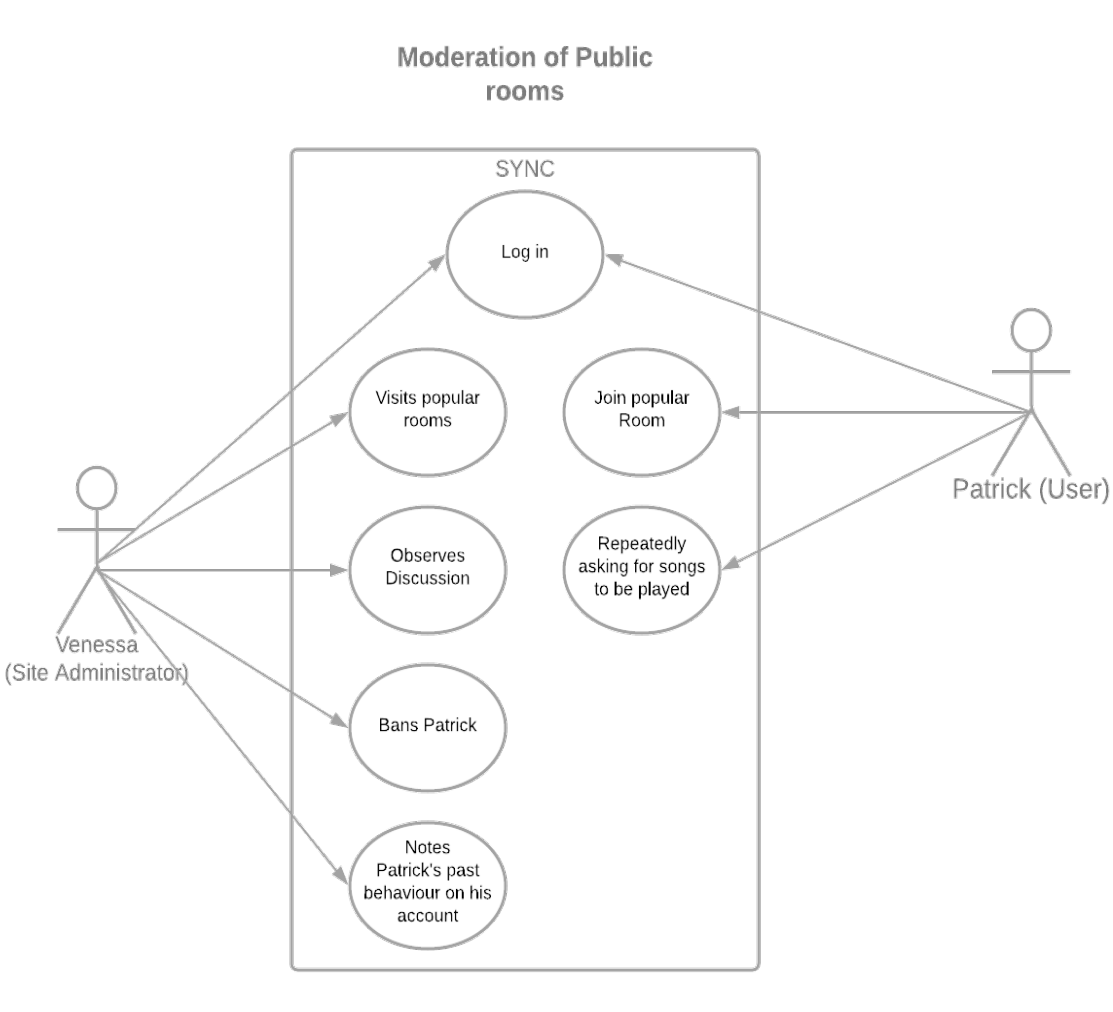
Title:	Creating a comment
Actors:	Luong (Room attendee)
Description:	Luong is a game fanatic who enjoys showing off his vast knowledge in video game soundtracks. He joins a public room that is playing the Cyber Punk Soundtrack. To show off his knowledge, Luong uses the comment text box option to comment on the current song and history of the artist. He then submits comments for others to react to. Luong now can communicate with others using comments within rooms.



Title:	Adding a friend through profile search
Actors:	Bryan (Registered user), Fetner (Registered user, Friend)
Description:	Bryan and Fetner are long term friends that miss each other during the COVID-19 pandemic. They decide to spend time together by listening to music through SYNC. They login into SYNC with their premium Spotify accounts. Bryan searches up Fetner's username to go to his profile page. Once he is on Fetner's profile page, Bryan sends an invite to be on Fetner's friend list. Fetner accepts friend requests and also sends a friend request to Bryan to be on his friend list. They are now added to each other's friend list.



Title:	Moderation of Public Rooms
Actors:	Vanessa (Site Administrator), Patrick (Registered User)
Description:	Vanessa is an administrator on SYNC. Due to her love of the site, she spends her free time moderating chat rooms. She visits the more popular rooms on the site to keep an eye on discussion. In a certain room she notices a user named Patrick repeatedly asking for a song to be played, clogging the chat with his requests. In order to give others a voice in the chat room, she gives Patrick a 10-minute ban to prevent him from spamming the chat for the time and discourages him from continuing this behavior. She also makes a note on his account regarding his past behavior to keep track of repeated offences which could lead to longer bans.



3. List of main data items and entities

- Username
  - An entity where a user is identified uniquely.
- Logged in user
  - A user that is logged in on their Spotify account.
- Room host
  - A logged in user who created a room that has access to all features of the website, such as being able to chat, choose what song to play next, etc.
- Listeners of room
  - It shows the number of users that are currently listening in the room.
- Voters
  - Users who can vote on a song to play next while in a room public, communal, or private.
- Current song
  - This is the song that is currently playing in a room.
- Song queue
  - This shows the list of songs that are currently in line for listening.
- Spotify account information
  - This is the information needed to use SYNC website. The information will be used to customize recommended rooms.
- Podcasts
  - Might have to find a loophole from Spotify API since it's disabled.
- Artists
  - This shows who the artist of the song that is currently playing in the room.
- Song Title
  - This shows the name of the song currently playing in the room.
- Chats
  - This is accessible by anyone in the room and is used to communicate with each other.
- Public rooms
  - A room that is hosted by a logged in user that is accessible to any logged in user.
- Communal rooms
  - A room that is public that a logged in user will be put on randomly based on most listened genres.
- Private rooms
  - A room that is hosted by a logged in user that is invite only.
- Playlists
  - This shows the playlists that the logged in user has in their Spotify account.
- Genre preferences
  - This shows the genre preferences selected by each logged in user.
- Most listened songs
  - This shows the most listened songs by each logged in user.

- Most liked songs
  - This shows the most liked songs by each logged in user.
- Recommended rooms
  - This is a room where the website will recommend for the logged in user based on their song, genre, or artist choice.
- Profile
  - This is where the logged in user can change profile picture, and any public information that they want to display.
- Friends
  - These are the connections that are added by the logged in user.
- Friends list
  - This shows the list of added connections of the logged in user.

4. Initial list of functional requirements

Unregistered Users

1. Unregistered Users shall be able to log into their Spotify Premium.
2. Unregistered Users shall be able to access the homepage of the website.
3. Unregistered Users shall be able to access the About Us of the website.
4. Unregistered Users shall be able to access the FAQ of the website.
5. Unregistered Users shall be able to access the Contact page of the website.
6. Unregistered Users shall be able to get access to technical support.

Registered Users

General

7. Registered Users shall have a premium Spotify account.
8. Registered Users shall be able to login into their Spotify Premium.
9. Registered Users shall be able to listen to music in real time.
10. Registered Users shall be able to access the Homepage of the website.
11. Registered Users shall be able to access the About Us of the website.
12. Registered Users shall be able to access the FAQ of the website.
13. Registered Users shall be able to access the Contact page of the website.
14. Registered Users shall be able to get access to technical support.
15. Registered Users shall be able to export the playlist of the room.
16. Registered Users shall be able to edit their profile.
17. Registered Users shall be able to change their SYNC usernames.
18. Registered Users shall be able to change their SYNC profile picture.
19. Registered Users shall be able to change any information under the Profile page.
20. Registered Users shall be able to change status offline.
21. Registered Users shall be able to change status online.
22. Registered Users shall be able to report other users for misconduct.
23. Registered Users shall be able to share a room link though social media.
24. Registered Users shall be able to share link through messaging form (message app, email)
25. Registered Users shall be able to logout.

Host

26. Registered Users that create a room shall have the status of host.
27. Registered Users as hosts shall be able to name the room.
28. Registered Users as hosts shall be able to generate playlists.
29. Registered Users as hosts shall be able to control the music queue.
30. Registered Users as hosts shall be able to pause currently playing songs.
31. Registered Users as hosts of a room shall be able to disable sharing
32. Registered Users as hosts shall be able to set a limit to the number of users in the room.
33. Registered Users as host of a room shall be able to kick a user out of the room.

Rooms

34. Registered Users shall be able to create a “room” public
35. Registered Users shall be able to create a “room” private.
36. Registered Users shall be able to search a public room.
37. Registered Users shall be able to search a private room.
38. Registered Users shall be able to join a public room.
39. Registered Users shall be able to join a private room.
40. Registered Users shall be able to join a random public room.
41. Registered Users shall be able to invite people to their room.
42. Registered Users who created a room shall be able to choose what song to play.
43. Registered Users shall be able to search for songs.
44. Registered Users shall be able to choose the next song to play in the room.
45. Registered Users shall be able to change the background theme of the room.
46. Registered Users that create a room shall be able to close the room.

Chat

47. Registered Users shall be able to chat in all room types.
48. Registered Users shall be able to chat with people who joined in their created room.
49. Registered Users shall be able to create group chat.
50. Registered Users shall be able to text in group chat.

Friends

51. Registered Users shall be able to add friends.
52. Registered Users shall be able to DM a friend.
53. Registered Users shall be able to see their friends list.
54. Registered Users shall be able to remove friends.
55. Registered Users shall be able to block friends.

Administrators

56. Administrators shall be able to change SYNC usernames.
57. Administrators shall be able to reset user passwords.
58. Administrators shall be able to change user friends list
59. Administrators shall be able to open rooms with specific music selections.
60. Administrators shall be able to join rooms.
61. Administrators shall be able to review user comments.
62. Administrators shall be able to ban users.
63. Administrators shall be able to leave messages regarding reasons for user bans.
64. Administrators shall be able to ban songs.
65. Administrators shall be able to ban podcasts.
66. Administrators shall be able to delete rooms.
67. Administrators shall be able to delete accounts permanently.

Rooms

68. Rooms shall display the room name.
69. Rooms shall display if they are public or private.
70. Rooms shall display the hostname.
71. Rooms shall display a description of the room.
72. Rooms shall be up during its dedicated time set.
73. Rooms shall display the number of users in the room.
74. Rooms shall list all users in the room.
75. Rooms shall display the current song.
76. Rooms shall display the song queue.
77. Rooms shall display genre.
78. Rooms shall display chat.
79. Rooms shall display who commented in the chat.
80. Rooms shall prompt the voting system.

Website

81. Website shall have an About Us page.
82. Website shall have a FAQs page.
83. Website shall prompt user to login to Spotify.
84. Website shall prompt user to accept terms and conditions.
85. Website shall keep user logged in.
86. Website shall have a technical support page.
87. Website shall display username.

88. Website shall display the user's account information.
89. Website shall show how we can be contacted.
90. Website shall show invites.
91. Website shall send notifications
92. Website shall show the user's most preferred genres/artists.
93. Website shall give the option to continue or cancel creation of the room.
94. Website shall allow user to send invitation link to rooms
95. Website shall display DMs
96. Website shall show the list of added friends.
97. Website shall display the number of SYNC friends the user has
98. Website shall show available public rooms.
99. Website shall show the history of rooms the users have been in.
100. Website shall show the history of rooms the users have been in.
101. Website shall show exported playlists.
102. Website shall be able to allow users to like playlists.
103. Website shall be able to allow users to add to the list of favorite playlists.
104. Website shall have premiers of podcast
105. Website shall have premiers of song drops
106. Website shall have premiers on album drops

5. List of non-functional requirements

Functionality

1. The website shall be conforming to the tools and frameworks that were approved by the CTO.
2. The website shall be using Amazon Web Services for deployment.
3. The website shall be user friendly.
4. The website shall be simple.
5. The website shall be usable to those who are slightly knowledgeable of navigating websites.

Security

6. Spotify username/ email address and password shall be required to use the web app.
7. Login prompt shall appear when the user first visits the website.
8. Private rooms shall only appear to invite Registered Users.

Privacy

9. Let users accept policies before creating an account.
10. Password and other personal information shall be kept hidden.
11. Collect Spotify data through API
12. We use API to dictate recommended rooms
13. We use API to group people together.
14. Authenticate users by checking with username and password?

Performance

15. The website shall be up all the time
16. The website shall make a search for a room easily
17. All users shall have their music synced with others having same preferences
18. Empty rooms should be destroyed automatically
19. The invite links to private rooms shall stay active till the room is active
20. The website shall not add more than 2 seconds to the time it takes to login to Spotify
21. Unused rooms shall be destroyed with 5 minutes of unattendance

System Requirements

22. The website shall work up to Version 88.0.4324.150 of Google Chrome.
23. The website shall work up to Version 85.0 of Mozilla Firefox.
24. The website shall work up to Version 81.0.416.64 of Microsoft Edge.
25. The website shall work up to Version 14.0 of Safari.
26. The website shall support Spotify music streaming.

Marketing

27. Each webpage shall have the company logo in the upper left corner.
28. Each webpage shall be clear and easy to understand for first time visitors.
29. Each webpage shall be able to link to social media platforms.

Content

30. The website shall have a navigation bar
31. The website shall have a search bar to search public rooms available.
32. The website shall present a general community room when users first sign in.
33. The website shall present recommended rooms for the specific users.
34. A navigation bar shall be present to direct users to other parts of the website
35. The website shall present an option to join private rooms

Coding Standards

36. The code shall be understandable
37. The code shall be organized
38. The code shall have proper working functions
39. The code shall have comments
40. The code shall be pushed or pulled from branches in git properly
41. The code shall be well maintained in the relevant branches
42. The code shall have proper documentation

Availability

43. The website shall be active even if no users are active on the website
44. The website shall resync when loss of connection occurs
45. The website shall refresh when the website does not load.
46. The website will make general rooms unavailable within a set time or minimum user tolerance.
47. The website shall generate error messages when an error occurs
    1. Connection loss

2. Incorrect Credentials

Fault tolerance

48. Website shall be able to refresh the Chat area when disconnected.
49. Room shall be able to be refreshed when disconnected.
50. Website shall reattempt accessing database if a database query fails.

Storage

51. Store users' listening history on the database.
52. Store users friends list on database.
53. Store administrator notices about users.
54. Remove friends from the users friend list on the database if user removes
55. Store users favorited music on the database.
56. Remove the favorite list from database if user removes
57. Store chat while the room is open in the database.
58. Store users voting record.
59. Store usernames on the database.
60. Store passwords on the database.
61. Store users ignore list on the database.
62. Store a banned word list on the database.
63. Store a banned user list on the database.
64. Store room name on database
65. Remove room name from database when room is destroyed
66. Store room description on database.
67. Remove room description from database when room is destroyed.
68. Store room song history on database.
69. Remove room song history from the database when the room is destroyed.
70. Store room voting history on database.
71. Remove room voting history from the database when the room is destroyed.

Expected Load

72. The website shall support as many rooms as Amazon Web Services can support.
73. The website shall support as many users as Amazon Web Services can support.

Legal

74. The website shall have Terms and Conditions.
75. The website shall have privacy policies

76. The website shall have copyright notice

6. Competitive Analysis

	Discord	Soundcloud.com	App.jqbx.fm	Beatsense.com	Listentogether.app
Strengths	Seamless onboarding experience.	Useful platform for aspiring artists.	Supports multiple services.	Users can jam with their music matches.	Nice UI
Weaknesses	Required to create an account and invite links to access servers.	Users cannot chat or make friends.	Hard time creating rooms, users need to have a Spotify premium account.	Very busy UI, confusing, - poor UX.	Lacking important services, poor user experience.
Pricing	Free, has option for Discord Nitro	Free, has option for Pro version	Free, needs Spotify premium account	Free	Free
Social Media	Facebook, Instagram, Twitter	Instagram, Snapchat, Facebook, Twitter	Discord, Facebook, Twitter	Blog posts, Facebook, Twitter	None
Onboarding	Simple, Smooth experience.	Takes quite time to follow.	Seamless onboarding	Too many steps to follow.	Moderate number of steps.
Usability	Famous among youth, gaming purposes	Used to share or create music online.	Easy to use	Bit complex to use	Usable.

Feature	Discord	Soundcloud.com	App.jqbx.fm	Beatsense.com	Listentogether.app	SYNC
Spotify support	+	-	+	-	+	+
UI simplicity	+	-	+	-	+	++
Chat	+	-	+	+	-	+
Public and private rooms	-	-	+	+	+	++
Voting System	-	-	-	-	-	+
Connections	+	+	+	+	-	+
Podcasts	-	+	-	-	-	+
Communal rooms	-	-	-	+	-	++
Top rooms	-	-	+	+	-	+

+ : Feature exists

++ : Feature is superior

- : Feature doesn’t exist

Summary of competitive analysis

As we created the concept of SYNC, we soon came to realize that there are many of the competitors doing what we wanted to do. Some competitors have better UI while some are better at providing services. Most of them have a very complex UI that leads to poor user experience. Our competitors do implement great features such as chat and synced music, but they somewhere failed to bring simplicity to the product. Our goal is to implement a more immersive and simplified UI with rooms and other features that allows users to feel connected to each other.

Most of our competitors have the concept of a single host, who plays and chooses the music, but they do not provide the live feeling like us. While we aim at providing a voting system where users can make a choice of their own and not just sit idly. Instead, they will have a say in the music chosen which aids in making them feel like a more active participant. None of the competitors currently support this feature which will give us an advantage over the market. We will also implement a recommendation algorithm where users will be recommended with people that share the same interests of music. Moreover, the recommendation's algorithm from Spotify can get overfitted, and we can solve that by syncing people's Spotify listening log together.

As opposed to other community-based apps that offer music sharing features, ours is focused on creating communities around music sharing via Spotify. We will provide the feature of communal rooms where the user will land along with other users after signing in. That being said if there are rooms with no users in it, to keep user experience simple for users browsing rooms, those inactive rooms shall be terminated. We strive to create an effective site that gives our users a community where they can make our app their home.

7. High-level system architecture and technologies used

Storage: Firebase functions on the backend to authenticate users' Spotify profile. Also, we store player status on firebase to sync users. Store basic users' info and play log on sqlite from django

Front-End: Implement React to manipulate data from Spotify API.

Profile:

- Implement Spotify API to import users' info. Users can modify display info on our website, which will be stored on our database.

    Information that will be imported from Spotify API:

    1. Name
    2. Age - restrict age in certain rooms
    3. Spotify account
        1. Songs log
        2. Playlists

    Information that will be stored on our server:

    4. Active-Status
    5. Active time
    6. Connections
        a. Friendlist
        b. Direct Message
    7. Song info
        a. Votes
        b. Play-rates (global)
        c. Click rates (from suggestion)
    8. Room info
        a. Name of room
        b. Room ID
        c. Host of room
        d. What type of room
        e. Users in room
        f. Queued music
        g. Song suggestion
        h. Number of votes
    9. Server Info
        a. Active room
        b. Room list
        c. Room removed when inactive

10. Chat
    a. Chat shall refresh
    b. Chat shall show who wrote what
    c. Support emojis

Technology:

Serve Host: AWS
Operating System: Ubuntu
Database: MySQL
Web Server: Apache or Nginx

Server-Side Language: Python

Additional Tech:

Front end framework: React
Web Framework: Django
IDE: Visual Studio Code, PyCharm
Web Analytics: Google Analytics
SSL Cert: Lets Encrypt (Cert Bot)
SASS: Bootstrap

8. Team Contribution

Team Lead, Document Master,	Rebecca Zumaeta	Contributed to writing half of the use cases of section 2. Main Use Cases and completed section 8. Assigned tasks to members on team and became available when needing feedback/guidance. Held and directed meeting towards document creation and researched along with team. Guided conversation and thought process per each member for each section of document.
Front End Lead, Document Assistant, mediator	Bryan Fetner	Wrote the entire summary of section 1. Contributed to writing and developing the use case scenarios for half of the written use cases of section 2. Main Use Cases. Discussed points and concepts to be implemented into nonfunctional and functional requirements. Gave suggestion on features and how to best implement them in documentation. Attended all meetings for the entirety of the time and continuously held conversation. Spoke out when passionate but open to other ideas when conversing with team.
Back End Lead, Document contributor	Luong Dang	Wrote out the mostly of section 7. High-level system architecture and technologies used. Contributed to section 3. List of main data items and entities making sure it connected back to section 7. Discussed concepts, features, and coding implementations into our project. Attended all meeting and contributed to conversation when felt most knowledgeable of subject matter. When asked for suggestion gave great concepts and ideas for other members to bounce from.
Front End Member	Malcolm Angelo De Villar	Wrote out half of section 3. List of Main Data Items and Entities, a good portion of section 4. Initial List of Functional requirements and a good portion of section 5. Non-functional requirements. In every

		section he wrote, he contributed to features and concepts. Contributed thoughts and input in other sections such as the Competitive Analysis section. Attended all meeting and gave input when he seemed best knowledgeable of subject. Put out work when asked and continuously checked with team when making decisions.
Front End Member	Hirva Patel	Built out diagram and wrote out paragraph of section 6. Competitive Analysis. Contributed to writing section 3. Main data items and section 5. Non-functional requirements. Contributed thoughts and implementations for site as whole which lead to requirements and entities implemented in document. Attended all meetings and contributed in conversation when she felt best fit and was passionate about the subject. Reported back to team when she had updates on work and wanted feedback. Took constructive criticism well and worked off of it.
Github Master and back end member	Vishakha Tyagi	Drew out each Use Case Diagram for section 2. Main Use Cases and contributed to constructing other sections such as 4. Functional and 5. Non-Functional requirements. Gave input and suggestion towards implementation of site which lead to requirements and entities involved in documentation. Attended all meetings and gave input when she felt best knowledgeable upon subject and is passionate upon ideas. Checked with other member, especially with team lead, when it comes to making any decisions within documentation.
Back End Member	Ashwini Managuli	Wrote out a good portion of section 4. List of Fictional Requirements. Contributed to writing sections 3. Main data items and Entities and section 5. Non-Functional requirements. Contributed thoughts and input into sections 7. High-level System

		Architecture and Technologies Used. Attended all scheduled meetings and contributed into conversation when wanting to share her thoughts and experiences. Adapted quickly to the tasks given to her and put out great work. Was open to feedback and implemented constructive criticism well.

9. 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 organized as discussed in class (e.g. master branch, development branch, folder for milestone documents etc.)

  Done