Department of Computer Science, San Francisco State University

SW Engineering CSC 648/848 Summer 2021

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Project Application And Name: Find a fitness partner - “FitHub”

Team Info: Team 07 | Error 404

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1. Executive Summary

Ever since COVID-19 struck the world in March of 2020, people have stayed inside due to safety protocol. Staying inside offers multiple issues for human beings. It breeds loneliness, inactivity, and in some cases mental illness. There is a reason why solitary confinement is the worst punishment a prisoner can receive. With the progressing development of vaccines, we have come up with a solution to connect people, foster activity, and help people in search of a better life post-COVID-19. Our solution here is "**Fithub**".

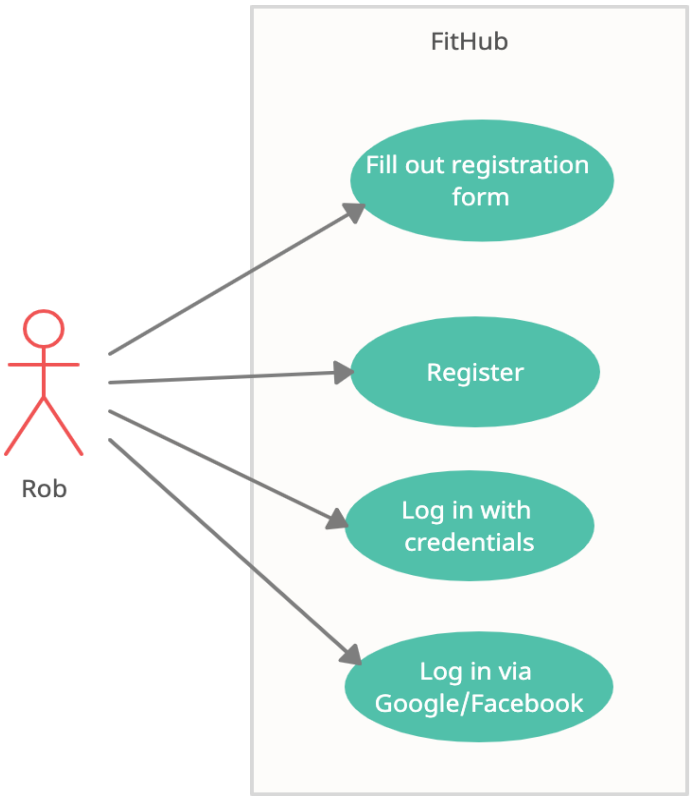
"Fithub" will be the first web application with a simple user interface that successfully finds workout partners for people based on their interests. With customizable interest options and use of high-quality software engineering practices to match people, the focus on finding a partner with maximum compatibility and one who complement each other increases.

The goal of our application is to bring people with shared interests together so that they can help and motivate each other to get fit. With our app we can help tailor their exercise experience to their needs and on their schedule. Our app lets users choose their workout and personal goals to help them find nearby people with the same plans. In addition to finding a workout partner, the user can even look out for events such as group biking being conducted nearby and join them as well. Also, the app intends to feature a mechanism that allows the user to add a compatible partner as a friend and then chatting over to workout together, saving time in searching for a new partner again.

Workouts include various indoor activities such as gym, yoga, meditation, etc and outdoor activities like hiking or sports games with an effort to reach out to a wide span of audience and having something for everyone. Every match will ensure the highest probability that people will find a workout partner. Fithub aims at inducing people to meet other like-minded people who enjoy exercising with similar interests.

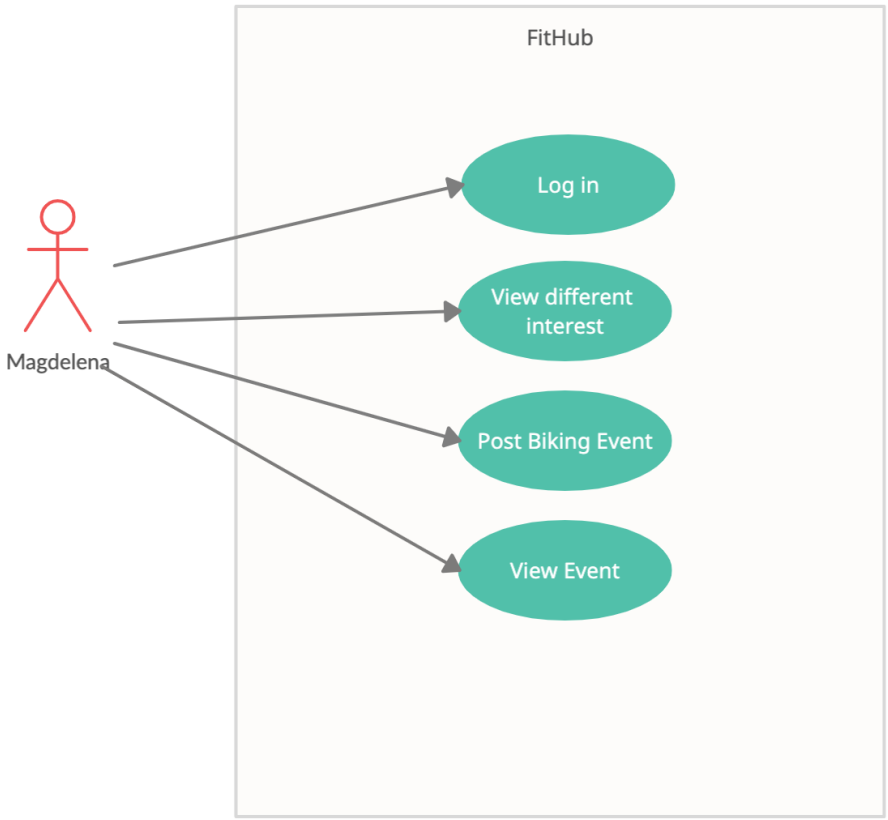
2. Main Use Cases

Title	Registration and Login
Actors	Rob
Description	Rob is a 19 year college student and is planning to begin working out post COVID-19. But, he is finding a lack of motivation to exercise. So he fills out a registration form and registers himself at FitHub. Once he logs in the system, he can find a partner and get motivated to workout together.

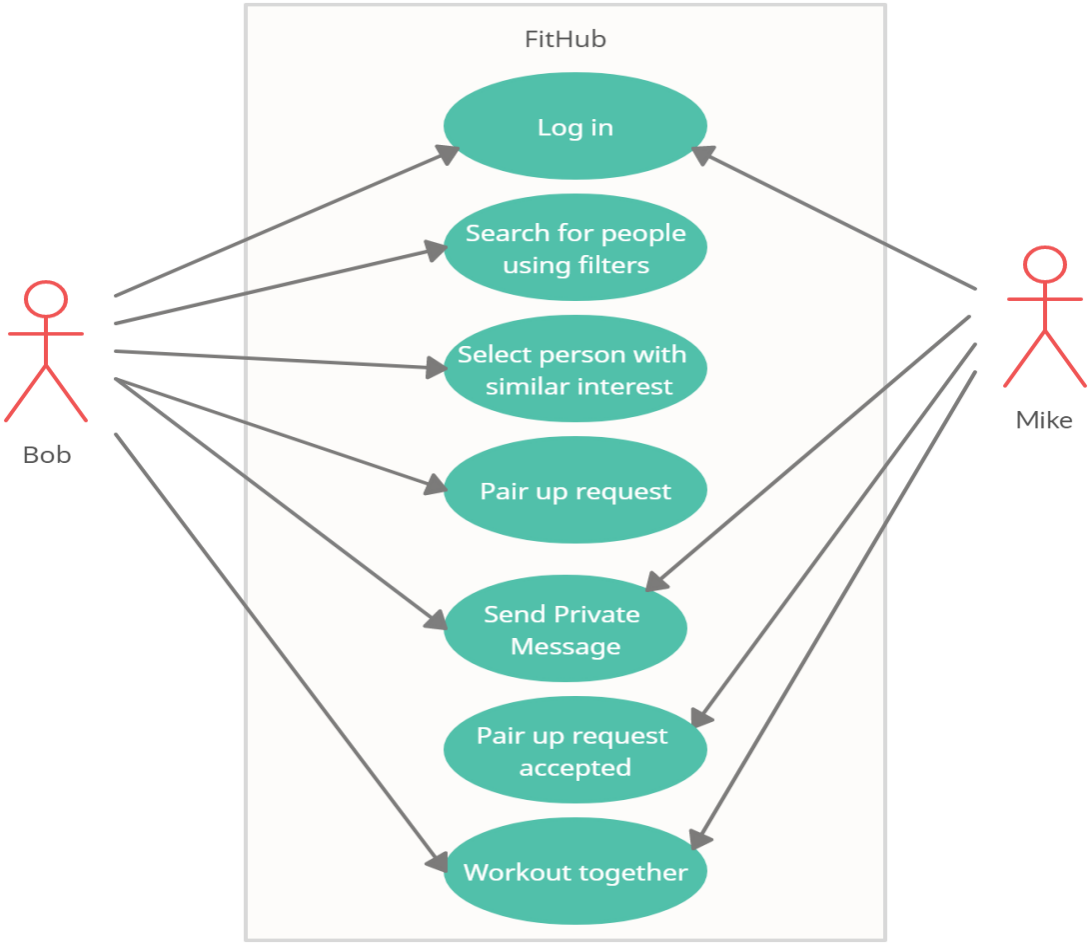


Title	Find A Partner
Actors	Jim and Jack
Description	Jim's buddy bailed on him last minute and he still wants to go to the gym with someone. He checks the app to see if anyone is going to his gym nearby. He finds Jack who is planning on lifting weights too. They pair up and meet each other at the gym.

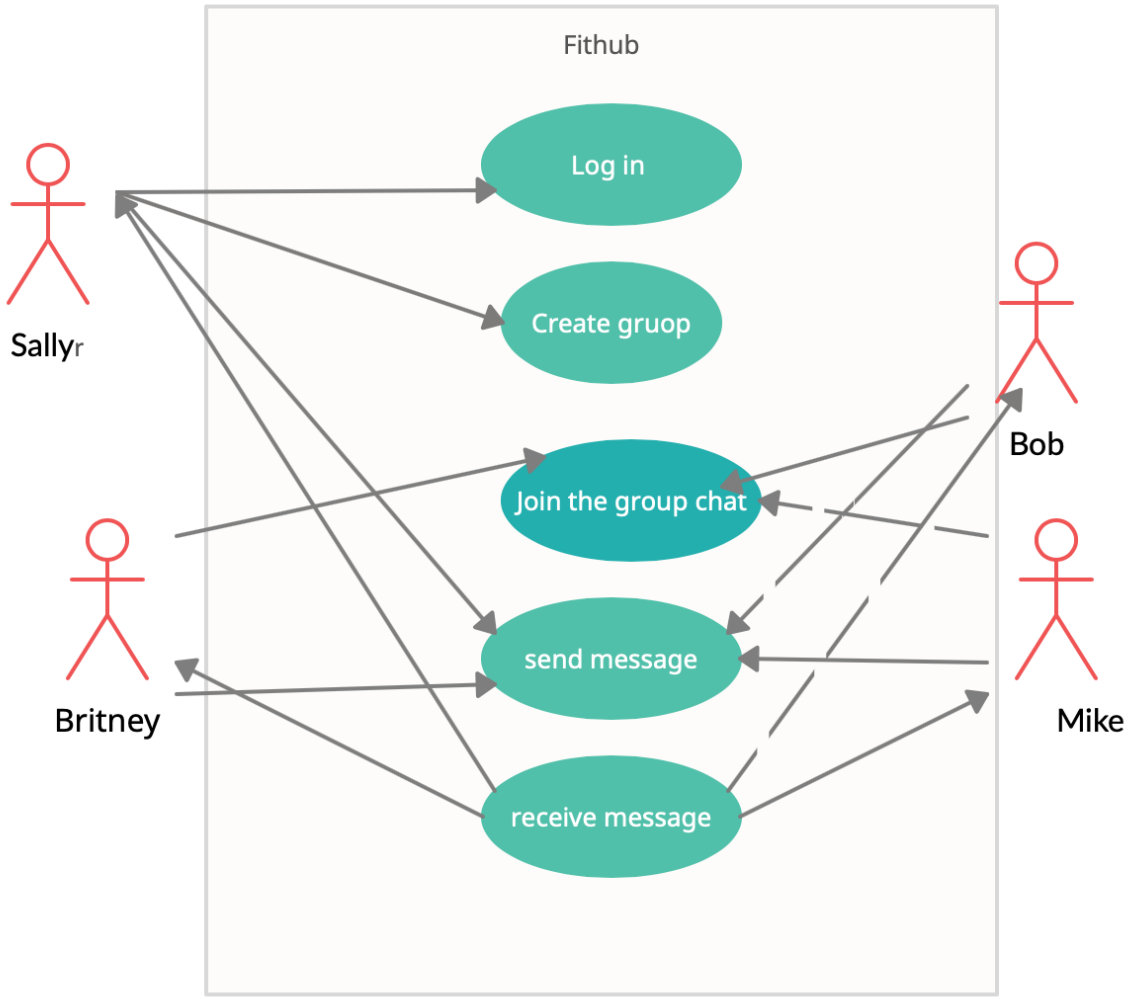
Title	Posting for events like - group biking
Actors	Magdelena
Description	Magdelena is planning on a bike trip this week. Magdelena used to be part of the bicycle team in her college. Magdelena misses the camaraderie with biking with others. Magdelena posts an event on the FitHub web application knowing that others will join her for the bike ride.



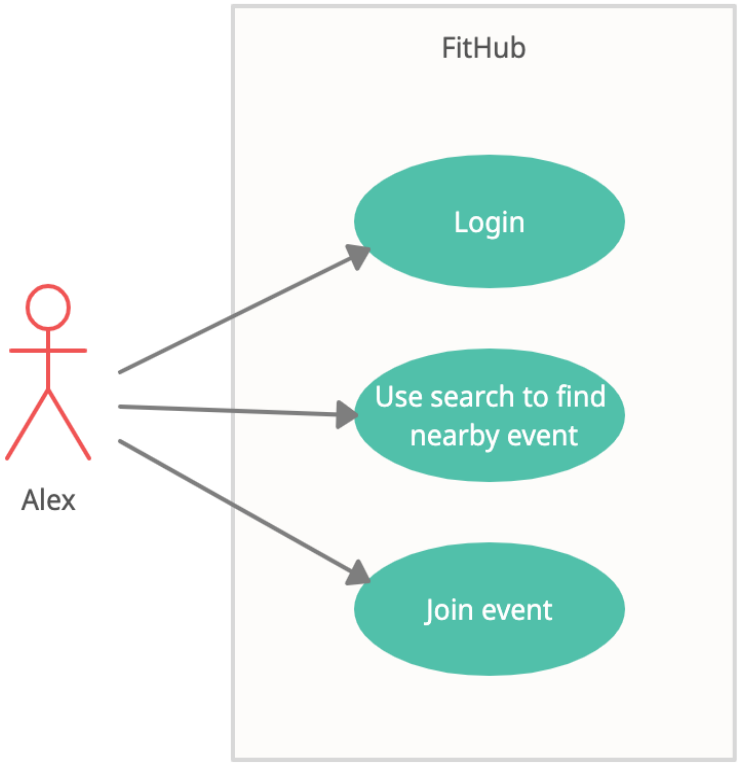
Title	Private Chat
Actors	Bob and Mike
Description	Bob and Mike had plans to meet up at the park at 7 pm to jog. Unfortunately, Bob is stuck in traffic and is going to be late. He messages Mike using the app to let him know that he will be 15 mins late. Mike then lets Bob know that he will wait and get started warming up.



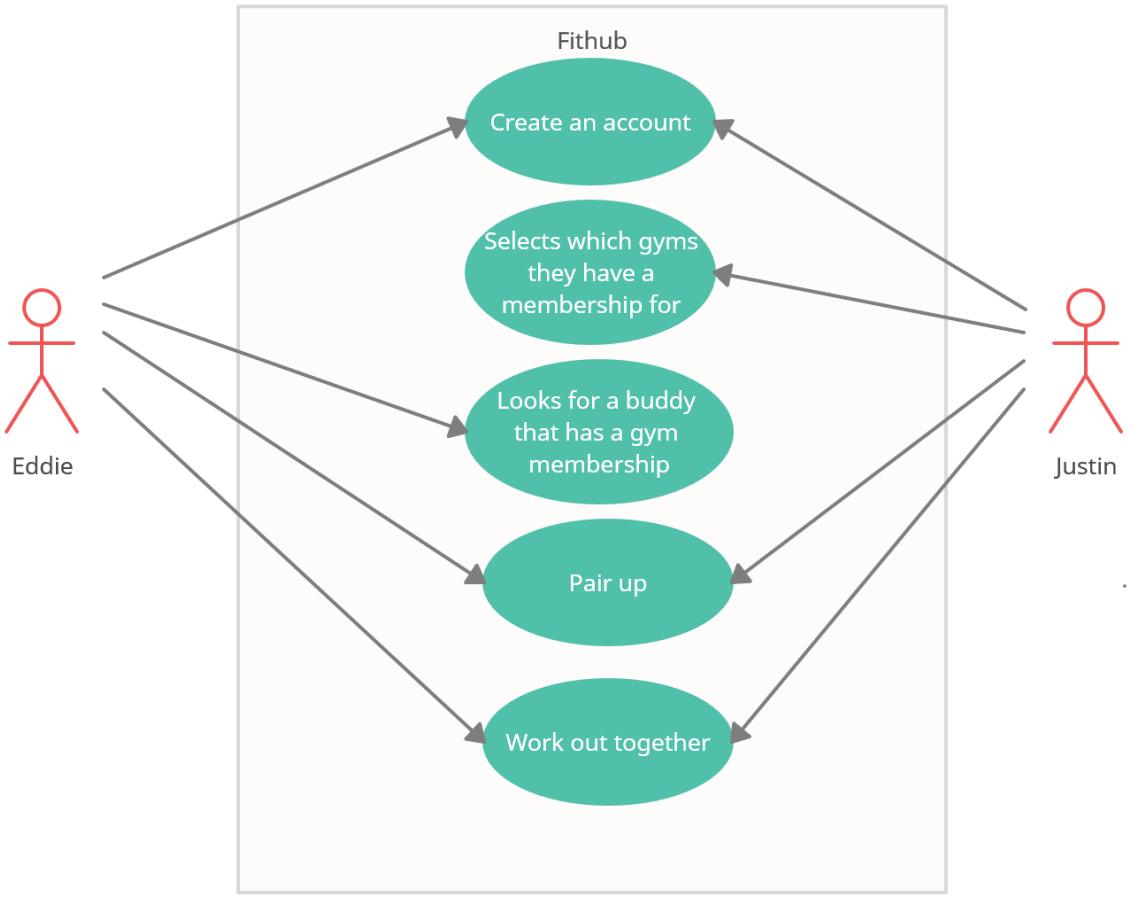
Title	Group Chat
Actors	Britney, Sally, Bob, Mike
Description	Britney, Sally, Bob and Mike are planning to workout together. However, Sally might not be able to come to the workout session. To inform her workout buddies, she informed them through our group chat.



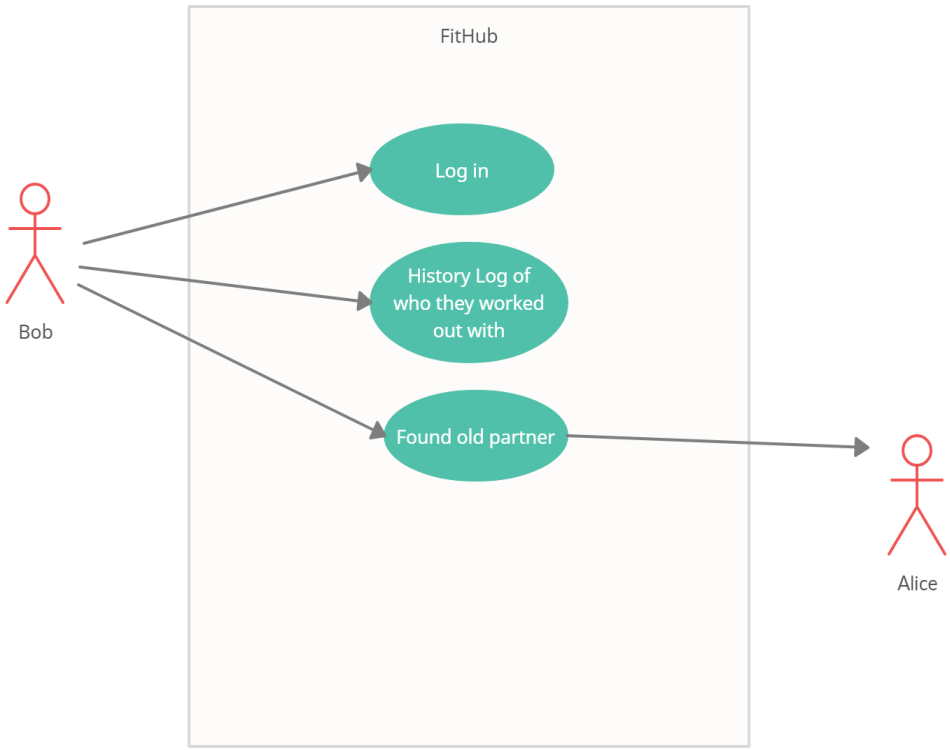
Title	Finding events nearby
Actors	Alex
Description	Alex has been working at home since the COVID-19. He wants to find some group biking events near his school to attend. The function allows him to find biking events by providing his location and the start time he expected.



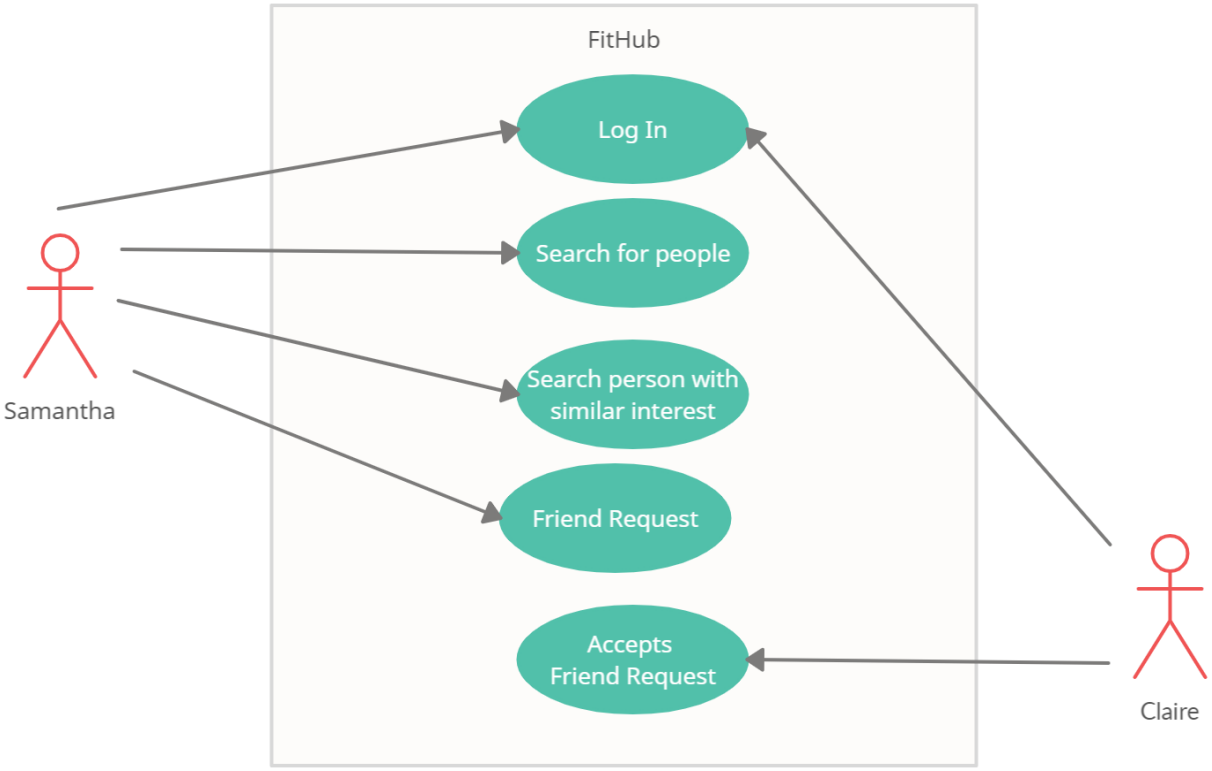
Title	Buddy Pass System
Actors	Eddie and Justin
Description	Justin currently has a gym membership, and Eddie wants to start going to the gym. Eddie is nervous to go alone so he utilizes our "Buddy Pass System". This system allows newcomers to have a workout partner and not be afraid to go to the gym by themselves. **NOTE** Our Buddy Pass System does not give gym passes, it only allows users to have a gym buddy. At the selected gym the users want to go to, they can request a gym pass. **END NOTE**



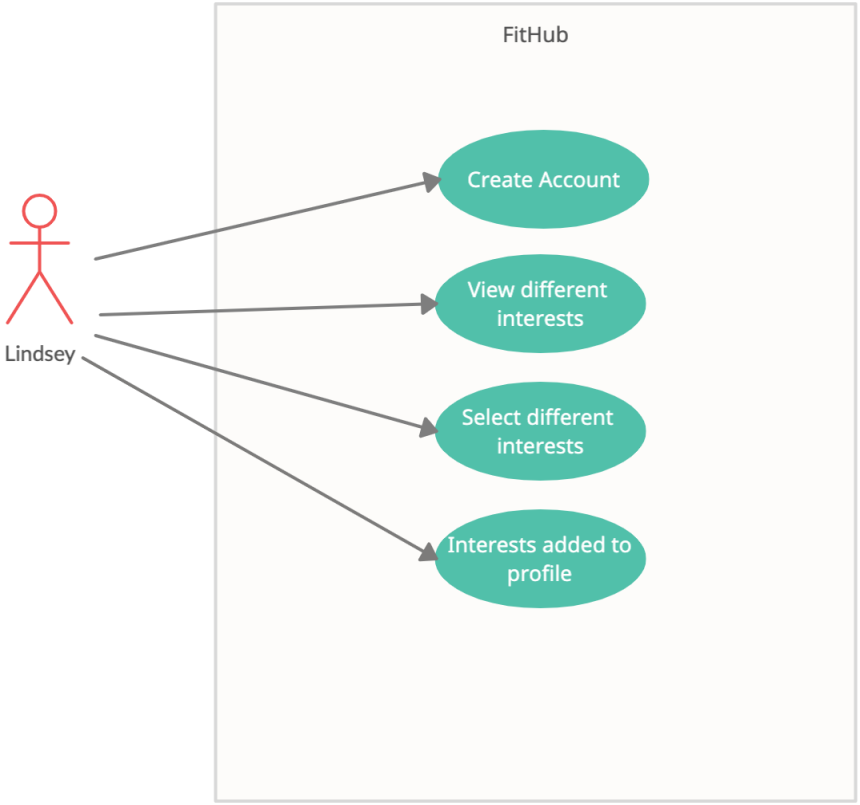
Title	History Log
Actors	Bob and Alice
Description	Bob could not remember the last workout partner who he enjoyed working with. So he looks into his previous logs and from there connects with Alice .



Title	Friends
Actors	Samantha and Claire
Description	Samantha has a hard time finding people she feels comfortable meeting up with she met online. She has a great experience with Claire and they get along really well during a workout session. Samantha sends Claire a friendship invitation, so they can meet up with each other whenever they both have free time again. Claire accepts and now they can see whenever each other logs in and is looking to find a workout buddy.



Title	Selecting interests
Actors	Lindsey
Description	Lindsey is a 35 year old woman who has been inactive during COVID-19. Ever since she got the vaccination, she is eager to exercise outdoors again. Lindsey in the past was interested in running and surfing. Lindsey selects these two activities in FitHub to see other like minded people around her. Knowing that it will be more enjoyable to run and surf with others.



3. List of main data items and entities

- Guest user
    - A user who hasn't registered or provided their information to FitHub
- Registered user
    - A user who has successfully created their account with FitHub and can access all the app features
- User interests
    - This information will be used by FitHub to show recommendations of people with similar interest
- User Profile
    - All the user related information that can be used to create its profile
- User logs
    - Previous workout partners or events that the user has been to can be looked in the user logs
- Activities
    - All the indoor and outdoor activities that Fithub allows a user to search or select as interest.
- Gym membership
    - A user's gym membership information. This information will be used in order to sent buddy pass request by other users
- Buddy Pass Owner
    - A user having gym membership and willing to share his gym pass with a friend so that they can workout together
- Events
    - A user will be posting events occurring that can be viewed by other users to join if it matches their interest.
- Friends
    - Two people that match based on interests and location.can become friends by sending and accepting the friend request
- Friend List
    - List of people the users are friends with.

- Private chat
    - This function can be accessed by people who are friends and can send private message on our web browser
- Group chat
    - This function can be accessed by people who are friends and belong in a group of people having a conversation.
- Clubs
    - Users can create physical activity clubs i.e. biking group, etc so as other users can join them
- Club owner
    - Owner of a distinct physical activity club.
- Club List
    - Particular set of clubs which users can view and/or join.

4. Initial list of functional requirements

Guest User:

1. Guest users shall be able to view events posted by other users.
2. Guest users shall be able to select their interests.
3. Guest users shall be able to put their City/Location.
4. Guest users shall see other users' user names of people looking to work out nearby.
5. Guest users shall be able to register.
6. Guest users shall be able to Log in as registered users.
7. Guest users shall be able to access the homepage.
8. Guest users shall be able to access the About us page.
9. Guest users shall be able to access the Contact us page.
10. Guest users shall be able to access the Support page
11. Guest users shall be able to delete their account from FitHub

Registered User:

12. Registered users shall be able to access homepage
13. Registered users shall be able to access About us page
14. Registered users shall be able to access Contact us page
15. Registered users shall be able to access Support Page
16. Registered users shall be able to send workout invites to other users.
17. Registered users shall be able to select their interests
18. Registered users shall be able to edit their information
19. Registered users shall be able to update their profile picture
20. Registered users shall be able to delete their profile picture
21. Registered users shall be able to deactivate their account
22. Registered users shall be able to save their frequent searches
23. Registered users shall be able to change their account passwords
24. Registered users shall be able to limit how much of their profile is shown in other user's searches results.

25. Registered users shall be able to send an introductory message to a different user in their search result.
26. Registered users shall be able to share their real time location with FitHub
27. Registered users shall be able to delete their account from Fithub

Searching People

28. Registered users shall be able to have a certain number of swipes per day.
29. Registered users shall be able search for buddies with similar interest
30. Registered users shall be able search for buddies nearby
31. Registered users shall be able to filter search options based on their interests.
32. Registered users shall be able to filter search options based on how far they are willing to travel.
33. Registered users shall be able to remove people from their search results

Friends

34. Registered users shall be able to find friends to exercise with.
35. Registered users shall be able to add other registered users as friends.
36. Registered users shall be able to access their friend list
37. Registered users shall DM (direct message) other registered users only if they are friends.
38. Registered users shall have multiple friends if they choose to.
39. Registered users shall have 0 friends if they choose to.
40. Registered users shall have the ability to unfriend a former friend.
41. Register users shall have the ability to block a former friend.
42. Register users shall have the ability to report a former friend.
43. Registered users shall view friend's club postings.
44. Registered users shall view friend's event postings.
45. Registered users shall be able to decline friend requests.
46. Registered users shall be able to accept friend requests.

Events

47. Registered users shall be able to create events
48. Registered users shall be able to delete events they created

49. Registered users shall be able to edit the events they created
50. Registered users shall be able to join an event
51. Registered users shall be able to exit from an event
52. Registered users shall be able to rejoin an event
53. Registered users shall invite people to events they created

Clubs

54. Registered users shall be able to create the club
55. Registered users shall be able to update the picture of the club they created
56. Registered users shall be able to edit the club name they created
57. Registered users shall be able to delete the club they created
58. Registered users shall be able to delete the club picture they created
59. Registered users shall be able to send request to join the club
60. Registered users shall be able to leave a club
61. Registered users shall be able to send request rejoin a club
62. Registered users shall be able to add members to the club they created
63. Registered users shall be able to remove members from the club they created
64. Registered users shall be able to post in club
65. Registered users shall be member of multiple clubs
66. Registered users shall be admin of multiple clubs
67. Registered users shall be able to invite people to club
68. Registered users shall be able to accept the joining request for club they created
69. Registered users shall be able to reject the joining request for club they created

Chats

70. Registered users shall be able to create a group chat
71. Registered users shall be able to create a private chat
72. Registered users shall be able to invite friends to the group chat
73. Registered users shall be able to remove people from group chat
74. Registered users shall be able to add unknown people from the chat
75. Registered users shall be able to post in the a group chat
76. Registered users shall be able to leave a group chat
77. Registered users shall be able to dissolution the group chat they cheated

78. Registered users shall be able to recall their posts
79. Registered users shall be able to reject to join in a private chat
80. Registered users shall be able to reject to join in a group chat
81. Registered users shall be able to accept to join in a private chat
82. Registered users shall be able to accept to join in a group chat

Buddy Pass

83. Registered users shall be able to view people with gym membership
84. Registered users shall be able to put request to access buddy pass
85. Registered users shall be able to accept the request to access buddy pass
86. Registered users shall be able to reject the request to buddy pass

History logs

87. Registered users shall access their event visits in logs
88. Registered users shall access their workout pairing information in logs
89. Registered users shall be able to access their workout partner's information from logs

Web Application

90. Web Application shall have About us Page
91. Web Application shall have Contact us page
92. Web Application shall ask user to log in
93. Web Application shall display user's profile
94. Web Application shall show notifications to the user
95. Web Application shall show friend requests
96. Web Application shall allow user to check their messages
97. Web Application shall allow user to check event dates they are planning to go
98. Web Application shall allow user to check updates of the club
99. Web Application shall allow user to change password of their account
100. Web Application shall allow user to deactivate their account
101. Web Application shall show buddy pass requests
102. Web Application shall show the logs of user activities
103. Web application shall show events occurring nearby

104. Web Application shall show people recommendation with similar interest
105. Web Application shall allow user to log out
106. Web Application shall allow user to delete the account
107. Web Application shall allow user to see list of friends
108. Web Application shall allow user to see list of clubs
109. Web Application shall allow user to search for people using various filter options

5. List of non-functional requirements

System Requirements

1. The application shall be able to run on the android system(Version 10).
2. The application shall be able to run on the android system(Version 11).
3. The application shall be able to run on Windows10(Version 1803).
4. The application shall be able to run on Windows10(Version 1809).
5. The application shall be able to run on Windows10(Version 1903).
6. The application shall be able to run on Windows10(Version 2004).
7. The application shall be able to run on Windows10(Version 20H2).
8. The application shall be able to run on Windows10(Version 21H1).
9. The application shall be able to run on Ubuntu 21.04.
10. The application shall be able to run on iOS 12.
11. The application shall be able to run on iOS 13.

Marketing

12. The application shall have the company logo visible on every page.
13. The application shall have the company name visible on every page.
14. The application shall have non-intrusive space dedicated to relevant ads.
15. The application shall have meta content for SEO purpose.

Legal requirements

16. The application shall prompt for Terms and Conditions for each new user to accept.
17. The application shall have all users verify that they're 18 years of age or older.
18. The application shall have copyright information on every page.

Privacy

19. The application shall prompt user to accept policies when creating account
20. The application shall ensure user's data will be shared between registered users
21. The password shall be needed for log-in action.
22. The user's passwords shall be hashed using Bcrypt.
23. The application's Network will be protected by the AWS Firewall
24. The application shall not allow more than 3 incorrect login attempts in 24 hours.

25. The application shall protect the privacy of users.
26. The application shall present all privacy policies appropriately to all users.
27. Users' private information should not be shared with 3rd platforms.
28. The basic security of the site shall all be tested.

User Interface

29. The application shall be aesthetically pleasing
30. The application shall have complementary colors
31. The application shall be easy to navigate for everyone
32. The application shall have a search bar
33. The application shall have a simple user interface
34. The application shall have a Filter button
35. The application shall have a Register button
36. The application shall have a Login button
37. The application shall have a Home button
38. The application shall have a Search button
39. The application shall have a Private Chat room
40. The application shall have a Group Chat room
41. The application shall have a Terms and Condition page
42. The application shall have a Home page button
43. The application shall have a User page button
44. The application shall have a Logout Button
45. The application shall have a Profile Picture of the User
46. The application shall have an Upload button
47. The application shall have a Block button
48. The application shall have an Unblock button
49. The application shall have pictures regarding to the activity
50. The application shall have a Nearby Button
51. The application shall have aesthetically pleasing photography
52. The application shall have smooth scrolling
53. The application shall have footer on every page
54. The application shall have header on every page
55. The application shall provide clear instructions on usability of features

Usability

56. The application shall be optimized for mobile browsers.
57. The application shall store data in the chosen database
58. The user personas shall be used.
59. The application shall have a Support page
60. Users that are older than the age of 18 shall be able to use the application to post information, search events, and register after spending 5 minutes reading the support page.

Performance and scalability

61. The Response Time shall be 3 seconds
62. The Throughput shall be between 128 MiB/s and 250 MiB/s
63. The system availability shall be 99%(AWS)
64. A REST service call shall respond with 500 milliseconds,
65. A synchronous database request shall respond with 1000 milliseconds,
66. A batch process shall complete its processing within 60 minutes.
67. The application shall be able to handle large number of users
68. The application shall be developed using microservices architecture enabling easy maintenance and launching/editing features to FitHub
69. The application shall be capable to recover from failures
70. The application shall provide user the requested data
71. The application shall be able to update the chat data in real time
72. The application shall have live updates regarding events

Coding Standards

73. The code shall be readable
74. The code shall be well aligned and properly formatted
75. The code shall be commented wherever needed
76. The code shall be organized with one coding style
77. The code shall be accessible to all the developers
78. The code versions shall be maintained using GITHub
79. The code shall be pushed to different branches

80. The code shall be merge to the master once approved by leads and leader
81. The code shall be in the repository that the professor has created for us

Fault Tolerance

82. The application shall be able to reload itself if loading request failed
83. The application shall try reconnecting database if the request fails

Storage

84. The server shall have 16 concurrent Integrations
85. The server shall have 20 CPU Cores
86. The server shall have 12(RAID) Data Disk
87. The server shall have 8 Volume Size (GiB)

Expected Load

88. The application shall support as many users AWS can support
89. The application shall support as many user requests as AWS can support
90. The application shall support as many database connections as AWS can support

Portability and compatibility

91. The application shall be able to run on Chrome 91.0.4472.
92. The application shall be able to run on Chrome 92.0.4515.
93. The application shall be able to run on Firefox 88.0.1.
94. The application shall be able to run on Firefox 89.0.1.
95. The application shall be able to run on Microsoft Edge 91.0.864.37.
96. The application shall be able to run on Microsoft Edge 46.03.4.5155.
97. The application shall be able to run on Safari 5.
98. The application shall be able to run on Safari 14.
99. The application shall be able to run with 1.8GHz or faster processor. Quad-core or better recommended.
100. The application shall run with 2 or more GB of RAM.
101. The application shall need a minimum of 1 GB up to 10 GB available space, depending on features installed.
102. The application shall be tested and deployed utilizing Docker and Kubernetes.

103. The application shall be continuously running 24/7 except for reasons of maintenance.

6. Competitive analysis

	FitHub	Facebook Groups	Workout Buddies	Strava	Runsocial	Athlete Network	Meetup.com
Link		https://www.facebook.com/	https://workoutbuddies.com/	https://www.strava.com/	https://www.runsocial.com/how	https://www.athletenetwork.com/	https://www.meetup.com/
Strengths	- Strictly for physical activities - Allows to look for people with similar interest	-Mass users on Facebook, easily accessible	-Downloadable application on IOS/ Google Play -Simple UI	-Downloadable application on IOS/ Google Play	Focuses on running activity indoor	Dedicated for athletes looking to pursue their career in athletics	Multiple events and clubs posted daily
Weaknesses	-Less foot traffic -No mobile app	-Saturated market in Facebook -Not specially dedicated for fitness believers	-Does not have a web application -Not good reviews on play store -Does not have option to post events -Does not have option to create or join clubs	-Not a lot of clubs -Dedicated for only running and cycling	-Less choice of activities	-Not for everyone	-No functionality to look for people with similar interest
Pricing	Free	Free	Varies based on plan	$5/month	Free	Free	$30/month
Social	-A direct	-Facebook	-Facebo	-Blog	-Twitter,	-Facebook	-Blog

Media	and a group messaging feature -Allows posting of events		ok, YouTube, Instagram, Twitter	Posts, Medium, Instagram, Twitter, YouTube	Facebook, Instagram	, Twitter, Linkedin, Pinterest, Instagram	Posts, Instagram, Twitter
Onboarding	-Extremely easy to register with -clear instructions	Well-ordered instructions, but not much -support after the first step	No updates since 2018	Sleek instructions	-Very simple and quick -within few clicks	-Simple UI but not so pleasing -Lengthy process to register	Uniform directions
Usability	-Aesthetically pleasing and easy to use	-Simple, easy to use	-Old styling, but simple to use	-Premier UI and UX design	-Easy to use, but only for indoors	-Complicated to navigate the app	-Straightforward and trouble-free

Features	**FitHub**	**Facebook Groups**	**Workout Buddies**	**Strava**	**Runsocial**	**Athlete Network**	**Meetup.com**
Support	++	-	**-**	++	++	+	++
UI simplicity	++	+	**+**	++	+	**+**	++
Private Chat	+	+	**+**	+	--	**+**	+
Group Chat	+	+	**-**	+	-	**++**	++
Matching	+	-	**-**	-	-	**+**	-
Events	++	++	**-**	+	--	**++**	++
Clubs	++	++	-	++	++	**++**	++

Buddy Pass	++	-	-	-	--	**-**	-
History Log	++	-	-	++	--	+	+

+: Feature exists ++: Feature is superior -: Feature doesn't exist

SUMMARY

FitHub is a web application that helps the users to search buddies with similar fitness goals. The idea is to engage and motivate more people to carry out fitness activities together. FitHub provides this platform to regulate life post COVID-19 and helps them to keep going and carry out exercise routines similar to pre-pandemic life.

FitHub at a high level could be categorized into Healthcare (Fitness) sector and therefore we say there is something for everyone that we can offer starting from people gyming together to people undergoing chiropractic & physiotherapy sessions. Fithub thus targets the wide span of audience and serves as a one stop solution. Apart from finding out people with similar exercise goals, fithub also provides the following set of great features to make app usage a unique experience.

1. Send Friends Requests,
2. 1:1 chats,
3. Create fitness groups/rooms,
3. Build customized clubs and organize special events.

Today, No other competitor app provides all such features together in one platform.

We understand that people now resuming their life back to normal routine are going to face more challenges to search for individuals with whom they can exercise or perform other sport activities such as running, hiking, biking, yoga, etc. and we want to leverage this opportunity to help them in such difficult times.

The competitive analysis:

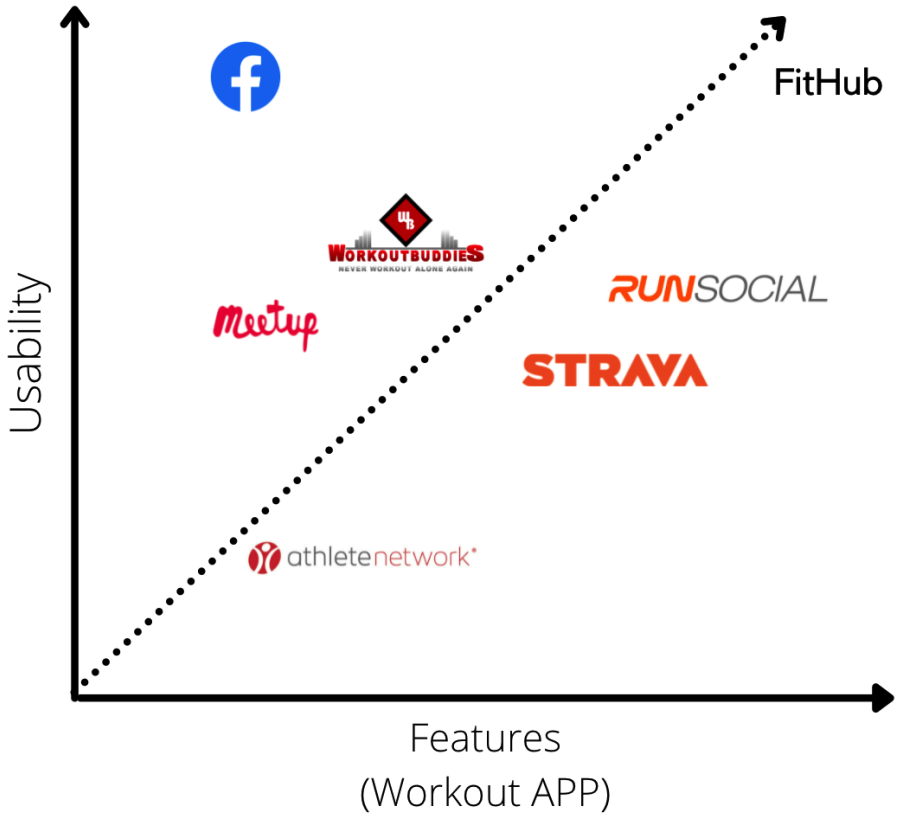
1. Our competitors have discrete features where one allows finding buddies but doesn't allow creating groups and clubs to organize events and vice-versa. For instance, facebook offers creating groups, adding friends, posting events but doesn't provide a feature to look

for fitness partners whereas, WorkoutBuddy allows users to search for fitness partners with similar goals but does not provide any option to post events or create clubs. Fithub is the one stop solution for users to overcome this limitation.

2. Fithub services are going to be completely free whereas the competitors require users to purchase periodic subscriptions.

3. In this digital world with so many apps out there, Fithub is focusing on the ease of usability for our customers by dedicatedly wrapping everything about fitness into one program.

To summarize, currently there is no one stop app which offers everything that FitHub would provide to all their users.



Competitive Analysis (where we expect FitHub to stand)

7. High-level system architecture and technologies use

The software components, frameworks, APIs, tools and systems that will be used in development :

- Server/ Platform Provider: Amazon Web Services (Deployment Platform)
- Operating System: Linux (Ubuntu 20.04.1)
- Tech Stack:
    - Front end stack: HTML, CSS, Javascript, Bootstrap 5.0, React 17.0.2
    - Server side language: Javascript, NodeJs v14.17.0
    - Frameworks: Express JS
- Databases: MySQL(8.0.25)
- Supported Browsers: Google Chrome, Mozilla Firefox, Apple Safari, Microsoft Edge, Internet Explorer

8. Checklist

No.	Item	Status
1	Team found a time slot to meet outside of the class	DONE
2	Github master chosen	DONE
3	Team decided and agreed together on using the listed SW tools and deployment server	DONE
4	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	ON TRACK
5	Team lead ensured that all team members read the final M1 and agree/ understand it before submission	DONE
6	Github is organized as discussed in class (e.g. master branch, development branch, folder for milestone documents etc.)	DONE