



Book Buddy

Sprint 2 Update

Team 5 - Code Avengers

Pace University Capstone Project - Spring 2024



Agenda

1. Project Review
2. MVP
3. Technologies
4. Algorithms
5. Diagrams
6. Product and Sprint Backlog
7. Metrics
8. Retrospective
9. Sprint 3 Plans
10. Demo

Team Members



Jimmy Karoly
Scrum Master/Developer



Dhanasri Salla
Machine Learning Engineer



Sai Sandeep Mandava
Machine Learning Engineer

Team Members



Praveen Raj Gujju
Tester



Anusha Meka
Developer



Sairam Vinjamoori
Developer

Team Members



Krushal Rama
Developer



Alekhya Bommineni
Developer



Changes due to Professor's Feedback

- Added pictures to Team Members slide
- Added explanation of how we are using the technologies
- Added algorithms slide
- Added full project backlog
- Deleted market analysis slide, as it was unneeded
- Changed project description to use template

Slides with changes have this icon:





Problem Statement

Recommendation systems are incredibly important to how users find new products, information and suggestions. These systems are great but can have biases in what they recommend. This is especially prevalent in the book industry where recommendation systems tend to prioritize white authors and authors that are more popular, this leads to people getting a less diverse set of recommendations instead of truly discovering things that are different that they might like.

It's important for people to get information from a variety of different voices with different experiences than their own, unfortunately most recommendation systems limit exposure to different perspectives.

We intend to research and develop a way for readers to find new authors that are under the radar and authors that have different life experiences. The application will combine this recommendation system with an e-commerce site where the user can purchase the books that are recommended.

Project Description

Project Name:	Book Buddy
Team:	Code Avengers
Project Description:	<p>A recommendation system that will prioritize unknown and less popular authors and allow users to purchase recommendations.</p> <p>For book readers</p> <p>who search for new books to read</p> <p>the recommendation system, Book Buddy,</p> <p>is a website</p> <p>that allows a user to generate recommendations based off of a survey or books they have read</p> <p>unlike GoodReads or other book recommendation systems</p> <p>our application will prioritize newer and unknown authors with different life experiences and views.</p>
Benefit Outcomes:	<p>A reader will have get recommendations that are different than they have gotten before</p> <p>Unknown and less popular authors will be able to gain a new audience</p> <p>Users will have a one stop site to organize their reading habits and purchase books that are recommended to them</p>
Github Link:	https://github.com/htmw/2024S-Code-Avengers/wiki

Personas



User Persona



Alex Müller

About



Age: 62 Years



New York, NY



Education: Bachelor's



Gender: Male



Job Title: Retired Bank Manager

Reading Habits

- Alex reads daily
- He can usually finish 3-4 books in a month

Profile

Alex is an avid book reader and always loves looking for new books. Lately he's been underwhelmed by the recommendations he's gotten from the leading book sites, and wants a place that will specifically recommend underrepresented authors.

Goals

- He wants to find new authors
- He doesn't just want the same popularity based recommendations

Pain Points






- Likes GoodReads but would want one place that could give recommendations and he could purchase them
- Gets recommended the same thing repeatedly

User Persona



Jennifer Farmer

About

-  **Age: 26 Years**
-  **Miami, FL**
-  **Education: Bachelor's**
-  **Gender: Female**
-  **Job Title: Graduate Student**

Reading Habits

- Jennifer reads daily
- Most reading for school she can finish 2 books of her own choosing a month

Profile

Jennifer is a 26 year old graduate student and she is interested in philosophy and gender studies. She reads a lot for school but also likes to find time to read for leisure.

Goals

- She wants to find books in her field of study that are written by less-known authors
- She wants to find one place for new recommendations and purchasing

Pain Points

- Difficulty finding diverse book recommendations outside the mainstream
- Doesn't have a lot of time to devote to finding new books

User Persona



Joseph Harps

About



Age: 32 Years



Los Angeles, CA



Education: Master's



Gender: Male



Job Title: Software Developer

Reading Habits

- Joseph tries to read once or twice a week
- He can usually finish 1 book a month

Profile

Joseph is a busy software developer and doesn't have a lot of time to read. He wants to branch out and find new topics to read about from different perspectives. He wants to experience books outside of the normal bestsellers.

Goals

- Since he doesn't have a lot of time he wants something that is easy to use and doesn't require much setup.

Pain Points

- Doesn't know where to start looking
- Good Reads seems to always recommend the same things



Team Working Agreement

Team Agreement

- All team members agree to attend all meetings scheduled every week on Wednesday, either before or after class
- If a team member can't attend a meeting then they will let the group know ahead of time, and we can talk about the possibility of rescheduling and if rescheduling is not possible then the absent teammate will agree to whatever is decided by the majority that attends the meeting
- If a team member needs help then they will reach out to the team in advance and not wait until the night before something is due
- All team members should feel open to sharing their opinion and group consensus will decide the direction we will go in, if not opposing opinions are shared then the assumption will be that you are in agreement.]
- Team members will stay active in the group chat and pay attention to questions and participate in group discussions about project details
- Work will be divided as evenly as possible and is expected to be complete in a timely manner
- Members agree to respect the time and other obligations of fellow team members, by attending meetings on time and responding in the group chat in a timely manner.
- Work will be done to the best of every members ability



Minimum Viable Product

Our MVP will consist of the following functionalities:

- Registration/Login

- Book Recommendations

- Book Collections for User

- Marketplace Functionality

Front End Technologies



We will be using the React JS library to create our UI along with some HTML and CSS as well.

For our login/registration we will be using Google Firebase. They allow you to interact with it through an API

Back End Technologies



We are using PyTorch for our ML Algorithm

We will create an API for the algorithm using Python

The backend will be written in Java using the Spring Framework

Our Database will be Postgres



ML Algorithm

1. Feature Vector Construction:

- Represent each book as a vector of features. Each dimension corresponds to a specific characteristic or keyword associated with the book.
- For textual features, use techniques like TF-IDF to weight the importance of each word or tag.

2. Cosine Similarity Calculation:

Calculate the cosine of the angle between two book vectors, A and B, using the formula:

$$\text{Cosine Similarity} = (\mathbf{A} \cdot \mathbf{B}) / \|\mathbf{A}\| \|\mathbf{B}\|$$

Where:

- $\mathbf{A} \cdot \mathbf{B}$ is the dot product of vectors A and B
- $\|\mathbf{A}\|$ and $\|\mathbf{B}\|$ are the magnitudes (Euclidean norms) of vectors A and B, respectively.

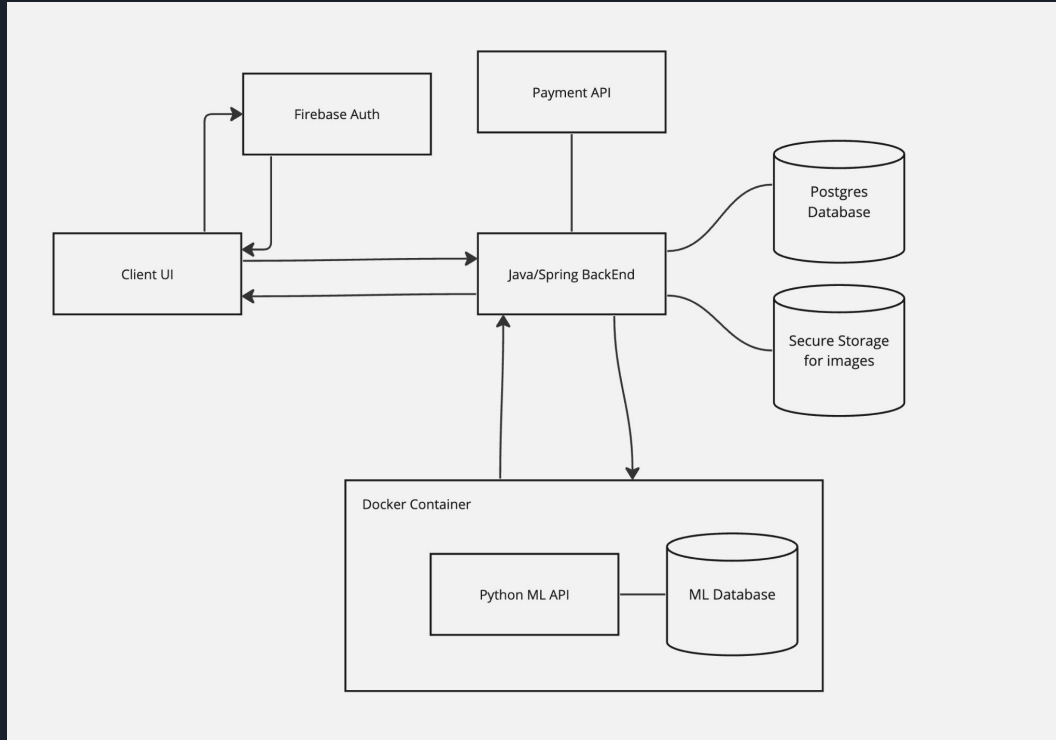
3. Interpretation:

- The cosine similarity ranges from -1 to 1, where 1 means identical, 0 indicates orthogonality (no similarity), and -1 implies opposite.
- For book recommendations, we focus on positive similarity scores, with higher scores indicating greater similarity.

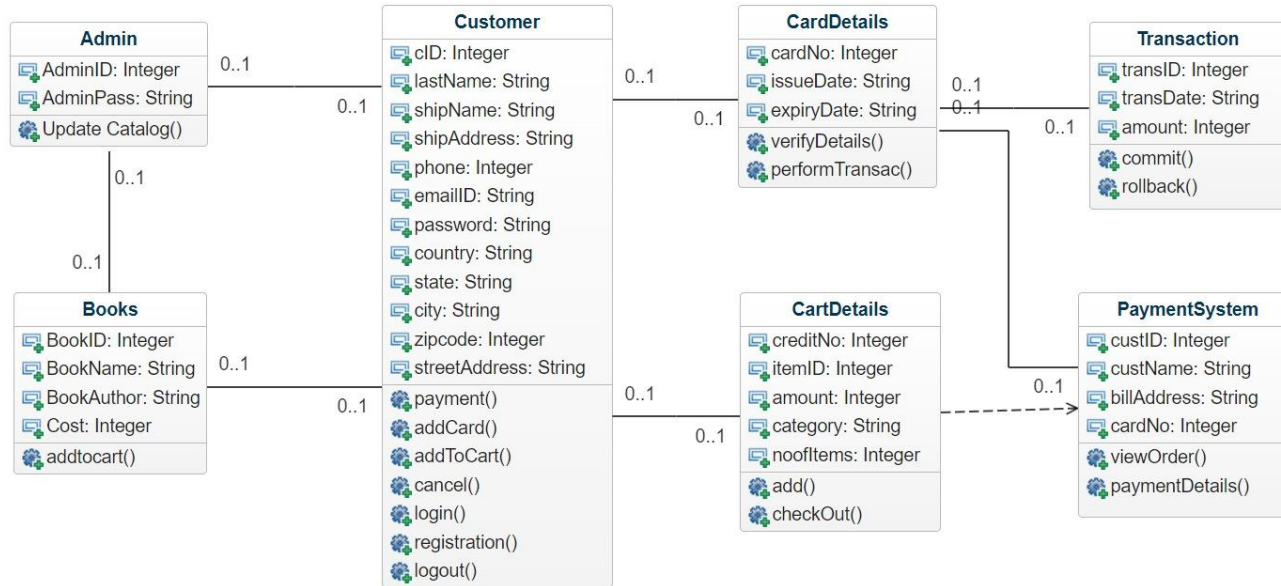
4. Recommendation:

- For a target book, calculate its cosine similarity with all other books in the dataset.
- Recommend books with the highest similarity scores to the reader.

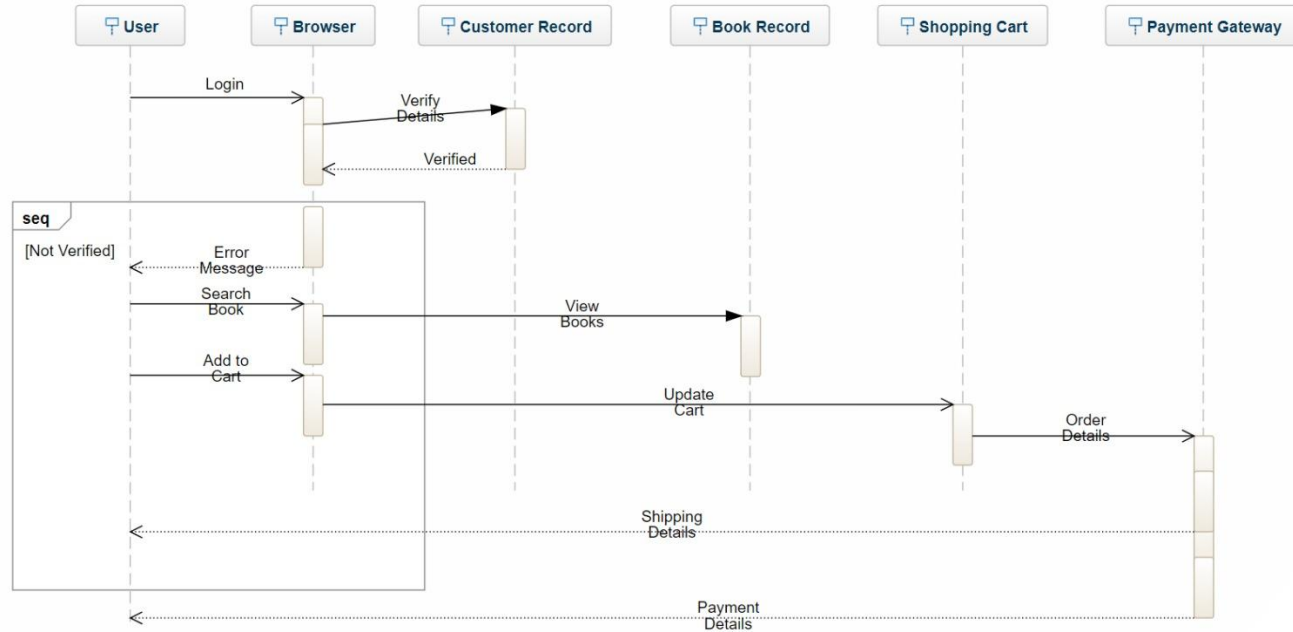
Conceptual Architecture Diagram



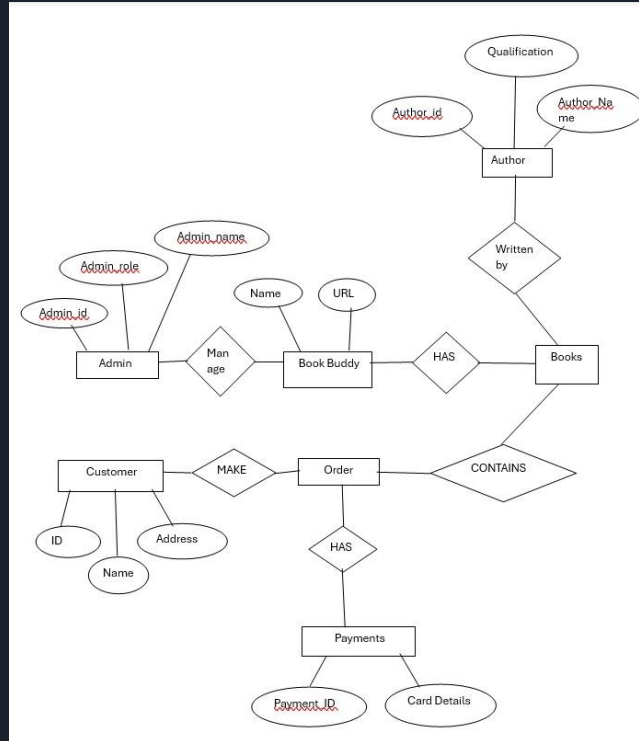
Class Diagram



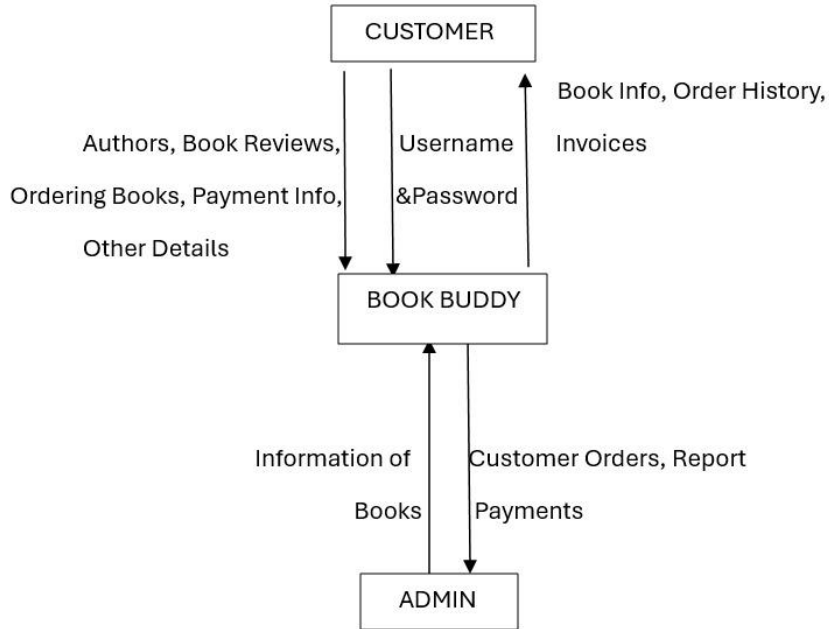
Sequence Diagram



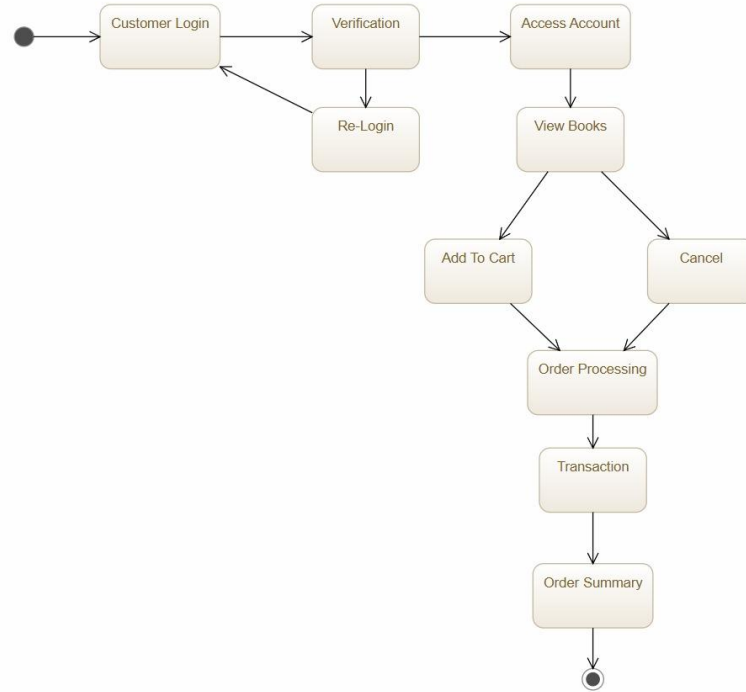
Entity Relationship Diagram



Context Diagram



State Diagram



Product Backlog - Overview

Product Backlog

ID	Task to be Completed	PRIORITY	Sprint	STATUS
1	As a passionate reader, I want to be able to get new recommendations from my known likes and dislikes so that I can discover new authors and books I might not have otherwise.	High	3	Not Started
2	As a new reader, I want to be able to get new recommendations even though I have not read many books so that I can try and read more.	High	3	Not Started
3	As a passionate reader, I want to be able to save my recommendations in a list so that I always have access to my recommendations without going through the process again.	Medium	3	Not Started
4	As a passionate reader, I want to be able to books I have liked or disliked to a list, so that I have a place to organize my reading habits.	Medium	3	Not Started
5	As a busy reader, I want to be able to register for an account so I can come back to the site and access my saved recommendations and lists.	High	2	In Progress
6	As a busy reader, I want to be able to login so that I can access my account and personalized features.	Medium	3	Not Started
7	As a user of the site, I want to be able to log out, so I can end my session securely.	Low	2	In Progress
8	As a busy reader, I want to be able to purchase books that are recommended to me so that I dont have to search another store or website.	High	3	Not Started
9	As a busy reader, I want to be able to be able to get a confirmation that my order was complete so that I don't have to contact the company for confirmation	Medium	4	Not Started
10	As a busy reader, I want to be able to be able to get a confirmation that my order was shipped so that I know to keep an eye out in the mail	Medium	4	Not Started
11	As a user who has placed numerous order, I want to be able to look at my order history and get invoices so that I am able to keep track of my purchases	Low	4	Not Started



User Stories in Detail

User Story 1:

As a passionate reader

I want to be able to get new recommendations from my known likes and dislikes

So that I can discover new authors and books I might not have otherwise.

Acceptance Criteria:

Given that the reader wants recommendations based off their likes and dislikes

When the reader requests recommendations

Then the system should serve those recommendations in a timely manner

The system should allow users to input their likes and dislikes
The recommendation system should take those parameters into account

The recommendations should include both well known and lesser know works

The recommendations should be presented in a visually appealing and easy-to-navigate format.

User Story 2:

As a new reader

I want to be able to get new recommendations even though I have not read many books

So that I can try and read more

Acceptance Criteria:

Given that the reader has not read many books in the past

When the reader requests recommendations

Then the system will ask general like and dislikes about certain genres to get a baseline

The system will have a short survey to get some information from reader with little to no reading history.

The system should offer a variety of genres and authors to help new readers explore different types of books.

The system should provide recommendations that are not overwhelming, considering the user's limited reading experience, a new reader should start with a smaller list of recommendations.



User Stories in Detail

User Story 3:

As a passionate reader

I want to be able to save my recommendations in a list

So that I always have access to my recommendations without going through the process again.

Acceptance Criteria:

Given that the reader wants to save their recommendations

When the system gives them the recommendations

Then the user will have an option to add them to a list

The lists should be easily accessible to the user.

The user should be able to view details about the books in the list.

The system should allow the user to add other books to the list found through searching or browsing the site.

User Story 4:

As a passionate reader

I want to be able to add books I have liked or disliked to a list

So that I have a place to organize my reading habits

Acceptance Criteria:

Given that the reader wants a way to organize their reading

When the user has a book they liked or disliked

Then they can add it to the list and mark it as such

The user should be able to have multiple lists and be able to name the lists.

The user should have a way to favorite, like or dislike books in their lists.

The user should be able to share/export lists to friends or other site users.



User Stories in Detail

User Story 5:

As a busy reader

I want to be able to register for an account

So that I can come back to the site and access my saved recommendations and lists

Acceptance Criteria:

Given that the reader wants to always have access to their lists

When the user comes to the site or tries to get recommendations

Then the site should prompt the user to register

The user should be able to register using third party logins and creating their own username/password.

The system will ask the user basic information to populate their user profile.

The system will send a confirmation email to the user when registration is complete.

User Story 6:

As a busy reader

I want to be able to login

So that I can access my account and personalized features

Acceptance Criteria:

Given that the user wants to access their personalized features

When the user inputs the correct username/password

Then the website will give them access to the resources requested

The system should display an error message if the user inputs the incorrect username/password combination.

After login, the user should be redirected to their personal dashboard or homepage.

The user should have a way to reset their password if it is forgotten.



User Stories in Detail

User Story 7:

As a user of the site
I want to be able to log out
So that I can end my session securely

Acceptance Criteria:

Given that the user wants to end their session
When the user clicks log out
Then the site will end that user session until they log in again

The site should have an easily accessible log out button.
After logout, it should provide a message or confirmation that log out was completed.
The logout button should redirect them to the home page or login page.
Logging out should clear any stored session information, such as cookies, to prevent unauthorized access to the account.

User Story 8:

As a busy reader
I want to be able to purchase books that are recommended to me
So that I don't have to search another store or website

Acceptance Criteria:

Given that the user wants to purchase books
When the user finds a book they like
Then the site will offer a way to buy that book

The system should have a simple buy system.
The system will send the user a confirmation email when purchase is complete
The system will send shipping notifications to the customer



User Stories in Detail

User Story 9:

As a busy reader

I want to be able to get a confirmation email that my order was completed

So that I don't have to contact the company for the status

Acceptance Criteria:

Given that the user wants an email receipt

When the user completes an order

Then the site will end send out a confirmation email including the order details

The confirmation will include an itemized receipt and a shipping estimation

User Story 10:

As a busy reader

I want to be able to get a confirmation email that my order was shipped

So that I know when the order ships and can watch my mail

Acceptance Criteria:

Given that the user a shipping confirmation

When the user's order ships

Then the site will send this confirmation as soon as possible

The shipping confirmation should have the tracking number if applicable.



User Stories in Detail

User Story 11:

As a user who has placed multiple orders

I want to be able to look at my order history and get invoices

So that I can keep track of my purchases and spending

Acceptance Criteria:

Given the user wants to look at an order history

When the user has placed multiple orders

Then the site will have a section for a customer to look at their previous orders

The site will have an easy to read order history

The order history will include invoices with the items purchased and total spent.

Sprint 2 Tasks, Stories, and Acceptance Criteria

Sprint 2 Tasks and Stories

ID	Sprint 2 Tasks	PRIORITY	POINTS	STATUS
1	Integrate firebase	Medium	4	In Progress
Acceptance Criteria for task 1: The integration should handle authentication errors gracefully, displaying relevant error messages to the user. The system should allow the user to register and login.				
2	Experiment with back end classes and business logic	Low	2	Complete
Acceptance Criteria for task 2: Determine the best way to model classes. Create repository, controller, and service classes.				
3	ML Dataset reasearch and beginning setup	Medium	3	Complete
Acceptance Criteria for task 3: Narrow down dataset selection. Start building recommendation system				
4	Write user stories	High	2	Complete
Acceptance Criteria for task 4: Make sure all MVP functionality has a story. Make sure all stories are assigned to a Sprint and Sprint 2 stories have a cost.				
5	Write acceptance criteria	High	2	Complete
Acceptance Criteria for task 5: Acceptance Criteria has been researched and written. Files uploaded on Github				
6	Write test cases for Sprint 2 stories	Medium	2	Complete
Acceptance Criteria for task 6: Each story that is being worked on will have corresponding test cases.				
7	Create Diagrams (Arch, Sequence, Class, ER)	High	3	Complete
Acceptance Criteria for task 7: Diagrams are discussed and drawn. Diagrams are uploaded on Github				

Sprint 2 Tasks, Stories, and Acceptance Criteria

8	Finalize design	Medium	1	Complete
Acceptance Criteria for task 8: Design of site has been discussed and completed.				
9	Implement login page	Medium	2	Complete
Acceptance Criteria for task 9: Login UI should have corresponding buttons and text fields as needed. Page should be ready for Firebase implementation next sprint				
10	Update wikipage with all information needed	Low	1	Complete
Acceptance Criteria for task 10: Double check wiki against checklist. Make sure all links work and are taking the user to the correct file.				
11	Complete Sprint 2 Powerpoint	Medium	2	Complete
Acceptance Criteria for task 11: Double check presentation against slide checklist. Implement and mark changes due to feedback. Double check all styling and font				
12	Complete Sprint 2 Retrospective	High	3	Complete
Acceptance Criteria for task 12: Have all team members participate. Brainstorm action items to work on next Sprint				
13	Film Sprint 2 presentation	Medium	4	Complete
Acceptance Criteria for task 13: Make sure presentation feels smooth. Make sure everyone is on camera when they are speaking. Make sure everyone knows when they are speaking and starts on time so we can minimize pauses				
TOTAL			31	

Sprint 2 Test Cases

Title	Description
Test Case ID	TC-0001
Title	Test for UI Implementation
Objective	To ensure homepage and login UI are correct
Preconditions	None
Test Data	None
Steps	<ol style="list-style-type: none">1. Open website2. Look and find registration/login buttons3. Make sure user has the ability to go back to previous page4. Make sure text fields take proper input5. Make sure code is ready for Firebase integration6. Check colors and font sizes for accessibility
Expected Result	The UI has all the required elements to start connecting with backend API
Actual Result	In Progress
Status	In Progress

Title	Description
Test Case ID	TC-0002
Title	Test for Firebase Integration
Objective	To ensure the user will be able to register and login
Preconditions	UI is complete and Firebase methods are in code
Test Data	Username: test@email.com Password: ThisIsABadPassword
Steps for Registration	<ol style="list-style-type: none">1. Go to home page and click register2. Choose email/password option3. Input test data4. Check in firebase console if user was created5. Check if user migration to site's DB was successful
Steps for Login	<ol style="list-style-type: none">1. Go to home page and click login2. Use test data to try to login3. Make sure login is successful4. Make sure user is transferred to correct page after login5. Check for password recovery option
Expected Result	A user is able to register and login using the methods from Firebase
Actual Result	In Progress
Status	In Progress

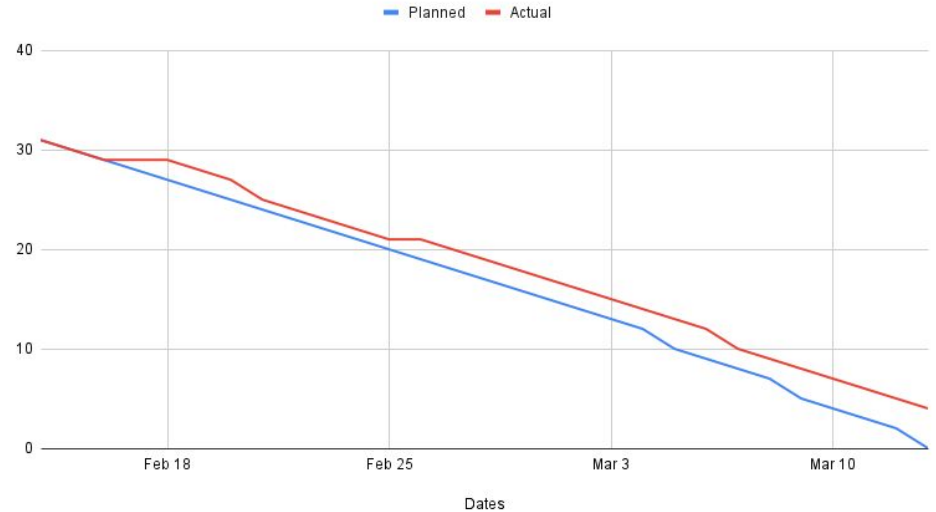
Sprint 2 Metrics and Burndown Chart

We still need to finish the Firebase Integration and that will be carried over to the next sprint

Team Velocity: Total points completed
27

Completed Committed Ratio: 31 total
points - Ratio is 87%

Burndown Chart for Sprint 2



Sprint 2 Retrospective

Sprint 2 Retro

What went well +

Coordination among teammates. + 3	Completed almost all tasks for Sprint 2 + 2
implementation of basic algorithm + 2	Front end UI has a great start + 2
team coordination has improved very well + 2	Have finished all the task assigned before the time + 1
successful implementation of testing of base model + 1	Successfully created the login and signup pages + 0

What can be improved +

availability + 5	More collaboration on features and implementation + 2
Adding more colors to the front end part + 1	Make sure we are all in agreement about the best way to implement features + 1
knowledge sharing + 1	getting new dataset + 1
Group agreement on when to turn in deliverables + 0	find an improved version of the machine learning recommendation model + 0
team work and more collaboration + 0	Coordination between internal team mates but needs to improve overall + 0
git commits + 0	

Action Items +

Active learning + 2	deadlines for submissions not only for group work but also individual submissions. + 1
Have more meaningful git commits and branches + 1	



Sprint 3 Plans

Stories from Sprint 2 carrying over:

- Integrate Firebase Auth

New Stories for Sprint 3:

- Implement and test ML algorithm
- Implement backend classes and methods
- Integrate firebase payment extension in backend
- Fully test all implemented features
- Technical Paper

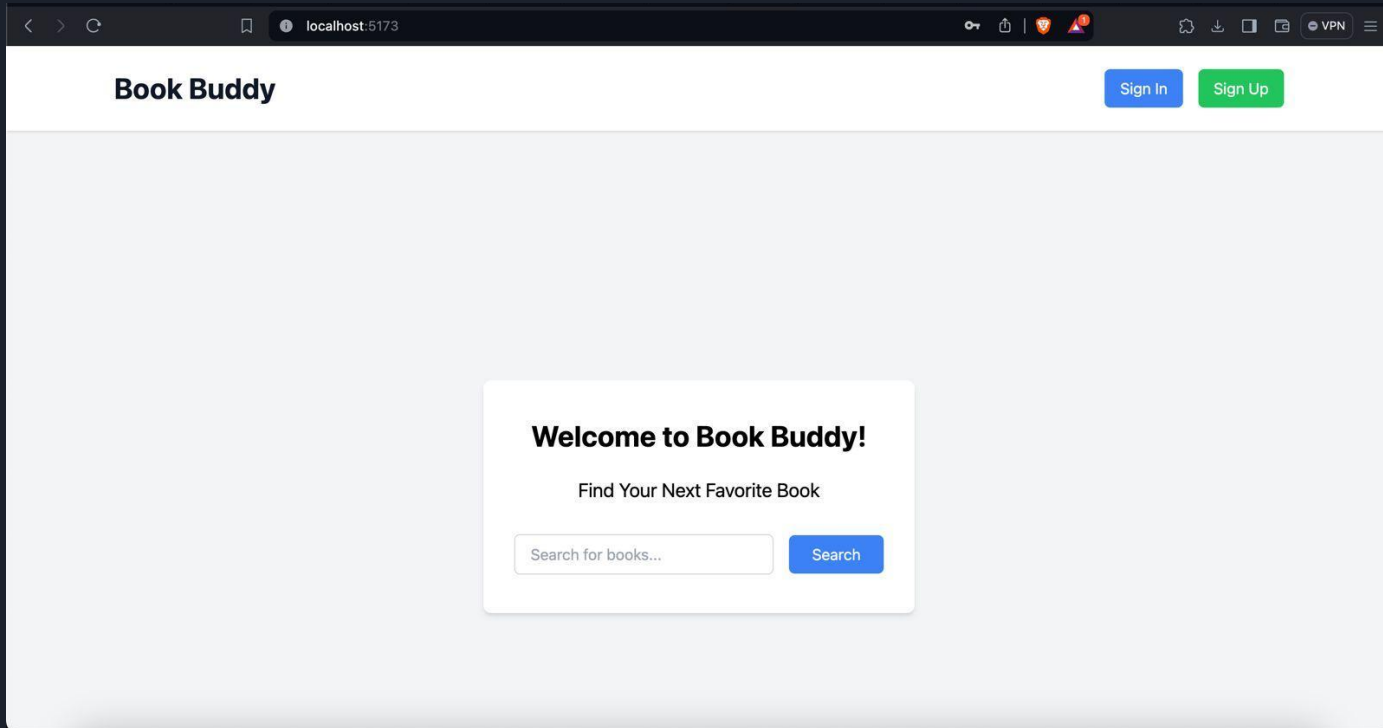


Current Work on API

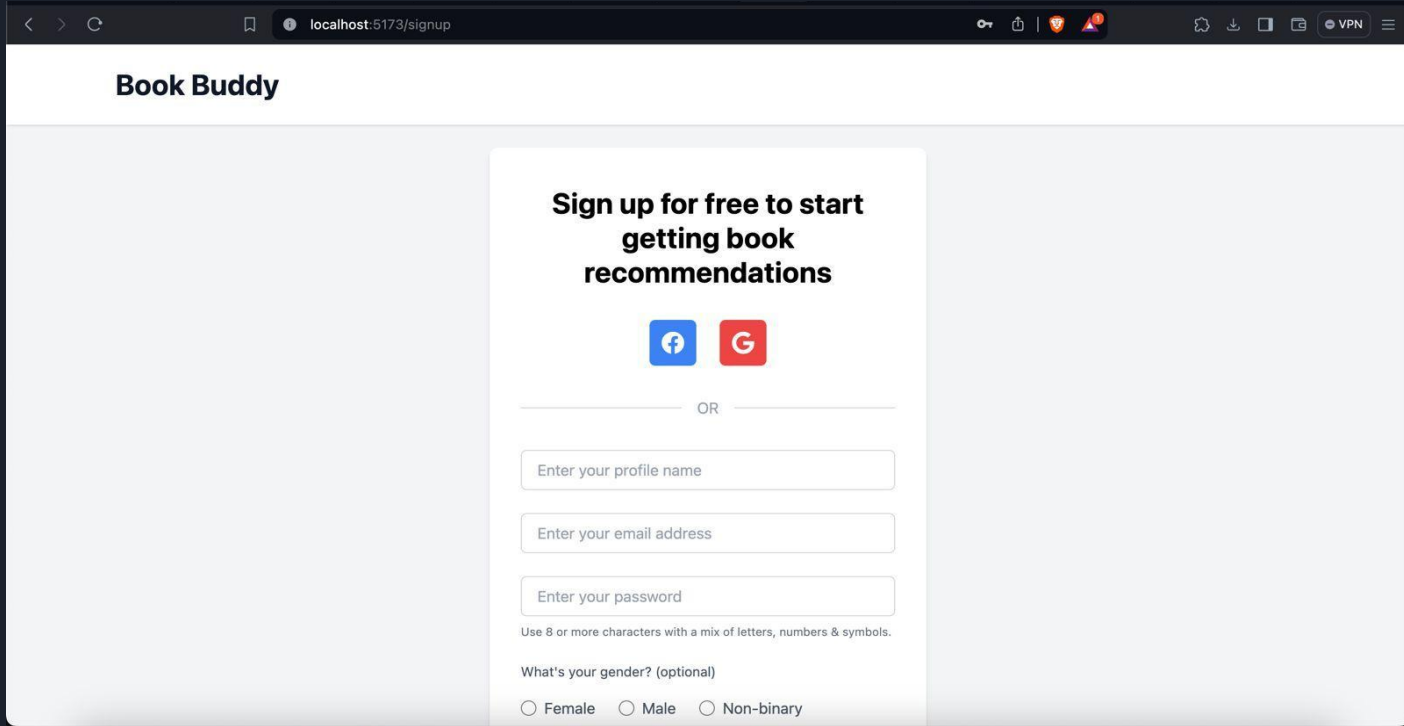
We are building the recommender systems as an external API. The frontend will connect with this and send the input then receive recommendations.

We are also building our backend as a REST API. We are using the Spring Framework and during Sprint 2 we brainstormed and experimented with them. The book recommendation and marketplace functionalities will use this backend.

Demo Screenshots





Demo Screenshots



The screenshot shows a web browser window with the address bar displaying 'localhost:5173/signup'. The page title is 'Book Buddy'. The main content is a signup form with the heading 'Sign up for free to start getting book recommendations'. Below the heading are two social media login buttons for Facebook and Google. A horizontal line with 'OR' in the center separates these from the standard form fields. The form fields are 'Enter your profile name', 'Enter your email address', and 'Enter your password'. Below the password field is a note: 'Use 8 or more characters with a mix of letters, numbers & symbols.' The final field is 'What's your gender? (optional)' with three radio button options: 'Female', 'Male', and 'Non-binary'.

Book Buddy

**Sign up for free to start
getting book
recommendations**

OR

Enter your profile name

Enter your email address

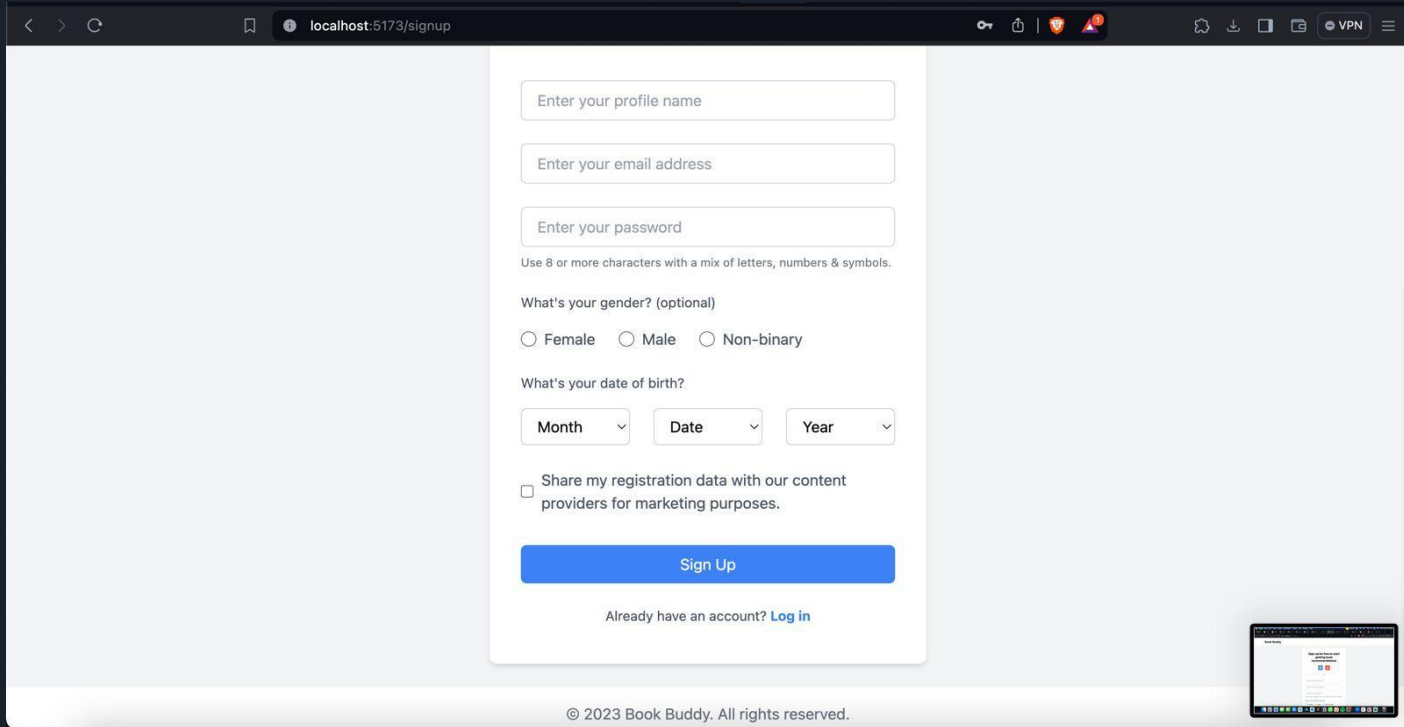
Enter your password

Use 8 or more characters with a mix of letters, numbers & symbols.

What's your gender? (optional)

☐ Female ☐ Male ☐ Non-binary

Demo Screenshots



localhost:5173/signup

Enter your profile name

Enter your email address

Enter your password

Use 8 or more characters with a mix of letters, numbers & symbols.

What's your gender? (optional)

☐ Female ☐ Male ☐ Non-binary

What's your date of birth?

Month Date Year

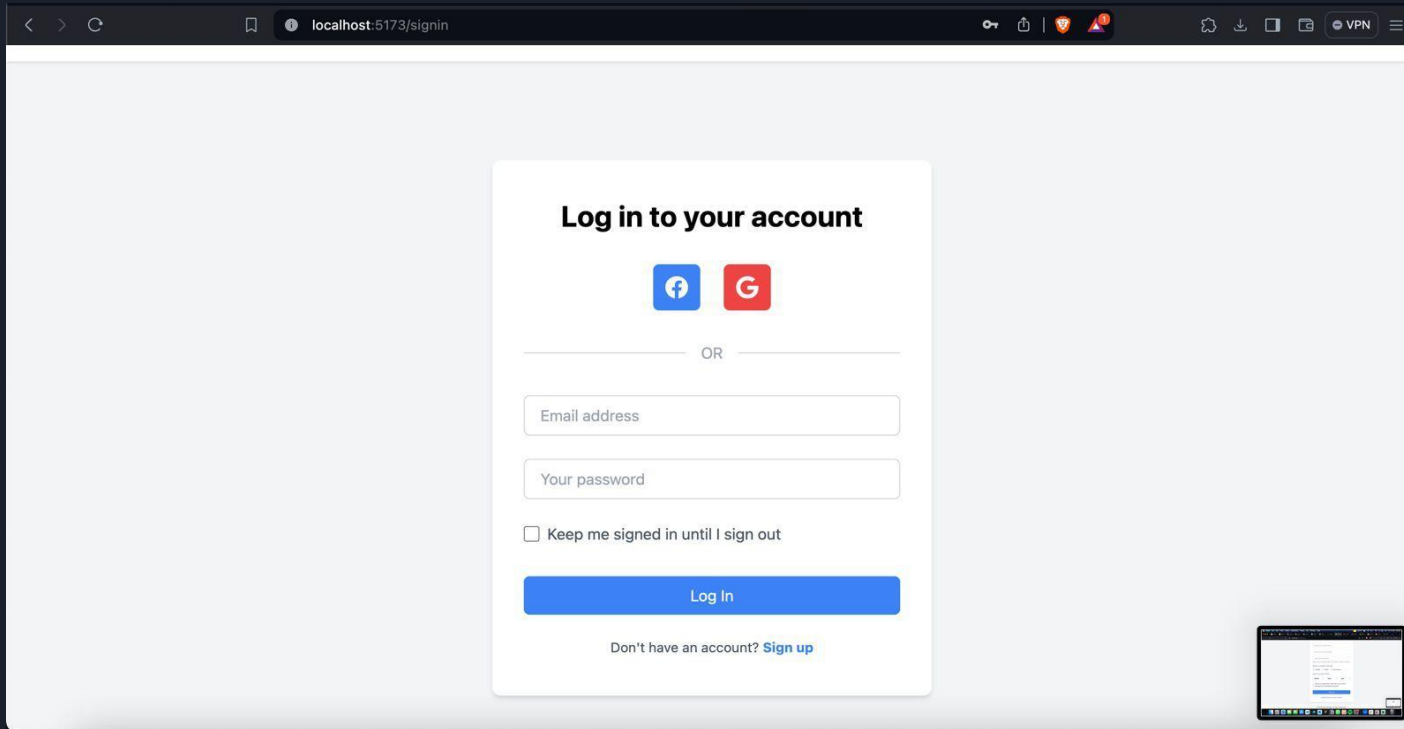
☐ Share my registration data with our content providers for marketing purposes.

Sign Up

Already have an account? [Log in](#)

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Demo Screenshots





WikiPage Link

<https://github.com/htmhw/2024S-Code-Avengers/wiki>



Application Demo