

Final Report Book Swap

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1 Introduction

College textbooks can be a huge expense for students, while resale value, typically, is very low. Often times, students will sell their textbooks back to the school at a fraction of the price to try to get some money back. Most textbooks for a class are used for multiple semesters, but schools don't provide a way for students to trade books with other students. I wanted to try to build a website that was dedicated to students getting in touch with other students who are willing to sell or trade textbooks.

2 Background

2.1 Preparation

During Software Engineering I had a chance to work on building a web application. It was a huge inspiration for building a website for my senior project and I wanted to have more experience coding in Python. There were a few features in our project that I had little interaction, such as the database and the admin system, that I wanted to try out for myself. Going through different tutorials was a great way to refresh my memory and get a good idea of what I would be able to accomplish for this project. Having a solid foundation in commenting from CS I and II really helped me in this project. Without proper commenting, this project would have been very confusing for me.

Software Engineering also gave me a great foundation on how to set expectations and time limits with projects. While I didn't get to every feature I would have liked to, I was able to accomplish all of the things I needed to have done.

2.2 Practice

This project was an interesting experience. In almost all of my classes that involved coding there was a huge support system of students that could answer a question to some degree. Working on this project, especially from a distance, I had very little help with problems that I ran into. There were many small parts in this project, a lot of which I had never worked with before and had to read about. Time management was a skill that I really wanted to work on with this project. I had bought a nice daily planner at the beginning of the semester and used that to try to distribute my time. This was something I have never been good at keeping up with, so I'm happy with the fact that I was able to keep a half-decent planner. It's definitely a habit I want to continue with, as it helped me be less stressed about deadlines.

3 Methods

Book Swap was built using the django framework, which uses Python as its primary language. I started off going through the documentation for django, which has a great tutorial layout, I watched a few different YouTube tutorials to decide how to approach building the website. I also ran through the CodeAcademy HTML/CSS tutorial that was available to brush up on those.

The first part of this project was setting up a web page and creating a database for textbooks. Textbooks are stored based on their title, author, isbn, and the relevant course. This was the most exciting part for me as I got to learn more about databases and how objects are stored and retrieved from a database. I then added a page to list the textbooks and used a built in filter system so that students can search the page for specific books based on the title, author, isbn, or course with the owner of the textbook being stored as a string until I could work on having user accounts. The biggest issues I faced during this part of the project were understanding how models work in django and, surprisingly, having a refresh button that worked to clear the filter and didn't look different than the submit button.

Originally, I wanted to have 3 separate databases, one for textbooks, one for colleges, so that each college could have their own textbook database, and the course databases. In order to build, I needed to have a student's e-mail address to confirm they were a student of a particular school. After finishing up everything with textbooks, I started looking into django's built in user/admin system. The built-in system, however, would not allow you to make changes and add fields to the user/admin objects so I had to build my own user

model. A majority of the problems I faced in this project came from building a user system myself. I found the errors that django would give when a problem would occur were obscure and mostly unhelpful. There were times where I would need to check if the user model was behaving correctly, however I could not do that without passing it through django's built in authentication process. This ended up taking much more time than I had anticipated as it was mostly trial and error and reading through code on Stack Exchange from people with similar problems. A major roadblock that came up was that a user could register, and after registering they would automatically log in, however the user object was not being stored properly, usernames were stored but passwords were not, so once they logged out they could no longer log back in, but they could also no longer register for an account as the username/e-mail had been taken. To not code myself in circles, this is where I commented the most. If I had to scrap code to try a different approach I would comment out the old code instead of deleting it, take notes on what happened when we tried it so that I could reference it if I needed to and to keep myself from trying the same thing repeatedly. Once our user system was working, I modified our textbooks to reference a user directly as its owner. I briefly worked on building an admin user object but realized that it would take up more time on the project than I had and I needed work on other features, so I moved on. I had also tried to build the school/course system but it became very intricate. Out of fear of breaking the user system, I decided to remove this feature.

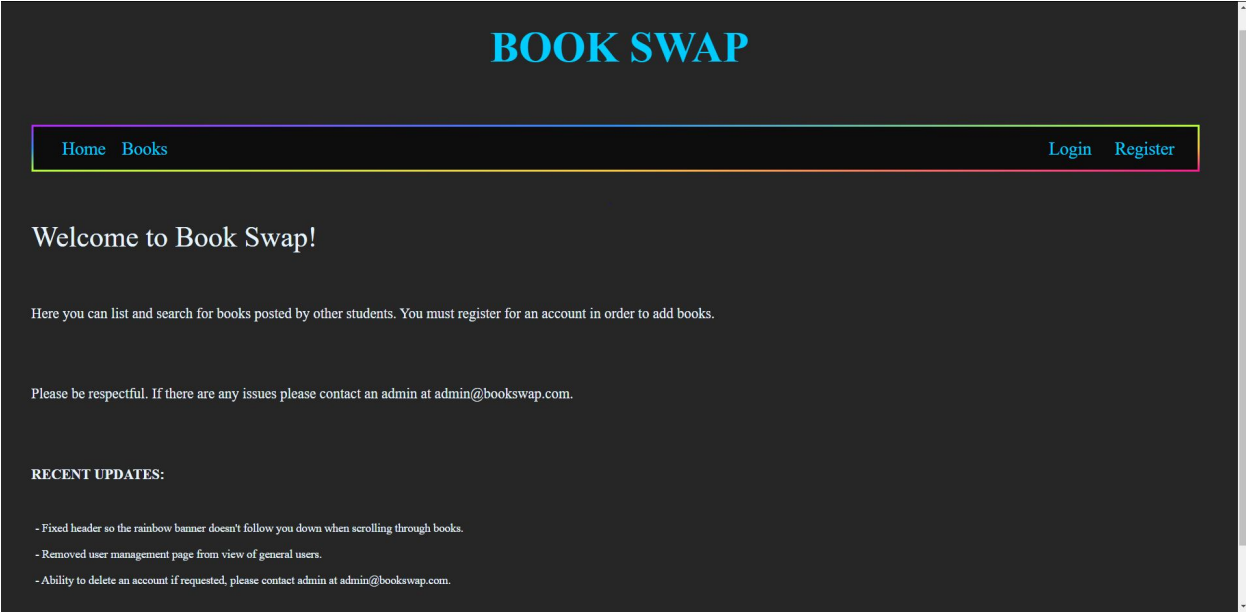
I then began to work on separating everything and creating different pages. I had worked with HTML/CSS before, so I was able to have the basics down for what I wanted. I modified the homepage to have a small message, and if the website were in actual use, a place to post updates and reminders. Using a universal header, I created separate pages for everything. Without being logged in you can view the homepage, the login page, the registration page, and a page with the textbooks, however you cannot view the contact information of any of the book owners unless you log in. Once logged in, users can add a textbook to the database and have a separate page with that displays their listed textbooks. From this page, you can also remove a textbook you no longer list. After all of the pages had been set up, I worked on styling and organizing the structure of the website's interface using various tutorials and lots of tweaking.

Once I finished styling, I went back to the problem of not having any type of admin system. At this point in the project, I wasn't sure if I had the time to try to build an admin user object, so the final function that I worked on was creating admin functions that only my user account has access to. I created a page that lists all user's username and e-mail with the option to delete the user. Once deleted, their listed textbooks will also be deleted from the textbook database. I finished off the project researching ways to give users more privacy while also allowing them to communicate with each other, ideally through a chat system. There are a few other features I would have liked to have added if I had more time. One would be a way for users to post requests for certain textbooks, a matching system would be ideal but is far beyond the scope of the project. Confirming e-mail addresses and having a way to modify your user e-mail and password is another.

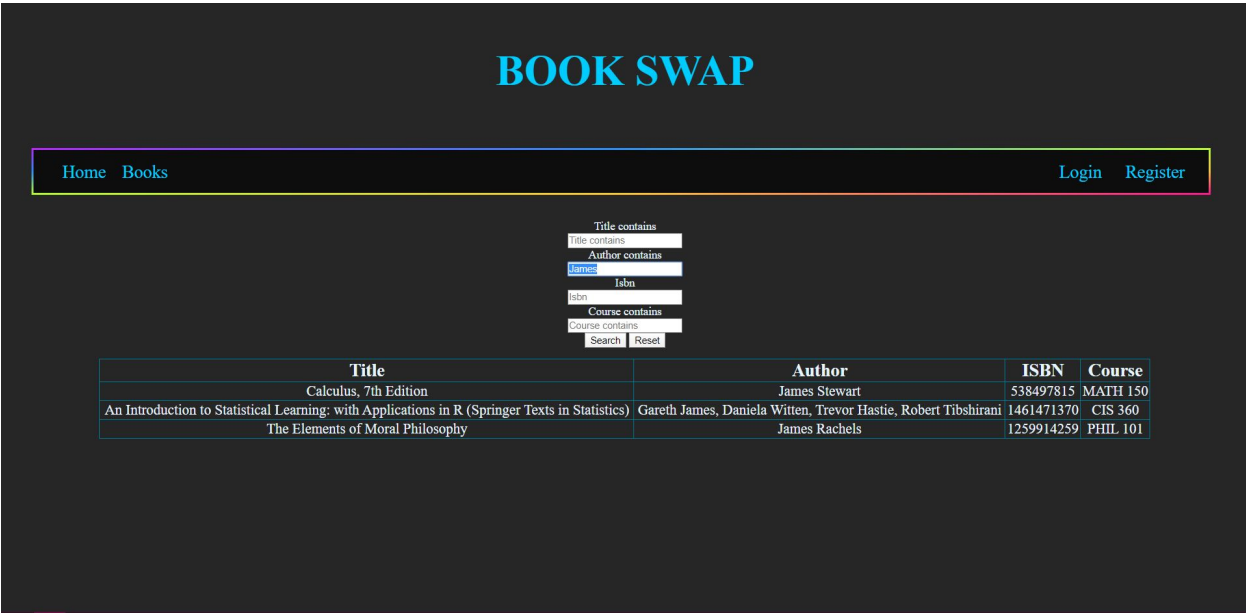
I started off with a trello backlog, but I did not maintain that very well. I found myself taking better notes in my daily planner on what I had accomplished that week and things that needed to be done, so I relied on that for managing my time. My time management, unfortunately, was thrown off by the issues with user accounts and COVID-19 causing chaos. When messing with key features, I kept several backups of the project to prevent completely breaking something, which helped a lot when I first started working on the user accounts.

4 Results

When you load book swap, you are taken to the homepage, which contains information on recent changes/updates to the website.



From here, you can view the book listings and search them.



Once logged in you are granted access to viewing contact information for book owners so that you can set up an exchange.

Title contains

Title contains

Author contains

Author contains

ISBN

ISBN

Course contains

Course contains

Search

Reset

Title	Author	ISBN	Course	Contact
Physics for Scientists and Engineers: A Strategic Approach with Modern Physics	Randal D. Knight	133953149	Physics II	patelsp198@potdsdam.edu
Calculus, 7th Edition	James Stewart	538497815	MATH 150	user1@potdsdam.edu
University Physics with Modern Physics, Volume 1 (Chs. 1-20) (14th Edition)	Hugh D. Young Rodger A. Freedman	133978044	PHYS 201	user1@potdsdam.edu
Microbiology: An Introduction (13th Edition)	Gerard J. Tortora, Berdell, Warner Bair Christine L. CaseR. Funke, Derek Weber,	134605187	BIO 300	user1@potdsdam.edu
An Introduction to Statistical Learning: with Applications in R (Springer Texts in Statistics)	Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani	1461471370	CIS 360	user2@potdsdam.edu
R for Data Science: Import, Tidy, Transform, Visualize, and Model Data	Hadley Wickham, Garrett Grolemund	1491910399	CIS 290	user2@potdsdam.edu
Fundamentals of Astrodynamics (Dover Books on Aeronautical Engineering)	Roger R. Bate, Donald D. Mueller, Jerry E. White	486600610	ENG 320	user3@potdsdam.edu
Physics for Scientists & Engineers with Modern Physics (4th Edition)	Douglas C. Giancoli	131495089	PHYS 300	user4@potdsdam.edu
Learning Python: Powerful Object-Oriented Programming	Mark Lutz	1449355730	CIS 125	user4@potdsdam.edu
History of Western Philosophy: And Its Connection with Political and Social Circumstances from the Earliest Times to the Present Day	Bertrand Russell	671201581	PHIL 203	user4@potdsdam.edu
The Elements of Moral Philosophy	James Rachels	1259914259	PHIL 101	user4@potdsdam.edu

You can add books to the database.

Please enter your textbook information here:

Title:

Author:

Isbn:

Course:

As well as view books that you have previously listed and remove them if you no longer want them listed.

BOOK SWAP

[Home](#) [Books](#) [Add a Book](#) [My Books](#) [Logout](#)

My Books

Title	Author	ISBN	Course	Delete
Calculus, 7th Edition	James Stewart	538497815	MATH 150	<input type="button" value="Delete"/>
University Physics with Modern Physics, Volume 1 (Chs. 1-20) (14th Edition)	Hugh D. Young Rodger A. Freedman	133978044	PHYS 201	<input type="button" value="Delete"/>
Microbiology: An Introduction (13th Edition)	Gerard J. Tortora, Berdell, Warner Bair Christine L. CaseR. Funke, Derek Weber,	134605187	BIO 300	<input type="button" value="Delete"/>

If logged in to my personal account, you are able to view a list of users and can delete users if needed.



5 Conclusion

Book Swap was filled with many different emotions. It had times where it was very exciting, but there were moments where it was incredibly frustrating. I do wish that I was able to accomplish more with the project, but I am happy with the final product. It functions like it's supposed to and has the key features that I was hoping to have. If I had more time, I would have loved to add more quality of life features for users using more advanced CSS and learning some JavaScript.

I think the best part of this project was how it made me feel passionate about programming. Sometimes when I would do coding for assignments, I would have moments where I would feel like I wasn't accomplishing anything or that maybe I just didn't enjoy coding as much as I thought I did. The idea of the project itself was very stressful and anxiety inducing, but once I actually sat down and started working on it, I would get more excited to try to fix a problem or learn about something new for a feature. I feel like my confidence as a programmer has gone up from working on this project. As I got closer to the end, I actually started to feel less stressed about the project and more comfortable with what I was doing. It's helped me feel like I made the right choice in picking this field. Even though I'm technically done with this project, I still have the urge to go in and add things.

My best advice to give to future students would be to not beat yourself up about what you don't know, but take steps towards figuring it out. My biggest setback in this project I think was my anxiety and frustration over the project. When I would get to a problem that I had absolutely no clue how to fix my first reaction was to panic, thinking that I wouldn't be able to figure it out, and then try to fix it without having a solid understanding of what was wrong. I had to learn how to step back and break down the problem or try to do things a different way. Sometimes my work was just reading or watching videos, other times I had to delete an entire days worth of code and I had to learn that it's okay to not have any new code written. Don't let yourself get overwhelmed, give yourself breaks and take it one piece at a time, you will eventually build something.

References

- [1] DJANGO. Django documentation v3.0, 2019.
- [2] HERMAN, M. "creating a custom user model in django", 2020.
- [3] JUSTDJANGO. Build a dynamic filtering form with django, 2019.

[1] [3] [2]