CPSC 471 Project Proposal:
Library Catalog System

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Introduction:

A library is defined as a collection of bibliography, books, movies, games, and other mediums that can be accessed by the public. While many library systems are fine to use to accomplish library tasks, some systems feel inefficient to do common tasks such as searching for items or requesting an item to put on hold. Our goal is to build a library web application that is simple and efficient for all users to accomplish typical library tasks along with a unique interaction feature to connect with other users; this is a feature that many library systems do not currently have. Making the library system more simple and efficient to use will allow users of the library system to accomplish their tasks more effectively, and thus improving their quality of life. The rest of this proposal will go over the problem, our proposed solution to the problem, and some of our motivations for this project.

Problem Definition:

We want to build an online library catalog web application where users are able to do essential library tasks effectively such as borrowing and returning items for library clients, and adding/removing items to/from the library catalog for librarians. This problem is interesting as it will involve building a full-stack web application with two different types of users (a customer and a librarian) which have different permission sets. This is not a novel problem and similar web applications currently exist for different libraries such as the University of Calgary library, or Calgary Public Library, both allow users to accomplish essential library tasks. However, as we interacted with these services, we encountered several problems with them such as clunkiness to search for items, because the default searches do not result in any information from the library catalog that most users would expect; instead, it requires the user to do more work in order to see items related to their searched keywords. While the current library systems that we have interacted with allow users to complete essential library tasks, we found that they can be rather tedious to accomplish because of how the specific system is designed and implemented; this means that there are likely systems that allow users to do all their tasks effectively, but the systems that we have looked at (University of Calgary Library and Calgary Public Library) all have some problems that can make it tedious for users to accomplish tasks. Our proposed solution aims to allow users to complete their essential library tasks effectively by creating a system that will be simple and efficient for users to complete their tasks.

Proposed Solution:

What does this project achieve?

In terms of what this project achieves in terms of objectives for this class, we wish to create a project that will allow us to learn about databases and how to implement it in a full stack web-based application using API calls to access the database. We will create a React frontend interface and a MySQL database that holds information about a library catalog, which would be accessed through an API written in Node.js.

What will the project produce?

We are going to build a full-stack react application for a library catalog that contains a database which contains information for a library catalog including titles, authors, genres, item descriptions, item availability through the library, and more for books, movies, and other mediums which will be accessed through an API written in Node.js. Users will be able to do common tasks from a library such as placing requests for books and movies (and potentially other mediums) at their specified library branch; searching the library catalog for specific titles; keyword searches such as genres, authors, year of release, etc; viewing the description and other information about the item; saving the item in a list for future usage; and other common library tasks. In addition to having standard features that a library is expected to have, there will also be social-interaction features for users such as for them to rate, comment, and give recommendations on other items; this will also make use of the MySQL database. The interactive features we are going to add is a unique functionality for our project. Most library systems we have encountered contain the necessary features for having a usable library, but they don't all contain interaction features that lets people give recommendations, reviews, opinions, suggestions, etc to books and other mediums that other users may find helpful when deciding whether they should check out an item or not; it can help introduce users to new items to potentially check out, or it can persuade them away from an item if it doesn't fit with what the user wants.

Describe in relative detail the features of each of the project's products.
NOTE: The features that have been mentioned here are at a fairly high level and may contain other features (sub-features) within them.

Proposed Feature	Feature Description
Searching up items	Users will be able to search for their desired item using a search bar. The default search will either be based on keywords or title of the item, but the user will have the option to change search criteria based on genre, year of release, author, etc.
Search results page	After a user searches for an item, there will be a page that contains a list of items that fit the searched criteria. We can also put a couple essential features on this page for each item such as availability information for the item and putting a request for the item if available.
Book information/description	There will be a page for each item that contains information about that item, and its attributes such as the title, author, genre, descriptions, availability, and more.
User data	There will be a section for user data, which contains information specific to each user such as how many items they have currently checked out, the due dates for their items, what items they have on hold, etc.
User profile page	Users will have an option to make publicly visible a profile page that can display some of the mediums that they have read, comments and ratings that they have done, favorite items, etc.
Adding and removing books from the catalog	Librarians will have the ability to add and remove items from the catalog. This is used when a library receives new items to add to their catalog, or they have to remove an item for whatever reason.
Librarian advanced searches	Librarians will have the ability to view information such as which user has the book currently checked out, when the book is expected to be returned, etc.
Program/events	Allow users to view and register for programs/events that are hosted by the library at particular branches. Programs/events contain information like event title, event

	description time and duration, dates, capacity, location, etc.
Account creation and login	These features facilitate the creation and login for users of the library system (both library clients and librarians). Account creation will ask for an email, username for the library system, and the password for the library system. There may also be additional features during signup like choosing the users' library branch. The account login process will just involve asking for the library username and password created during account creation.
Item check-out process	There will be a "cart" interface for users to add a number of items they want to check-out, then there will be a process to check-out the books by selecting the particular branch that the client wants to pick up the books from and a confirmation that they have requested the items. If some items are not available, there will be an interface here letting the clients know that they can be in a waitlist for those items.

Motivation:

We aim to make borrowing books, movies, and other items, and performing other library tasks simple and efficient, while also providing a system that will present items and user information in an organized manner. To this end, we want to build a web based application that incorporates a streamlined user interface with quick loading times for queries and a responsive system for users to use in general. This will allow both clients and librarians to do their library tasks with ease. This is important as libraries are used by people of all ages and we aim to create an interface that is accessible to less tech-savvy patrons such as the elderly. As it stands, we aim to implement essential features of a digital library in a simplistic and efficient way, all of which can be found in typical digital library systems such as the Calgary Public Library website. The addition of the interactive features that will allow users rate and leave reviews on items from the library is a unique feature that can help users select their next piece of bibliography.

Conclusion:

We aim to build a fully interactive library catalog system where users can borrow and return books, movies and other types of bibliography, search for items, and search for programs provided by the library with ease. Librarians can also use the system to

allow them to create, update and delete item entries from the database with ease. Additionally there will be unique interactive features such as commenting and rating items that other users of the library system can view, which provide information to users whether the item would be of interest to them or not. Overall, our goal is to create a streamlined library catalog that is easy and efficient to use for both library staff and library clients that contains all the necessities that a library has along with an interactive service which can improve the quality of life for users. We want to ensure that the process of borrowing items, returning items, searching for items, and participating in the library programs is seamless, simple, and efficient for users.

Estimated Timeline:

30 January, 2022	Submit project proposal
4 February, 2022	Translate book and other datasets into a tables in MySQL, create user tables in MySQL
11 February, 2022	Start working on API using Postman and Node.js
18 February, 2022	Finish building all the endpoints Submit extended/expanded ERD (Feb 17)
25 February, 2022	Start building the front end of the application and connect the API to the front end
4 March, 2022	Build authentication and the 2/3 types of users in the system Submit relational model from EERD (March 1)
11 March, 2022	Add features such as users loaning out books to users, calculating due dates and fines
18 March, 2022	Add features such as program to the database and connect to front end
25 March, 2022	Fix any bugs found and test the application
April 1, 2022	Fix any bugs found and test the application and work on final report
April 8, 2022	Demo the project
April 12, 2022	Submit final report

Inspiration/References:

We have taken inspiration for our project idea from library systems:

- University of Calgary Library (https://library.ucalgary.ca/)
- Calgary Public Library (https://calgarylibrary.ca/)

We have been inspired by interactive features on some websites that feature user feedback and ratings to create our social-interactive features such as ratings out of five stars. Some websites we were inspired by include letterboxd and IMDB.

- Letterboxd (https://letterboxd.com/)
- IMDB(https://www.imdb.com/)