Introduction: In this project, we aim to make the process of tracking and loaning an assortment of books, magazines, and digital media easier and more accessible. It will be able to keep track of the users membership to properly manage permissions allowing different views of the database and apply borrowing rules for them, as well as generate reports on total fees, client activity, inventory, and overdue items.

* Scope: We are designing, implementing, and managing a relational database system for a mock local library. The system will manage a diverse collection of loanable items, track various types of memberships, enforce borrowing rules and generate meaningful reports
* Glossary:
  + ER Diagram: Graphical representation of the database that uses entities that consist of describing attributes and relations between those entities to plan how data will be organized.
  + Relational Database: Way of organizing data in tables using rows, columns, and keys. Also uses connections between tables called relationships to allow multiple tables to join together
  + 3NF (Third Normal Form)/BCNF (Boyce-Codd Normal Form): Database normalization techniques that structure a relational database to reduce data redundancy
  + SQL (Structured Query Language): Programming language that allows users to communicate with relational databases to store, retrieve, and manipulate data
  + DDL (Data Definition Language): A language used to define the structure and schema of a database

Stakeholders:

* End-Users- These are the ordinary users who can check out books, magazines, or digital media
* Library Staff-They will run queries on this database to ensure that the books are checked out or in stock along with regular library functionalities (ex, checkout, checkin, search isb, search title/ availability,...).
* Database Administrator-This is a representative of the database, any or all questions or problems should be run through this entity.

Functional Requirements:

* User Administration- Allow for the administrator to manage user accounts, roles, and permissions within the database
* Data Entry- Admin should be able to access and update the inventory based on the requirements
* Retrieval- Users and library staff should be able to retrieve the items from inventory based on their search criterion, as well as other account information
* Updates-Allow for User Administration to update information of media, including availability of the media.
* Deletions-Allow for User Administration to delete media no longer belonging to the library, and to delete clients who are no longer using the database’s services
* Report Generation-Library staff can generate a report based on financials, overdue items, inventory, client activity, and a monthly summary

Data Requirements:

* Entities:
  + Book: {title, author, ISBN, publication\_year, genre, availability\_status}
  + Digital Media: {title, creator, ISBN, publication\_year, genre, availability\_status}
  + Magazine: {title, issue\_number, publication\_date, availability\_status}
  + Client: {unique\_id, name, contact\_info, membership\_type, account\_status}
  + Fee: {unique\_id, ISBN, membership\_type}

User Requirements:

* User Types:
  + End User
    - Search/checkout items from the database
    - Check loan status and view outstanding fees
    - Get recommendations based on the selected genre (sorted out through popularity or number of checkouts)
  + Library Staff
    - Manage client accounts and maintain the list of items based on several criteria, such as genre, popularity, date of buying, etc.
    - Generate a report of total fees collected within the last month, broken down by membership type
    - Produce a list of clients who have exceeded their borrowing limits
    - Determine the most frequently borrowed items by each client type
    - Perform basic mathematical calculations to figure out average loan time, amount due by the client, etc.
    - Be able to update the information of existing entities as needed
  + Database Admin
    - Summarize the library’s revenue from fees, and manage the membership and inventory items
    - Have low level access to the database
    - Be able to create or update entities
    - Able to access client activity

Hardware and Software Requirements:

* Hardware: This will run on an individual device, since the overall database size/use case is relatively small it will not require much storage/processing power
* Software: We will make this project using SQL, specifically MySQL

Appendices:

* There is currently no addition needed here, but it will be updated as required.

GitHub repository management:

* A new path was added for the Database Requirements to easily separate this document from previous documents