Introduction [5 points]:

Project Overview: Srihari

This database is intended to maintain records of inventory and services for a small town’s library. This includes all typical operations expected of a small town’s library.

Scope: Adam

Items included in the scope: loanable items (Books, DVDs, CDs, Magazines), in library services (computer access, newspaper, microfiche), customers, and librarians. It will include a borrowing/returning system with limits, fees, and reservations. Different user interfaces will be created for staff and clients, allowing book checkouts, catalog searches, and overdue fee tracking. The database will be implemented in MariaDB and will include queries for generating various reports.

The system will not include a fully developed UI, AI-based recommendations, external payment integration, or multi-library support.

Glossary:

- **ISBN** – International Standard Book Number, a unique identifier for books.
- **Loanable Items** – Books, DVDs, CDs, and magazines that members can borrow.
- **Reservation** – The process of placing a hold on a currently checked-out item.
- **Overdue Fee** – A fine charged to a member for returning an item late.
- **MariaDB –** The relational database management system used for implementation.

Stakeholders [5 points]: Aiden

- Users
    - Seniors
    - Adults
    - Children
- Staff
    - Administrators
        - CEO
        - Board Members
        - Managers
    - Librarians
    - Assistant Librarian
        - Page
    - Programming Coordinator
    - Volunteers
- City
    - Taxpayers
    - Treasurer
- Content Creators
    - Authors
    - Directors
    - Artists
- Content Distributors
    - Publishers

Misc:

- User interface for staff
    - Loan items to customers
- User interface for customers
    - Reserve items

User Administration:

- Adding new users and staff to the database
- Removing users and staff
- Updating user attributes (fees, loaned items, reserved items)

Data Administration:

- Adding loanable item entries to support the process of adding new books/movies/etc to the library.
- Removing existing entries to reflect the removal of destroyed or missing items.
- Updating item statuses (Loanable / Stock values)
- Updating missing items (check if item has not been returned in x number of days)

Data Retrieval:

- Example Queries:
    - List all currently loaned books
    - List all accounts with an outstanding fine
    - Filter loanable items based on type (book, DVDs, newspaper)
    - Filter books based on year, genre, publisher
    - Search for specific item name

Report Generation:

- Analyze the full list of loans (both active and prior) and identify the most popular items. Include different search filters such as the past week, month, or year.
- Analyze the database for unpopular items
- Determine which items are popular by user age
- Report on the amount of time computers have been used

Data Entities (and attributes):

- Books
    - Item ID [Int] [Not Null]
    - ISBN [Int] [Not Null]
    - Dewey Decimal [Text]
    - Title [Text]
    - Author [Text]

    - Genre [Text]
    - Year [Date]
    - Publisher [Text]
    - Loanable [Int]
    - Stock [Int] [Not Null]
    - Shelved [Bool] [Not Null]
- DVDs
    - Item ID [Int] [Not Null]
    - Title [Text]
    - Directors [Text]
    - Publisher [Text]
    - Year [Date]
    - Loanable [Int]
    - Stock [Int] [Not Null]
    - Shelved [Bool] [Not Null]
- CDs
    - Item ID [Int] [Not Null]
    - Title [Text]
    - Performing Artists [Text]
    - Distributor [Text]
    - Year [Int]
    - Loanable [Int]
    - Stock [Int] [Not Null]
    - Shelved [Bool] [Not Null]
- Magazines
    - Item ID [Int] [Not Null]
    - Title [Text]
    - Issue number [Int]
    - Publication date [Date]
    - Stock [Int] [Not Null]
    - Shelved [Bool] [Not Null]
- Customer
    - UserID [Int] [Not Null]
    - Name [Text]
    - Contact Information
        - Phone [Int]
        - Email [Text]
        - Address [Text]
    - Age [Int]
    - Status [Text]
    - Fees [Float]
- Computer
    - ID [int] [Not Null]
    - Available [bool]

- Microfiche(Newspapers)
    - Publisher/Name [Text] [Not Null]
    - Publishing date [Date] [Not Null]

Hardware and Software Requirements [5 points]: Peter

We will be running a self-hosted MariaDB database on a team member's server. The database will be deployed using the official MariaDB docker image, and all of the necessary network configurations will be established so that the team (and anyone with the login credentials) will be able to access the database via a URL. The database will have 16GB of storage, 1 core/2 threads, and 1GB of RAM allocated, which should be sufficient for the scope of the project. Should more resources be needed, the limits can be scaled up as required.

To connect to the database, users can connect to the URL "sql.peterpham.me" on port 3306. The database is "eecs", username is "user", and the password is "EECS447". For security, the firewall will only allow connections via KU's subnet (129.237.0.0/16) and the team members' home IPs if they desire to work on the database remotely.