# Library Management System – Project Tasks (Updated)

## S1. Database & Tables

* Create a `library` database.
* Create the following tables with appropriate datatypes and constraints:
* - `books` – `id`, `title`, `author`, `genre`, `published\_date`, `stock`
* - `members` – `id`, `first\_name`, `last\_name`, `email`, `membership\_date`
* - `loans` – `id`, `book\_id`, `member\_id`, `loan\_date`, `due\_date`, `return\_date`
* - `late\_fees` – `id`, `member\_id`, `amount`, `reason`, `date\_issued`

## S2. Constraints

* Add a NOT NULL constraint to required fields.
* Add a UNIQUE constraint on `members.email`.
* Add a CHECK constraint to ensure `stock >= 0`.
* Add a FOREIGN KEY constraint linking loans to books and members.

## S3. Insert Data

* Insert at least 10 books.
* Insert at least 5 members.
* Insert sample loan transactions (mix of returned and overdue books).
* Insert some sample late fee records.

## S4. Basic Queries

* Select all books by a specific author.
* List members who joined in the last 6 months.
* Show all overdue books (books where `return\_date` is NULL and `due\_date` is before today).

## S5. Joins

* Display each loan with member full name and book title.
* List all members who currently have borrowed books (no return date).

## S6. Aggregations

* Count total books in the library.
* Show the number of loans per member.
* Find the most borrowed book.

## S7. Sorting & Set Operations

* Sort books by published date (newest first).
* Use UNION to combine a list of all authors and members’ first names.
* Use INTERSECT to find names that appear in both members and authors.
* Use EXCEPT to find members who are not authors.

## S8. Subqueries

* Find members who have borrowed more than the average number of books.
* List books that are currently loaned out.
* Find members who have overdue loans using a subquery.

## S9. Indexing

* Create an index on `books.title` for faster title search.
* Create an index on `loans.due\_date` for quick overdue checks.

## S10. Views

* Create a view `active\_loans` showing all currently borrowed books with member name and due date.
* Create a view `member\_summary` showing total loans and total late fees for each member.
* Create a view `popular\_books` showing books ordered by number of times borrowed.