



ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ



Software Engineering

Project title: “ Library Borrowing and Book Tracking System”

Progress Report for Week1

Group 4-I4GIC-A

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Academic Year 2025-2026

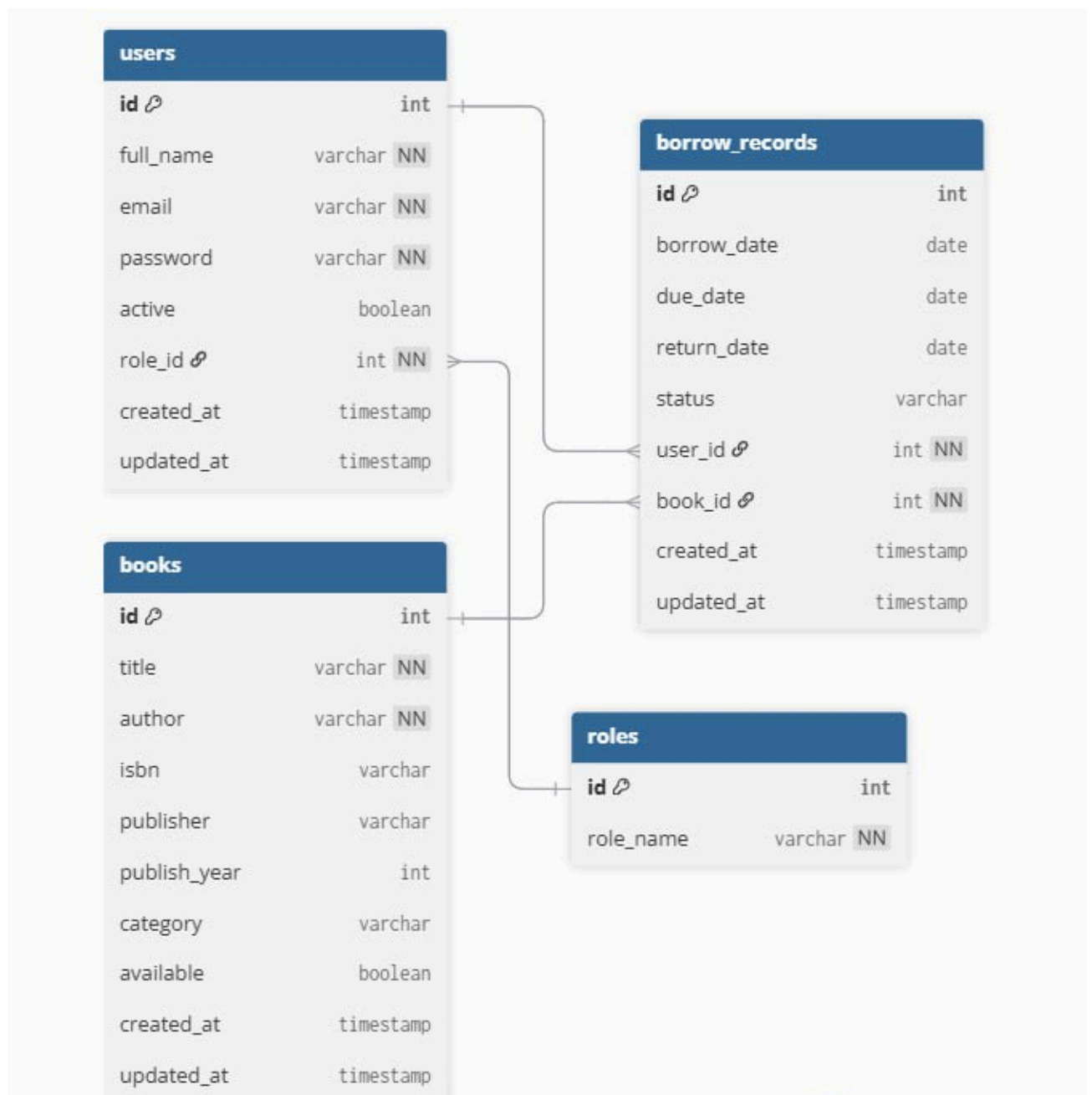
Library Borrowing and Book Tracking System

1. Setting up

- We set up the project environment using Spring Boot, Thymeleaf.

2. Complete Relational database, Relationship, and Constraint Summary

2.1. Relational Database



2.2 Relationship

From table	To table	Relationship	Description
USERS	BORROW_RECORDS	1:M	One user borrows many times
BOOKS	BORROW_RECORDS	1:M	One book borrowed many time
ROLES	USERS	1:M	One role assigned to many user

2.3. TABLE-SPECIFIC CONSTRAINTS

a. users

Column	Type	Constraint	Description
Id	int	PK, AUTO_INCREMENT	Unique user ID
Full-name	varchar	NOT NULL	User full name
email	varchar	UNIQUE, NOT NULL	Login email
password	varchar	NOT NULL	Encrypted password
active	boolean	NULLABLE	Account active status
role_id	int	FK → roles.id, NOT NULL	User role (Admin, Librarian, Teacher, Student)
create_at	timestamp	DEFAULT CURRENT_TIMESTAMP	Record creation timestamp
update_at	timestamp	DEFAULT CURRENT_TIMESTAMP	Last update timestamp

- All users are stored in one table
- Role determines permissions in the system

b. books

Column	Type	Constraint	Description
id	int	PK, Auto Increment	Unique book ID
title	varchar	NOT NULL	Book title
author	varchar	NOT NULL	Author name
isbn	varchar	UNIQUE	Book ISBN number
publisher	varchar	NULLABLE	Publisher name
publisher_year	int	NULLABLE	Year of publication
category	varchar	NULLABLE	Book category/genre
available	boolean	NULLABLE	Whether the book is available to borrow
create_at	timestamp	DEFAULT CURRENT_TIMESTAMP	Record creation timestamp
updated_at	timestamp	DEFAULT CURRENT_TIMESTAMP	Last update timestamp

- **available** helps track borrowing status

c. borrow_records

Column	Type	Constraint	Description
id	int	PK, AUTO_INCREMENT	Unique borrow record ID
borrow_date	date	NULLABLE	Date the book was borrowed
due_date	date	NULLABLE	Expected return date
return_date	date	NULLABLE	Actual return date
status	varchar	NULLABLE	Borrow status: BORROWED, RETURNED, OVERDUE
user_id	int	FK → users.id, NOT NULL	User who borrowed the book
book_id	int	FK → books.id, NOT NULL	Book borrowed
created_id	timestamp	DEFAULT CURRENT_TIMESTAMP	Record creation timestamp
updated_id	timestamp	DEFAULT CURRENT_TIMESTAMP	Record creation timestamp

- racks borrowing workflow
- **status** is used to detect overdue or returned books

d. roles

Column	Type	Constraint	Description
Id	Int	PK, AUTO_INCREMENT	Unique ID for each role
Role-name	Varchar	Unique, not null	Role type: LIBRARIAN, TEACHER, STUDENT

- Defines the type of user
- Use for **role-based access control**