Department of Statistics & Computer Science

University of Kelaniya

ACADEMIC YEAR -2023/2024(Semester ii)

Full-Stack Software Development

Lab Sheet 06

Objective: Develop a library management system using **Spring Boot** with **MongoDB** for database management. Implement CRUD operations and additional custom queries.

Questions:

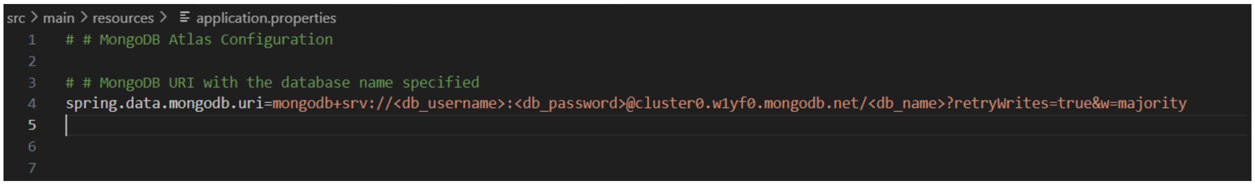
1. **Create the library backend with MongoDB**

Step 1: Set Up the Project

a. Create a new Spring Boot project using Spring Initializer.
b. Include the following dependencies:

- Spring Web (for RESTful capabilities)
- Spring Data MongoDB (for MongoDB integration)
- Lombok (to reduce boilerplate code)

I. Open the application.properties file and add the MongoDB configuration

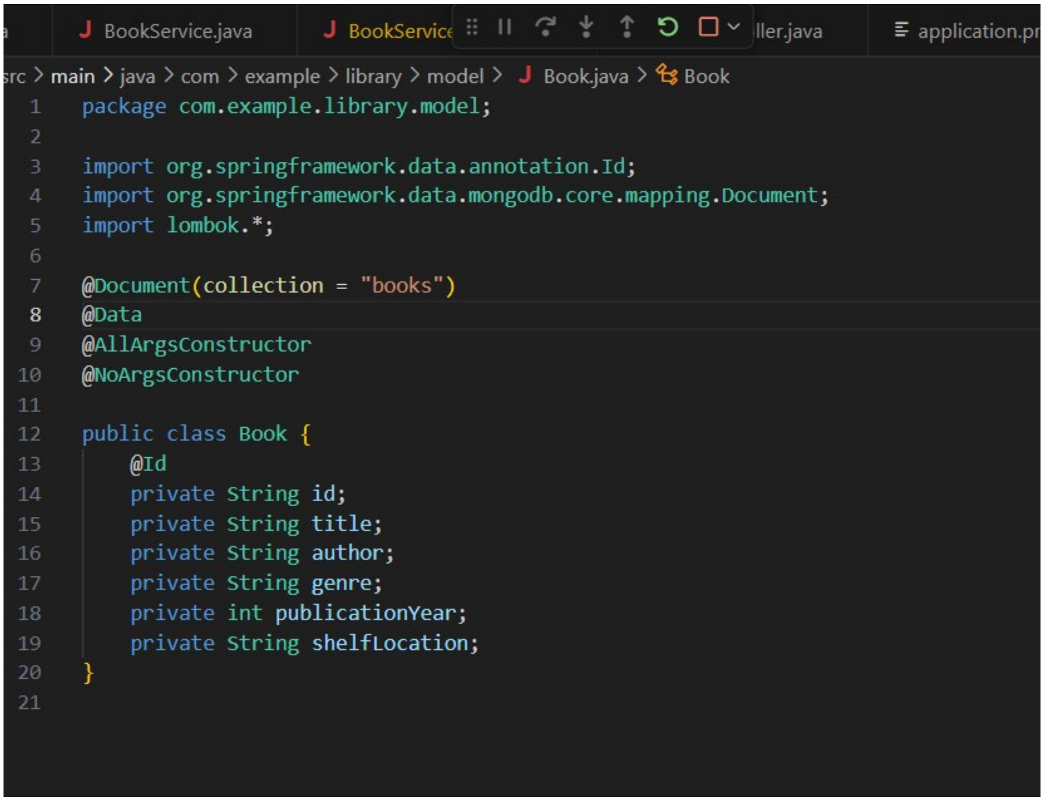


```
# # MongoDB Atlas Configuration

# # MongoDB URI with the database name specified
spring.data.mongodb.uri=mongodb+srv://<db_username>:<db_password>@cluster0.w1yf0.mongodb.net/<db_name>?retryWrites=true&w=majority


```

II. Create a book class using MongoDB.


BookService.java
BookServic
ller.java
application.pr
rc > main > java > com > example > library > model > Book.java > Book

```
package com.example.library.model;

import org.springframework.data.annotation.Id;
import org.springframework.data.mongodb.core.mapping.Document;
import lombok.*;

@Document(collection = "books")
@Data
@AllArgsConstructor
@NoArgsConstructor

public class Book {
    @Id
    private String id;
    private String title;
    private String author;
    private String genre;
    private int publicationYear;
    private String shelfLocation;
}
```

III. Create a book Repository Interface (This interface extends MongoRepository to handle CRUD operations).

IV. **Create the Book Service Interface to define the business logic methods required for managing books.**

In this interface, declare all the methods that the application should support, such as:

- Adding a new book
- Retrieving all books
- Fetching a book by its ID
- Updating book details
- Deleting a book by its ID
- Finding books by their publication year
- Getting the genre of a specific book by its ID
- Deleting all books published in a specific year

V. Implement the **BookServiceImpl** class.

VI. Create the **BookController** Class (Define REST API endpoints).

Submission Guidelines:

• Prepare a Word document named "PS/XXXX/XXX_Tutorial06" or "EC/XXXX/XXX_Tutorial06".

• Include the following elements:

▪ Header with your student number, Tutorial Number and course code.

▪ Source code, screenshots of your work.

▪ Footer with page number.