**Exercise 3: Online Bookstore - Handling Path Variables and Query Parameters**

import org.springframework.web.bind.annotation.\*;

import java.util.ArrayList;

import java.util.List;

import java.util.stream.Collectors;

@RestController

@RequestMapping("/books")

public class BookController {

private List<Book> books = new ArrayList<>();

// Initialize with some books

public BookController() {

books.add(new Book(1, "Java Programming", "John Smith", 29.99, "1234567890"));

books.add(new Book(2, "Python Essentials", "Jane Doe", 39.99, "0987654321"));

books.add(new Book(3, "Spring Boot Guide", "John Smith", 49.99, "1122334455"));

}

// GET all books

@GetMapping

public List<Book> getAllBooks(@RequestParam(required = false) String title,

@RequestParam(required = false) String author) {

// Filter books based on query parameters if provided

return books.stream()

.filter(book -> (title == null || book.getTitle().equalsIgnoreCase(title)) &&

(author == null || book.getAuthor().equalsIgnoreCase(author)))

.collect(Collectors.toList());

}

// GET a book by ID using path variable

@GetMapping("/{id}")

public Book getBookById(@PathVariable int id) {

return books.stream()

.filter(book -> book.getId() == id)

.findFirst()

.orElse(null);

}

// POST a new book

@PostMapping

public Book createBook(@RequestBody Book newBook) {

books.add(newBook);

return newBook;

}

// PUT to update an existing book

@PutMapping("/{id}")

public Book updateBook(@PathVariable int id, @RequestBody Book updatedBook) {

Book book = books.stream()

.filter(b -> b.getId() == id)

.findFirst()

.orElse(null);

if (book != null) {

book.setTitle(updatedBook.getTitle());

book.setAuthor(updatedBook.getAuthor());

book.setPrice(updatedBook.getPrice());

book.setIsbn(updatedBook.getIsbn());

}

return book;

}

// DELETE a book by ID

@DeleteMapping("/{id}")

public String deleteBook(@PathVariable int id) {

books.removeIf(book -> book.getId() == id);

return "Book with id " + id + " has been deleted.";

}

}

class Book {

private int id;

private String title;

private String author;

private double price;

private String isbn;

// Constructors, getters, and setters

public Book() {}

public Book(int id, String title, String author, double price, String isbn) {

this.id = id;

this.title = title;

this.author = author;

this.price = price;

this.isbn = isbn;

}

public int getId() {

return id;

}

public void setId(int id) {

this.id = id;

}

public String getTitle() {

return title;

}

public void setTitle(String title) {

this.title = title;

}

public String getAuthor() {

return author;

}

public void setAuthor(String author) {

this.author = author;

}

public double getPrice() {

return price;

}

public void setPrice(double price) {

this.price = price;

}

public String getIsbn() {

return isbn;

}

public void setIsbn(String isbn) {

this.isbn = isbn;

}

}