**Exercise 4: Creating and Configuring a Maven Project**

**📄 Project Overview**

This project demonstrates the setup and configuration of a Spring Boot application using **Maven** for a **Library Management System**. It follows a clean architecture and includes all required Spring Boot components for building RESTful APIs.

**🎯 Objectives**

* Create a Maven-based Java project.
* Add and configure required dependencies using Maven.
* Set up a well-structured application with appropriate layers.
* Implement backend functionality using Spring Boot and expose it via REST APIs.

**🛠 Technologies Used**

* Java 17
* Spring Boot 3.x
* Maven
* Spring Web
* Spring Data JPA
* H2 Database (in-memory)

**📦 Project Setup Process**

The project was initialized using Maven. It can be done either:

* Manually using the terminal  
  **or**
* Through [Spring Initializr](https://start.spring.io) (recommended)

**Steps Followed:**

1. Created a new Maven project with the base package structure:  
   com.example.library
2. Added Maven dependencies for:
   * Spring Boot Starter Web
   * Spring Boot Starter Data JPA
   * H2 Database
3. Created a main application class:  
   LibraryManagementApplication.java
4. Implemented core layers:
   * **Model** (Entity class for Book)
   * **Repository** (extends JpaRepository)
   * **Service** (handles business logic)
   * **Controller** (exposes REST endpoints)
5. Configured application.properties to use the H2 in-memory database.

**🚀 How to Build and Run**

Ensure you have Java 17+ and Maven installed.

**🧪 Terminal Commands:**

bash

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# Navigate to the project directory

cd library-management-ex4

# Build the project

mvn clean install

# Run the application

mvn spring-boot:run

Once started, the server runs at:

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http://localhost:8080

**📘 API Endpoints**

**➕ POST /books**

**Description:** Add a new book to the library system.

**Sample Request:**

json

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{

"title": "Clean Code",

"author": "Robert C. Martin"

}

**Sample Response:**

json

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{

"id": 1,

"title": "Clean Code",

"author": "Robert C. Martin"

}

**📚 GET /books**

**Description:** Retrieve a list of all books stored in the library.

**Sample Response:**

json

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[

{

"id": 1,

"title": "Clean Code",

"author": "Robert C. Martin"

}

]

**✅ Conclusion**

This exercise provides hands-on experience in setting up a full-fledged Spring Boot application using Maven. It introduces the basic structure and practices used in enterprise Java development, such as layering, dependency management, and API design.