Exercise 1: Configuring a Basic Spring Application

Scenario:

Your company is developing a web application for managing a library. You need to use the Spring Framework to handle the backend operations.

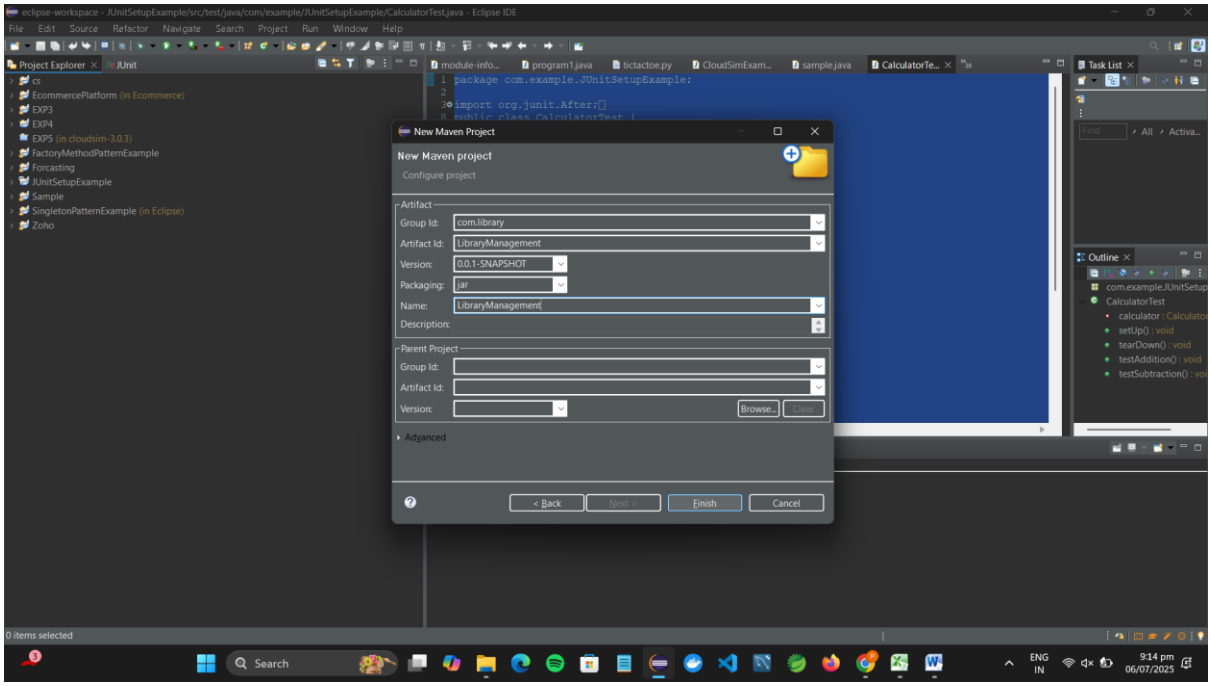
Steps:

Set Up a Spring Project:

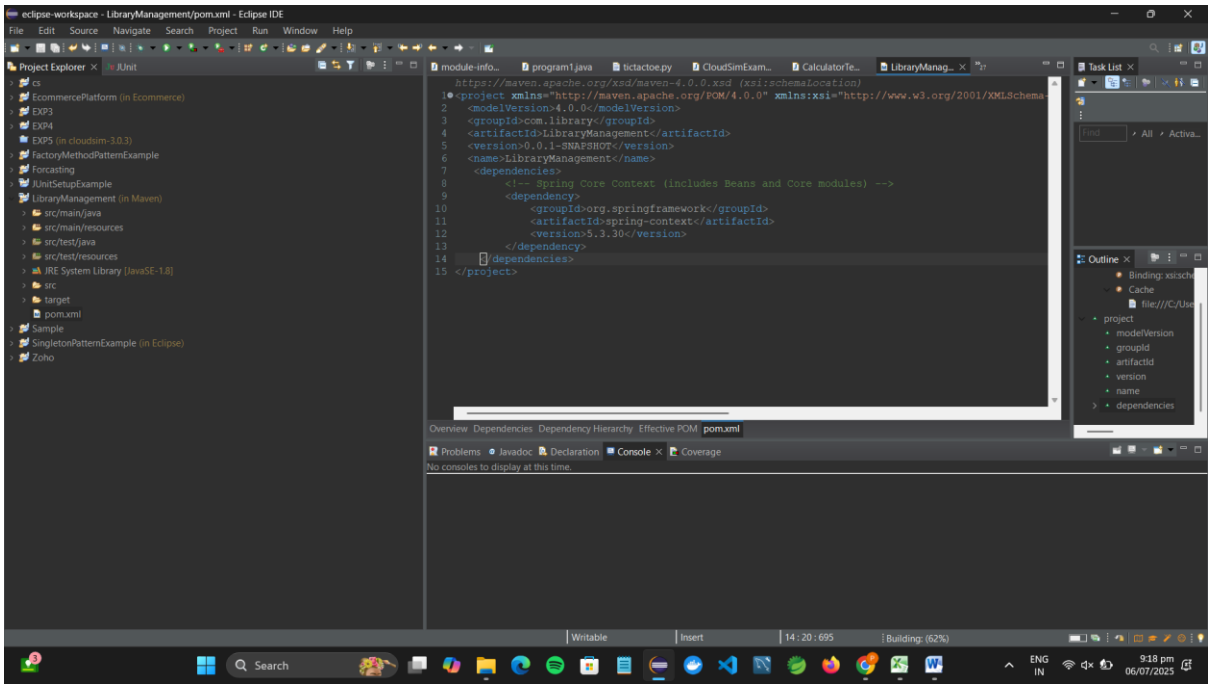
- Create a Maven project named **LibraryManagement**.

Open Eclipse:

1. Go to File → New → Project
2. Select Maven → Maven Project → **Next**
3. Choose **"Create a simple project"** → **Next**
4. Fill:
   - **Group Id:** com.library
   - **Artifact Id:** LibraryManagement
   - **Version:** (default is fine)
   - **Packaging:** jar
   - Click **Finish.**

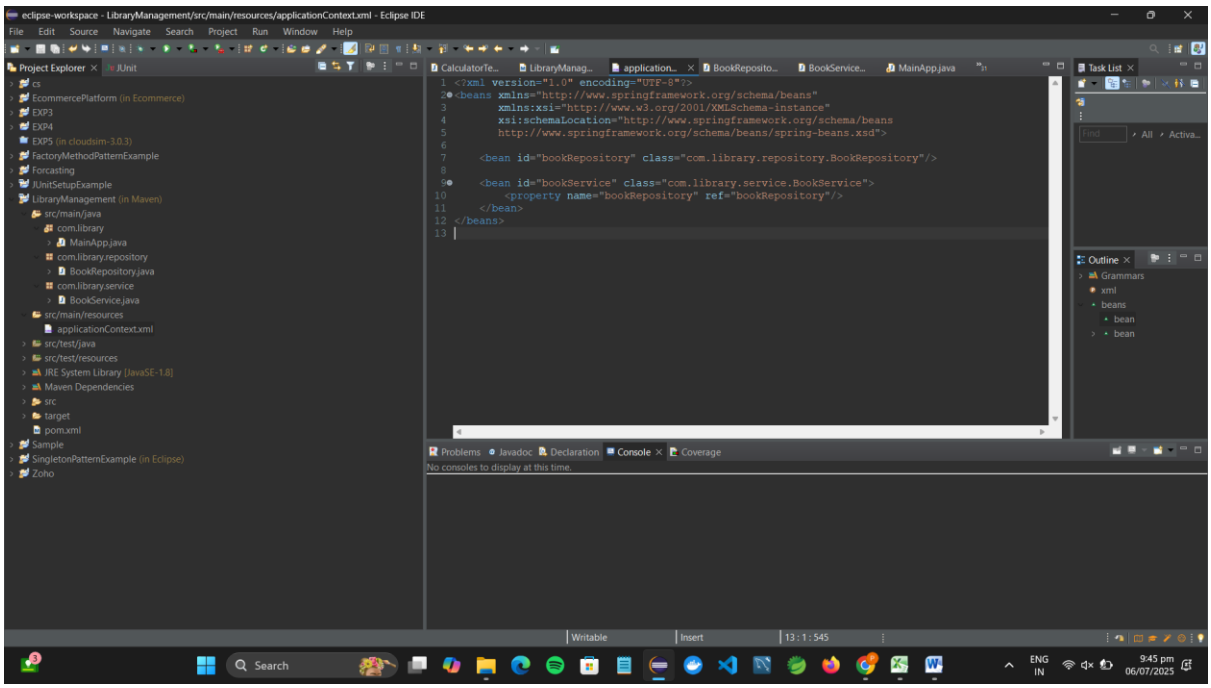


Add Spring Core dependencies in the **pom.xml** file.



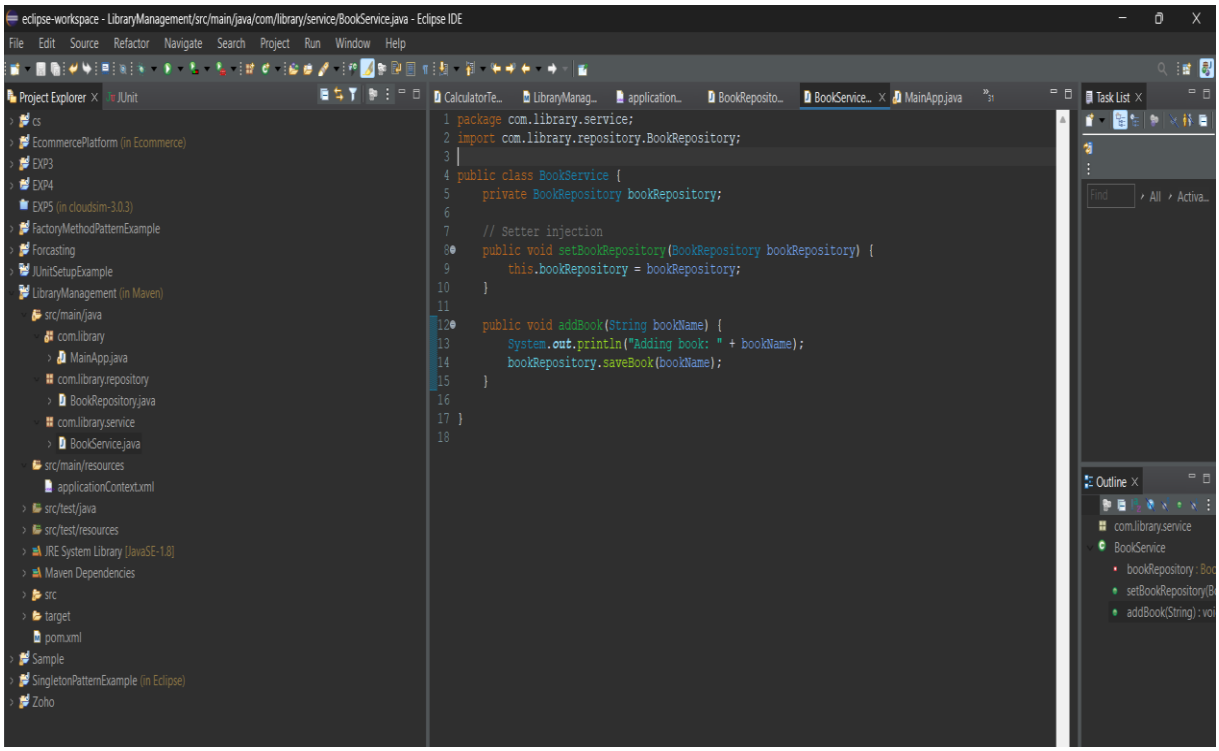
Configure the Application Context:

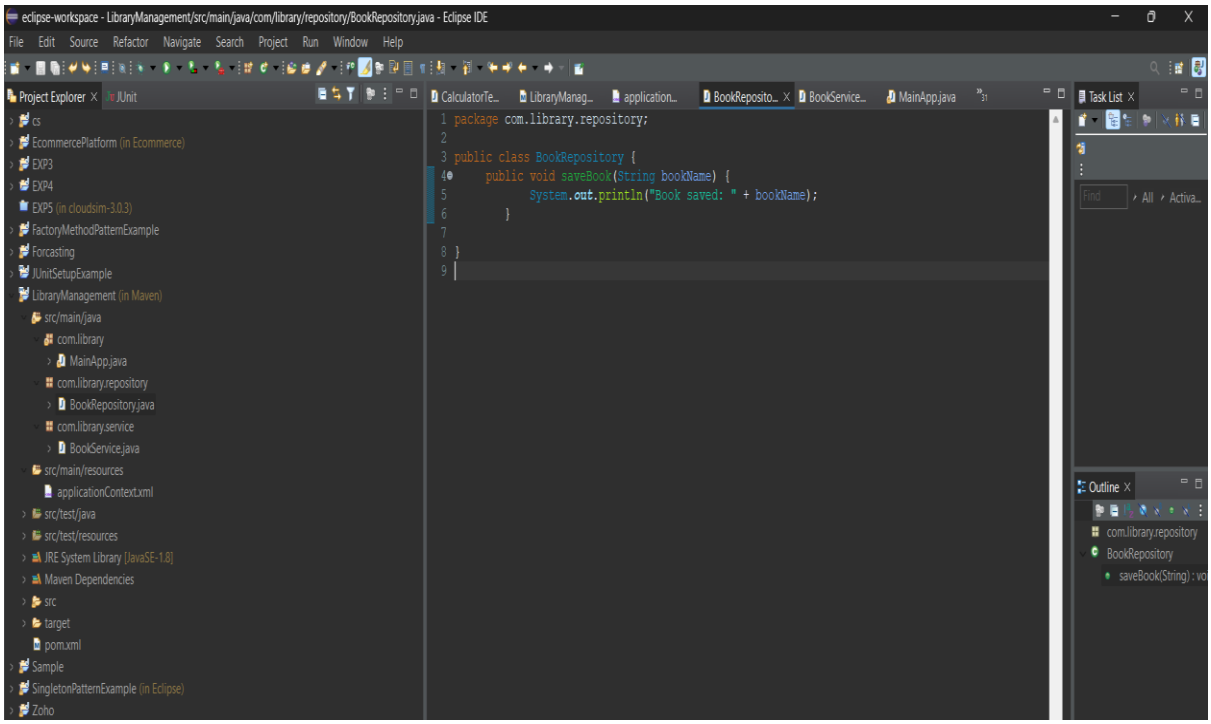
- Create an XML configuration file named **applicationContext.xml** in the **src/main/resources** directory.
- Define beans for **BookService** and **BookRepository** in the XML file.



Define Service and Repository Classes:

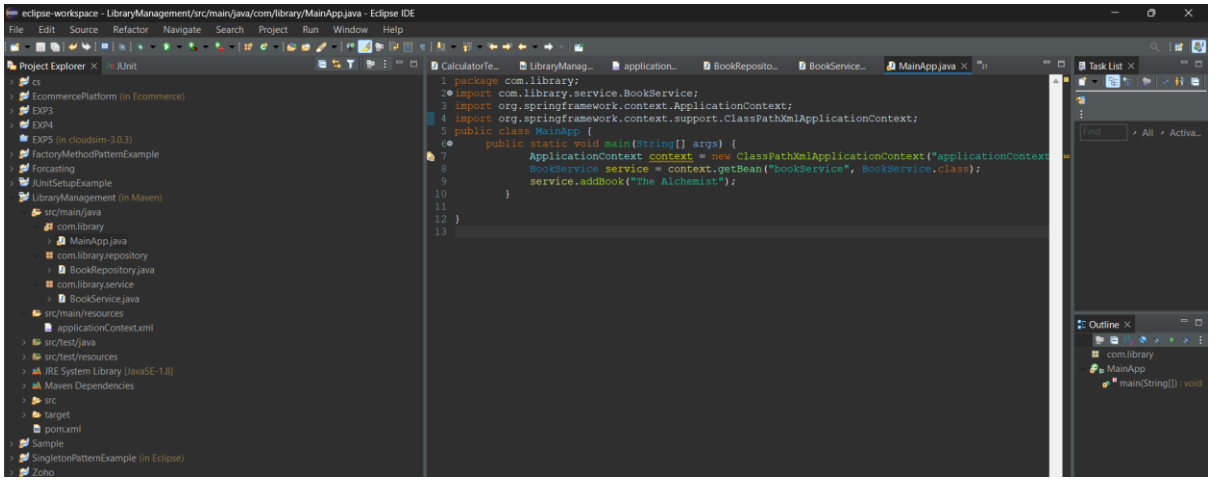
- Create a package **com.library.service** and add a class **BookService**.
- Create a package **com.library.repository** and add a class **BookRepository**.





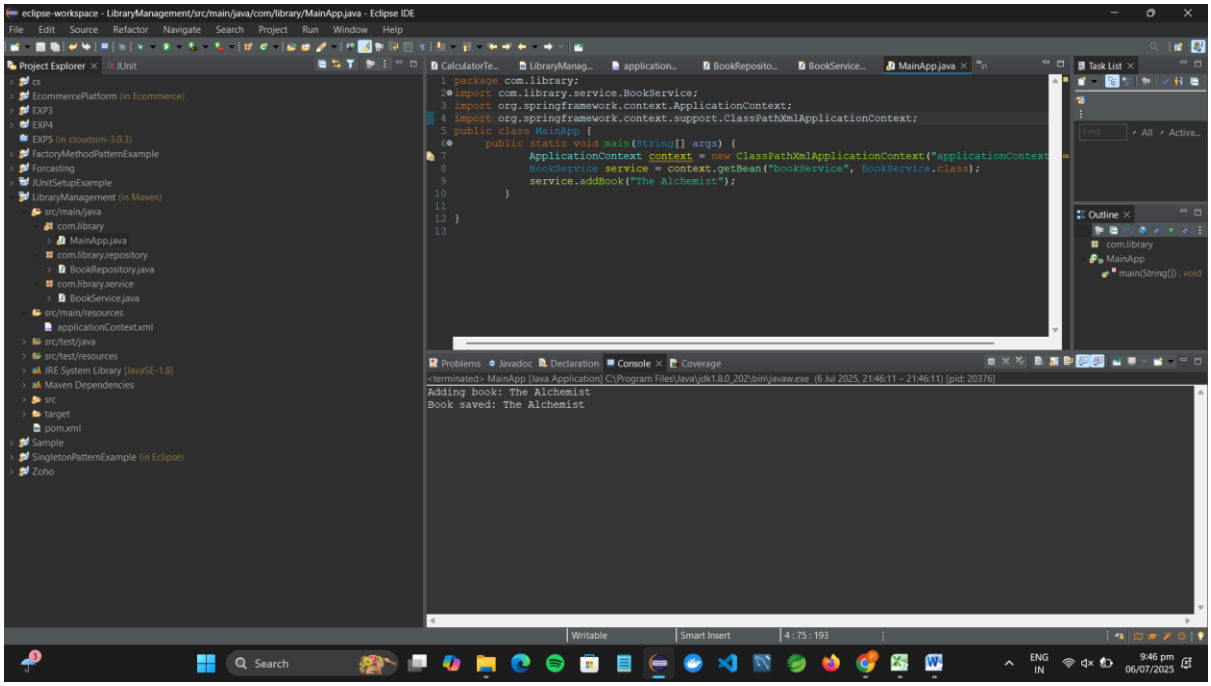
Run the Application:

Create a main class to load the Spring context and test the configuration



Right-click on MainApp.java → Run As → Java Application

Ouput Screenshot:



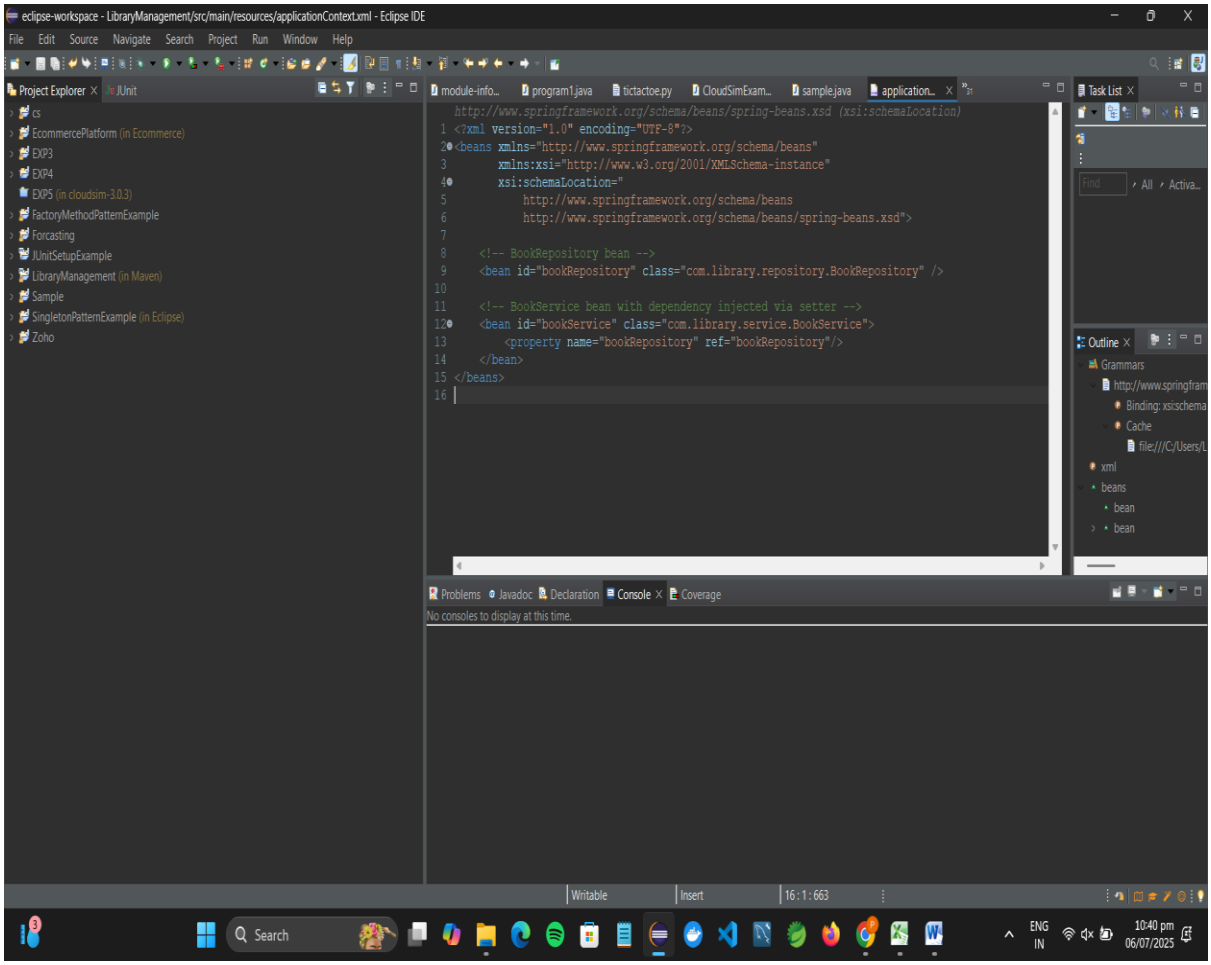
Exercise 2: Implementing Dependency Injection

Scenario:

In the library management application, you need to manage the dependencies between the BookService and BookRepository classes using Spring's IoC and DI.

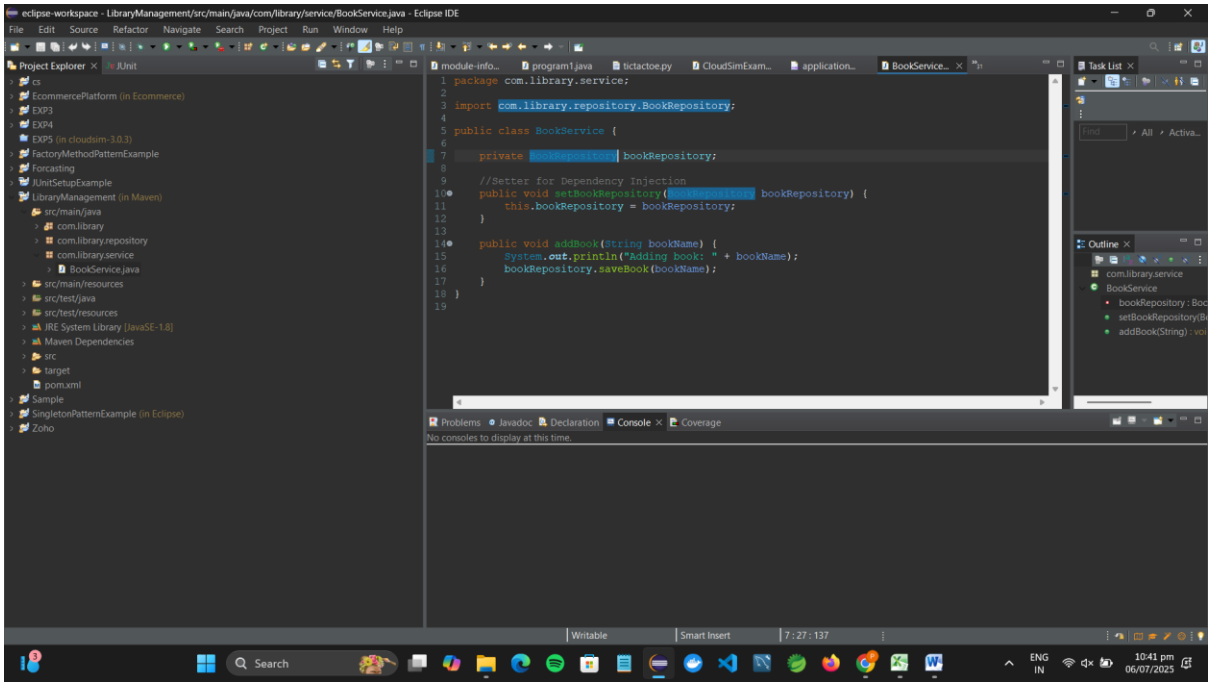
Steps:

1. **Modify the XML Configuration:**
    - Update **applicationContext.xml** to wire **BookRepository** into **BookService**.



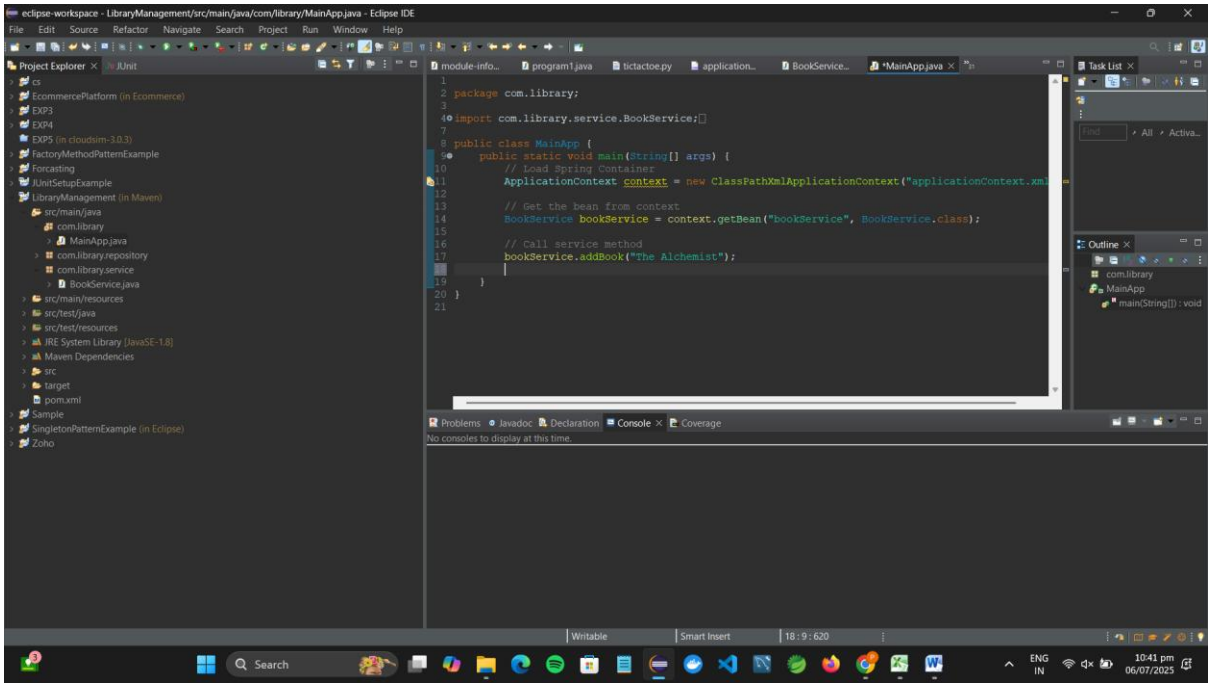
2. **Update the BookService Class:**

   - Ensure that **BookService** class has a setter method for **BookRepository**.

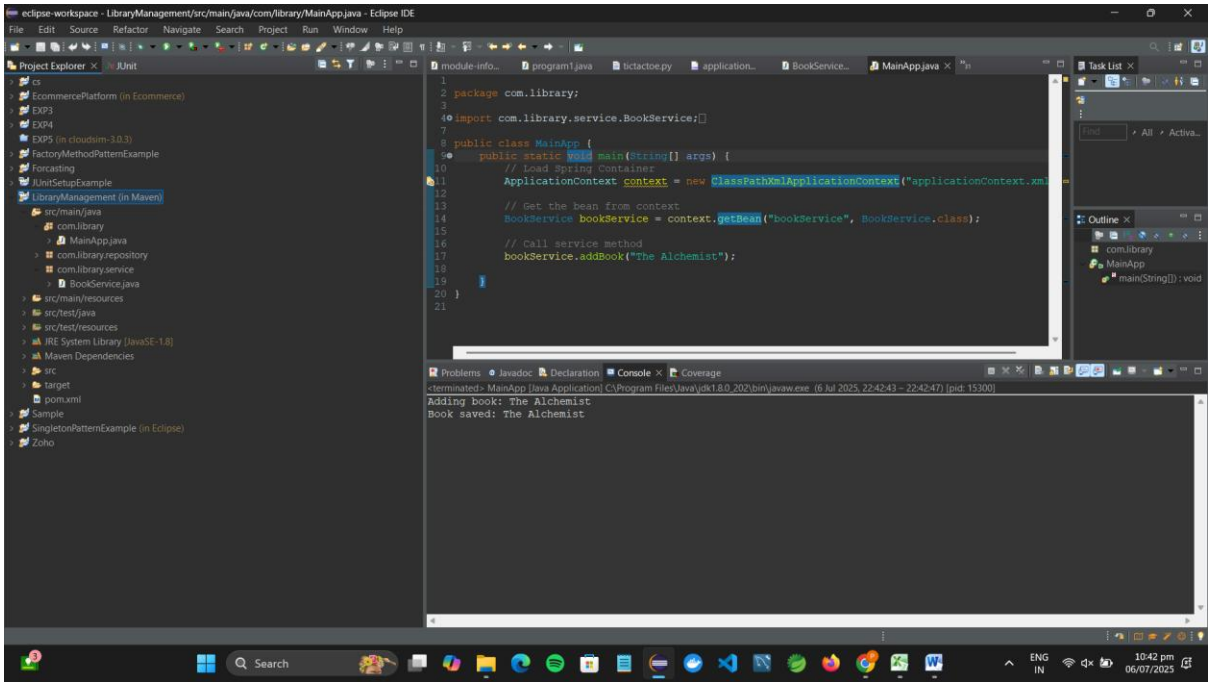


3. **Test the Configuration:**

   - Run the **LibraryManagementApplication** main class to verify the dependency injection.



Output Screenshot:



Result:

Component	Purpose
`applicationContext.xml`	Wires `bookRepository` into `bookService` using DI
`BookService.java`	Has a setter method to accept the injected dependency
`MainApp.java`	Loads Spring context and verifies DI works

Exercise 4: Creating and Configuring a Maven Project

Scenario:

You need to set up a new Maven project for the library management application and add Spring dependencies.

Steps:

1. **Create a New Maven Project:**
   - Create a new Maven project named **LibraryManagement**.
2. **Add Spring Dependencies in pom.xml:**
   - Include dependencies for Spring Context, Spring AOP, and Spring WebMVC.

Code:

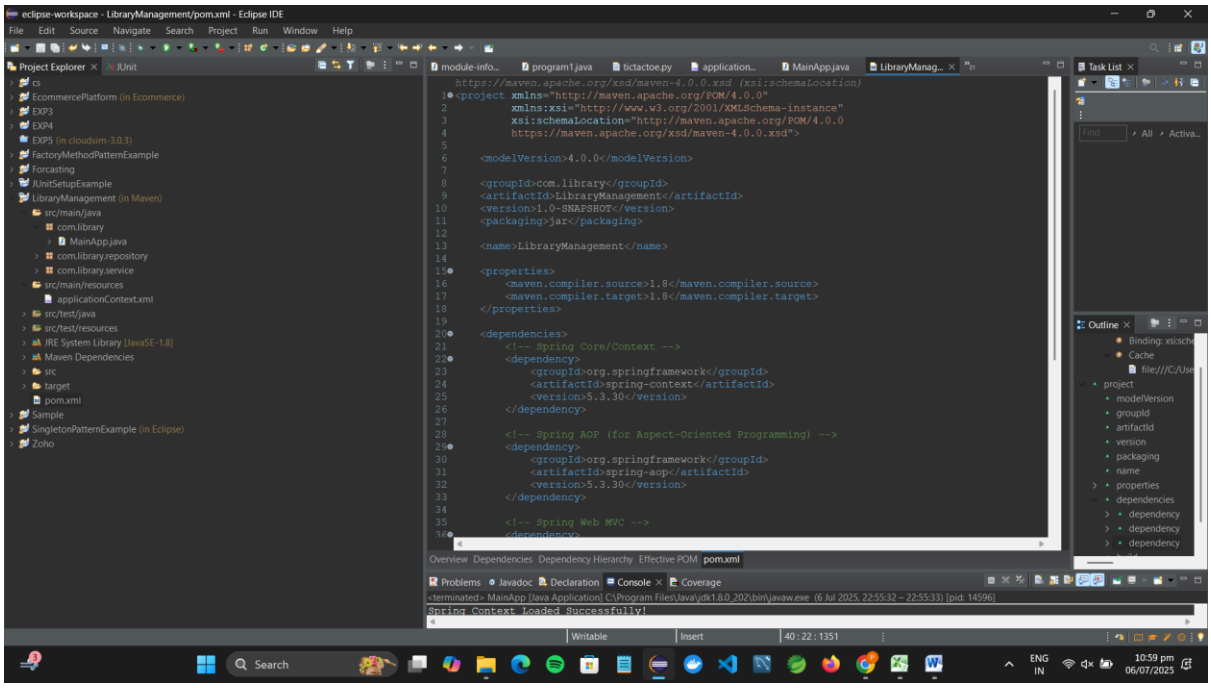
```
    <dependencies>
        <!-- Spring Core/Context -->
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-context</artifactId>
            <version>5.3.30</version>
        </dependency>

        <!-- Spring AOP (for Aspect-Oriented Programming) -->
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-aop</artifactId>
            <version>5.3.30</version>
        </dependency>

        <!-- Spring Web MVC -->
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-webmvc</artifactId>
            <version>5.3.30</version>
        </dependency>
    </dependencies>
```

3. **Configure Maven Plugins:**
   - Configure the Maven Compiler Plugin for Java version 1.8 in the pom.xml file.

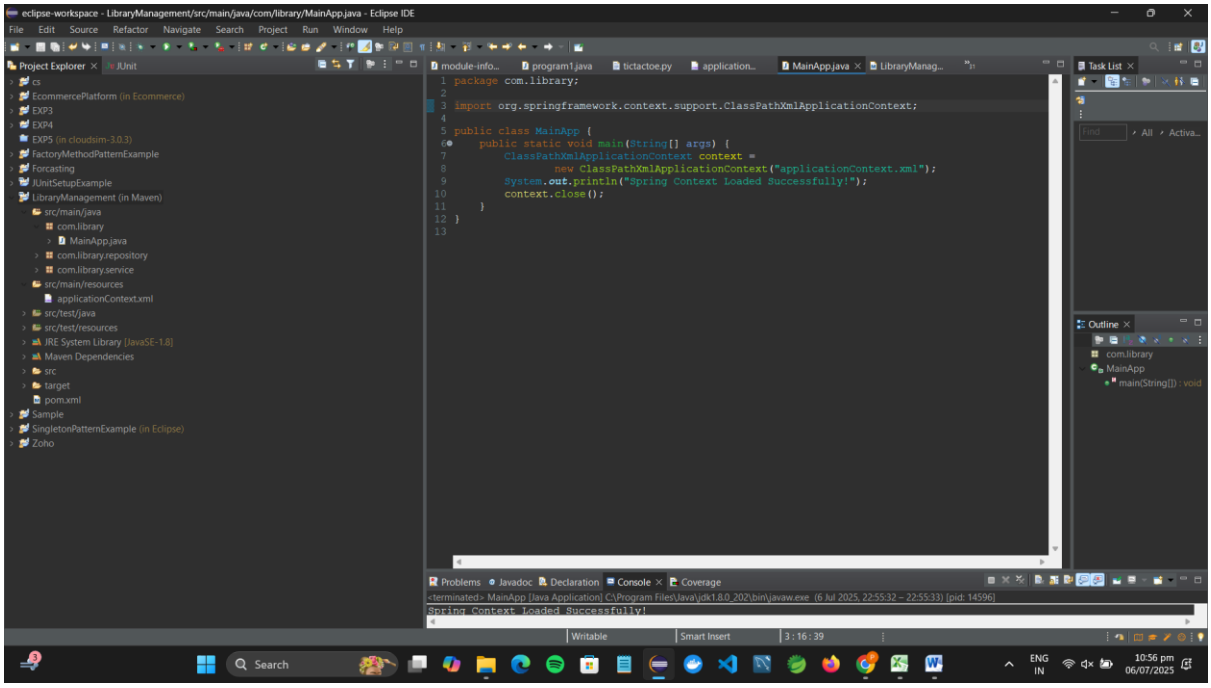
```
<plugins>
            <!-- Maven Compiler Plugin for Java 1.8 -->
            <plugin>
                <groupId>org.apache.maven.plugins</groupId>
                <artifactId>maven-compiler-plugin</artifactId>
                <version>3.8.1</version>
```

```
            <configuration>
                <source>1.8</source>
                <target>1.8</target>
            </configuration>
        </plugin>
    </plugins>
```

Updated pom.xml:



MainApp.java:



Output Screenshot: