

## Exercise 2: Implementing Dependency Injection

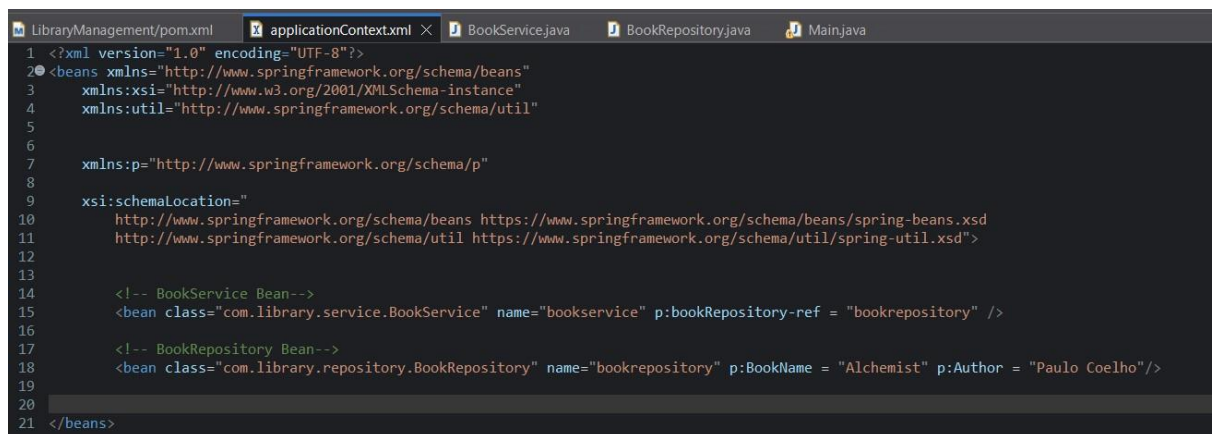
### Scenario:

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:

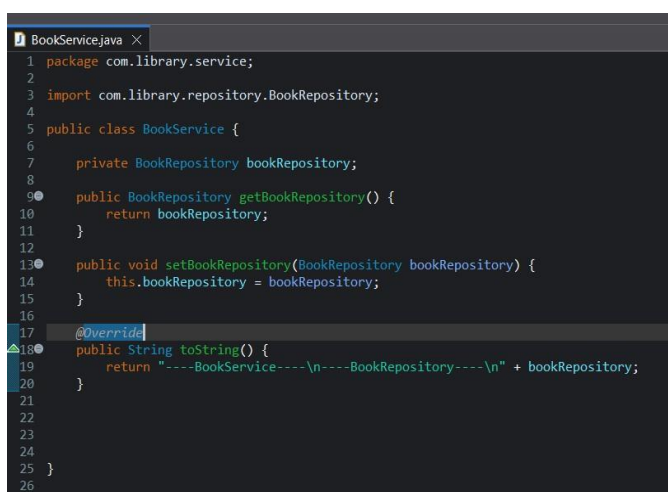
- Update `applicationContext.xml` to wire `BookRepository` into `BookService`.

A screenshot of an IDE showing the `applicationContext.xml` file. The file contains XML configuration for Spring beans. It defines two beans: `bookservice` of type `com.library.service.BookService` and `bookrepository` of type `com.library.repository.BookRepository`. The `bookservice` bean has a property `p:bookRepository-ref` set to `bookrepository`. The `bookrepository` bean has properties `p:BookName` set to `Alchemist` and `p:Author` set to `Paulo Coelho`.

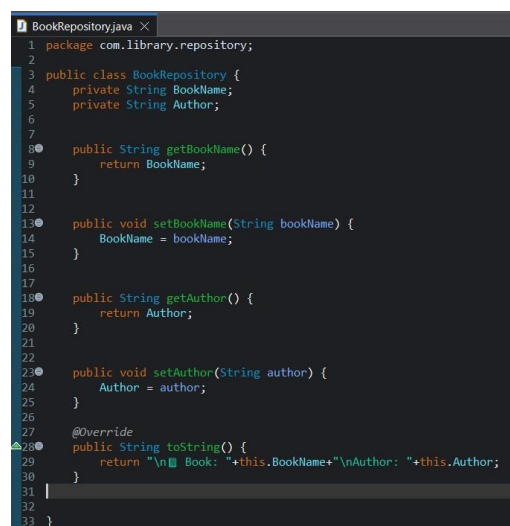
```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <beans xmlns="http://www.springframework.org/schema/beans"
3       xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
4       xmlns:util="http://www.springframework.org/schema/util"
5
6       xmlns:p="http://www.springframework.org/schema/p"
7
8       xsi:schemaLocation="
9         http://www.springframework.org/schema/beans https://www.springframework.org/schema/beans/spring-beans.xsd
10        http://www.springframework.org/schema/util https://www.springframework.org/schema/util/spring-util.xsd">
11
12    <!-- BookService Bean -->
13    <bean class="com.library.service.BookService" name="bookservice" p:bookRepository-ref = "bookrepository" />
14
15    <!-- BookRepository Bean -->
16    <bean class="com.library.repository.BookRepository" name="bookrepository" p:BookName = "Alchemist" p:Author = "Paulo Coelho"/>
17
18  </beans>
```

#### 2. Update the BookService Class:

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

A screenshot of an IDE showing the `BookService.java` file. The class is in the `com.library.service` package and imports `com.library.repository.BookRepository`. It has a private field `bookRepository` and methods `getBookRepository()`, `setBookRepository(BookRepository bookRepository)`, and `toString()`. The `setBookRepository` method sets `this.bookRepository` to the parameter. The `toString` method returns a string representation of the object, including the `bookRepository`.

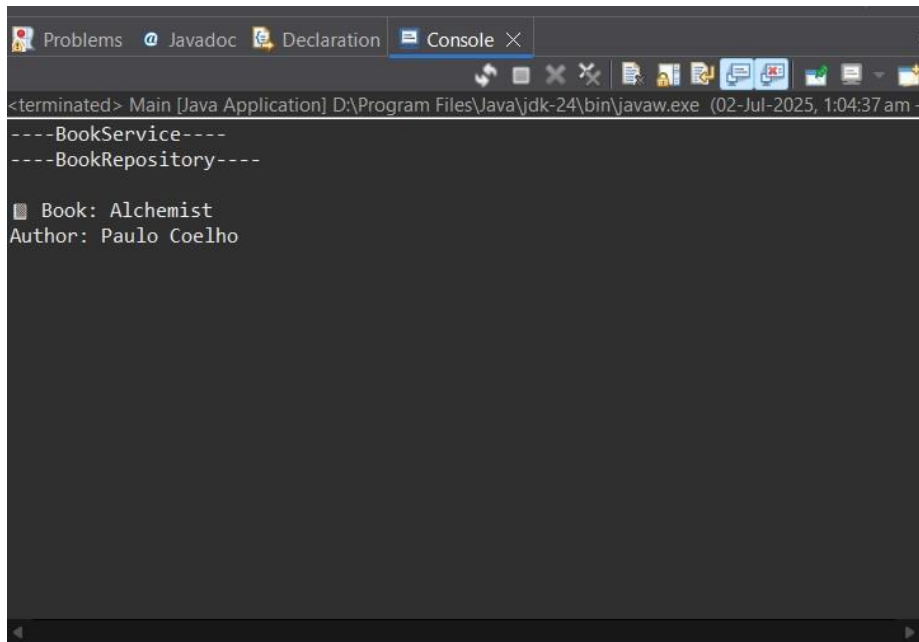
```
1 package com.library.service;
2
3 import com.library.repository.BookRepository;
4
5 public class BookService {
6
7     private BookRepository bookRepository;
8
9     public BookRepository getBookRepository() {
10         return bookRepository;
11     }
12
13     public void setBookRepository(BookRepository bookRepository) {
14         this.bookRepository = bookRepository;
15     }
16
17     @Override
18     public String toString() {
19         return "----BookService----\n---BookRepository---\n" + bookRepository;
20     }
21
22 }
23
24
25
26
```

A screenshot of an IDE showing the `BookRepository.java` file. The class is in the `com.library.repository` package. It has private fields `BookName` and `Author` and methods `getBookName()`, `setBookName(String bookName)`, `getAuthor()`, `setAuthor(String author)`, and `toString()`. The `setBookName` and `setAuthor` methods set the respective fields. The `toString` method returns a string representation of the object, including the `BookName` and `Author`.

```
1 package com.library.repository;
2
3 public class BookRepository {
4     private String BookName;
5     private String Author;
6
7
8     public String getBookName() {
9         return BookName;
10    }
11
12    public void setBookName(String bookName) {
13        BookName = bookName;
14    }
15
16    public String getAuthor() {
17        return Author;
18    }
19
20    public void setAuthor(String author) {
21        Author = author;
22    }
23
24    @Override
25    public String toString() {
26        return "\n Book: "+this.BookName+"\nAuthor: "+this.Author;
27    }
28
29
30
31
32
33
34
```

#### 3. Test the Configuration:

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



```
<terminated> Main [Java Application] D:\Program Files\Java\jdk-24\bin\javaw.exe (02-Jul-2025, 1:04:37 am -
----BookService----
----BookRepository----

Book: Alchemist
Author: Paulo Coelho
```