**Exercise 7: Implementing Constructor and Setter Injection**

**Scenario:**

The library management application requires both constructor and setter injection for better control over bean initialization.

**Steps:**

1. **Configure Constructor Injection:**
   * Update applicationContext.**xml** to configure constructor injection for **BookService**.
2. **Configure Setter Injection:**
   * Ensure that the **BookService** class has a setter method for **BookRepository** and configure it in **applicationContext.xml**.
3. **Test the Injection:**
   * Run the **LibraryManagementApplication** main class to verify both constructor and setter injection.

**LibraryManagementApplication.java**

package com.library;

import com.library.service.BookService;

import org.springframework.context.ApplicationContext;

import org.springframework.context.support.ClassPathXmlApplicationContext;

public class LibraryManagementApplication {

public static void main(String[] args) {

ApplicationContext context = new ClassPathXmlApplicationContext("applicationContext.xml");

BookService bookService = (BookService) context.getBean("bookService");

bookService.addBook("Clean Code by Robert C. Martin");

}

}

**BookRepository.java**

package com.library.repository;

public class BookRepository {

public void saveBook(String title) {

System.out.println("Book saved to DB: " + title);

}

}

**BookService.java**

package com.library.service;

import com.library.repository.BookRepository;

public class BookService {

private BookRepository bookRepository;

private String libraryName;

// Constructor Injection

public BookService(String libraryName) {

this.libraryName = libraryName;

}

// Setter Injection

public void setBookRepository(BookRepository bookRepository) {

this.bookRepository = bookRepository;

}

public void addBook(String title) {

System.out.println("[" + libraryName + "] Adding book: " + title);

bookRepository.saveBook(title);

}

}

**applicationContext.xml**

<?xml version="1.0" encoding="UTF-8"?>

<beans xmlns="http://www.springframework.org/schema/beans"

xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xsi:schemaLocation="

http://www.springframework.org/schema/beans

http://www.springframework.org/schema/beans/spring-beans.xsd">

<!-- BookRepository Bean -->

<bean id="bookRepository" class="com.library.repository.BookRepository" />

<!-- BookService Bean with Constructor + Setter Injection -->

<bean id="bookService" class="com.library.service.BookService">

<!-- Constructor injection: setting libraryName -->

<constructor-arg value="City Central Library" />

<!-- Setter injection: injecting BookRepository -->

<property name="bookRepository" ref="bookRepository" />

</bean>

</beans>

**pom.xml**

<?xml version="1.0" encoding="UTF-8"?>

<project xmlns="http://maven.apache.org/POM/4.0.0"

xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xsi:schemaLocation="http://maven.apache.org/POM/4.0.0

http://maven.apache.org/xsd/maven-4.0.0.xsd">

<modelVersion>4.0.0</modelVersion>

<groupId>com.library</groupId>

<artifactId>demo</artifactId>

<version>1.0-SNAPSHOT</version>

<name>Library Management</name>

<url>http://www.example.com</url>

<properties>

<project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>

<maven.compiler.source>1.8</maven.compiler.source>

<maven.compiler.target>1.8</maven.compiler.target>

</properties>

<dependencies>

<!-- Spring Context (for IoC container and XML config) -->

<dependency>

<groupId>org.springframework</groupId>

<artifactId>spring-context</artifactId>

<version>5.3.30</version>

</dependency>

<!-- Logging for Spring -->

<dependency>

<groupId>commons-logging</groupId>

<artifactId>commons-logging</artifactId>

<version>1.2</version>

</dependency>

<!-- JUnit for testing (optional) -->

<dependency>

<groupId>junit</groupId>

<artifactId>junit</artifactId>

<version>4.13.2</version>

<scope>test</scope>

</dependency>

</dependencies>

<build>

<plugins>

<!-- Compiler Plugin for Java 8 -->

<plugin>

<artifactId>maven-compiler-plugin</artifactId>

<version>3.8.1</version>

<configuration>

<source>${maven.compiler.source}</source>

<target>${maven.compiler.target}</target>

</configuration>

</plugin>

<!-- Exec Plugin to run main class -->

<plugin>

<groupId>org.codehaus.mojo</groupId>

<artifactId>exec-maven-plugin</artifactId>

<version>3.1.0</version>

<configuration>

<mainClass>com.library.LibraryManagementApplication</mainClass>

</configuration>

</plugin>

</plugins>

</build>

</project>

**Output**

**A screenshot of a computer program

AI-generated content may be incorrect.**