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

**Java Classes**

**BookRepository.java**

package com.example.library.repository;  
  
public class BookRepository {  
 public String findAll() {  
 return "All books";  
 }  
}

**BookService.java**

package com.example.library.service;  
  
import com.example.library.repository.BookRepository;  
  
public class BookService {  
 private BookRepository bookRepository;  
  
 // Default constructor (needed for setter injection)  
 public BookService() { }  
  
 // Constructor for constructor injection  
 public BookService(BookRepository bookRepository) {  
 this.bookRepository = bookRepository;  
 }  
  
 public void setBookRepository(BookRepository bookRepository) {  
 this.bookRepository = bookRepository;  
 }  
  
 public String listBooks() {  
 return bookRepository.findAll();  
 }  
}

**LibraryManagementApplication.java**

package com.example.library;  
  
import org.springframework.context.ApplicationContext;  
import org.springframework.context.support.ClassPathXmlApplicationContext;  
import com.example.library.service.BookService;  
  
public class LibraryManagementApplication {  
 public static void main(String[] args) {  
 ApplicationContext ctx = new ClassPathXmlApplicationContext("applicationContext.xml");  
  
 BookService ctorBean = ctx.getBean("bookServiceCtor", BookService.class);  
 BookService setterBean = ctx.getBean("bookServiceSetter", BookService.class);  
  
 System.out.println("Constructor‑injected: " + ctorBean.listBooks());  
 System.out.println("Setter‑injected : " + setterBean.listBooks());  
  
 ((ClassPathXmlApplicationContext) ctx).close();  
 }  
}

**Spring Configuration File**

**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  
 https://www.springframework.org/schema/beans/spring-beans.xsd">  
  
 <bean id="bookRepository" class="com.example.library.repository.BookRepository"/>  
  
 <!-- Constructor injection -->  
 <bean id="bookServiceCtor" class="com.example.library.service.BookService">  
 <constructor-arg ref="bookRepository"/>  
 </bean>  
  
 <!-- Setter injection -->  
 <bean id="bookServiceSetter" class="com.example.library.service.BookService">  
 <property name="bookRepository" ref="bookRepository"/>  
 </bean>  
  
</beans>  
**Pom.xml**

<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.example</groupId>

<artifactId>LibraryManagement</artifactId>

<version>1.0-SNAPSHOT</version>

<packaging>jar</packaging>

<properties>

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

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

<spring.version>5.3.32</spring.version>

</properties>

<dependencies>

<dependency>

<groupId>org.springframework</groupId>

<artifactId>spring-context</artifactId>

<version>${spring.version}</version>

</dependency>

<dependency>

<groupId>org.springframework</groupId>

<artifactId>spring-aop</artifactId>

<version>${spring.version}</version>

</dependency>

<dependency>

<groupId>org.springframework</groupId>

<artifactId>spring-webmvc</artifactId>

<version>${spring.version}</version>

</dependency>

<dependency>

<groupId>jakarta.servlet</groupId>

<artifactId>jakarta.servlet-api</artifactId>

<version>5.0.0</version>

<scope>provided</scope>

</dependency>

<dependency>

<groupId>junit</groupId>

<artifactId>junit</artifactId>

<version>4.13.2</version>

<scope>test</scope>

</dependency>

</dependencies>

<build>

<plugins>

<plugin>

<groupId>org.apache.maven.plugins</groupId>

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

<version>3.11.0</version>

<configuration>

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

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

</configuration>

</plugin>

</plugins>

</build>

</project>

**Output:**

