**Exercise 3: Implementing Logging with Spring AOP**

**CODE:**

***pom.xml file: -***

<?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>org.example</groupId>  
 <artifactId>LibraryManagement</artifactId>  
 <version>1.0-SNAPSHOT</version>  
  
 <properties>  
 <maven.compiler.source>21</maven.compiler.source>  
 <maven.compiler.target>21</maven.compiler.target>  
 <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>  
 </properties>  
 <dependencies>  
 <!-- https://mvnrepository.com/artifact/org.springframework/spring-context -->  
 <dependency>  
 <groupId>org.springframework</groupId>  
 <artifactId>spring-context</artifactId>  
 <version>6.2.6</version>  
 </dependency>  
 <!-- https://mvnrepository.com/artifact/org.springframework/spring-core -->  
 <dependency>  
 <groupId>org.springframework</groupId>  
 <artifactId>spring-core</artifactId>  
 <version>6.2.6</version>  
 </dependency>  
 <!-- https://mvnrepository.com/artifact/org.springframework/spring-aop -->  
 <dependency>  
 <groupId>org.springframework</groupId>  
 <artifactId>spring-aop</artifactId>  
 <version>6.2.6</version>  
 </dependency>  
  
 <!-- https://mvnrepository.com/artifact/org.aspectj/aspectjweaver -->  
 <dependency>  
 <groupId>org.aspectj</groupId>  
 <artifactId>aspectjweaver</artifactId>  
 <version>1.9.22.1</version>  
 </dependency>  
 </dependencies>  
</project>

***BookService Class: -***

package org.Library.service;  
  
import org.Library.repository.BookRepository;  
  
public class BookService {  
 private BookRepository bookRepository;  
  
 public void setBookRepository(BookRepository bookRepository) {  
 this.bookRepository = bookRepository;  
 }  
  
 public void addBook(String title){  
 System.*out*.println("Saving book...");  
 bookRepository.saveBook(title);  
 }  
}

***BookRepository Class: -***

package org.Library.repository;  
  
public class BookRepository {  
 public void saveBook(String title){  
 System.*out*.println("Saved Book: "+title);  
 }  
}

***LoggingAspect Class: -***

package org.Library.Aspect;  
  
import org.aspectj.lang.JoinPoint;  
import org.aspectj.lang.annotation.After;  
import org.aspectj.lang.annotation.Aspect;  
import org.aspectj.lang.annotation.Before;  
  
@Aspect  
public class LoggingAspect {  
 @Before("execution(\* org.Library.service.\*.\*(..))")  
 public void logBeforeMethod(JoinPoint joinPoint){  
 String methodName=joinPoint.getSignature().getName();  
 System.*out*.println("[BEFORE] Method "+methodName+" is about to execute.");  
 }  
 @After("execution(\* org.Library.service.\*.\*(..))")  
 public void logAfterMethod(JoinPoint joinPoint){  
 String methodName=joinPoint.getSignature().getName();  
 System.*out*.println("[AFTER] Method "+methodName+" has completed execution.");  
 }  
}

***applicationContext.xml file: -***

<?xml version="1.0" encoding="UTF-8"?>  
<beans xmlns="http://www.springframework.org/schema/beans"  
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
 xmlns:aop="http://www.springframework.org/schema/aop"  
 xsi:schemaLocation="  
 http://www.springframework.org/schema/beans  
 https://www.springframework.org/schema/beans/spring-beans.xsd  
 http://www.springframework.org/schema/aop  
 https://www.springframework.org/schema/aop/spring-aop.xsd">  
  
 <aop:aspectj-autoproxy/>  
 <bean class="org.Library.repository.BookRepository" name="bookRepository"/>  
 <bean class="org.Library.service.BookService" name="bookService">  
 <property name="bookRepository" ref="bookRepository"/>  
 </bean>  
 <bean class="org.Library.Aspect.LoggingAspect" name="loggingAspect"/>  
</beans>

***LibraryManagementApplication Class: -***

package org.Library;  
  
import org.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("All about Spring Core");  
 }  
}

**OUTPUT:**

