**LibraryManagement System**

**Project structure:**

LibraryManagement/

├── pom.xml

├── README.txt

├── src/

│ └── main/

│ ├── java/

│ │ └── com/

│ │ └── library/

│ │ ├── LibraryManagementApplication.java # Main class

│ │ ├── service/

│ │ │ └── BookService.java # No @Service

│ │ ├── repository/

│ │ │ └── BookRepository.java # No @Repository

│ │ └── aspect/

│ │ └── LoggingAspect.java # Can be used with XML AOP

│ └── resources/

│ └── applicationContext.xml # Defines all beans manually

**LoggingAspect.java**

package com.library.aspect;

import org.aspectj.lang.ProceedingJoinPoint;

import org.aspectj.lang.annotation.Around;

import org.aspectj.lang.annotation.Aspect;

import org.springframework.stereotype.Component;

@Aspect

@Component

public class LoggingAspect {

    @Around("execution(\* com.library.service.\*.\*(..))")

    public Object logExecutionTime(ProceedingJoinPoint joinPoint) throws Throwable {

        long start = System.currentTimeMillis();

        Object result = joinPoint.proceed();

        long duration = System.currentTimeMillis() - start;

        System.out.println(joinPoint.getSignature() + " executed in " + duration + "ms");

        return result;

    }

}

**BookRepository.java**

package com.library.repository;

public class BookRepository {

    public void getBook() {

        System.out.println("Fetching book...");

    }

}

**BookService.java**

package com.library.service;

import com.library.repository.BookRepository;

public class BookService {

    private BookRepository bookRepository;

    // Setter for dependency injection

    public void setBookRepository(BookRepository bookRepository) {

        this.bookRepository = bookRepository;

    }

    public void displayBook() {

        bookRepository.getBook();

    }

}

**LibraryManagementApplication.java**

package com.library;

import org.springframework.context.ApplicationContext;

import org.springframework.context.support.ClassPathXmlApplicationContext;

import com.library.service.BookService;

public class LibraryManagementApplication {

    public static void main(String[] args) {

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

        // Get bean by ID

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

        service.displayBook();

    }

}

**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">

    <!-- Define Repository Bean -->

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

    <!-- Define Service Bean and inject Repository -->

    <bean id="bookService" class="com.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.library</groupId>

    <artifactId>LibraryManagement</artifactId>

    <version>1.0-SNAPSHOT</version>

    <properties>

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

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

    </properties>

    <dependencies>

        <dependency>

            <groupId>org.springframework</groupId>

            <artifactId>spring-context</artifactId>

            <version>5.3.32</version>

        </dependency>

        <dependency>

            <groupId>org.springframework</groupId>

            <artifactId>spring-aop</artifactId>

            <version>5.3.32</version>

        </dependency>

        <dependency>

            <groupId>org.aspectj</groupId>

            <artifactId>aspectjweaver</artifactId>

            <version>1.9.21</version>

        </dependency>

    </dependencies>

    <build>

        <plugins>

            <plugin>

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

                <version>3.8.1</version>

                <configuration>

                    <source>1.8</source>

                    <target>1.8</target>

                </configuration>

            </plugin>

            <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:**

