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

**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 {  
 String methodName = joinPoint.getSignature().getName();  
 long start = System.*currentTimeMillis*();  
  
 System.*out*.println("[LOG] Method " + methodName + " started");  
  
 Object result = joinPoint.proceed();  
  
 long end = System.*currentTimeMillis*();  
 System.*out*.println("[LOG] Method " + methodName + " ended in " + (end - start) + " ms");  
  
 return result;  
 }  
}

**applicationContext.xml**   
*<?*xml version="1.0" encoding="UTF-8"*?>*<beans xmlns="http://www.springframework.org/schema/beans"  
 xmlns:context="http://www.springframework.org/schema/context"  
 xmlns:aop="http://www.springframework.org/schema/aop"  
 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  
 http://www.springframework.org/schema/context  
 http://www.springframework.org/schema/context/spring-context.xsd  
 http://www.springframework.org/schema/aop  
 http://www.springframework.org/schema/aop/spring-aop.xsd">  
<context:component-scan base-package="com.library" /><aop:aspectj-autoproxy />

<bean id="bookRepository" class="com.library.repository.BookRepository" />  
 <bean id="authorRepository" class="com.library.repository.AuthorRepository" />  
  
 <bean id="bookService" class="com.library.service.BookService">  
 <property name="bookRepository" ref="bookRepository" />  
 <property name="authorRepository" ref="authorRepository" />  
 </bean>  
</beans>

**LibraryManagementApplication.java**   
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.printBookDetails();  
 }  
}

**Output**

