Exercise 4: Creating and Configuring a Maven Project

Objective:

To configure an existing Maven project named LibraryManagement with necessary Spring dependencies and plugins for building a Spring-based library management system.

Step 1: Use Existing Maven Project — LibraryManagement

Note:

The project LibraryManagement already existed with the following Maven configuration:

- **Group ID:** com.library
- **Artifact ID:** LibraryManagement
- **Java Version:** JDK 21

Action Taken:

Instead of creating a new project, modifications were made to the existing pom.xml to add Spring dependencies and configure the Maven compiler plugin.

Step 2: Add Spring Dependencies

Code Added in <dependencies> section:

```
<dependencies>
    <!-- Spring Context (includes spring-core and spring-beans) -->
    <dependency>
        <groupId>org.springframework</groupId>
        <artifactId>spring-context</artifactId>
        <version>5.3.31</version>
    </dependency>

    <!-- Spring AOP -->
    <dependency>
        <groupId>org.springframework</groupId>
        <artifactId>spring-aop</artifactId>
        <version>5.3.31</version>
    </dependency>

    <!-- Spring Web MVC -->
    <dependency>
        <groupId>org.springframework</groupId>
        <artifactId>spring-webmvc</artifactId>
        <version>5.3.31</version>
    </dependency>

    <!-- Servlet API for Spring WebMVC (compile only) -->
    <dependency>
        <groupId>javax.servlet</groupId>
        <artifactId>javax.servlet-api</artifactId>
```

```
        <version>4.0.1</version>
        <scope>provided</scope>
    </dependency>
</dependencies>
```

Why These Are Important:

- spring-context: Core Spring features (IoC container, Beans)
- spring-aop: Enables Aspect-Oriented Programming features
- spring-webmvc: Enables the use of Spring's Model-View-Controller architecture
- javax.servlet-api: Required to compile servlet-based components in Spring MVC

Step 3: Configure Maven Compiler Plugin

Since your project uses **Java 21**, the Maven Compiler plugin is already set up correctly.
Verified Code in <build> section:

```
<build>
    <plugins>
        <plugin>
            <groupId>org.apache.maven.plugins</groupId>
            <artifactId>maven-compiler-plugin</artifactId>
            <version>3.11.0</version>
            <configuration>
                <release>21</release>
            </configuration>
        </plugin>
    </plugins>
</build>
```

Explanation:
The maven-compiler-plugin is configured to compile the code using JDK 21, ensuring compatibility with modern Java features.