# 練習
# ORM 與 JPA

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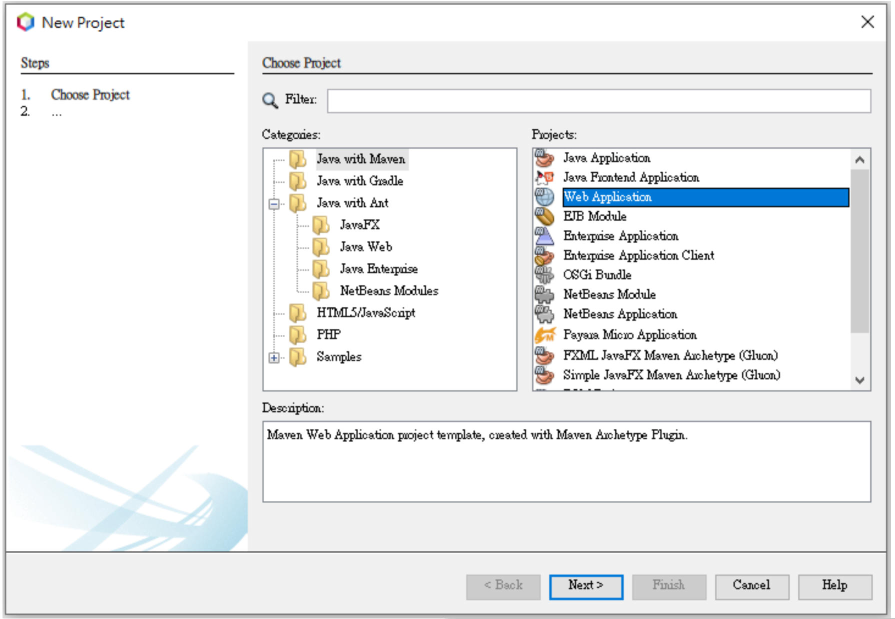
# Lab 1 Maven DVD Library

- 建立 DVDMaven專案
- 複製JSP檔案至Web Pages
  - index.jsp / list_library.jsp / add_dvd.jsp / success.jsp / error.jsp / set_pref.jsp
- 複製Java檔案至Source Packages
  - controller 套件
    - AddDVDServlet.java / SetPrefsServlet.java
  - model類別
    - DVDItem.java
  - web套件
    - InitializeLibrary.java

# Lab 1 Maven DVD Library

- 新增web.xml
  - 設定libraryFile初始參數為/WEB-INF/library.txt
  - 設定genre-list初始參數為Animation, Action, Sci-Fi
- 複製library.txt至 /WEB-INF/
- 修改pom.xml
  - 新增JSTL 相依性
- Maven 清理及建構
- 測試、執行

# 建立 DVDMaven專案


New Project

Steps

1. Choose Project
2. ...

Choose Project

Filter:

Categories:

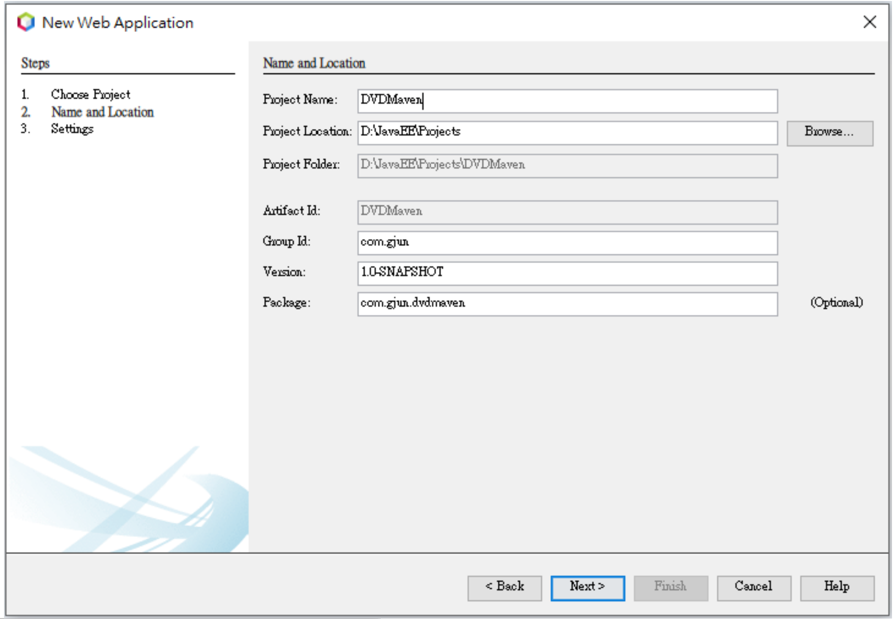
- Java with Maven
- Java with Gradle
- Java with Ant
  - JavaFX
  - Java Web
  - Java Enterprise
  - NetBeans Modules
- HTML5/JavaScript
- PHP
- Samples

Projects:

- Java Application
- Java Frontend Application
- Web Application
- EJB Module
- Enterprise Application
- Enterprise Application Client
- OSGi Bundle
- NetBeans Module
- NetBeans Application
- Payara Micro Application
- FXML JavaFX Maven Archetype (Gluon)
- Simple JavaFX Maven Archetype (Gluon)

Description:

Maven Web Application project template, created with Maven Archetype Plugin.


New Web Application

Steps

1. Choose Project
2. Name and Location
3. Settings

Name and Location

Project Name: DVDMaven

Project Location: D:\JavaEE\Projects

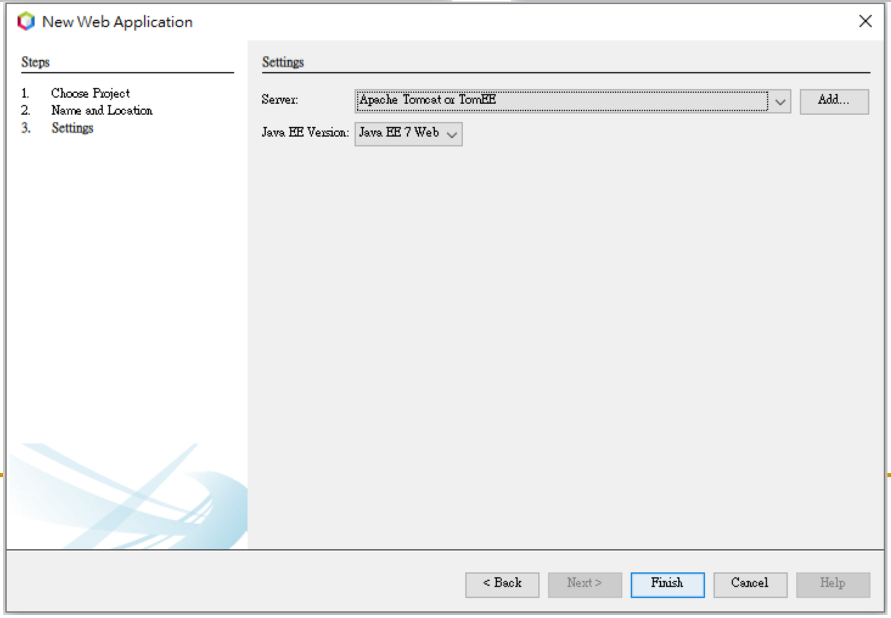
Project Folder: D:\JavaEE\Projects\DVDMaven

Artifact Id: DVDMaven

Group Id: com.gjun

Version: 1.0-SNAPSHOT

Package: com.gjun.dvdmaven (Optional)


New Web Application

Steps

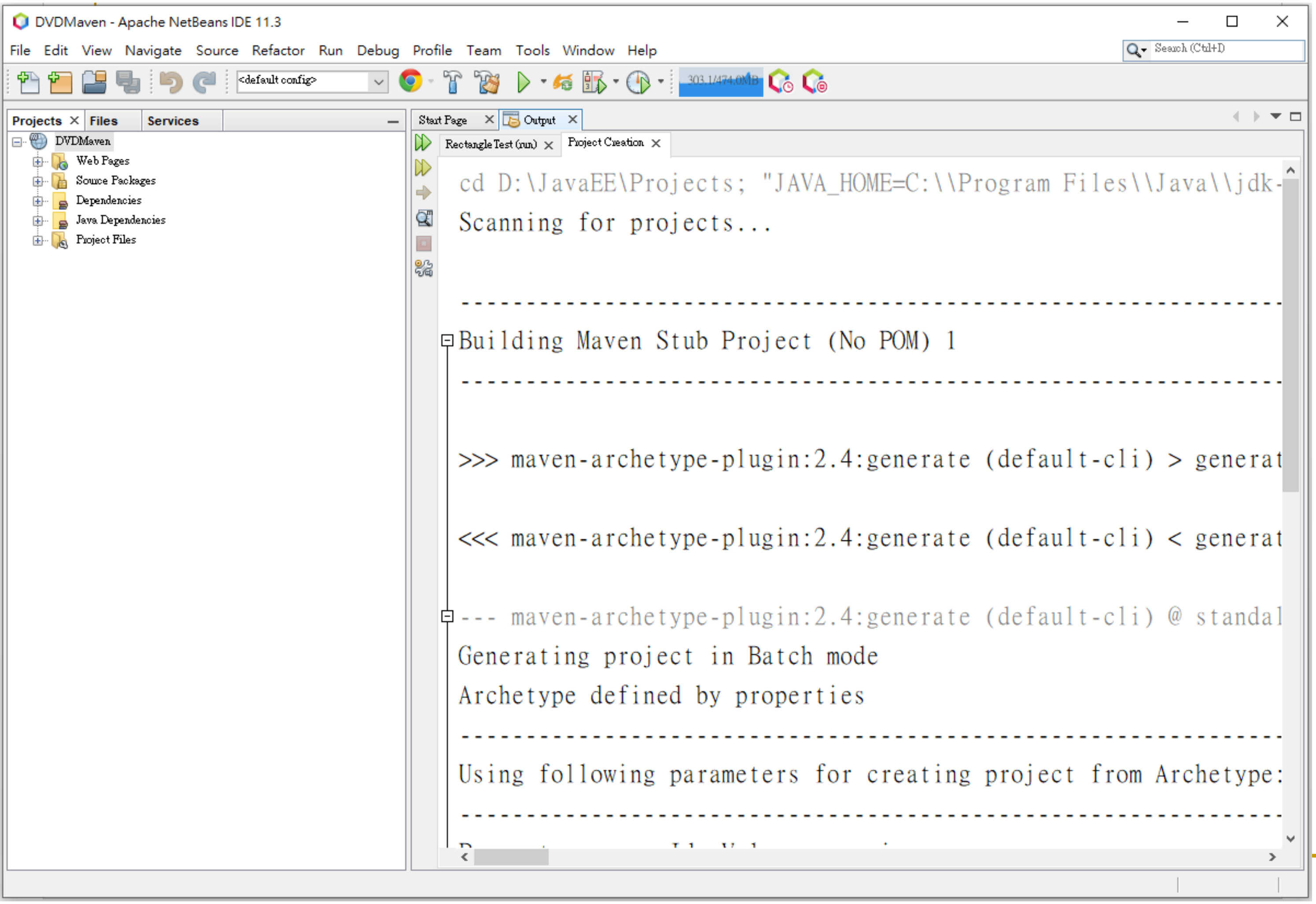
1. Choose Project
2. Name and Location
3. Settings

Settings

Server: Apache Tomcat or TomEE

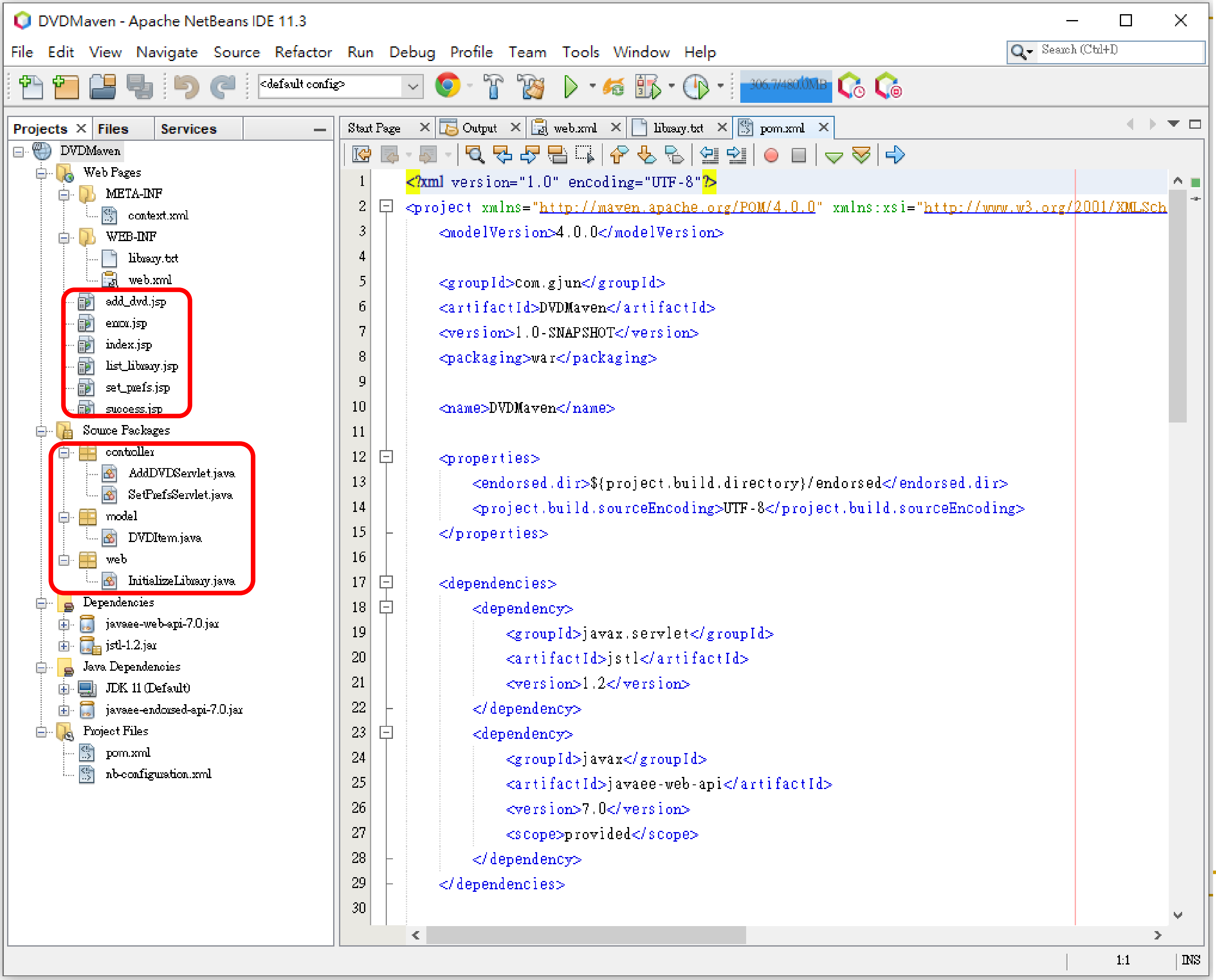
Java EE Version: Java EE 7 Web

# DVDMaven專案



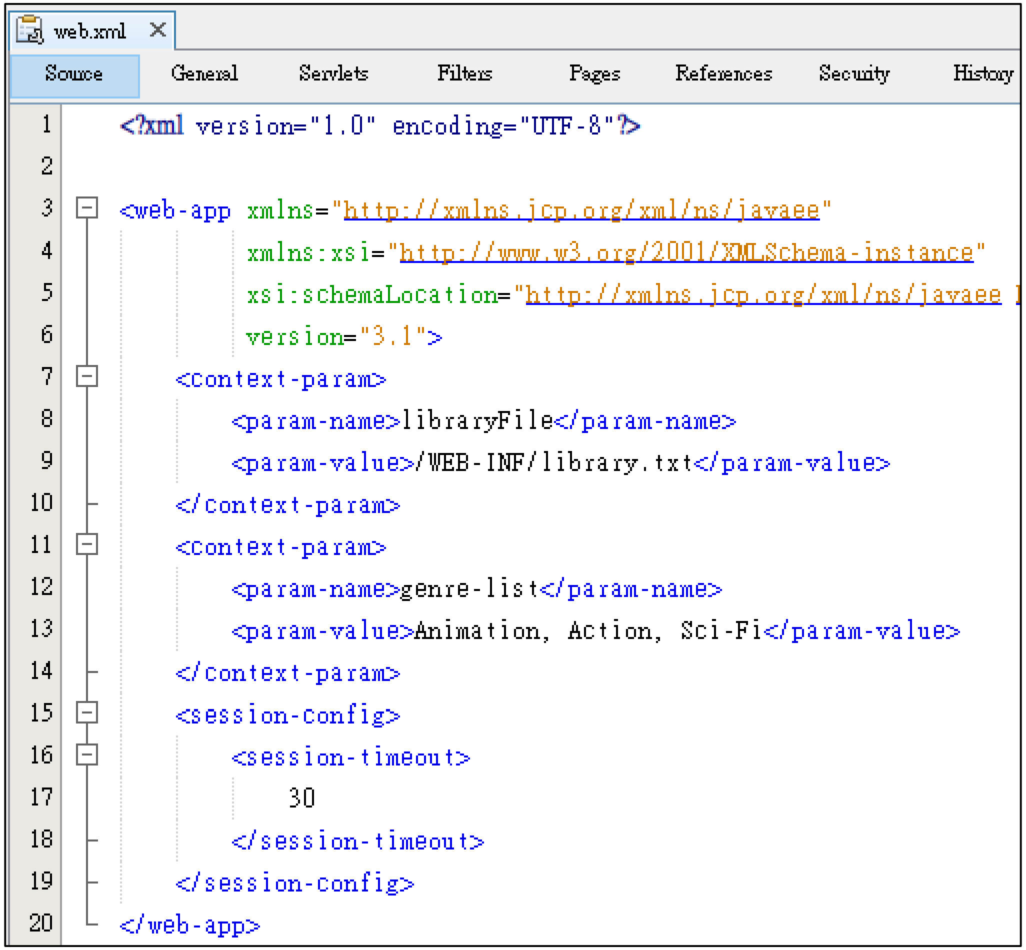
```
cd D:\JavaEE\Projects; "JAVA_HOME=C:\\Program Files\\Java\\jdk-
Scanning for projects...

------------------------------------------------------------------------
Building Maven Stub Project (No POM) 1
------------------------------------------------------------------------

>>> maven-archetype-plugin:2.4:generate (default-cli) > generat

<<< maven-archetype-plugin:2.4:generate (default-cli) < generat

--- maven-archetype-plugin:2.4:generate (default-cli) @ standal
Generating project in Batch mode
Archetype defined by properties
------------------------------------------------------------------------
Using following parameters for creating project from Archetype:
------------------------------------------------------------------------
```

# 複製 JSP / Java 檔案



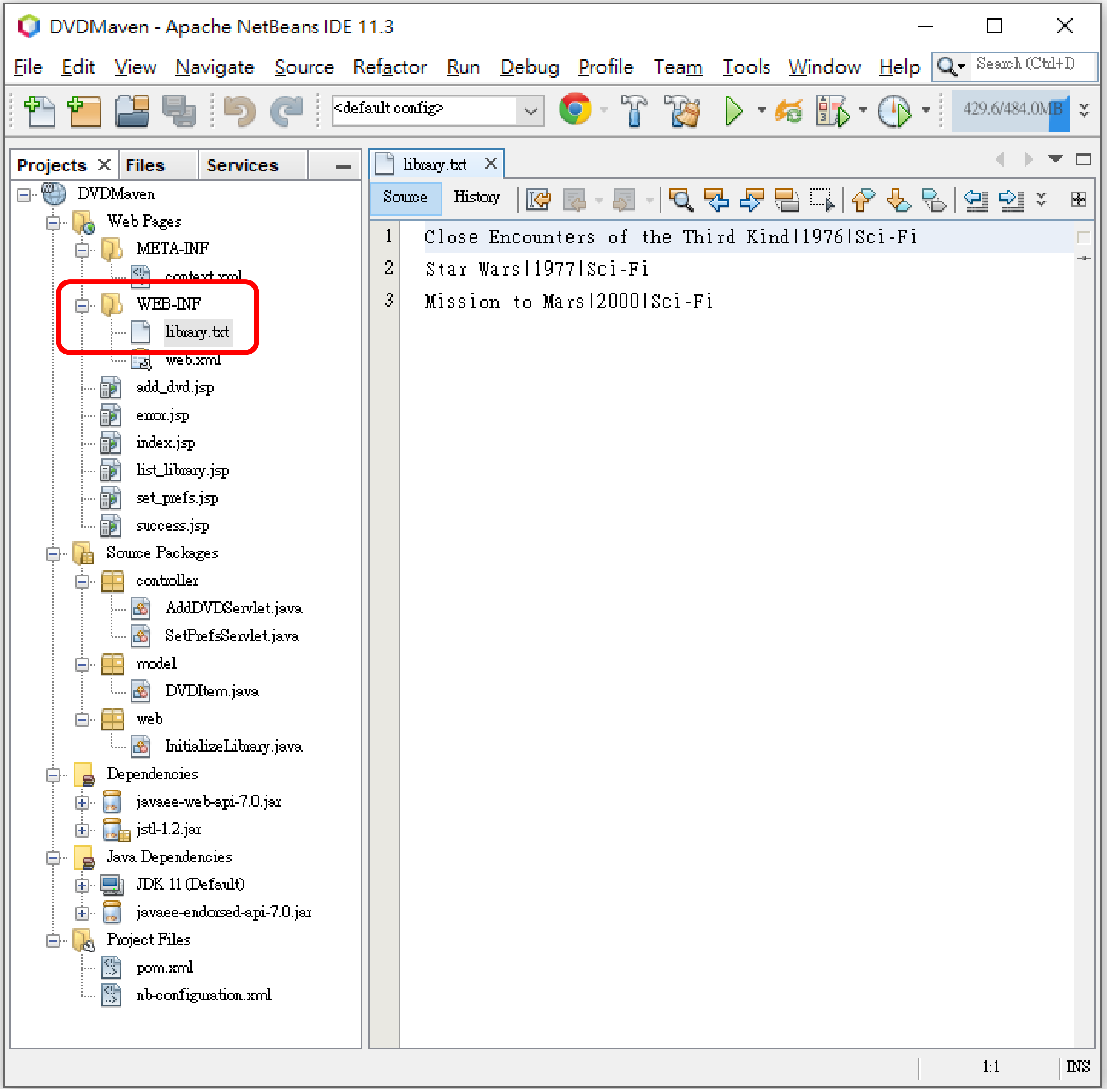
```xml
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSch
    <modelVersion>4.0.0</modelVersion>

    <groupId>com.gjun</groupId>
    <artifactId>DVDMaven</artifactId>
    <version>1.0-SNAPSHOT</version>
    <packaging>war</packaging>

    <name>DVDMaven</name>

    <properties>
        <endorsed.dir>${project.build.directory}/endorsed</endorsed.dir>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
    </properties>

    <dependencies>
        <dependency>
            <groupId>javax.servlet</groupId>
            <artifactId>jstl</artifactId>
            <version>1.2</version>
        </dependency>
        <dependency>
            <groupId>javax</groupId>
            <artifactId>javaee-web-api</artifactId>
            <version>7.0</version>
            <scope>provided</scope>
        </dependency>
    </dependencies>

```

# web.xml



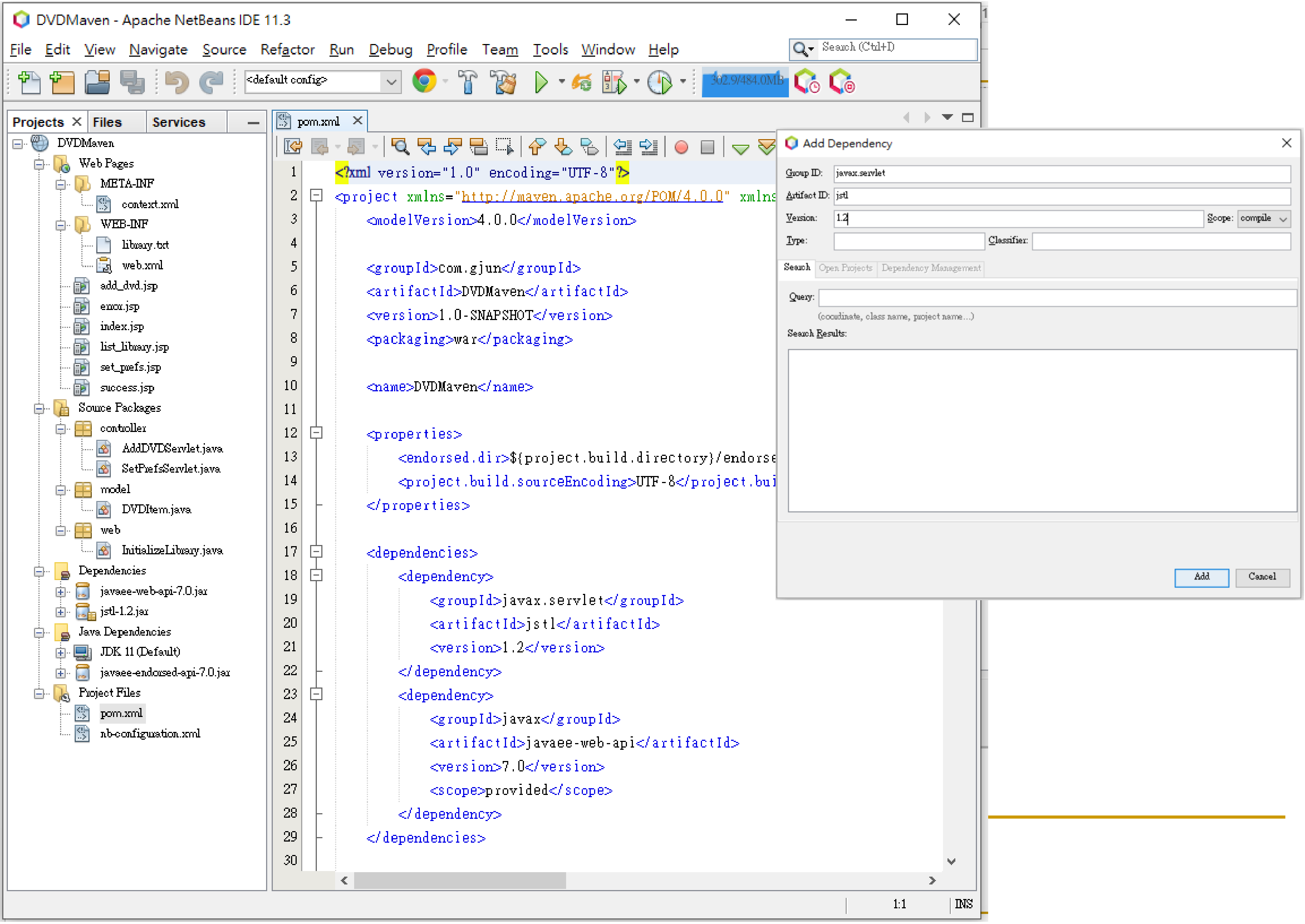
```
<?xml version="1.0" encoding="UTF-8"?>

<web-app xmlns="http://xmlns.jcp.org/xml/ns/javaee"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
         version="3.1">
    <context-param>
        <param-name>libraryFile</param-name>
        <param-value>/WEB-INF/library.txt</param-value>
    </context-param>
    <context-param>
        <param-name>genre-list</param-name>
        <param-value>Animation, Action, Sci-Fi</param-value>
    </context-param>
    <session-config>
        <session-timeout>
            30
        </session-timeout>
    </session-config>
</web-app>
```

# 複製 library.txt



```
Close Encounters of the Third Kind|1976|Sci-Fi
Star Wars|1977|Sci-Fi
Mission to Mars|2000|Sci-Fi
```

# 新增JSTL 相依性



```xml
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns
    <modelVersion>4.0.0</modelVersion>

    <groupId>com.gjun</groupId>
    <artifactId>DVDMaven</artifactId>
    <version>1.0-SNAPSHOT</version>
    <packaging>war</packaging>

    <name>DVDMaven</name>

    <properties>
        <endorsed.dir>${project.build.directory}/endorse
        <project.build.sourceEncoding>UTF-8</project.bui
    </properties>

    <dependencies>
        <dependency>
            <groupId>javax.servlet</groupId>
            <artifactId>jstl</artifactId>
            <version>1.2</version>
        </dependency>
        <dependency>
            <groupId>javax</groupId>
            <artifactId>javaee-web-api</artifactId>
            <version>7.0</version>
            <scope>provided</scope>
        </dependency>
    </dependencies>

```

Group ID: javax.servlet

Artifact ID: jstl

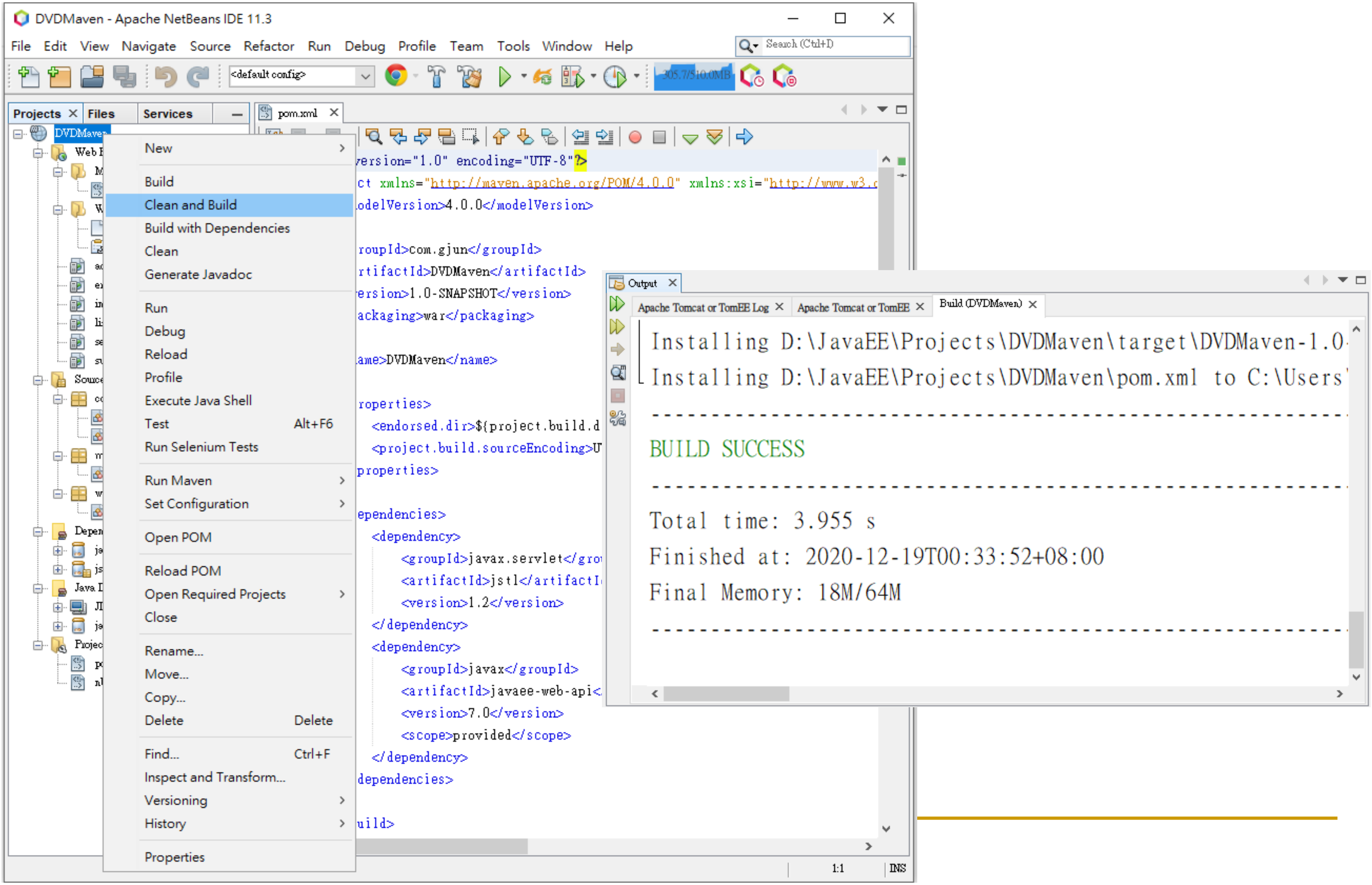
Version: 1.2 Scope: compile

Type: Classifier:

Query:

(coordinate, class name, project name...)

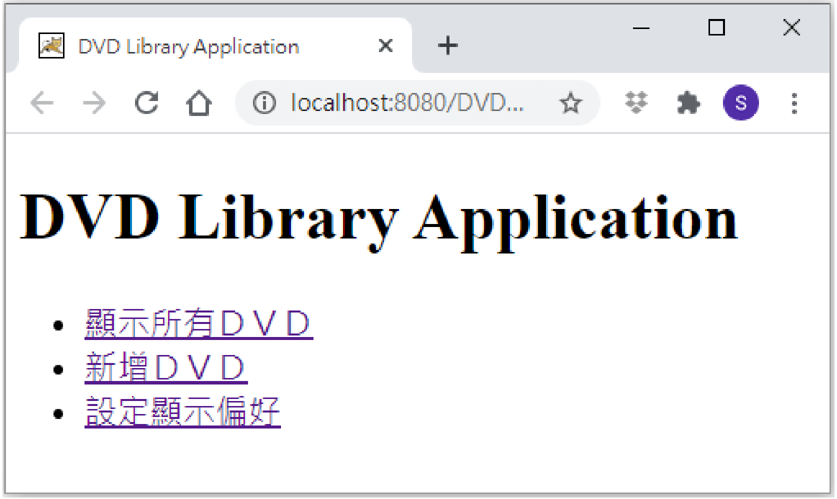
# Maven 清理及建構



```
ersion="1.0" encoding="UTF-8"?>
ct xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.c
odelVersion>4.0.0</modelVersion>

roupId>com.gjun</groupId>
rtifactId>DVDMaven</artifactId>
ersion>1.0-SNAPSHOT</version>
ackaging>war</packaging>

ame>DVDMaven</name>

roperties>
  <endorsed.dir>${project.build.d
  <project.build.sourceEncoding>U
properties>

ependencies>
  <dependency>
      <groupId>javax.servlet</gro
      <artifactId>jstl</artifactI
      <version>1.2</version>
  </dependency>
  <dependency>
      <groupId>javax</groupId>
      <artifactId>javaee-web-api<
      <version>7.0</version>
      <scope>provided</scope>
  </dependency>
dependencies>

uild>
```

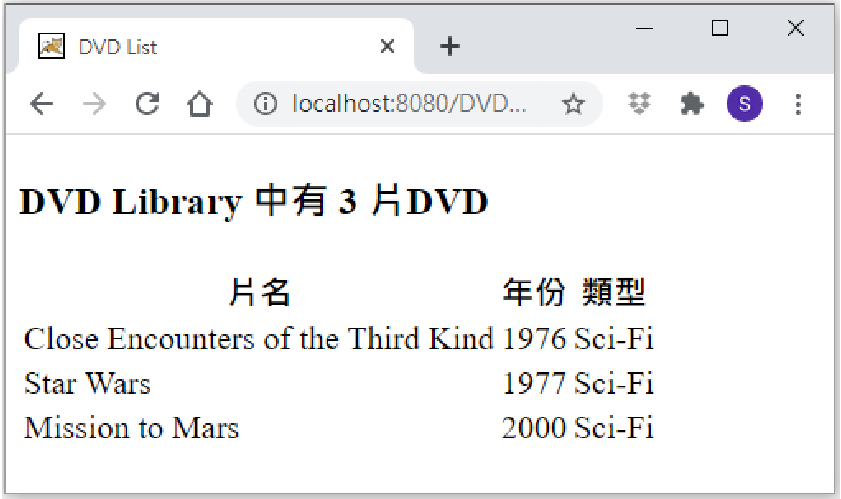
```
Installing D:\JavaEE\Projects\DVDMaven\target\DVDMaven-1.0
Installing D:\JavaEE\Projects\DVDMaven\pom.xml to C:\Users'
------------------------------------------------------------------------
BUILD SUCCESS
------------------------------------------------------------------------
Total time: 3.955 s
Finished at: 2020-12-19T00:33:52+08:00
Final Memory: 18M/64M
------------------------------------------------------------------------
```

# 測試、執行



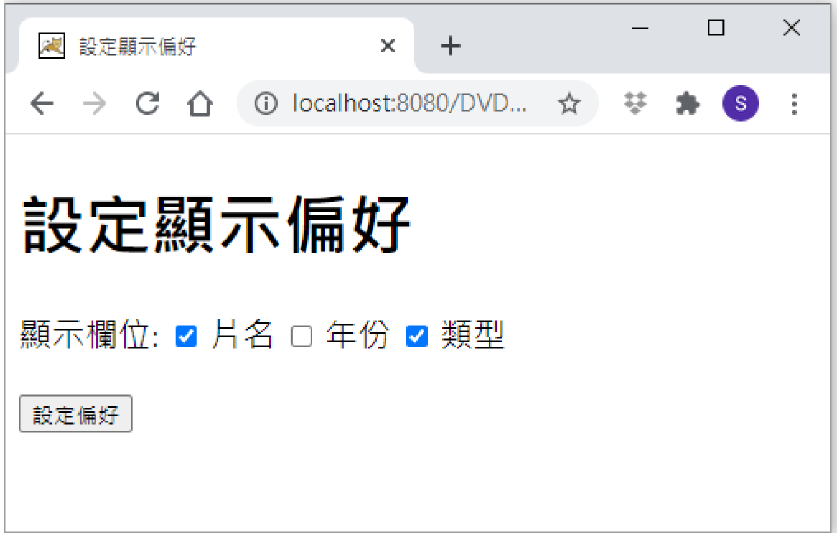
# DVD Library Application

- 顯示所有ＤＶＤ
- 新增ＤＶＤ
- 設定顯示偏好



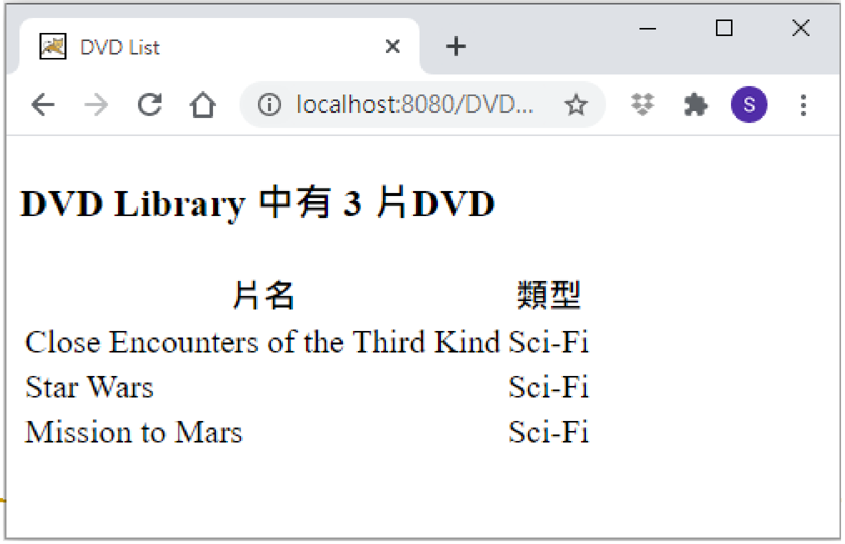
### DVD Library 中有 3 片DVD

| 片名 | 年份 | 類型 |
|---|---|---|
| Close Encounters of the Third Kind | 1976 | Sci-Fi |
| Star Wars | 1977 | Sci-Fi |
| Mission to Mars | 2000 | Sci-Fi |



# 設定顯示偏好

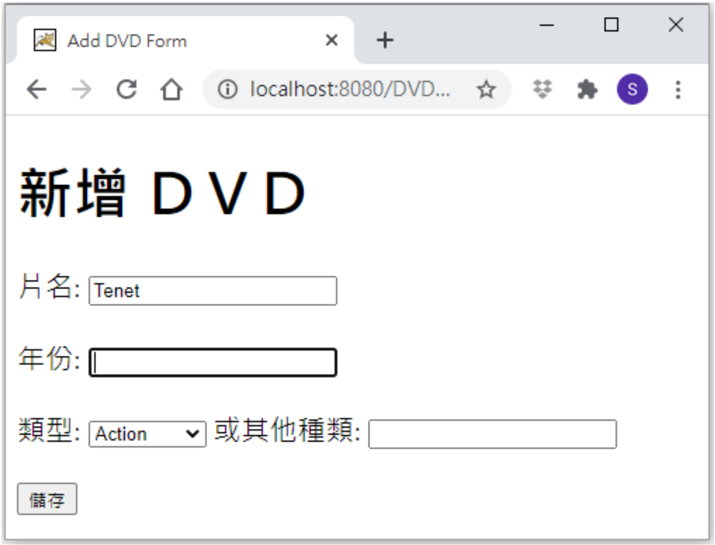
顯示欄位: ☑ 片名 □ 年份 ☑ 類型



### DVD Library 中有 3 片DVD

| 片名 | 類型 |
|---|---|
| Close Encounters of the Third Kind | Sci-Fi |
| Star Wars | Sci-Fi |
| Mission to Mars | Sci-Fi |

# 測試、執行



Add DVD Form

localhost:8080/DVD...

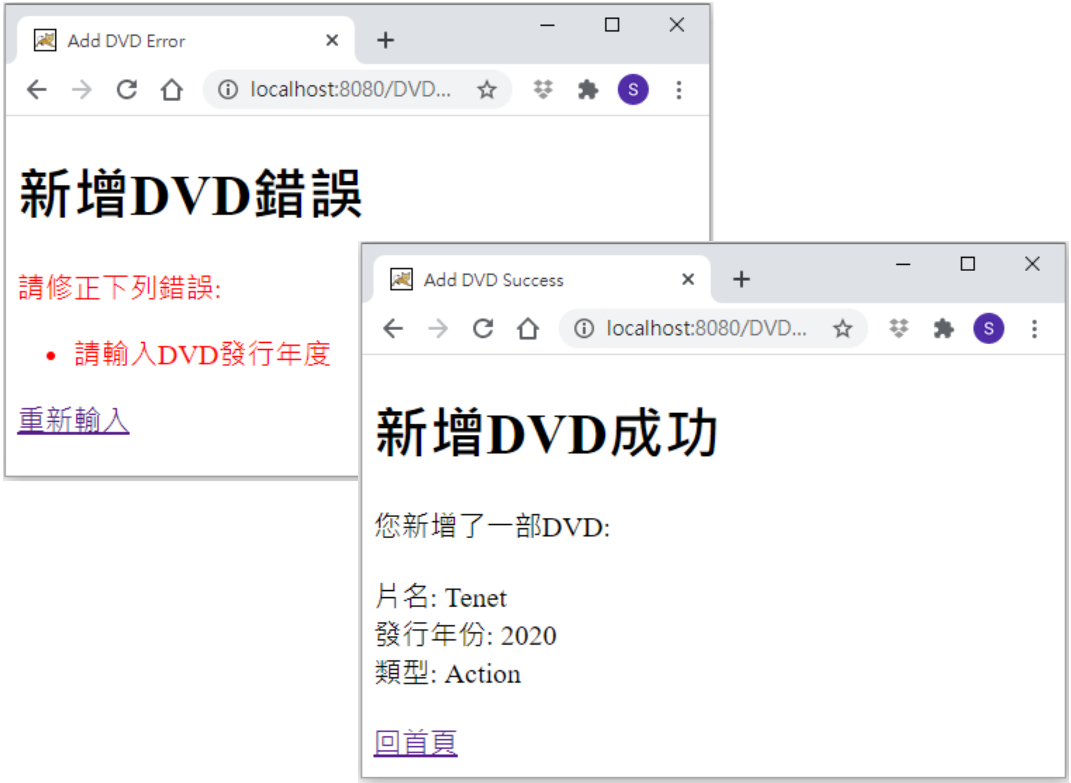
# 新增 DVD

片名: Tenet

年份:

類型: Action 或其他種類:

儲存



Add DVD Error

localhost:8080/DVD...

# 新增DVD錯誤

請修正下列錯誤:

- 請輸入DVD發行年度

重新輸入

Add DVD Success

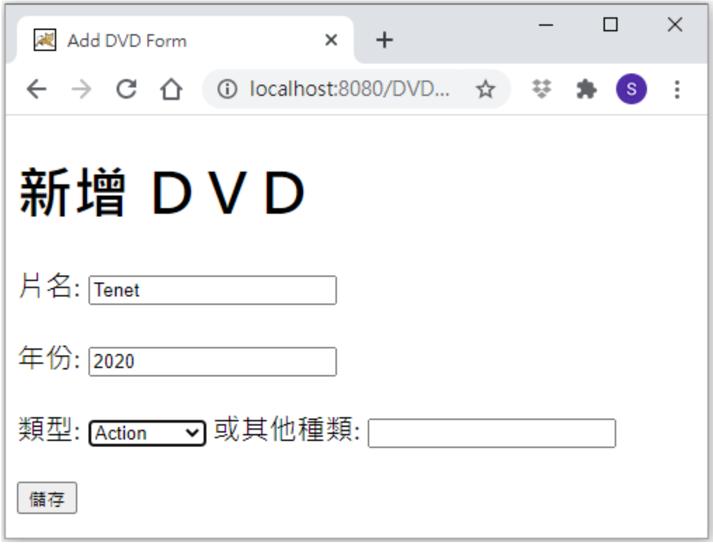
localhost:8080/DVD...

# 新增DVD成功

您新增了一部DVD:

片名: Tenet
發行年份: 2020
類型: Action

回首頁



Add DVD Form

localhost:8080/DVD...

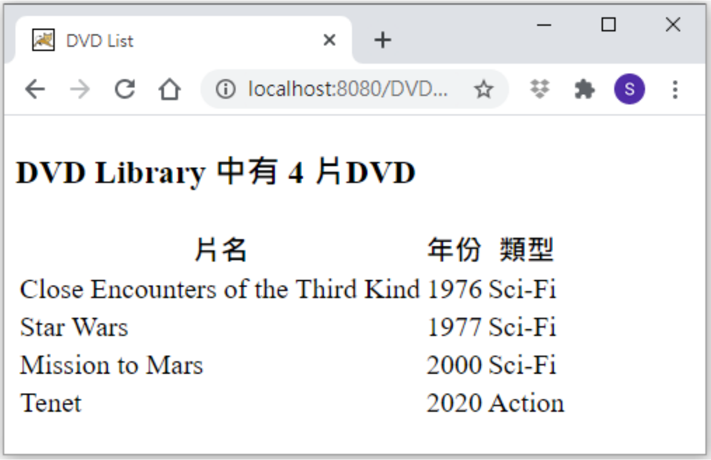
# 新增 DVD

片名: Tenet

年份: 2020

類型: Action 或其他種類:

儲存



DVD List

localhost:8080/DVD...

## DVD Library 中有 4 片DVD

| 片名 | 年份 | 類型 |
|---|---|---|
| Close Encounters of the Third Kind | 1976 | Sci-Fi |
| Star Wars | 1977 | Sci-Fi |
| Mission to Mars | 2000 | Sci-Fi |
| Tenet | 2020 | Action |

# Lab 2

- 使用 DVDMaven 專案
- 新增 Exercise 資料庫
- 刪除原 Model.DVDItem.java
- 建立 Entity 類別 Model.DVDItem
  - 類別名稱為預設(與資料表名稱相同)
  - 主鍵值型態為 long, 產生策略為容器自選
  - 屬性包含 String title, year, genre
    - 資料表欄位為title, yearstr, genre
  - 提供屬性存取方法
- 檢視 persistence.xml

# Lab 2

- 新增 controller.ListDVDServlet.java
  - EntityManager 屬性
  - public void init()
    - 建立 EntityManager 物件
  - protected void processRequest(…)
    - JPQL 查詢字串: "SELECT dvd FROM DVDItem dvd"
    - 建立Query物件: EntityManager物件createQuery()
    - 取得查詢結果: Query物件getResultList()
    - 將List查詢結果加入ServletContext屬性DVDList
    - 轉送至list_library.jsp頁面
- 修改 index.jsp
  - 顯示 所有DVD 超連結改為List_DVD

# Lab 2

- 修改 controller.AddDVDServlet.java
  - EntityManager及EntityTransaction 物件屬性
  - public void init()
    - 建立 EntityManager 物件
  - protected void processRequest(…)
    - 保留請求參數取得及驗證程式碼
      - 取得請求參數 title, year, genre
      - 驗證請求參數
      - 驗證失敗轉送error.jsp
    - 建立DVDItem物件
      - 無參數建構子建構
      - 請求參數title, year, genre 設定DVDItem 物件對應屬性

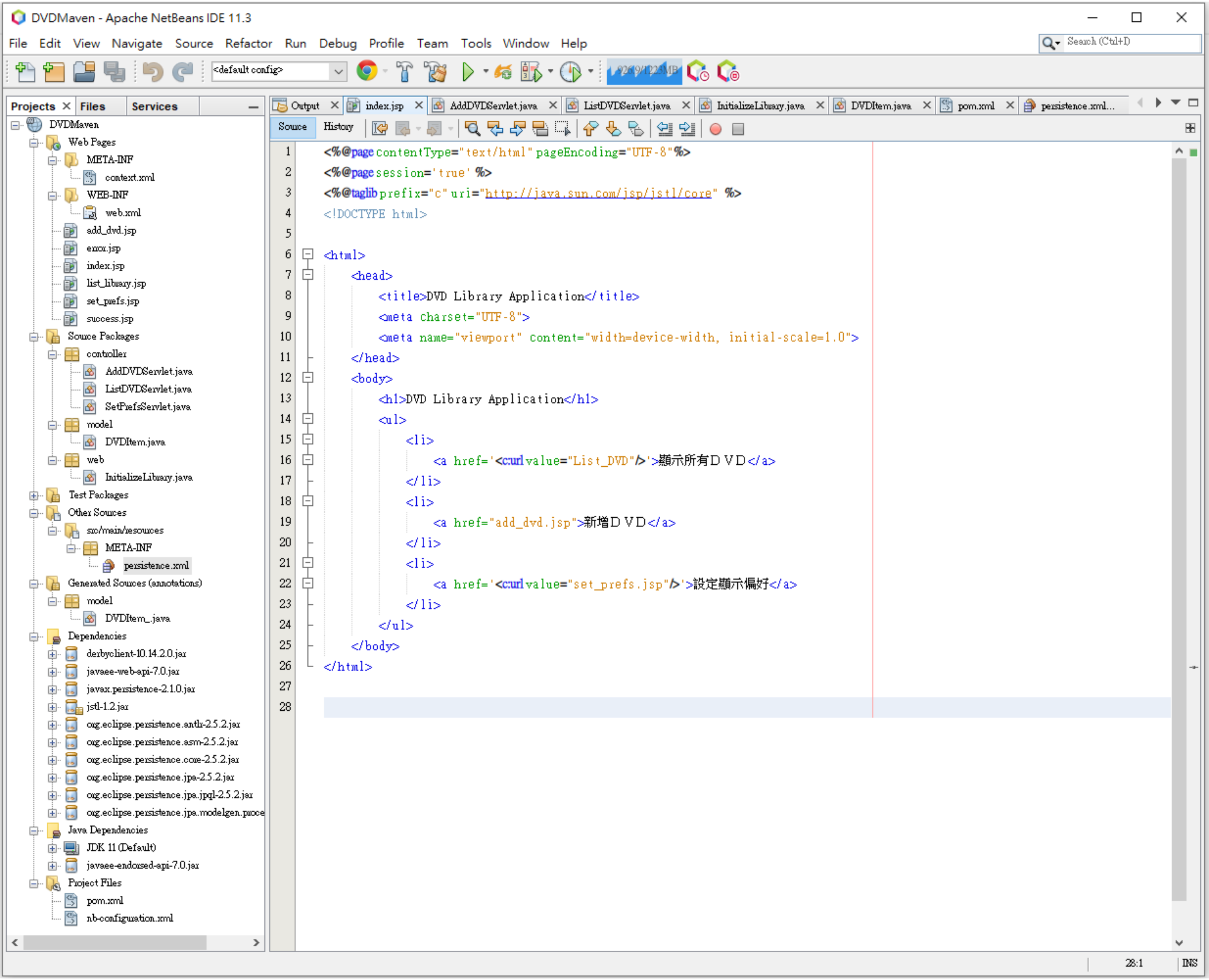
# Lab 2

- 新增DVDItem資料
  - 取得交易物件 EntityTransaction
  - 啟動交易 (EntityTransaction物件 begin() 方法)
  - 資料新增至對應資料表中 (EntityManager 物件persist() 方法)
  - 確認變更 (EntityTransaction物件 commit() 方法)
- 查詢所有DVDItem列表
  - JPQL 查詢字串: "SELECT dvd FROM DVDItem dvd"
  - 建立Query物件: EntityManager物件createQuery()
  - 取得查詢結果: Query物件getResultList()
- 將DVDItem列表查詢結果加入ServletContext屬性DVDList
- 將建立的DVDItem物件加入Request屬性dvd
- 轉送至success.jsp頁面

# Lab 2

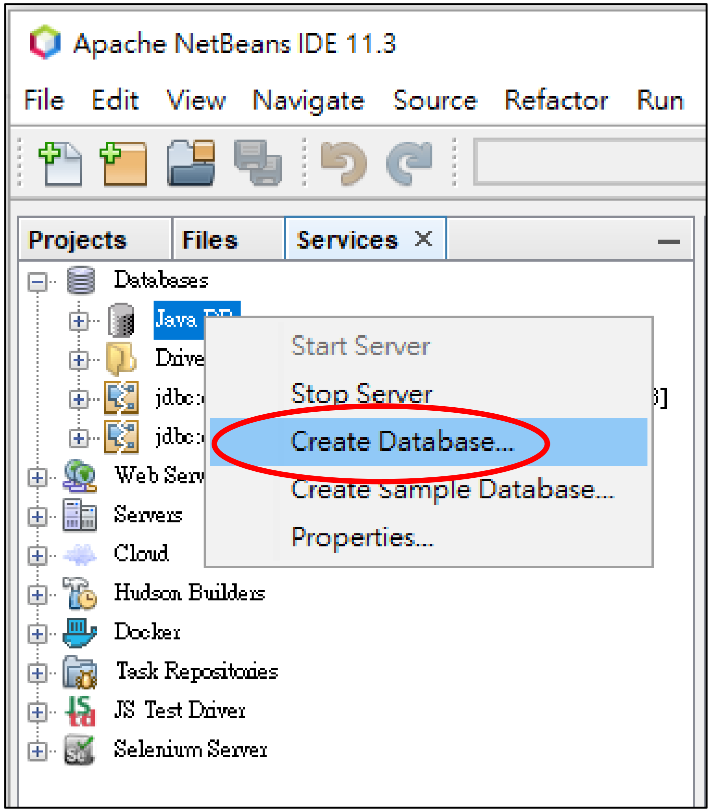
- 修改 web.InitializeLibrary.java
  - 刪除讀取library.txt部分程式
  - 僅保留genreList相關程式
- 刪除library.txt
- 修改web.xml
  - 刪除 libraryFile 初始參數
- 測試執行
- 檢視DVDItem資料表

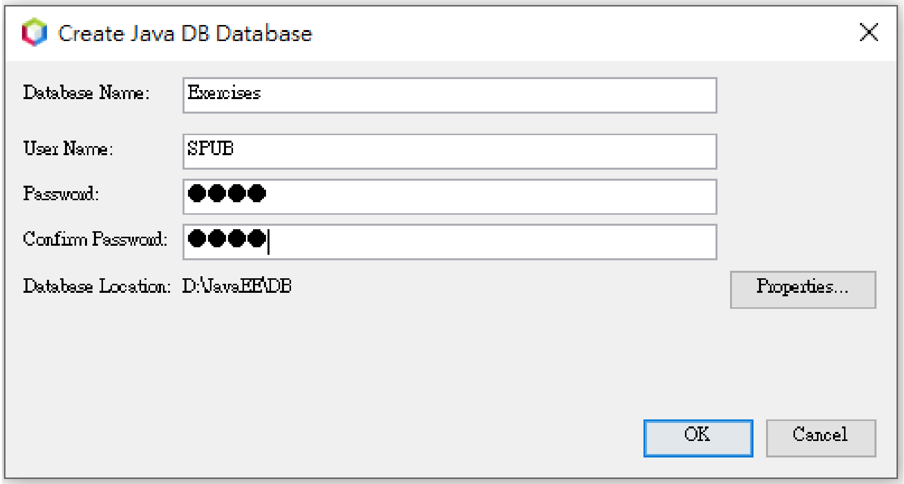
# DVDMaven 專案



```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page session='true' %>
<%@taglib prefix="c" uri="http://java.sun.com/jsp/jstl/core" %>
<!DOCTYPE html>

<html>
    <head>
        <title>DVD Library Application</title>
        <meta charset="UTF-8">
        <meta name="viewport" content="width=device-width, initial-scale=1.0">
    </head>
    <body>
        <h1>DVD Library Application</h1>
        <ul>
            <li>
                <a href='<c:url value="List_DVD"/>'>顯示所有ＤＶＤ</a>
            </li>
            <li>
                <a href="add_dvd.jsp">新增ＤＶＤ</a>
            </li>
            <li>
                <a href='<c:url value="set_prefs.jsp"/>'>設定顯示偏好</a>
            </li>
        </ul>
    </body>
</html>

```

# 建立 Exercises 資料庫





Database Name: Exercises

User Name: SPUB

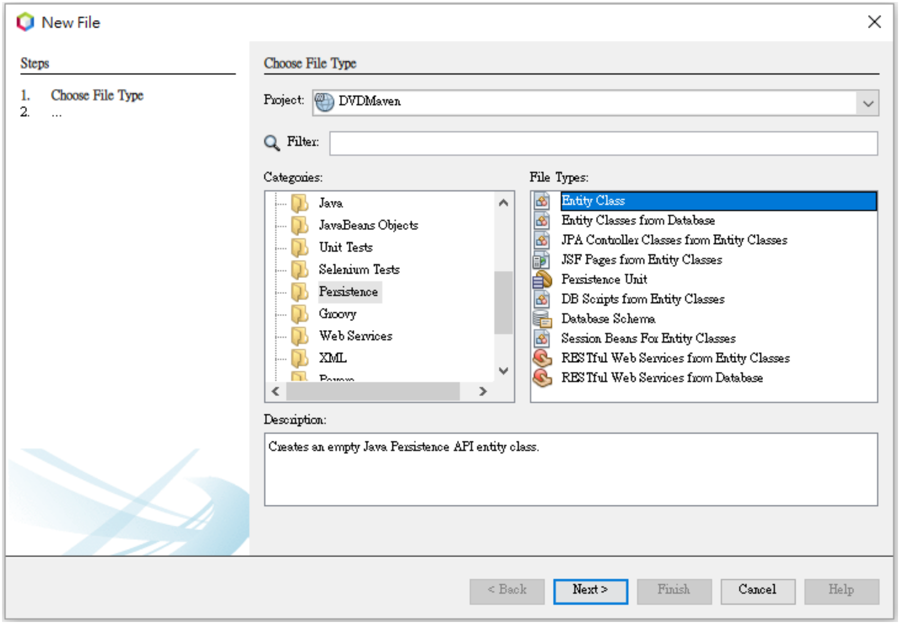
Password: ●●●●

Confirm Password: ●●●●

Database Location: D:\JavaEE\DB

User Name : SPUB
Password: SPUB

# Entity 類別 Model.DVDItem



Project: DVDMaven

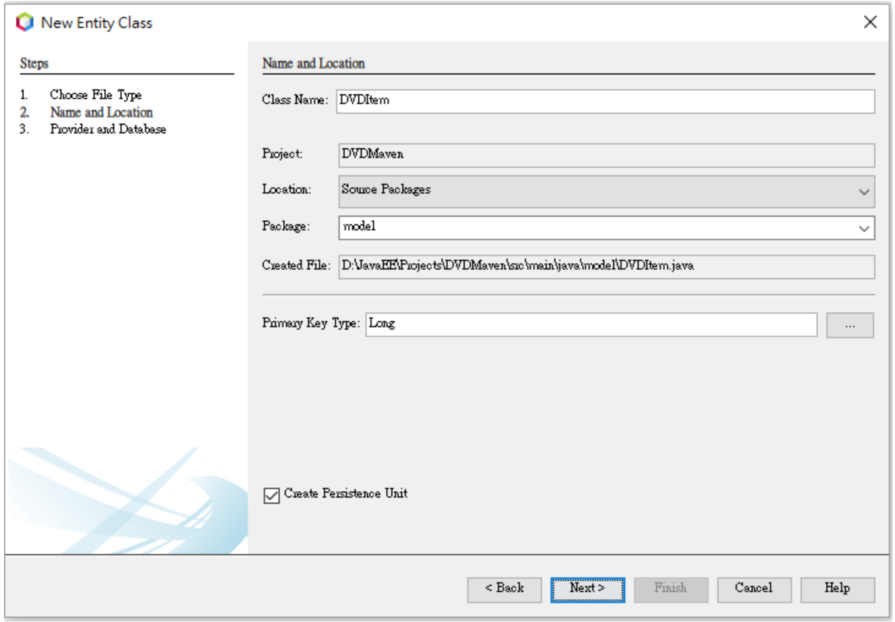
Filter:

Categories:
- Java
- JavaBeans Objects
- Unit Tests
- Selenium Tests
- Persistence
- Groovy
- Web Services
- XML
- Pærm

File Types:
- Entity Class
- Entity Classes from Database
- JPA Controller Classes from Entity Classes
- JSF Pages from Entity Classes
- Persistence Unit
- DB Scripts from Entity Classes
- Database Schema
- Session Beans For Entity Classes
- RESTful Web Services from Entity Classes
- RESTful Web Services from Database

Description:

Creates an empty Java Persistence API entity class.



Class Name: DVDItem

Project: DVDMaven

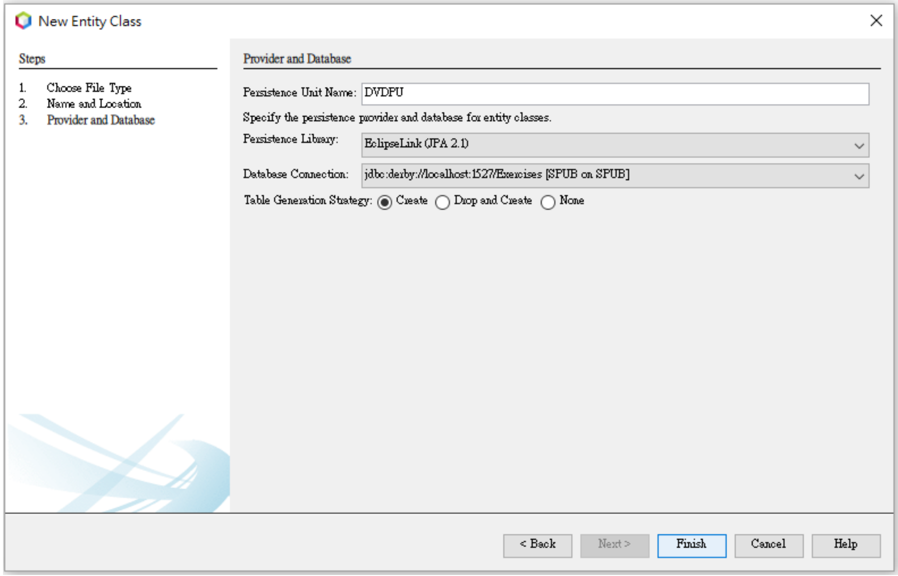
Location: Source Packages

Package: model

Created File: D:\JavaEE\Projects\DVDMaven\src\main\java\model\DVDItem.java

Primary Key Type: Long

☑ Create Persistence Unit



Persistence Unit Name: DVDPU

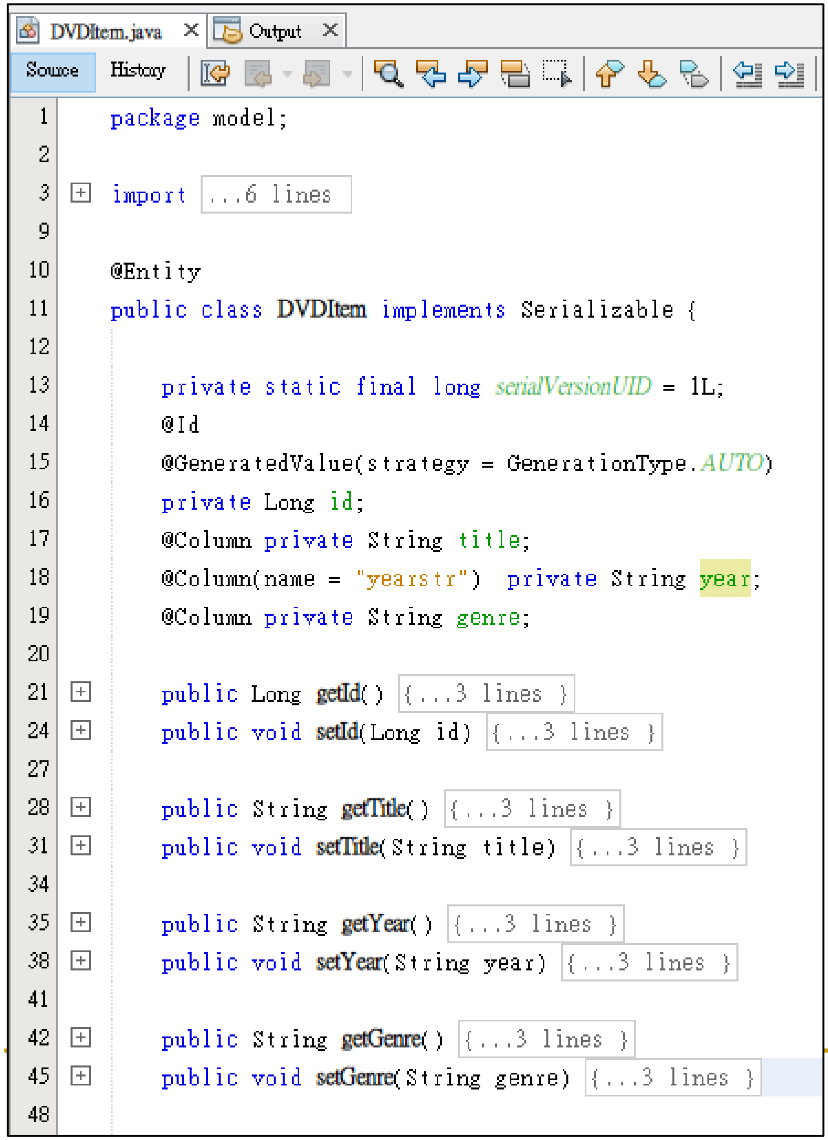
Specify the persistence provider and database for entity classes.

Persistence Library: EclipseLink (JPA 2.1)

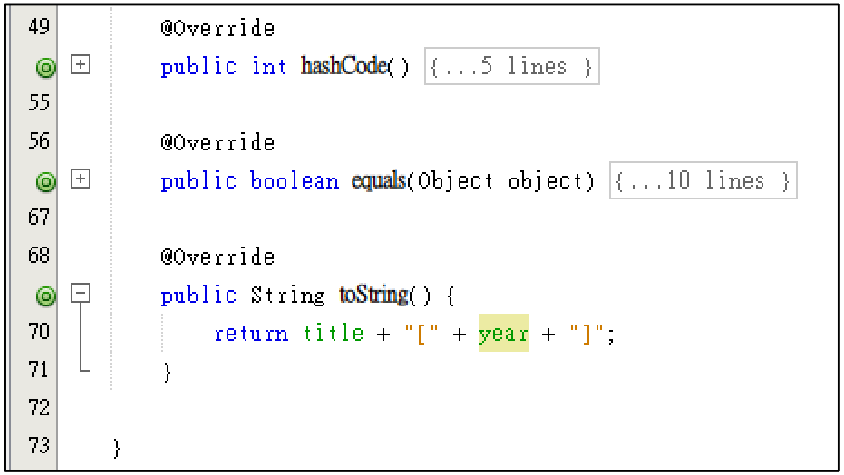
Database Connection: jdbc:derby://localhost:1527/Exercises [SPUB on SPUB]

Table Generation Strategy: ● Create ○ Drop and Create ○ None

# Entity 類別 Model.DVDItem

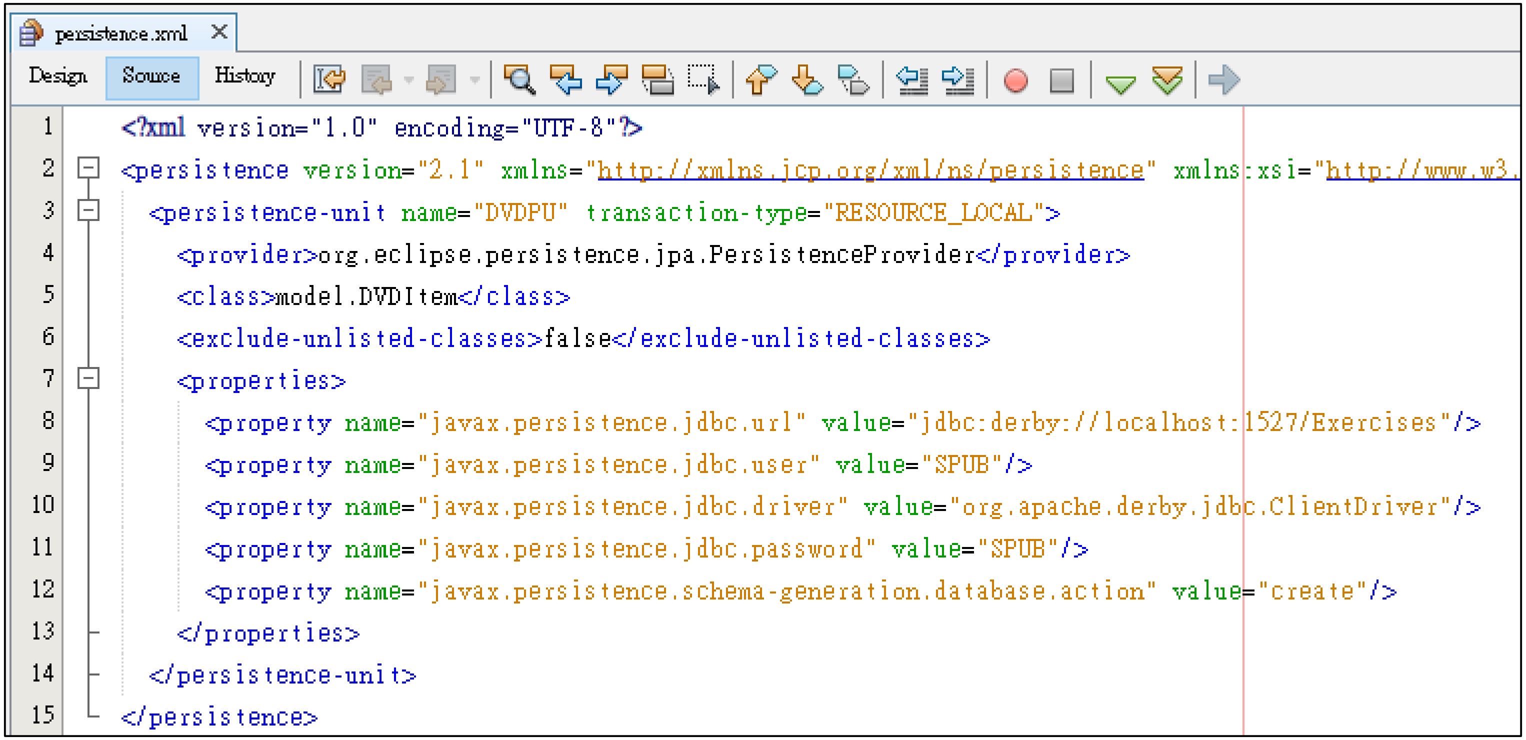


```
package model;

import ...6 lines

@Entity
public class DVDItem implements Serializable {

    private static final long serialVersionUID = 1L;
    @Id
    @GeneratedValue(strategy = GenerationType.AUTO)
    private Long id;
    @Column private String title;
    @Column(name = "yearstr")  private String year;
    @Column private String genre;

    public Long getId() {...3 lines }
    public void setId(Long id) {...3 lines }

    public String getTitle() {...3 lines }
    public void setTitle(String title) {...3 lines }

    public String getYear() {...3 lines }
    public void setYear(String year) {...3 lines }

    public String getGenre() {...3 lines }
    public void setGenre(String genre) {...3 lines }

```



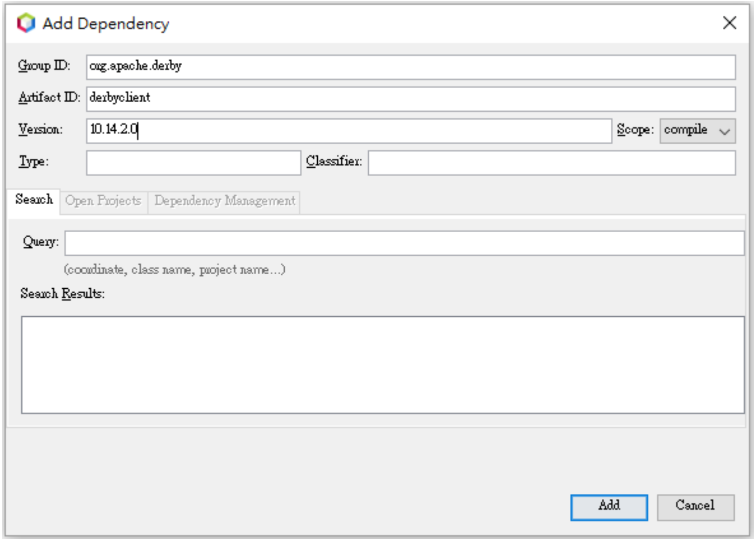
```
    @Override
    public int hashCode() {...5 lines }

    @Override
    public boolean equals(Object object) {...10 lines }

    @Override
    public String toString() {
        return title + "[" + year + "]";
    }

}
```

# 檢視 persistence.xml



```xml
<?xml version="1.0" encoding="UTF-8"?>
<persistence version="2.1" xmlns="http://xmlns.jcp.org/xml/ns/persistence" xmlns:xsi="http://www.w3.
  <persistence-unit name="DVDPU" transaction-type="RESOURCE_LOCAL">
    <provider>org.eclipse.persistence.jpa.PersistenceProvider</provider>
    <class>model.DVDItem</class>
    <exclude-unlisted-classes>false</exclude-unlisted-classes>
    <properties>
      <property name="javax.persistence.jdbc.url" value="jdbc:derby://localhost:1527/Exercises"/>
      <property name="javax.persistence.jdbc.user" value="SPUB"/>
      <property name="javax.persistence.jdbc.driver" value="org.apache.derby.jdbc.ClientDriver"/>
      <property name="javax.persistence.jdbc.password" value="SPUB"/>
      <property name="javax.persistence.schema-generation.database.action" value="create"/>
    </properties>
  </persistence-unit>
</persistence>
```

# 新增/檢視相依性



Add Dependency

Group ID: org.apache.derby

Artifact ID: derbyclient

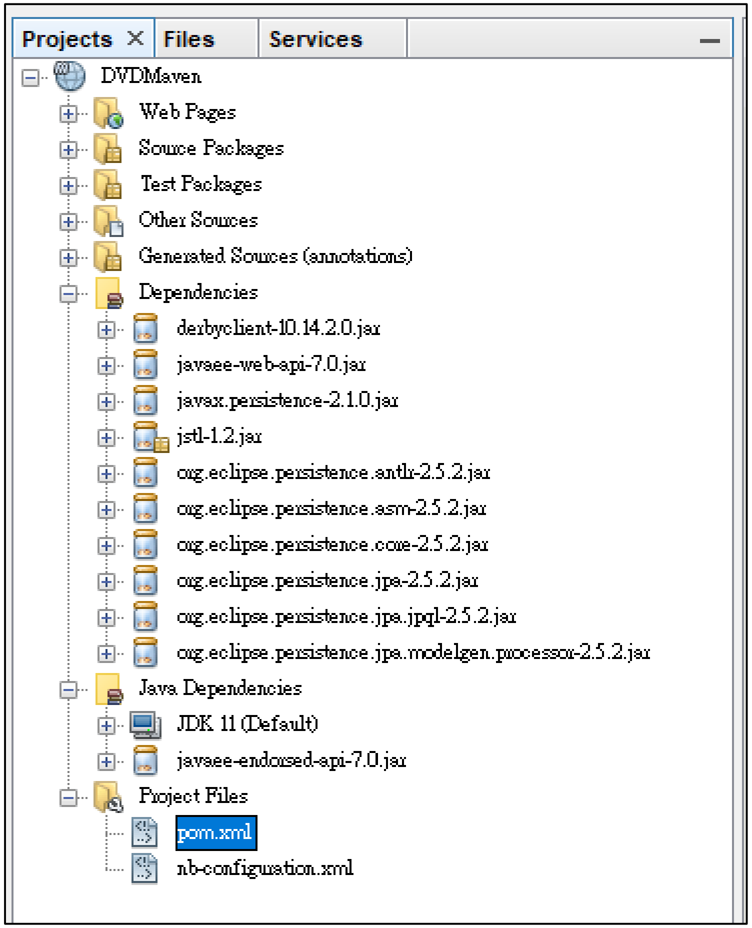
Version: 10.14.2.0 Scope: compile

Type: Classifier:

Query:

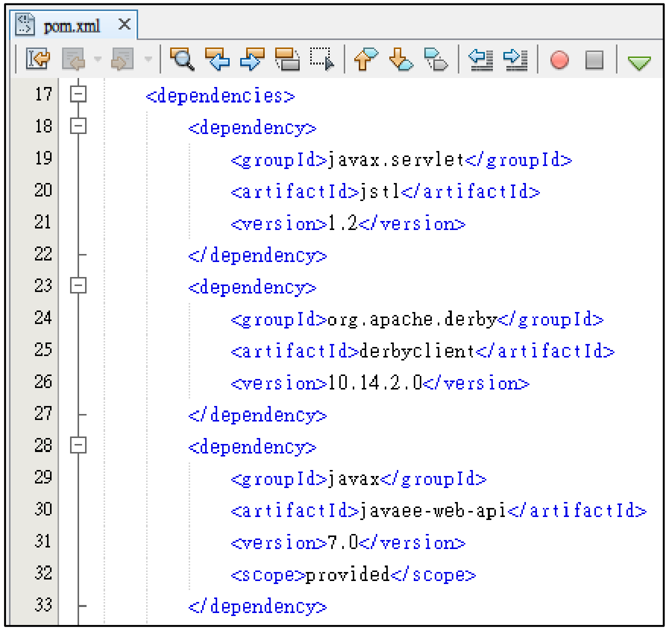
(coordinate, class name, project name...)

Search Results:

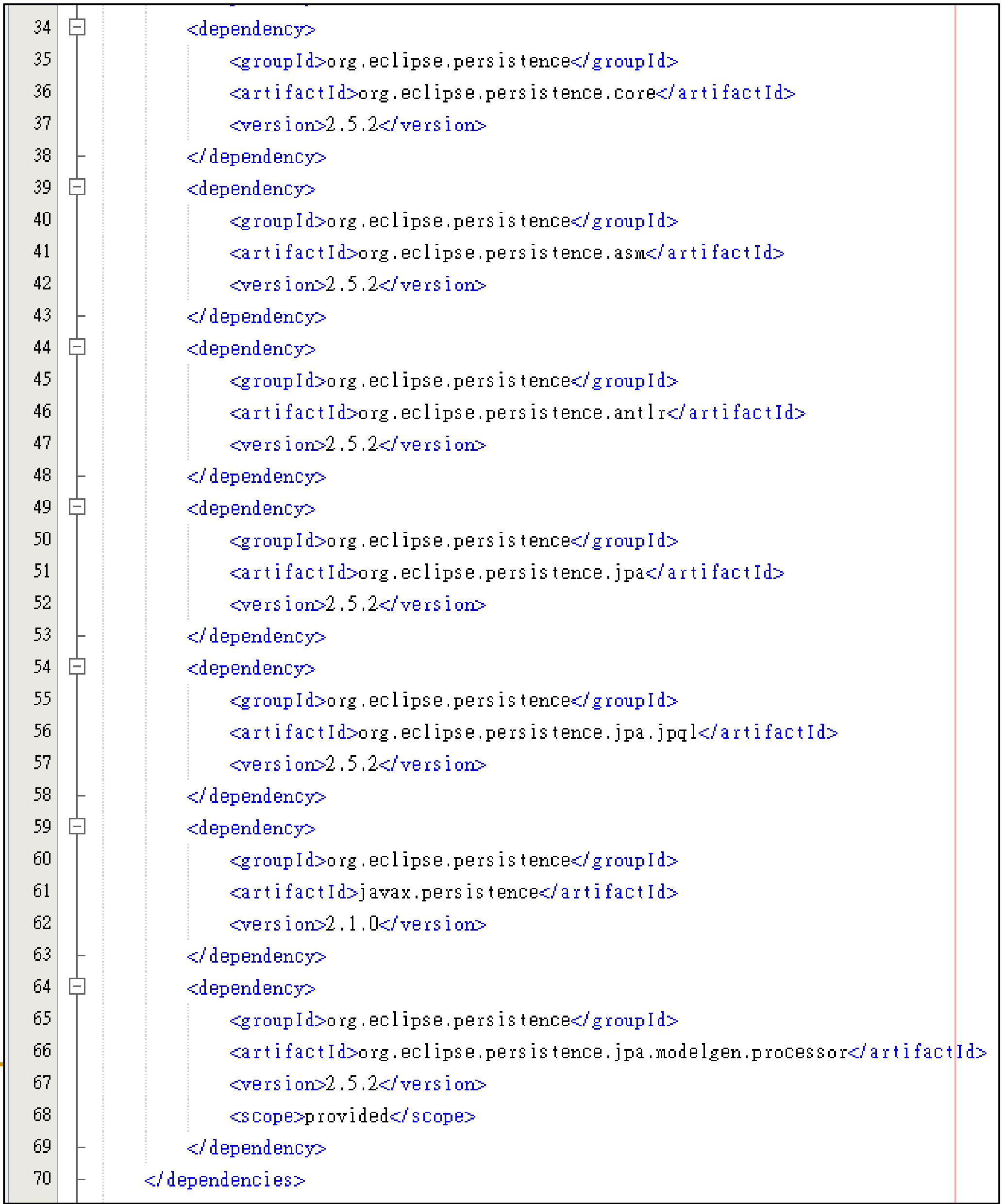


- DVDMaven
  - Web Pages
  - Source Packages
  - Test Packages
  - Other Sources
  - Generated Sources (annotations)
  - Dependencies
    - derbyclient-10.14.2.0.jar
    - javaee-web-api-7.0.jar
    - javax.persistence-2.1.0.jar
    - jstl-1.2.jar
    - org.eclipse.persistence.antlr-2.5.2.jar
    - org.eclipse.persistence.asm-2.5.2.jar
    - org.eclipse.persistence.core-2.5.2.jar
    - org.eclipse.persistence.jpa-2.5.2.jar
    - org.eclipse.persistence.jpa.jpql-2.5.2.jar
    - org.eclipse.persistence.jpa.modelgen.processor-2.5.2.jar
  - Java Dependencies
    - JDK 11 (Default)
    - javaee-endorsed-api-7.0.jar
  - Project Files
    - pom.xml
    - nb-configuration.xml

# 新增/檢視相依性

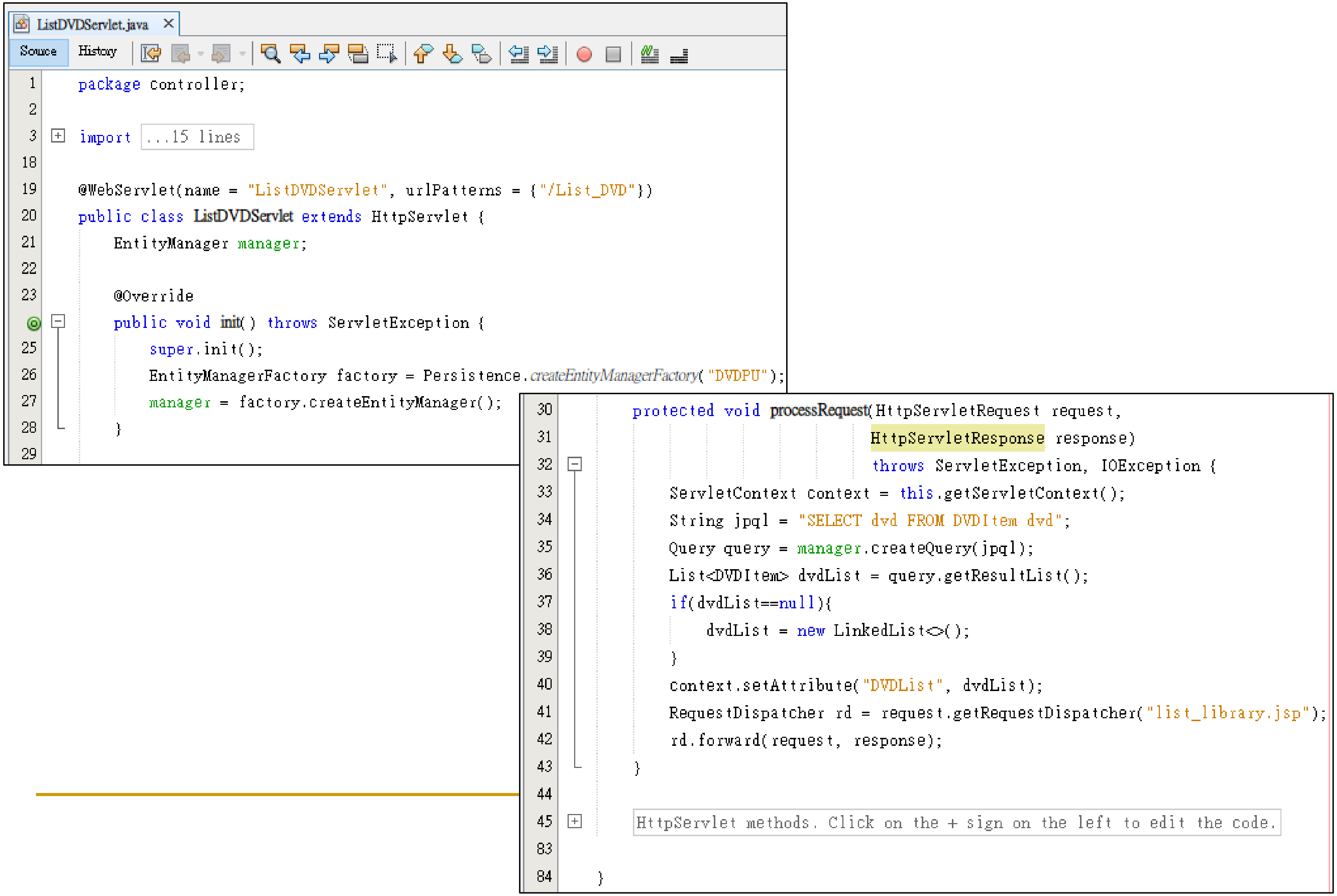


```
    <dependencies>
        <dependency>
            <groupId>javax.servlet</groupId>
            <artifactId>jstl</artifactId>
            <version>1.2</version>
        </dependency>
        <dependency>
            <groupId>org.apache.derby</groupId>
            <artifactId>derbyclient</artifactId>
            <version>10.14.2.0</version>
        </dependency>
        <dependency>
            <groupId>javax</groupId>
            <artifactId>javaee-web-api</artifactId>
            <version>7.0</version>
            <scope>provided</scope>
        </dependency>
```



```
        <dependency>
            <groupId>org.eclipse.persistence</groupId>
            <artifactId>org.eclipse.persistence.core</artifactId>
            <version>2.5.2</version>
        </dependency>
        <dependency>
            <groupId>org.eclipse.persistence</groupId>
            <artifactId>org.eclipse.persistence.asm</artifactId>
            <version>2.5.2</version>
        </dependency>
        <dependency>
            <groupId>org.eclipse.persistence</groupId>
            <artifactId>org.eclipse.persistence.antlr</artifactId>
            <version>2.5.2</version>
        </dependency>
        <dependency>
            <groupId>org.eclipse.persistence</groupId>
            <artifactId>org.eclipse.persistence.jpa</artifactId>
            <version>2.5.2</version>
        </dependency>
        <dependency>
            <groupId>org.eclipse.persistence</groupId>
            <artifactId>org.eclipse.persistence.jpa.jpql</artifactId>
            <version>2.5.2</version>
        </dependency>
        <dependency>
            <groupId>org.eclipse.persistence</groupId>
            <artifactId>javax.persistence</artifactId>
            <version>2.1.0</version>
        </dependency>
        <dependency>
            <groupId>org.eclipse.persistence</groupId>
            <artifactId>org.eclipse.persistence.jpa.modelgen.processor</artifactId>
            <version>2.5.2</version>
            <scope>provided</scope>
        </dependency>
    </dependencies>
```

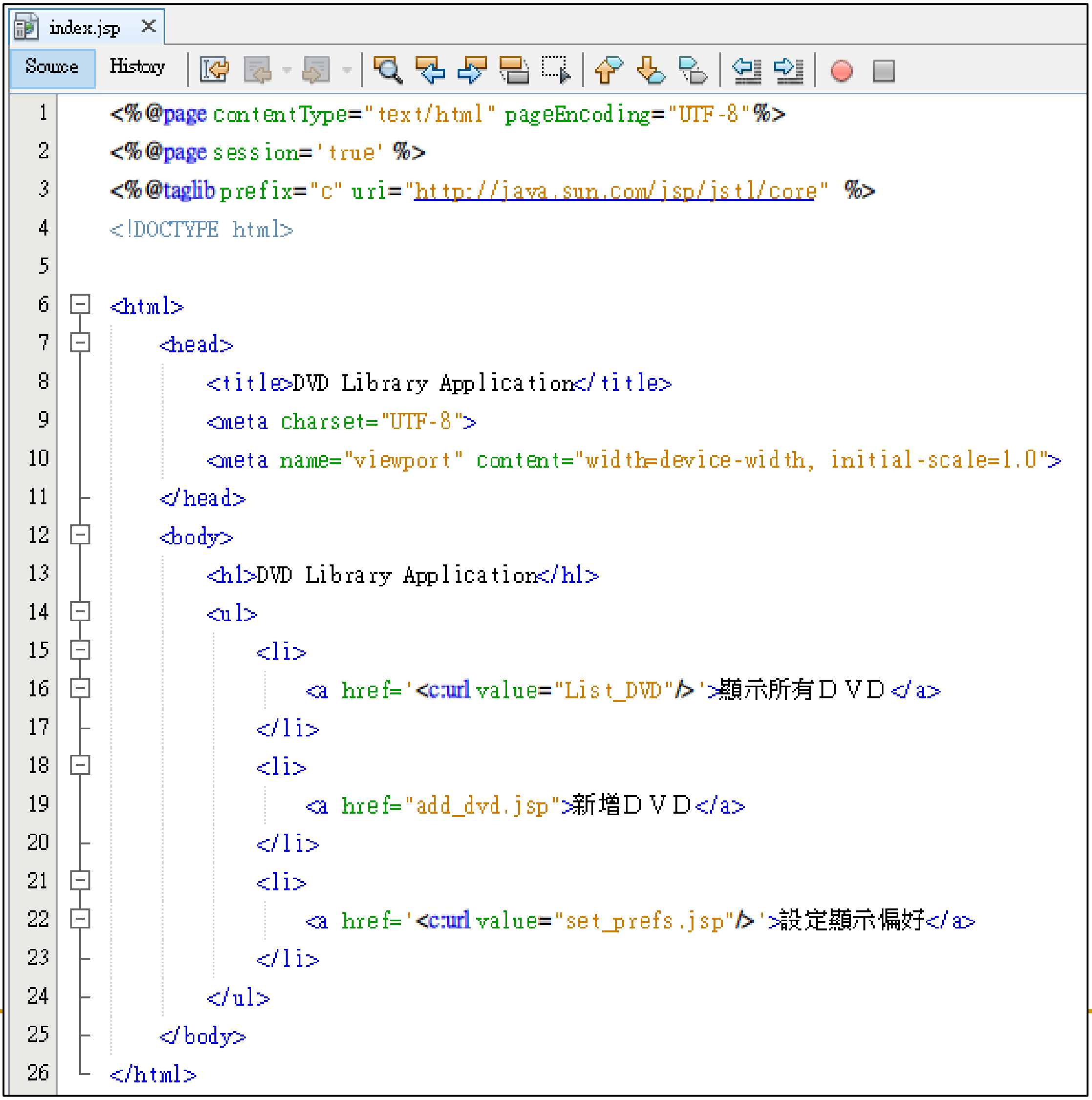
# controller.ListDVDServlet.java



```java
package controller;

import ...15 lines

@WebServlet(name = "ListDVDServlet", urlPatterns = {"/List_DVD"})
public class ListDVDServlet extends HttpServlet {
    EntityManager manager;

    @Override
    public void init() throws ServletException {
        super.init();
        EntityManagerFactory factory = Persistence.createEntityManagerFactory("DVDPU");
        manager = factory.createEntityManager();
    }

```

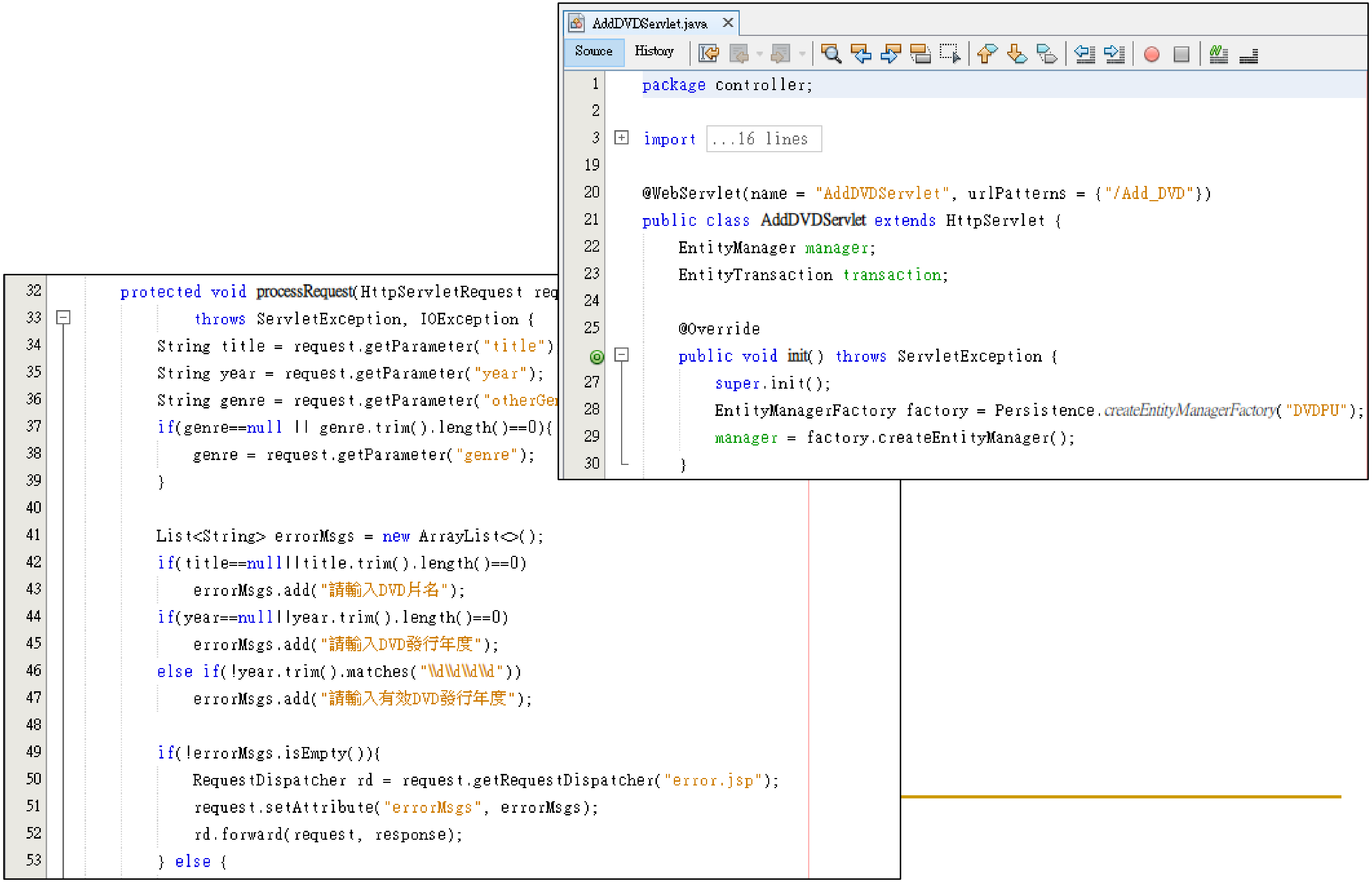
```java
    protected void processRequest(HttpServletRequest request,
                                  HttpServletResponse response)
                                  throws ServletException, IOException {
        ServletContext context = this.getServletContext();
        String jpql = "SELECT dvd FROM DVDItem dvd";
        Query query = manager.createQuery(jpql);
        List<DVDItem> dvdList = query.getResultList();
        if(dvdList==null){
            dvdList = new LinkedList<>();
        }
        context.setAttribute("DVDList", dvdList);
        RequestDispatcher rd = request.getRequestDispatcher("list_library.jsp");
        rd.forward(request, response);
    }

    HttpServlet methods. Click on the + sign on the left to edit the code.

}
```

# index.jsp



```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page session='true' %>
<%@taglib prefix="c" uri="http://java.sun.com/jsp/jstl/core" %>
<!DOCTYPE html>

<html>
    <head>
        <title>DVD Library Application</title>
        <meta charset="UTF-8">
        <meta name="viewport" content="width=device-width, initial-scale=1.0">
    </head>
    <body>
        <h1>DVD Library Application</h1>
        <ul>
            <li>
                <a href='<c:url value="List_DVD"/>'>顯示所有ＤＶＤ</a>
            </li>
            <li>
                <a href="add_dvd.jsp">新增ＤＶＤ</a>
            </li>
            <li>
                <a href='<c:url value="set_prefs.jsp"/>'>設定顯示偏好</a>
            </li>
        </ul>
    </body>
</html>
```

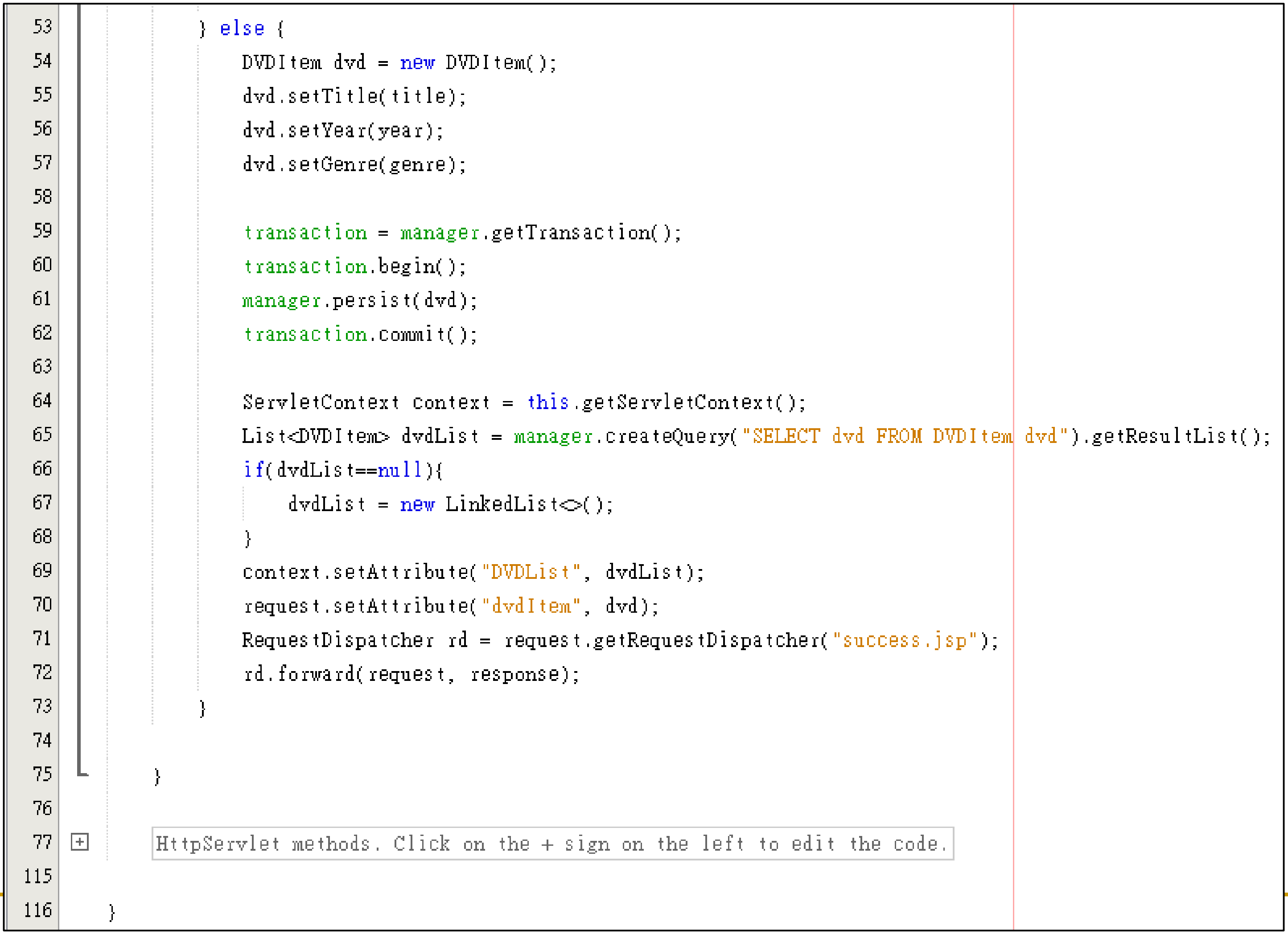
# controller.AddDVDServlet.java



```java
package controller;

import ...16 lines

@WebServlet(name = "AddDVDServlet", urlPatterns = {"/Add_DVD"})
public class AddDVDServlet extends HttpServlet {
    EntityManager manager;
    EntityTransaction transaction;

    @Override
    public void init() throws ServletException {
        super.init();
        EntityManagerFactory factory = Persistence.createEntityManagerFactory("DVDPU");
        manager = factory.createEntityManager();
    }
```

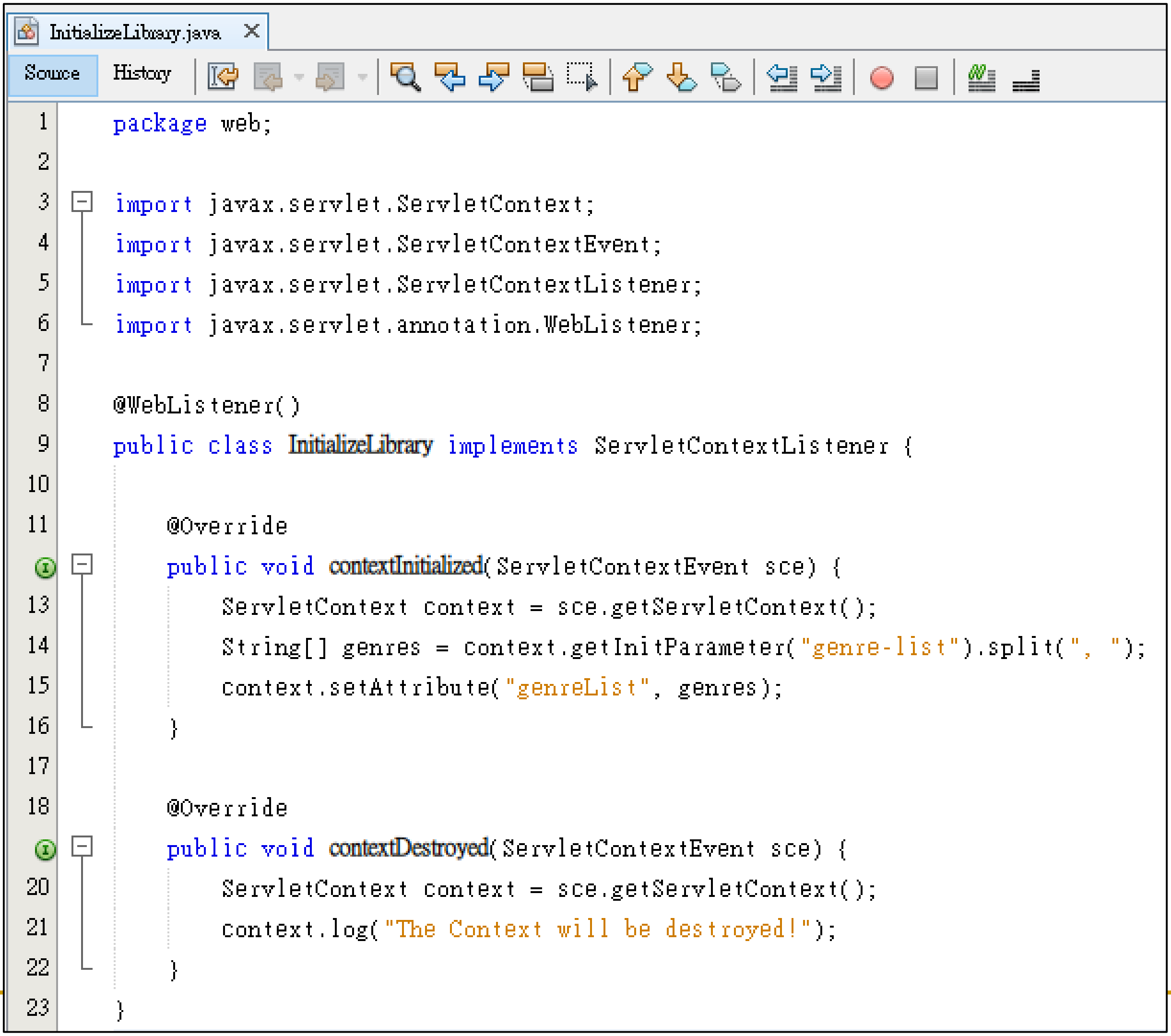
```java
    protected void processRequest(HttpServletRequest req
            throws ServletException, IOException {
        String title = request.getParameter("title")
        String year = request.getParameter("year");
        String genre = request.getParameter("otherGe
        if(genre==null || genre.trim().length()==0){
            genre = request.getParameter("genre");
        }

        List<String> errorMsgs = new ArrayList<>();
        if(title==null||title.trim().length()==0)
            errorMsgs.add("請輸入DVD片名");
        if(year==null||year.trim().length()==0)
            errorMsgs.add("請輸入DVD發行年度");
        else if(!year.trim().matches("\\d\\d\\d\\d"))
            errorMsgs.add("請輸入有效DVD發行年度");

        if(!errorMsgs.isEmpty()){
            RequestDispatcher rd = request.getRequestDispatcher("error.jsp");
            request.setAttribute("errorMsgs", errorMsgs);
            rd.forward(request, response);
        } else {
```

# controller.AddDVDServlet.java



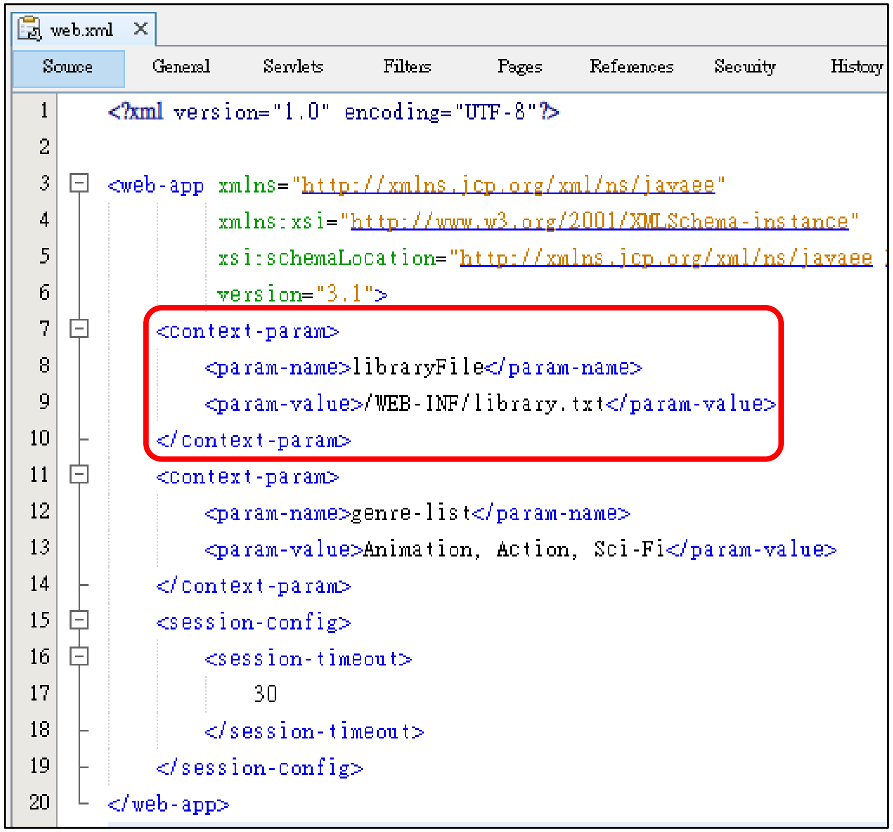
```
        } else {
            DVDItem dvd = new DVDItem();
            dvd.setTitle(title);
            dvd.setYear(year);
            dvd.setGenre(genre);

            transaction = manager.getTransaction();
            transaction.begin();
            manager.persist(dvd);
            transaction.commit();

            ServletContext context = this.getServletContext();
            List<DVDItem> dvdList = manager.createQuery("SELECT dvd FROM DVDItem dvd").getResultList();
            if(dvdList==null){
                dvdList = new LinkedList<>();
            }
            context.setAttribute("DVDList", dvdList);
            request.setAttribute("dvdItem", dvd);
            RequestDispatcher rd = request.getRequestDispatcher("success.jsp");
            rd.forward(request, response);
        }

    }

    HttpServlet methods. Click on the + sign on the left to edit the code.

}
```

# web.InitializeLibrary.java

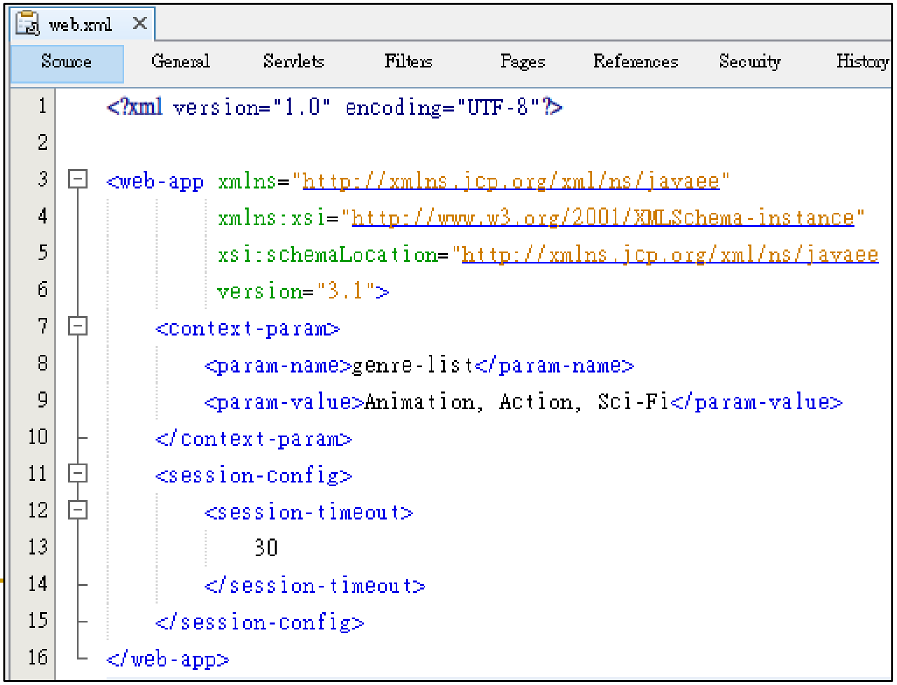


```java
package web;

import javax.servlet.ServletContext;
import javax.servlet.ServletContextEvent;
import javax.servlet.ServletContextListener;
import javax.servlet.annotation.WebListener;

@WebListener()
public class InitializeLibrary implements ServletContextListener {

    @Override
    public void contextInitialized(ServletContextEvent sce) {
        ServletContext context = sce.getServletContext();
        String[] genres = context.getInitParameter("genre-list").split(", ");
        context.setAttribute("genreList", genres);
    }

    @Override
    public void contextDestroyed(ServletContextEvent sce) {
        ServletContext context = sce.getServletContext();
        context.log("The Context will be destroyed!");
    }
}
```

# web.xml

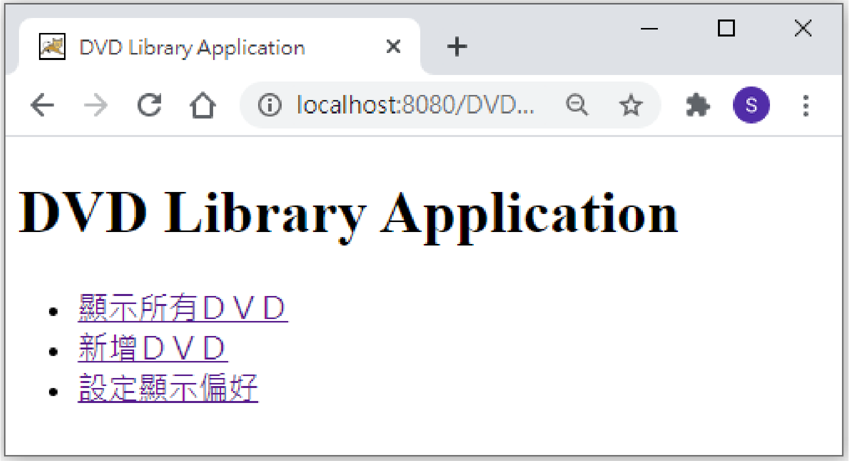


```
<?xml version="1.0" encoding="UTF-8"?>

<web-app xmlns="http://xmlns.jcp.org/xml/ns/javaee"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
         version="3.1">
    <context-param>
        <param-name>libraryFile</param-name>
        <param-value>/WEB-INF/library.txt</param-value>
    </context-param>
    <context-param>
        <param-name>genre-list</param-name>
        <param-value>Animation, Action, Sci-Fi</param-value>
    </context-param>
    <session-config>
        <session-timeout>
            30
        </session-timeout>
    </session-config>
</web-app>
```



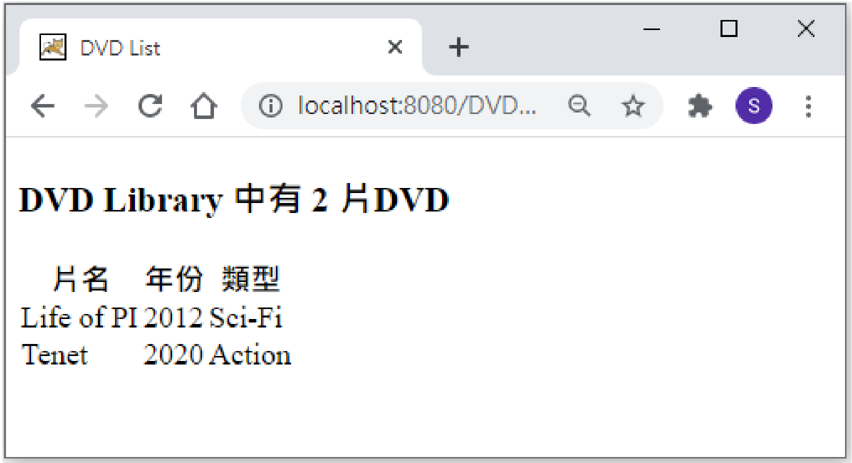
```
<?xml version="1.0" encoding="UTF-8"?>

<web-app xmlns="http://xmlns.jcp.org/xml/ns/javaee"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
         version="3.1">
    <context-param>
        <param-name>genre-list</param-name>
        <param-value>Animation, Action, Sci-Fi</param-value>
    </context-param>
    <session-config>
        <session-timeout>
            30
        </session-timeout>
    </session-config>
</web-app>
```

# 測試、執行



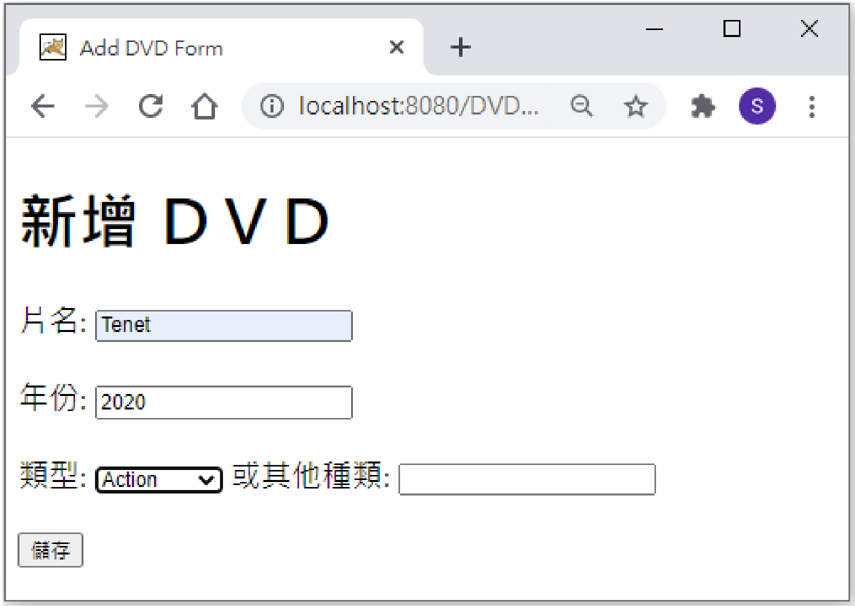
# DVD Library Application

- 顯示所有ＤＶＤ
- 新增ＤＶＤ
- 設定顯示偏好



### DVD Library 中有 2 片DVD

| 片名 | 年份 | 類型 |
|---|---|---|
| Life of PI | 2012 | Sci-Fi |
| Tenet | 2020 | Action |



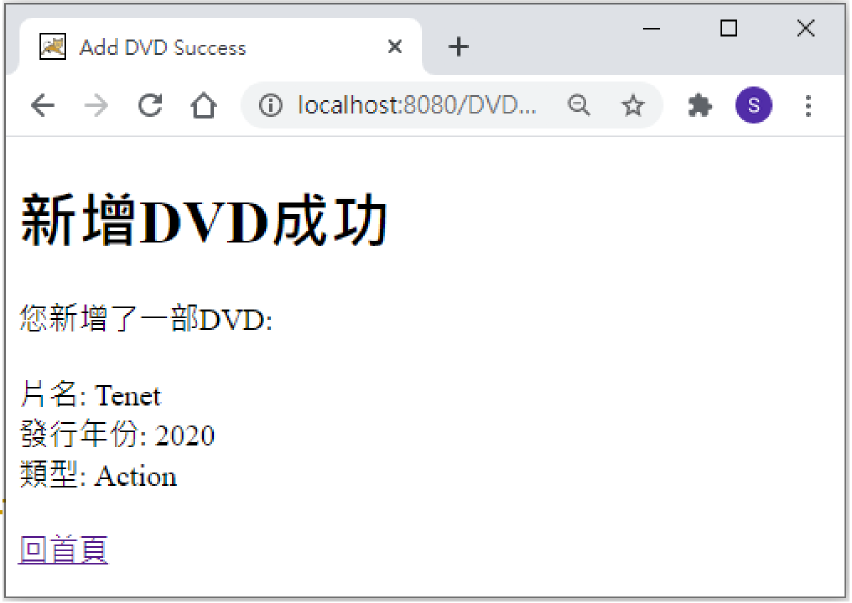
# 新增ＤＶＤ

片名: Tenet

年份: 2020

類型: Action 或其他種類:

儲存



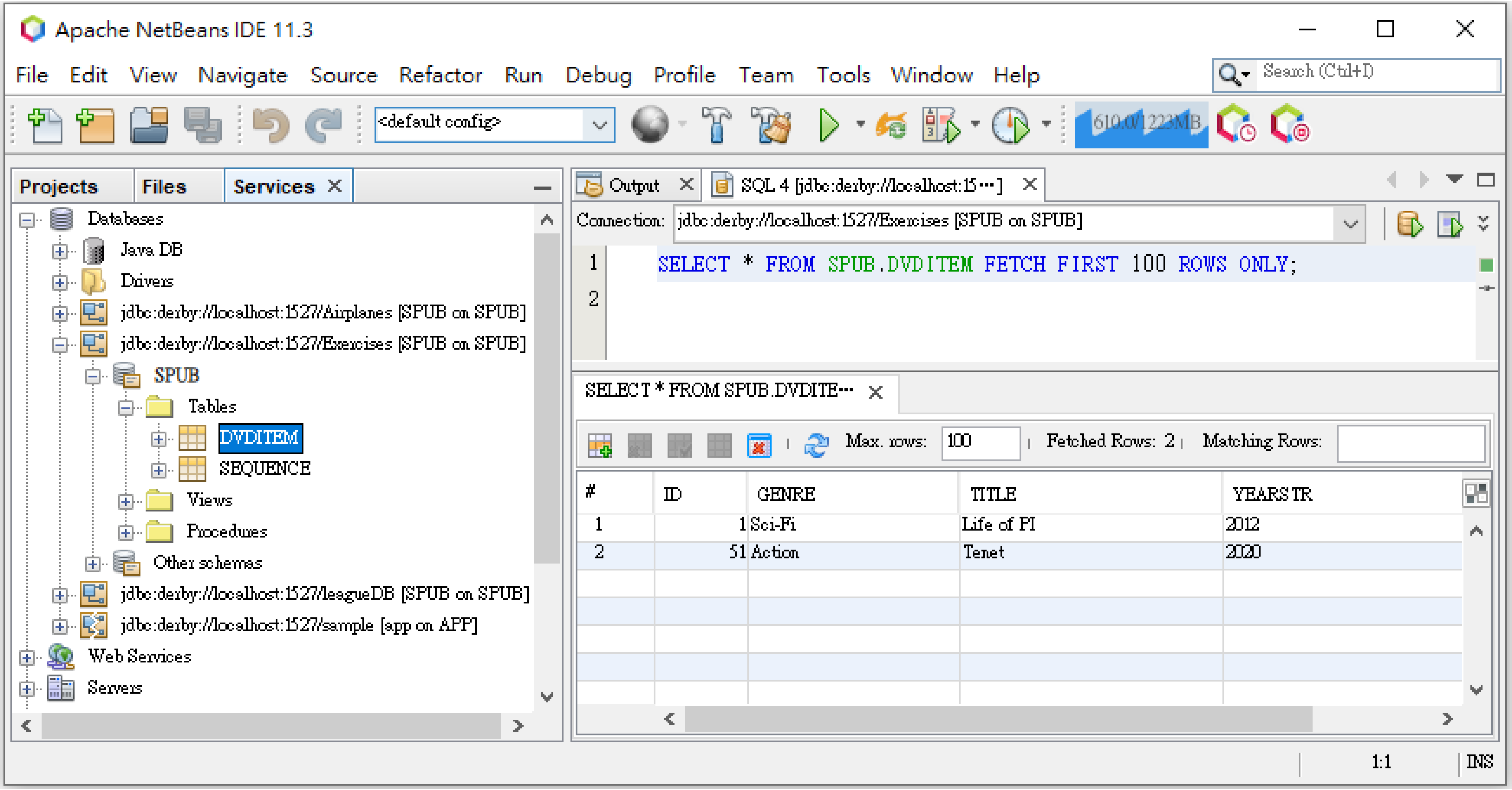
# 新增DVD成功

您新增了一部DVD:

片名: Tenet
發行年份: 2020
類型: Action

回首頁

# 檢視DVDITEM資料表


Apache NetBeans IDE 11.3
File Edit View Navigate Source Refactor Run Debug Profile Team Tools Window Help
Search (Ctrl+I)
<default config>
610.0/1223MB
Projects Files Services
Databases
Java DB
Drivers
jdbc:derby://localhost:1527/Airplanes [SPUB on SPUB]
jdbc:derby://localhost:1527/Exercises [SPUB on SPUB]
SPUB
Tables
DVDITEM
SEQUENCE
Views
Procedures
Other schemes
jdbc:derby://localhost:1527/leagueDB [SPUB on SPUB]
jdbc:derby://localhost:1527/sample [app on APP]
Web Services
Servers
Output
SQL 4 [jdbc:derby://localhost:15…]
SELECT * FROM SPUB.DVDITE…
1:1
INS

Connection: jdbc:derby://localhost:1527/Exercises [SPUB on SPUB]

```
SELECT * FROM SPUB.DVDITEM FETCH FIRST 100 ROWS ONLY;
```

Max. rows: 100 Fetched Rows: 2 Matching Rows:

| # | ID | GENRE | TITLE | YEARSTR |
|---|---|---|---|---|
| 1 | 1 | Sci-Fi | Life of PI | 2012 |
| 2 | 51 | Action | Tenet | 2020 |