Java EE 7 Web
表達語言與標準動作標籤

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課程大綱

1) **JSP文稿Scripting 元素替代方案**
2) 表達語言(Expression Language)
3) 標準動作標籤

開發的角色分配(job roles)

- 開發大型網路應用程式的工作角色包括：
  - 網頁設計人員
    - 負責建立應用程式的view元件
    - 主要應用技術是HTML網頁及JSP頁面。
  - 網路元件開發人員
    - 負責建立應用程式的controller元件
    - 主要應用技術是Java Servlet 程式。
  - 商業元件開發人員
    - 負責建立應用程式的model元件
    - 主要應用技術是Java Beans、DAO元件(置於同一網路伺服器)、EJB元件(分散式遠端伺服器)。

JSP文稿Scripting 元素替代方案

- 文稿Scripting元素
  - 混雜邏輯及展示,不易閱讀及維護
  - 內嵌 Java 程式碼,網頁設計人員需具撰寫Java能力

- 替代方案
  - 標準動作 Standard Action 標籤
  - Expression Language表達語言
  - 標籤函式庫
    - 自訂標籤函式庫 (Custom Tag Library)
    - 標準標籤函式庫 (JSTL) Tag Library
  - 網頁設計人員建立JSP網頁時,不需要瞭解Java程式

課程大綱

1) JSP文稿Scripting 元素替代方案

2) **標準動作標籤**

   - **Java Beans動作標籤**
   - Include 動作標籤

3) 表達語言(Expression Language)

標準動作標籤 Standard Action Tag

- 標準動作標籤
  - JSP規格書中定義XML標籤，執行特定事先定義動作
  - <jsp：actionName attr="value"...>
  - 減少JSP中所包含的Java程式碼
  - 標籤定義在規格書中，每個JSP容器都必須支援
  - 常用標準動作標籤
    - 與JavaBean元件互動的標準動作
    - 引入(include)或轉向(forward)其他檔案的標準動作
    - 內嵌用戶端技術的標籤動作
    - 標籤檔案使用有關的標準動作
    - 描述JSP檔裏使用的標準動作

標準動作標籤 Standard Action Tag

	標準動作標籤	描述
Java Beans 標準動作	<jsp:useBean>	使用useBean 標籤宣告要使用的Java Bean
	<jsp:setProperty>	使用setProperty 標籤在JavaBeans 實例中儲存資料
	<jsp:getProperty>	getProperty 標籤是用來從JavaBean 實體取得屬性，並將它顯示在輸出串流裏
Include / Forward 標準動作	<jsp:include>	動態加入指定的資源執行結果
	<jsp:forward>	請求轉向派送到指定的資源裏執行
	<jsp:param>	將參數加到request 中，在jsp:include 和jsp:forward 標籤裏使用
Plug-in 標準動作	<jsp:plugin>	依不同用戶端瀏覽器產生不同applet 標籤(OBJECT 或EMBED)
	<jsp:params>	提供Java applet 參數，使用在jsp:plugin 標籤中
	<jsp:fallback>	若Java applet 無法在用戶端執行時，提供替代文字，用在jsp:plugin 標籤裏

標準動作標籤 Standard Action Tag

	標準動作標籤	描述
檔案使用有關的標準動作	<jsp:attribute>	用在標準或自訂標籤裏，提供屬性和值
	<jsp:body>	用在標準或自定標籤來提供標籤本體
	<jsp:invoke>	用在標籤檔案來觸發JSP 網頁的部分
	<jsp:doBody>	使用標籤檔案來觸發標籤的本體
	<jsp:element>	動態定義XML 元素的標籤值
JSP檔裏使用的標準動作取代文稿元素	<jsp:text>	附加JSP 網頁、JSP 檔或標籤檔案的樣板資料
	<jsp:output>	修改JSP 檔或標籤檔案的輸出屬性
	<jsp:root>	定義JSP 檔的根元素
	<jsp:declaration>	定義JSP 檔裏的宣告 <%! %>
	<jsp:scriptlet>	定義JSP 檔裏的scriptlet <% %>
	<jsp:expression>	定義JSP 檔裏的表示式 <%= %>

JavaBeans Component

- 重複使用的java物件
- 規則
  - 類別需為public
  - 類別需實作java.io.Serializable
  - 提供無參數建構子no-argument constructor
  - 屬性均不為public
  - 屬性需定義存取屬性的方法 getXXX(), setXXX()
    - Read Only屬性 : 只定義getter
    - Read-Write屬性 : 定義getter, setter
- 使用方法
  - 在Scriptlet中建立並初始化一個實體
  - 在JSP中可用標準動作元素來操作Java Beans

```
package beans;
import java.io.Serializable;
public class CustomerBean implements Serializable {
        private String name;
        private String email;
        private String phone;
        public CustomerBean() {
                this.name = "";
                this.email = "";
                this.phone = "";
        }
        public void setName(String name) {
                this.name = name;
        }
        public String getName() {
                return name;
        }
        public void setEmail(String email) {
                this.email = email;
         }
         public String getEmail() {
                return email;
         }
         public void setPhone(String phone) {
                this.phone = phone;
         }
         public String getPhone() {
                return phone;
         }
}
```

標準動作元素 - useBeans

<jsp:useBeans id="變數名稱" scope=" 存取範圍" 型別規格 />

屬性	用途
id	JSP中參考Java Bean的變數名稱
scope	定義Java Bean的存取範圍, 可為 application / session / request / page, (預設值為page)
class	Java Bean的類別名稱
beanName	Java Bean名稱
type	id屬性值的變數型別 (多型)

} 型別規格

- 型別規格
  - class=“類別名稱”
  - class=“類別名稱” type=“變數型別”
  - beanName=“Java Bean名稱”
  - beanName=“Java Bean名稱” type=“變數型別”
  - type=“變數型別”

Java Beans Scope

scope	Bean 儲存位置	說明
page	PageContext	只在目前網頁可存取這個Java bean
request	ServletRequest	同一HTTP Request物件可存取 如將請求轉送至另一個JSP,新JSP可透過ServletRequest物件取得這個Java bean
session	HttpSession	同一Seesion內可存取這個Java bean
application	ServletContext	Web應用程式中所有JSP皆可存取這個Java bean

Java Beans Scope

```
<jsp:useBean id= "cust" scope= "request"
                   class= "beans.CustomerBean" />
```

```
CustomerBean cust = (CustomerBean) request.getAttribute("cust");
if (cust == null) {
    cust = new CustomerBean();
    request.setAttribute("cust", cust);
}
```

標準動作元素 - setProperty

```
<jsp:setProperty name= "JavaBean名稱" property = "屬性名稱"
                  [param= "參數名稱" ] [value= "屬性值" ] />
```

```
<jsp:getProperty name= "JavaBean名稱" property= "屬性名稱" />
```

屬性	用途
name	JavaBean名稱(useBean中的 id 屬性)
property	欲設定的屬性名稱
param	HTTP Request中對應參數名稱(與屬性名稱不同時)
value	欲設定的屬性值

標準動作元素 - setProperty

- 設定Java Bean的屬性
  - 將Http Request中的參數值,設為Java Bean的屬性

```
<jsp:setProperty name= "cust" property= "*" /> (introspection)
<jsp:setProperty name= "cust" property= "name" />
<jsp:setProperty name= "cust" property= "name" param= "usrName" />
```

  - 自行設定Java Bean的屬性

```
<jsp:setProperty name = "cust" property= "name" value= "sean" />
<jsp:setProperty name = "cust" property= "name"
                                             value= "<%=loginID%>" />
```

- 取得Java Bean的屬性

```
<jsp:getProperty name= "cust" property = "name" />
```

Java Bean Properties

```
<jsp:useBean id = "cust" scope = "session"
                                   class = "beans.CustomerBean" >
    <jsp:setProperty name = "cust" property = "name" value= "Sean" />
</jsp:useBean>
```

```
CustomerBean cust = (CustomerBean) session.getAttribute( "cust" );
if (cust == null) {
   cust = new CustomerBean();
   session.setAttribute("cust", cust);
   cust.setName(“Sean”);
}
```

Java Bean Properties

```
<jsp:useBean id = "cust" scope = " session"
                                        class = "beans.CustomerBean" />
<jsp:setProperty name= "cust" property = "name" value= "Sean" />
```

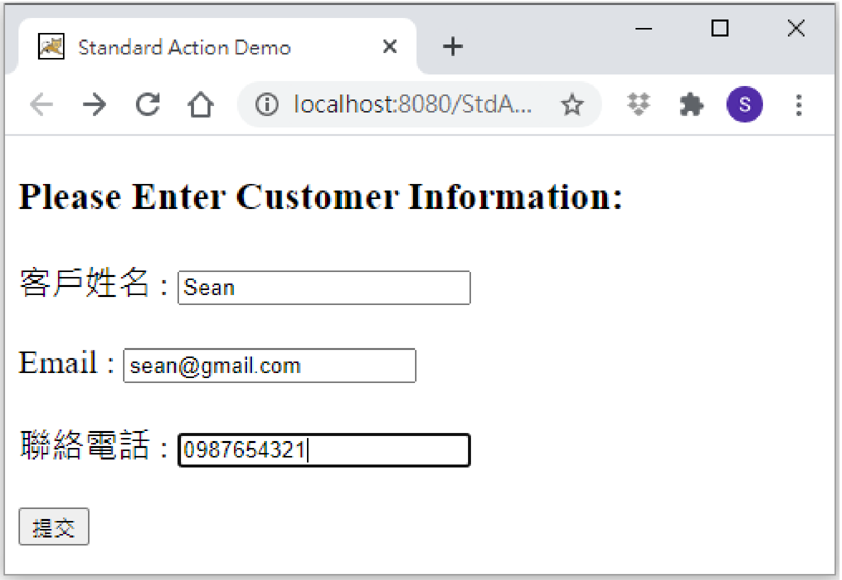
```
CustomerBean cust = (CustomerBean) session.getAttribute( "cust" );
if (cust == null) {
    cust = new CustomerBean();
    session.setAttribute("cust", cust);
}
cust.setName(“Sean”);
```

Java Bean Properties

```
<%
    CustomerBean cust = new CustomerBean();
    cust.setName(request.getParameter("name"));
    cust.setEmail(request.getParameter("email"));
    cust.setPhone(request.getParameter("phone"));
%>
<HTML>
<BODY>
客戶姓名 : <%= cust.getName(); %>

Email      : <%= cust.getEmail(); %>

聯絡電話 : <%= cust.getPhone(); %>

</BODY>
</HTML>
```

```
<jsp:useBean id= "cust" scope = "page"
        class= "beans.CustomerBean" />
<jsp:setProperty name="cust" property="*" />



<HTML>
<BODY>
客戶姓名 : <jsp:getProperty name= "cust"
                    property= "name" />
Email      : <jsp:getProperty name= "cust"
                    property= "email" />
聯絡電話 : <jsp:getProperty name= "cust"
                    property= "phone" />
</BODY>
</HTML>
```

StdActionDemo



Please Enter Customer Information:

客戶姓名 : Sean

Email : sean@gmail.com

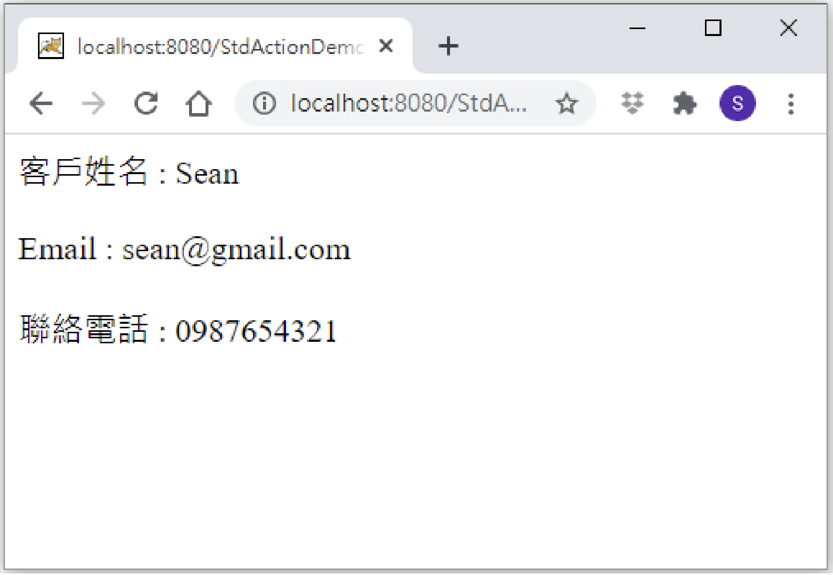
聯絡電話 : 0987654321

提交

```
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Standard Action Demo</title>
    </head>
    <body>
        <h3>Please Enter Customer Information:</h3>
        <form action ="customerInfo.jsp" method="post">
            客戶姓名 : <input type="text" name="name"/> <br/><br/>
            Email   :    <input type="text" name="email"/> <br/><br/>
            聯絡電話 : <input type="text" name="phone"/> <br/><br/>
            <input type="submit"/>
        </form>
    </body>
</html>
```

StdActionDemo

```
<jsp:useBean id= "cust" scope = "page"
                    class= "beans.CustomerBean" />
<jsp:setProperty name="cust" property="*" />

<HTML>
<BODY>
客戶姓名 : <jsp:getProperty name= "cust" property= "name" />
Email      : <jsp:getProperty name= "cust" property= "email" />
聯絡電話 : <jsp:getProperty name= "cust" property= "phone" />
 </BODY>
</HTML>
```



客戶姓名 : Sean

Email : sean@gmail.com

聯絡電話 : 0987654321

```
package beans;
import java.io.Serializable;
public class CustomerBean implements
                                        Serializable {
      private String name;
      private String email;
      private String phone;
      public CustomerBean() {
                this.name = "";
                this.email = "";
                this.phone = "";
      }
      public void setName(String name) {
                this.name = name;
      }
      public String getName() {
                return name;
      }
      public void setEmail(String email) {
                this.email = email;
       }
       public String getEmail() {
                return email;
       }
       public void setPhone(String phone) {
                this.phone = phone;
       }
       public String getPhone() {
                return phone;
       }
}
```

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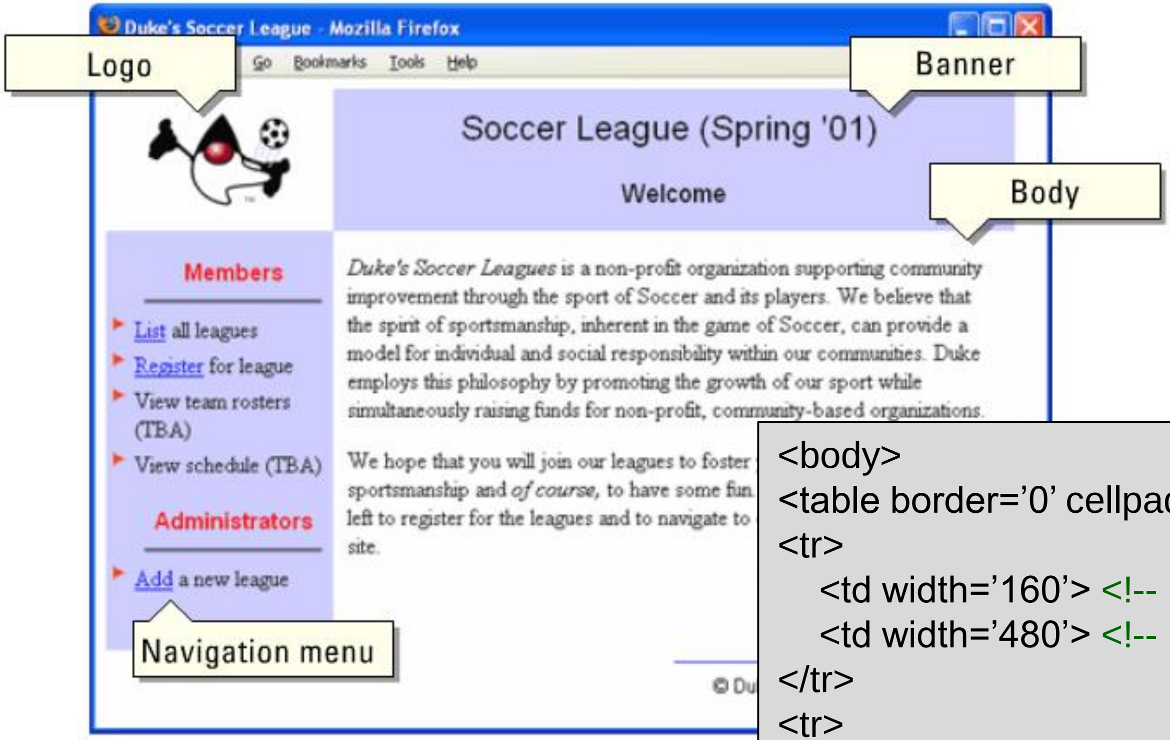
   - ❑ Java Beans動作標籤
   - ❑ **Include 動作標籤**
3) 表達語言(Expression Language)

複雜的網頁版面配置



Soccer League (Spring '01)

Welcome

Members

- List all leagues
- Register for league
- View team rosters (TBA)
- View schedule (TBA)

Administrators

- Add a new league

Duke's Soccer Leagues is a non-profit organization supporting community improvement through the sport of Soccer and its players. We believe that the spirit of sportsmanship, inherent in the game of Soccer, can provide a model for individual and social responsibility within our communities. Duke employs this philosophy by promoting the growth of our sport while simultaneously raising funds for non-profit, community-based organizations.

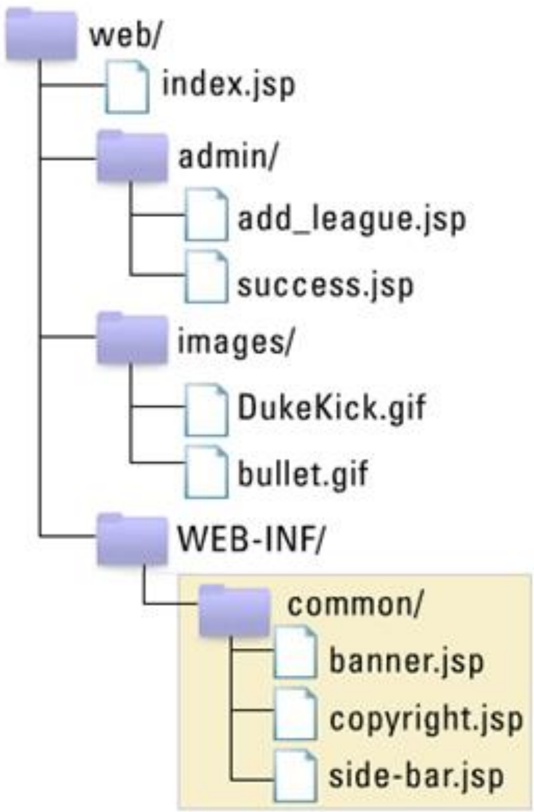
We hope that you will join our leagues to foster sportsmanship and *of course*, to have some fun left to register for the leagues and to navigate to site.

© Du

```
<body>
<table border='0' cellpadding='0' cellspacing='0' width='640'>
<tr>
   <td width='160'> <!-- logo here --> </td>
   <td width='480'> <!-- banner here --> </td>
</tr>
<tr>
   <td width='160'> <!-- navigation menu here --> </td>
   <td width='480'> <!-- main content here --> </td>
</tr>
<tr>
   <td width='160'> <!-- nothing here --> </td>
   <td width='480'> <!-- copyright notice here --> </td>
</tr>
</table>
</body>
```

展現層片段(segment)

- Presentation Segment
  - 靜態HTML程式碼
  - 動態JSP程式
  - 嵌入到其他JSP 網頁中
  - 不能包含html、head 或body 標籤
    - 被嵌入的JSP網頁可能包含定義整個網頁回應的html 和body 標籤結構
  - 通常共用的展示層片段，放置於隱藏目錄 (WEB-INF/)之下
    - 此目錄下的內容，不能從瀏覽器直接請求的方式來取得



將展現層片段加到JSP 網頁

- 在JSP網頁內包含其他JSP片段內容
  - JSP 指令標籤：include 指令
  - jsp:include 標準動作

- JSP指令標籤 Directive Tag

  <%@ include file=“*欲加入之JSP或html檔案*” %>
  - 在解譯時期 translation time 將網頁包含進來,再編譯成 Servlet
  - 被包含的網頁通常不含<html>, <head>,<body>標籤

標準動作標籤：include、param

- 標準動作標籤
  - 標準動作標籤元素--include

```
<jsp:include page="欲加入之JSP或html檔案"   />
```

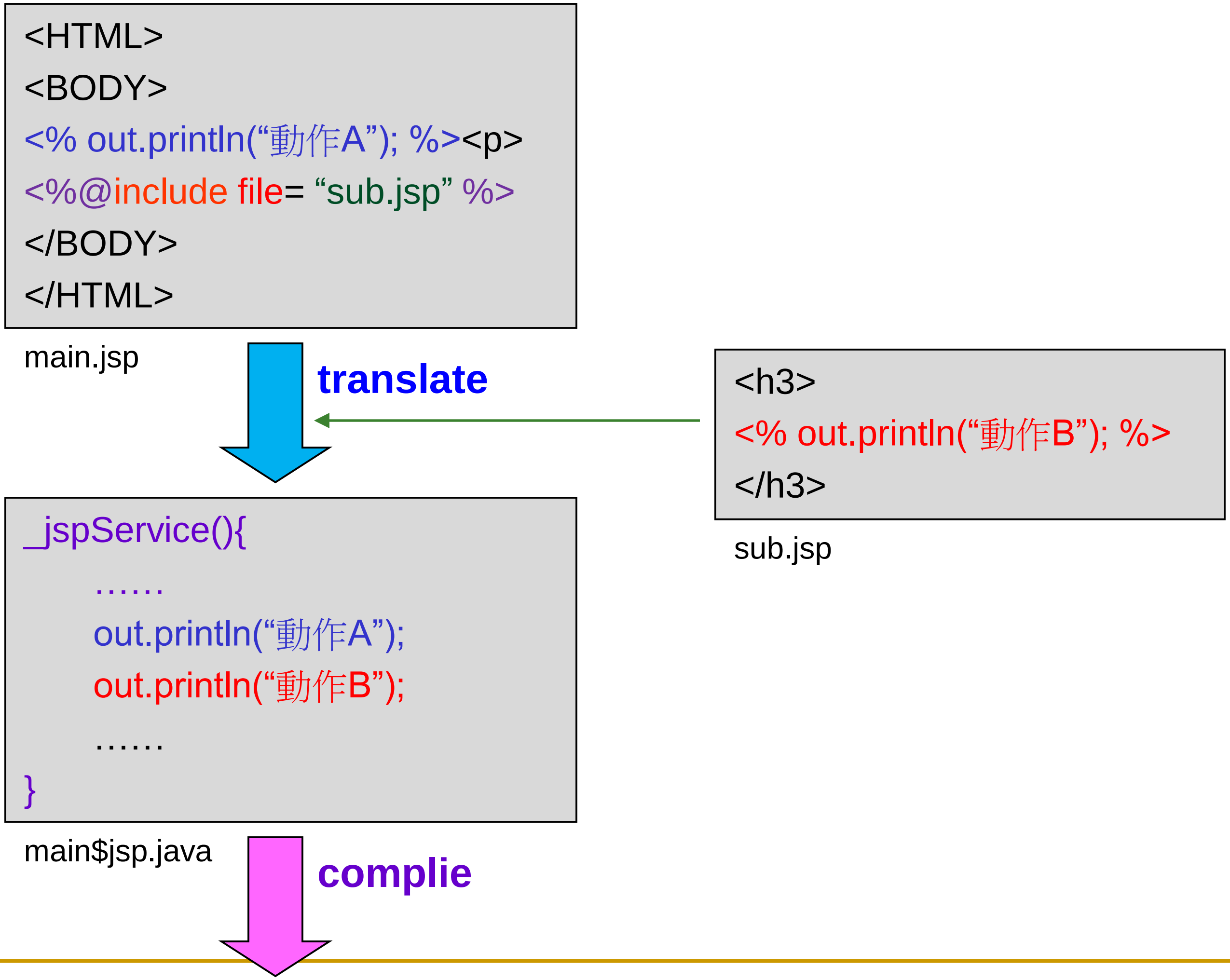
  - 在執行時期才將網頁包含進來

- 標準動作標籤元素—param

```
<jsp:include page="欲加入之JSP或html檔案"   >
      <jsp:param name="參數名稱"   value="參數值"   />
</jsp:include>
```

  - 在執行時期將參數傳給被包含的網頁,決定其執行結果

JSP 指令標籤：include 指令



```
<HTML>
<BODY>
<% out.println(“動作A”); %><p>
<%@include file= “sub.jsp” %>
</BODY>
</HTML>
```

main.jsp

translate

```
<h3>
<% out.println(“動作B”); %>
</h3>
```

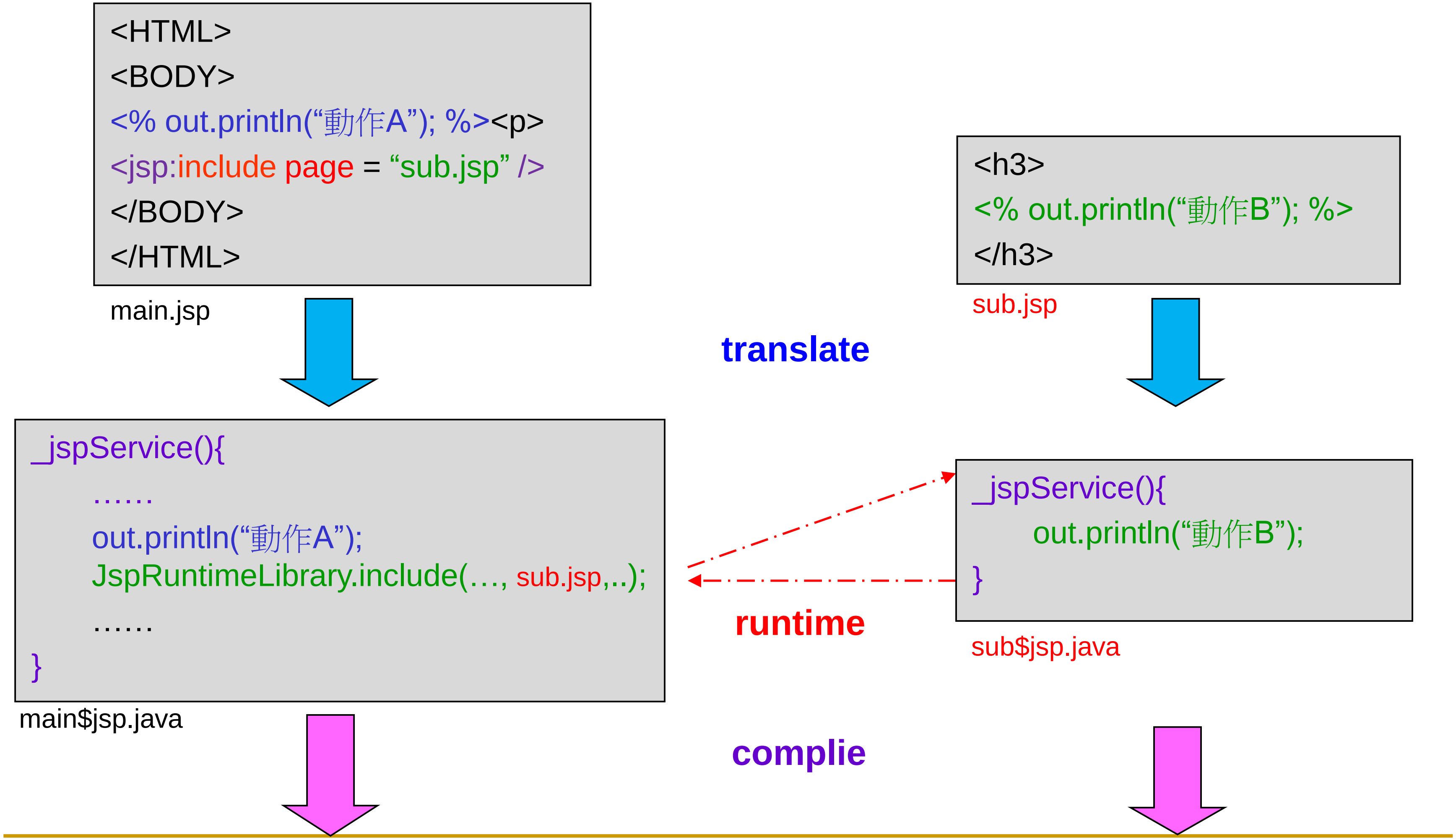
sub.jsp

```
_jspService(){
      ……
      out.println(“動作A”);
      out.println(“動作B”);
      ……
}
```

main$jsp.java

complie

標準動作元素：include



```
<HTML>
<BODY>
<% out.println("動作A"); %><p>
<jsp:include page = "sub.jsp" />
</BODY>
</HTML>
```

main.jsp

```
<h3>
<% out.println("動作B"); %>
</h3>
```

sub.jsp

translate

```
_jspService(){
      ……
      out.println("動作A");
      JspRuntimeLibrary.include(…, sub.jsp,..);
      ……
}
```

main$jsp.java

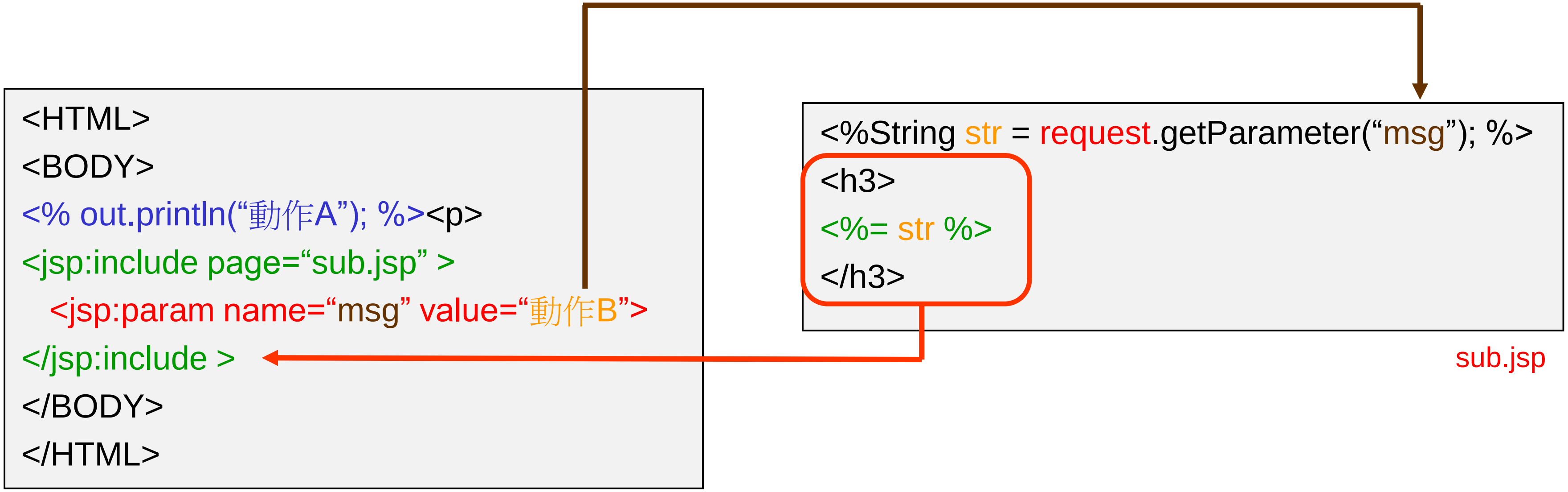
```
_jspService(){
      out.println("動作B");
}
```

sub$jsp.java

runtime

complie

標準動作元素：param



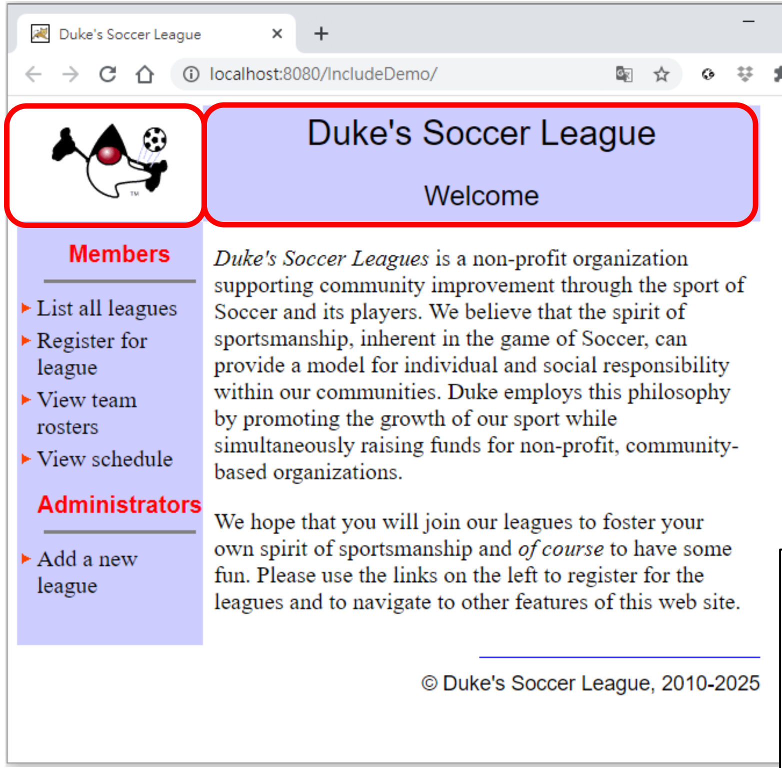
```
<HTML>
<BODY>
<% out.println(“動作A”); %><p>
<jsp:include page=“sub.jsp” >
   <jsp:param name=“msg” value=“動作B”>
</jsp:include >
</BODY>
</HTML>
```

main.jsp

```
<%String str = request.getParameter(“msg”); %>
<h3>
<%= str %>
</h3>
```

sub.jsp

IncludeDemo



Duke's Soccer League

Welcome

Members

- List all leagues
- Register for league
- View team rosters
- View schedule

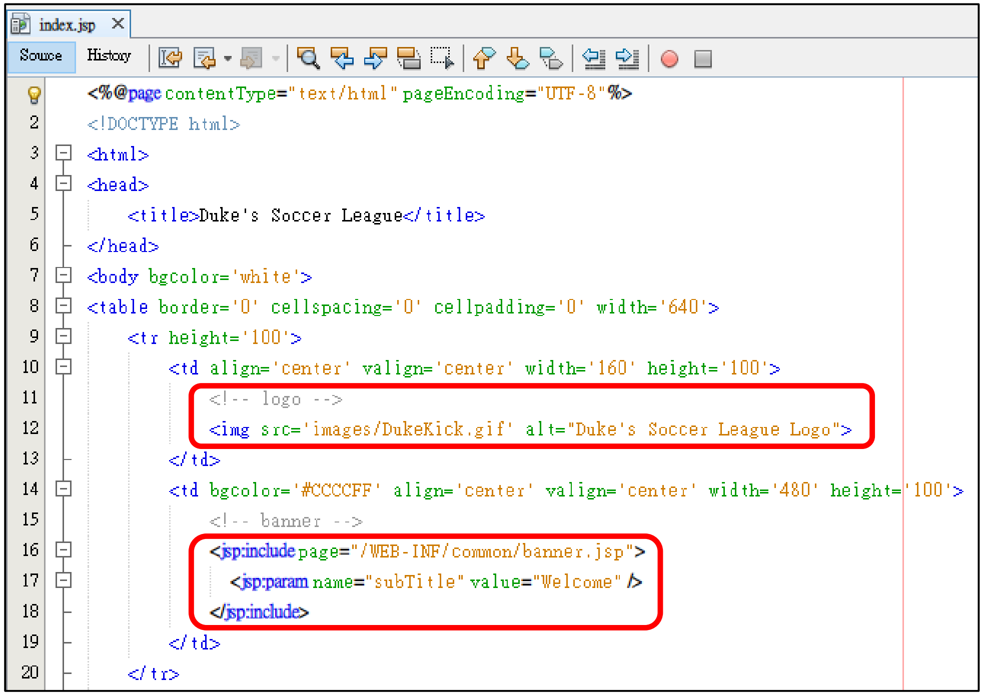
Administrators

- Add a new league

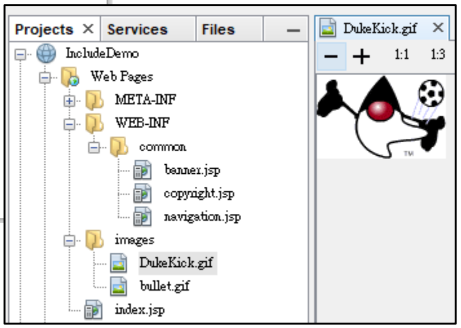
Duke's Soccer Leagues is a non-profit organization supporting community improvement through the sport of Soccer and its players. We believe that the spirit of sportsmanship, inherent in the game of Soccer, can provide a model for individual and social responsibility within our communities. Duke employs this philosophy by promoting the growth of our sport while simultaneously raising funds for non-profit, community-based organizations.

We hope that you will join our leagues to foster your own spirit of sportsmanship and *of course* to have some fun. Please use the links on the left to register for the leagues and to navigate to other features of this web site.

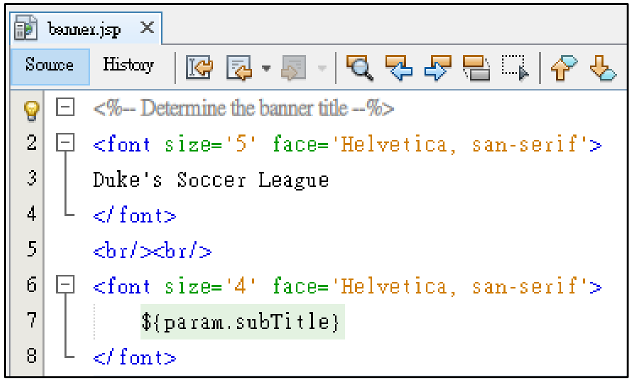
© Duke's Soccer League, 2010-2025



```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
<head>
    <title>Duke's Soccer League</title>
</head>
<body bgcolor='white'>
<table border='0' cellspacing='0' cellpadding='0' width='640'>
    <tr height='100'>
        <td align='center' valign='center' width='160' height='100'>
            <!-- logo -->
            <img src='images/DukeKick.gif' alt="Duke's Soccer League Logo">
        </td>
        <td bgcolor='#CCCCFF' align='center' valign='center' width='480' height='100'>
            <!-- banner -->
            <jsp:include page="/WEB-INF/common/banner.jsp">
                <jsp:param name="subTitle" value="Welcome" />
            </jsp:include>
        </td>
    </tr>
```

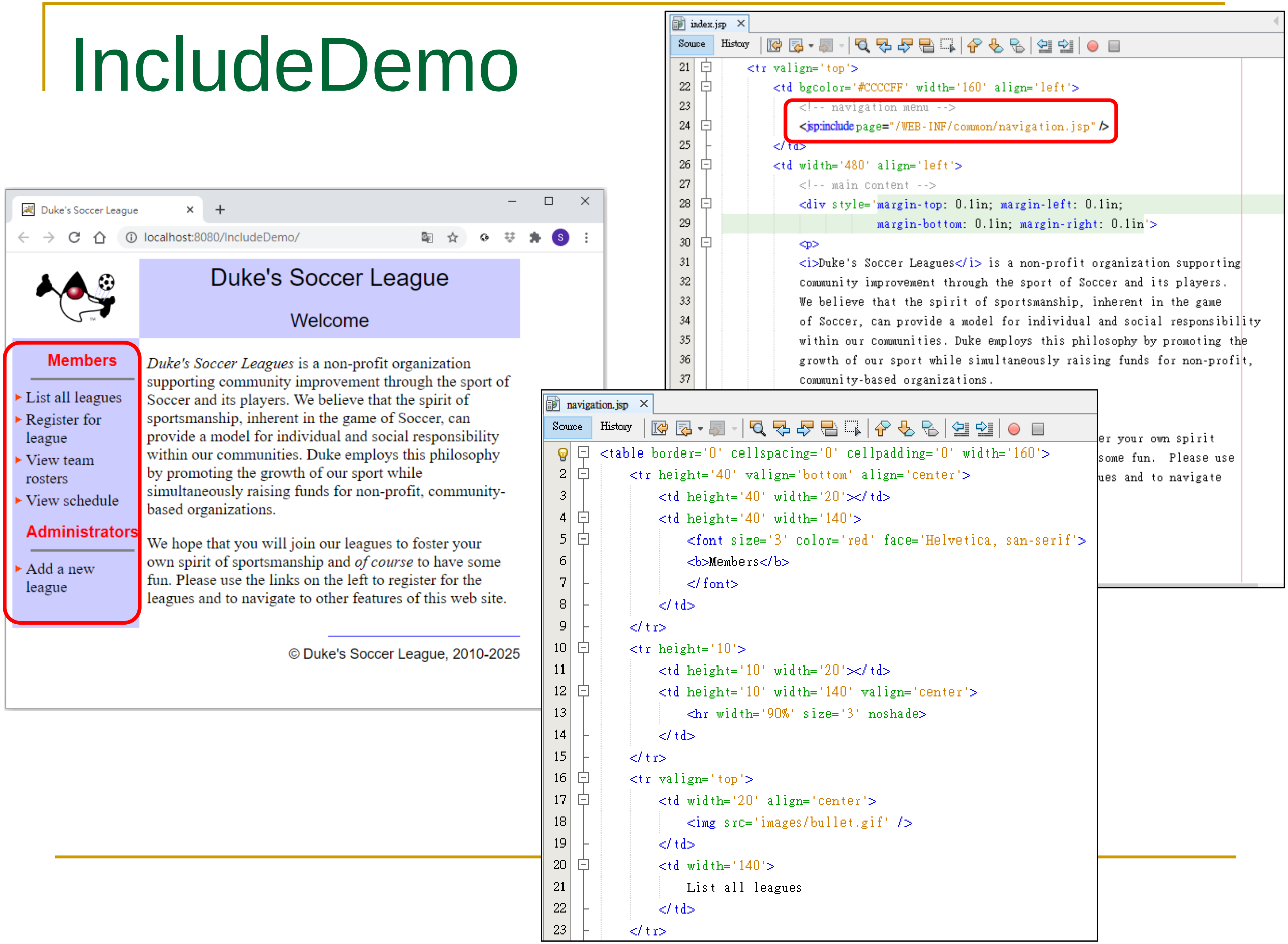


```
IncludeDemo
    Web Pages
        META-INF
        WEB-INF
            common
                banner.jsp
                copyright.jsp
                navigation.jsp
        images
            DukeKick.gif
            bullet.gif
        index.jsp
```



```
<%-- Determine the banner title --%>
<font size='5' face='Helvetica, san-serif'>
Duke's Soccer League
</font>
<br/><br/>
<font size='4' face='Helvetica, san-serif'>
    ${param.subTitle}
</font>
```

IncludeDemo



Duke's Soccer League

localhost:8080/IncludeDemo/

Duke's Soccer League

Welcome

Members

- List all leagues
- Register for league
- View team rosters
- View schedule

Administrators

- Add a new league

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index.jsp

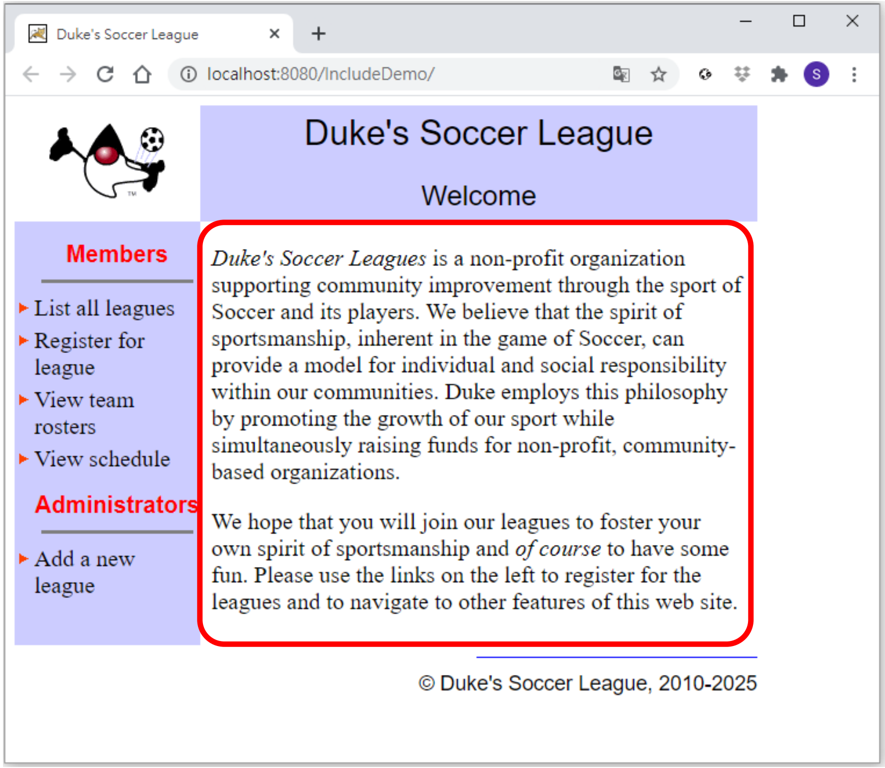
```
<tr valign='top'>
  <td bgcolor='#CCCCFF' width='160' align='left'>
    <!-- navigation menu -->
    <jsp:include page="/WEB-INF/common/navigation.jsp" />
  </td>
  <td width='480' align='left'>
    <!-- main content -->
    <div style='margin-top: 0.1in; margin-left: 0.1in;
                margin-bottom: 0.1in; margin-right: 0.1in'>
    <p>
    <i>Duke's Soccer Leagues</i> is a non-profit organization supporting
    community improvement through the sport of Soccer and its players.
    We believe that the spirit of sportsmanship, inherent in the game
    of Soccer, can provide a model for individual and social responsibility
    within our communities. Duke employs this philosophy by promoting the
    growth of our sport while simultaneously raising funds for non-profit,
    community-based organizations.
```

```
er your own spirit
some fun.  Please use
ues and to navigate
```

navigation.jsp

```
<table border='0' cellspacing='0' cellpadding='0' width='160'>
  <tr height='40' valign='bottom' align='center'>
    <td height='40' width='20'></td>
    <td height='40' width='140'>
      <font size='3' color='red' face='Helvetica, san-serif'>
      <b>Members</b>
      </font>
    </td>
  </tr>
  <tr height='10'>
    <td height='10' width='20'></td>
    <td height='10' width='140' valign='center'>
      <hr width='90%' size='3' noshade>
    </td>
  </tr>
  <tr valign='top'>
    <td width='20' align='center'>
      <img src='images/bullet.gif' />
    </td>
    <td width='140'>
      List all leagues
    </td>
  </tr>
```

IncludeDemo



Duke's Soccer League

Welcome

Members

- List all leagues
- Register for league
- View team rosters
- View schedule

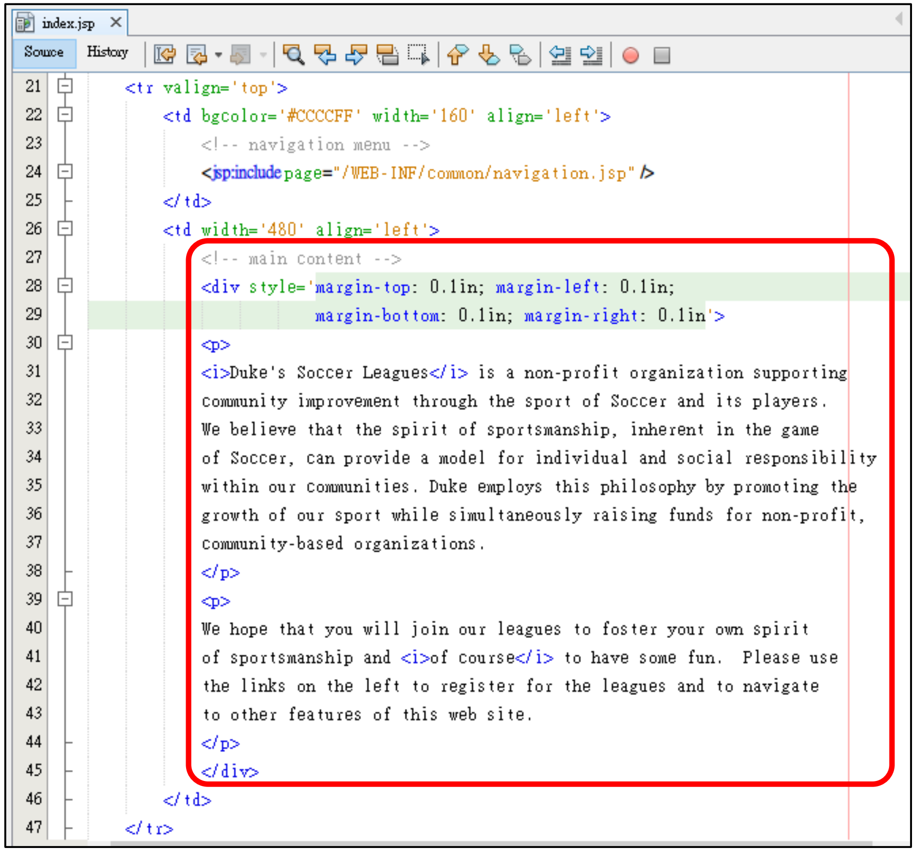
Administrators

- Add a new league

Duke's Soccer Leagues is a non-profit organization supporting community improvement through the sport of Soccer and its players. We believe that the spirit of sportsmanship, inherent in the game of Soccer, can provide a model for individual and social responsibility within our communities. Duke employs this philosophy by promoting the growth of our sport while simultaneously raising funds for non-profit, community-based organizations.

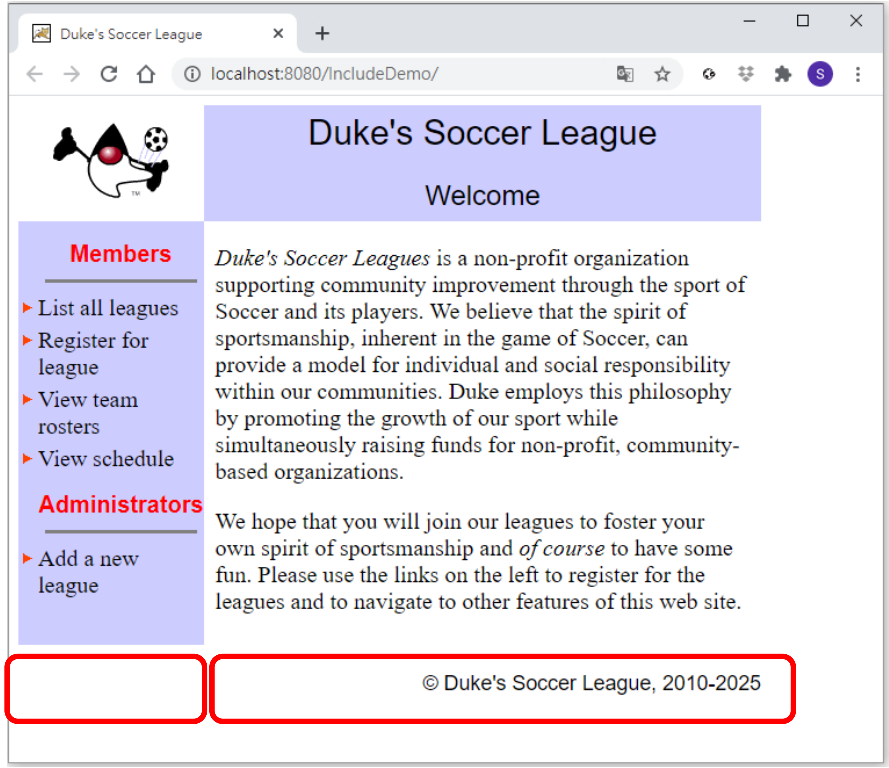
We hope that you will join our leagues to foster your own spirit of sportsmanship and *of course* to have some fun. Please use the links on the left to register for the leagues and to navigate to other features of this web site.

© Duke's Soccer League, 2010-2025



```
<tr valign='top'>
    <td bgcolor='#CCCCFF' width='160' align='left'>
        <!-- navigation menu -->
        <jsp:include page="/WEB-INF/common/navigation.jsp" />
    </td>
    <td width='480' align='left'>
        <!-- main content -->
        <div style='margin-top: 0.1in; margin-left: 0.1in;
                    margin-bottom: 0.1in; margin-right: 0.1in'>
        <p>
        <i>Duke's Soccer Leagues</i> is a non-profit organization supporting
        community improvement through the sport of Soccer and its players.
        We believe that the spirit of sportsmanship, inherent in the game
        of Soccer, can provide a model for individual and social responsibility
        within our communities. Duke employs this philosophy by promoting the
        growth of our sport while simultaneously raising funds for non-profit,
        community-based organizations.
        </p>
        <p>
        We hope that you will join our leagues to foster your own spirit
        of sportsmanship and <i>of course</i> to have some fun.  Please use
        the links on the left to register for the leagues and to navigate
        to other features of this web site.
        </p>
        </div>
    </td>
</tr>
```

IncludeDemo



Duke's Soccer League

Welcome

Members

- List all leagues
- Register for league
- View team rosters
- View schedule

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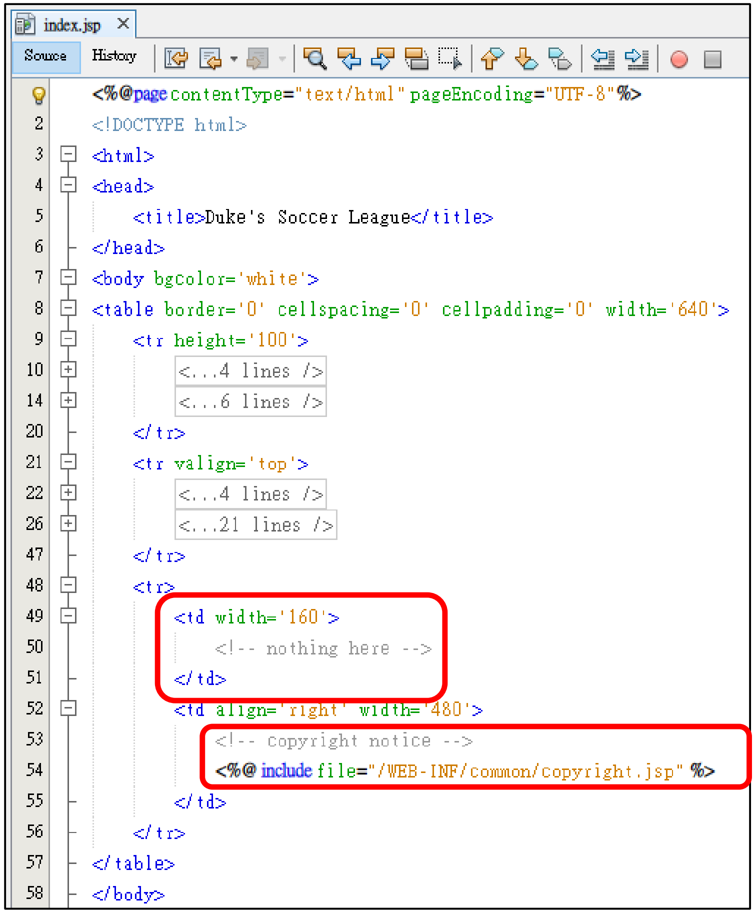
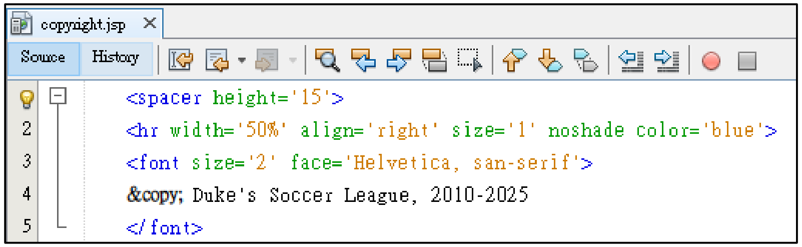
© Duke's Soccer League, 2010-2025



```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
<head>
    <title>Duke's Soccer League</title>
</head>
<body bgcolor='white'>
<table border='0' cellspacing='0' cellpadding='0' width='640'>
    <tr height='100'>
        <...4 lines />
        <...6 lines />
    </tr>
    <tr valign='top'>
        <...4 lines />
        <...21 lines />
    </tr>
    <tr>
        <td width='160'>
            <!-- nothing here -->
        </td>
        <td align='right' width='480'>
            <!-- copyright notice -->
            <%@ include file="/WEB-INF/common/copyright.jsp" %>
        </td>
    </tr>
</table>
</body>
```



```
<spacer height='15'>
<hr width='50%' align='right' size='1' noshade color='blue'>
<font size='2' face='Helvetica, san-serif'>
&copy; Duke's Soccer League, 2010-2025
</font>
```

Soccer 範例

success.jsp

```
<%@ page session="false" %>
<%@ page import="model.League" %>
<%
League league = (League) request.getAttribute("league");
%>
<%-- Generate the HTML response --%>
<html>
<head>
   <title>Duke's Soccer League: Add League Success</title>
</head>
<body bgcolor='white'>
<%-- Generate page heading --%>
<!-- Page Heading -->
<table border='1‘ width='400'>
<tr bgcolor='#CCCCFF' height='20'>
   <td>
      <h3> Duke's Soccer League: Add League Success</h3>
  </td>
</tr>
</table>
<%-- Generate main body --%>
<p>
Your request to add the <i><%=league.getTitle()%></i>
league was successful.

</p>
</body>
</html>
```

success.jsp

```
<%@ page session="false" %>
<%-- Retrieve the 'league' from the request-scope --%>
<jsp:useBean id="league" scope="request"
                                    type="model.League" />

<%-- Generate the HTML response --%>
<html>
<head>
 <title>Duke's Soccer League: Add League Success</title>
</head>
<body bgcolor='white'>
<%-- Generate page heading --%>
<!-- Page Heading -->
<table border='1‘ width='400'>
<tr bgcolor='#CCCCFF' height='20'>
   <td>
      <h3> Duke's Soccer League: Add League Success</h3>
   </td>
</tr>
</table>
<%-- Generate main body --%>
<p>
Your request to add the <i>
<jsp:getProperty name="league" property="title" />
</i> league was successful.
</p>
</body>
</html>
```

thank_you.jsp

```
<%@ page session="true" %>
<%@ page import="model.League" %>
<%@ page import="model.Player" %>
<%
   League league = (League) session.getAttribute("league");
   Player player = (Player) session.getAttribute("player");
%>
<%-- Generate the HTML response --%>
<html>
<head>
   <title>Duke's Soccer League: Registration</title>
</head>
<body bgcolor='white'>
<%-- Generate page heading --%>
<!-- Page Heading -->
<table border='1' width='400'>
<tr bgcolor='#CCCCFF' height='20'>
   <td> <h3>Duke's Soccer League: Registration</h3> </td>
</tr>
</table>
<%-- Present the main body --%>
<p>
Thank you, <%=player.getName()%>. <br>
Your request to register the<i><%=league.getTitle()%></i>
league was successful.

</p><br>
</body>
</html>
```

thank_you.jsp

```
<%@ page session="true" %>

<%-- Retrieve the 'league' and 'player' from the session-scope --%>
<jsp:useBean id="league" scope="session"
                                   type="model.League" />
<jsp:useBean id="player" scope="session"
                                   type="model.Player" />


<%-- Generate the HTML response --%>
<html>
<head>
   <title>Duke's Soccer League: Registration</title>
</head>
<body bgcolor='white'>
<%-- Generate page heading --%>
<!-- Page Heading -->
<table border='1' width='400'>
<tr bgcolor='#CCCCFF' height='20'>
   <td> <h3>Duke's Soccer League: Registration</h3> </td>
</tr>
</table>
<%-- Present the main body --%>
<p>
Thank you, <jsp:getProperty name="player" property="name" />.
<br>Your request to register the <i>
<jsp:getProperty name="league" property="title" /></i>
league was successful.
</p><br>
</body>
</html>
```

Lab 1 – 標準動作 UseBean

- 建立 ContactInfo 網路應用專案
- 撰寫 index.jsp
  - Form 表單, Action = setAddress.jsp
  - 五個請求參數 address1 / address2 / city / country / postcode
- 撰寫 domain.Address.java
  - 五個屬性address1 / address2 / city / country / postcode

Lab 1 – 標準動作 UseBean

- 撰寫 setAddress.jsp
  - 使用<jsp:useBean>標準動作標籤,來建立Java Bean Address
    - Scope設為session
  - 使用<jsp:setProperty>標準動作標籤,取得請求參數,並設定Java Bean中同名的屬性
  - 列印設定成功訊息
  - 使用<jsp:getProperty>標準動作標籤顯示設定值
- 撰寫 showAddress.jsp
  - 使用<jsp:useBean>標準動作標籤,來取得Session中的 Address Java Bean
    - Scope設為session
  - 使用<jsp:getProperty>標準動作標籤,顯示取得之Java Bean指定屬性值

Lab 1 – 標準動作 UseBean

- 測試、執行
  - http://localhost:8080/ContactInfo/index.jsp 輸入地址資訊
  - 送出請求至setAddress.jsp
    - 檢視設定訊息
    - Session加入此 Address Java Bean 物件
  - http://localhost:8080/ContactInfo/showAddress.jsp 檢視Session中 Address Java Bean 物件

課程大綱

1) JSP文稿Scripting 元素替代方案
2) 標準動作標籤
3) **表達語言(Expression Language)**

Expression Language

- 使用環境
  - JSTL1.0中為方便存取資料自訂的語言,當時只能Java Standard Tag Library (JSTL)中使用

    <c:out value="“ ${ x+3 } ”>
  - JSP2.0之後,可以在JSP頁面中直接使用

    <p>Hello! ${ name } </p>

- 優點
  - 存取資料語法簡單,使用方便
  - 未指定變數範圍時,自動尋找變數
  - 自動轉變資料型態

Expression Language

- EL語法

  ${ *Expression Language* }

  跳脫使其暫時無效：

  \${ *Expression Language* }

- 在JSP中，EL主要用於
  - 使用在HTML樣版文字中
    - 輸出：EL表示式執行結果值會併入輸出串流

    ```
    <h1>Welcome ${name}</h1>
    ```

  - 表示標準和自訂動作中的屬性值
    - 屬性值設定：EL 表示式執行結果值設定屬性。

    ```
    <jsp:include page=”${location}”>
    ```

Expression Language

- Dot (.) 運算子
  - 存取Map(鍵值對)元素
    - page、request、session、application 範圍屬性(Attributes)
    - param：請求參數(Request Parameters)
    - header：請求標頭資訊(Request Headers)
    - initParam：Servlet初始參數
    - 鍵值包含特殊字元可能發生解讀錯誤 (ex: 鍵值"user.name")

    ${scope.key} ${variable.key}
  - 存取可視範圍內JavaBean屬性
    - 屬性值必須遵守JavaBean命名慣例

    ${scope.bean.attribute}
    - 允許串接 cascade來存取傳回物件中的屬性

    ${scope.bean.method.attribute}
  - Map元素鍵值與Java Bean同名時, Map鍵值優先

Expression Language

- [ ] 運算子
  - 存取Map(鍵值對)元素

    ${scope["key"]}　${variable["key"]}
  - 存取 JavaBean屬性

    ${scope["bean"]["attribute"]}

    ${scope["bean"]["method"] ["attribute"]}
  - 存取陣列型態屬性

    ${scope["array"][index]}
  - . 及 [ ] 運算子 可以交換使用

    ${scope["bean"].method["attribute"]}

EL存取Bean的資料

- 下列兩種情形,只能使用[ ]
  - 存取array型態屬性
    - ~~${paramValues.fruits.2 }~~
    - ${paramValues.fruits[2] }
  - 屬性名稱中有特殊字元
    - ~~${sessionScope.user.login-name }~~
    - ${sessionScope.user["login-name"] }

EL隱含變數名稱

隱含變數	型態	說明
pageContext	java.servlet. ServletContext	表示此JSP的pageContext
pageScope	java.util.Map	取得Page範圍中屬性值(JSP中區域變數)
requestScope	java.util.Map	取得Request範圍中屬性值
sessionScope	java.util.Map	取得Session範圍中屬性值
applicationScope	java.util.Map	取得Application範圍中屬性值
param	java.util.Map	取得請求參數中某一名稱之單一對應值
paramValues	java.util.Map	取得請求參數中某一名稱之多筆對應值
header	java.util.Map	取得請求標頭中某一名稱之單一對應值
headerValues	java.util.Map	取得請求標頭中某一名稱之多筆對應值
initParam	java.util.Map	取得Servlet初始參數值
cookie	java.util.Map	取得請求中Cookie值

自動尋找屬性變數

- 未指定變數名稱時,自動至不同範圍搜尋屬性
- 尋找順序
  - 依下列順序尋找,找到即傳回
  - 全部Scope都未找到,傳回null

屬性Scope	EL中Scope名稱
page	pageScope
request	requestScope
session	sessionScope
application	applicationScope

EL 存取Bean的資料

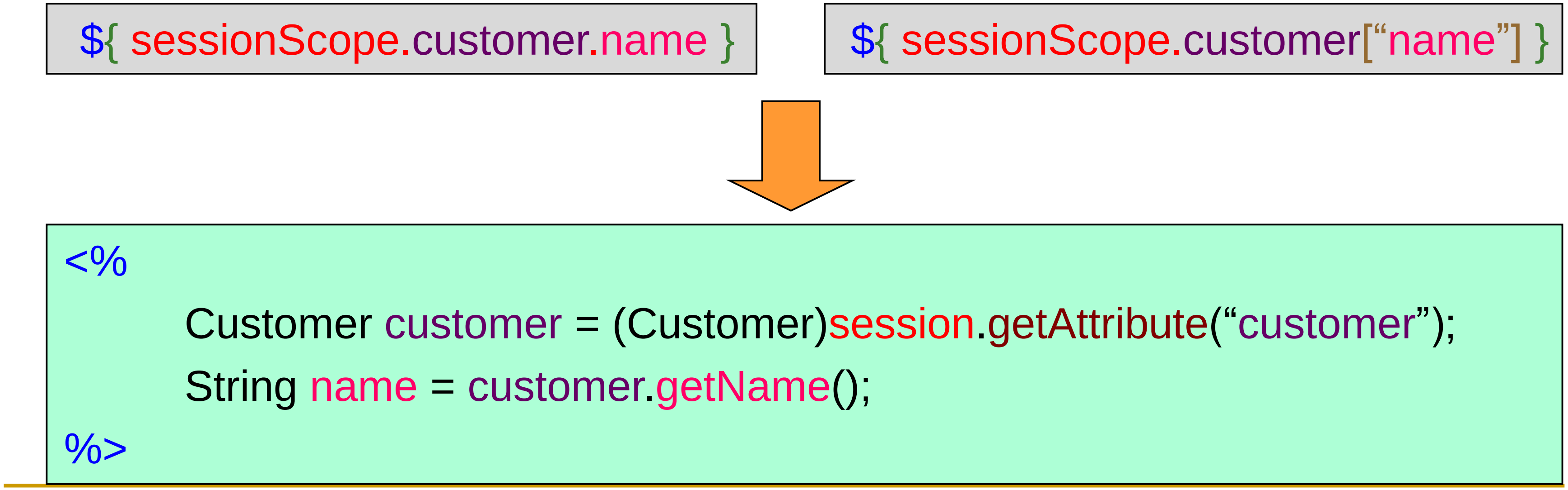
- 存取useBeans 標準動作中Java Bean 的getter資料

  ${bean.attribute} ${bean.method}

  ${scope.bean.attribute} ${scope.bean.method}

  ${scope.bean.method.attribute}

  - 使用·或 [ ]存取資料



```
${ sessionScope.customer.name }
```

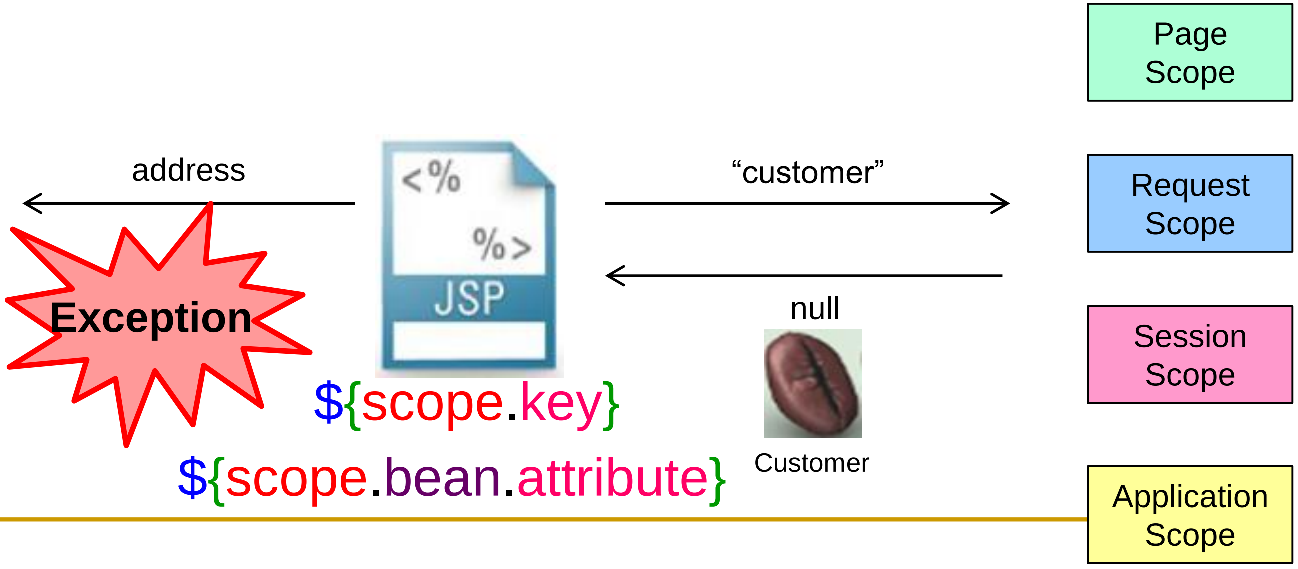
```
${ sessionScope.customer[“name”] }
```

```
<%
        Customer customer = (Customer)session.getAttribute(“customer”);
        String name = customer.getName();
%>
```

EL 查詢錯誤

- 在可視範圍找不到屬性鍵值或變數時
  - 傳回值為 null
  - ${nonExistent} 顯示空字串
- EL 參考不存在的屬性時
  - getXXX()方法不存在
  - ${exists.notFound} 會丟出例外

```
public class CustomerBean …{
   private String name;
   private String email;
   public String getName() {
      return name;
   }
   public String getEmail() {
      return email;
   }
   …..
}
```

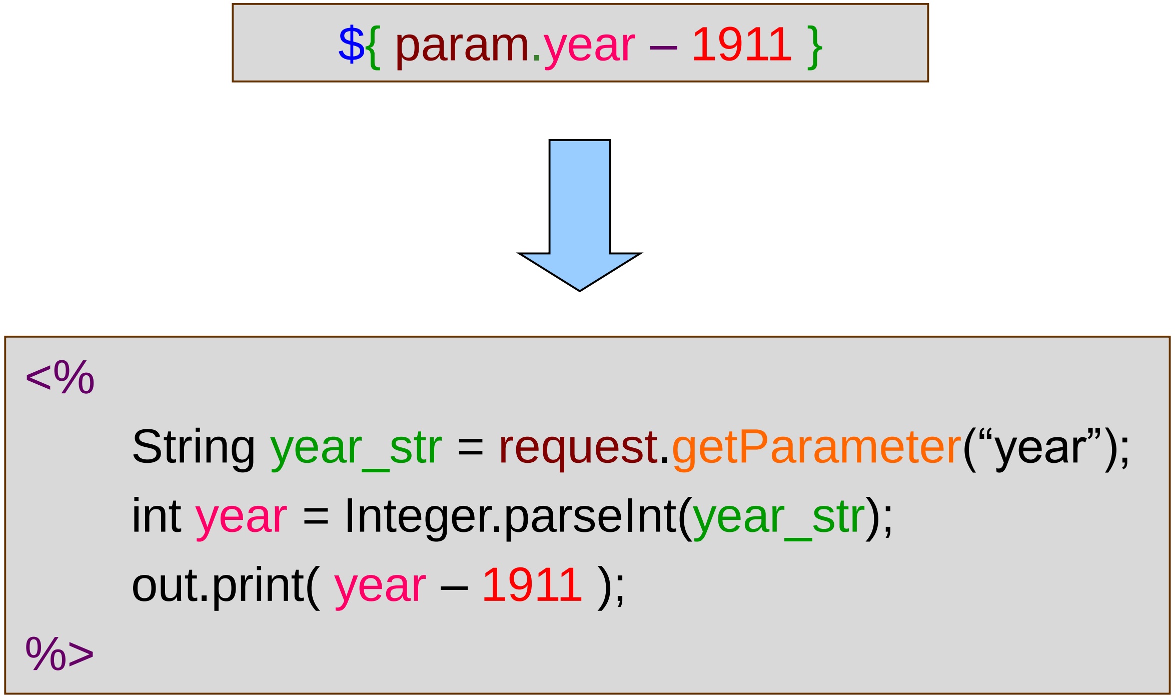


${scope.key}

${scope.bean.attribute}

自動轉變型態

- 有需要時,EL engine會試圖作資料轉型



```
${ param.year – 1911 }
```

```
<%
        String year_str = request.getParameter(“year”);
        int year = Integer.parseInt(year_str);
        out.print( year – 1911 );
%>
```

EL 運算符號

- 算術運算
  - 運算整數和浮點數的值
  - 通常來執行資料單位轉換
  - 資料不能被轉換(ex:字元), 會丟出例外事件

算術運算	運算符號
加	+
減	-
乘	*
除	/ and div
Remainder	% and mod

EL 運算符號

- 比較運算 & 邏輯運算
  - 回傳 boolean 值 : true或false
  - 用在樣版文字輸出，顯示字串true 或false
  - 通常運用在設定標準動作標籤或標籤函式庫的屬性值

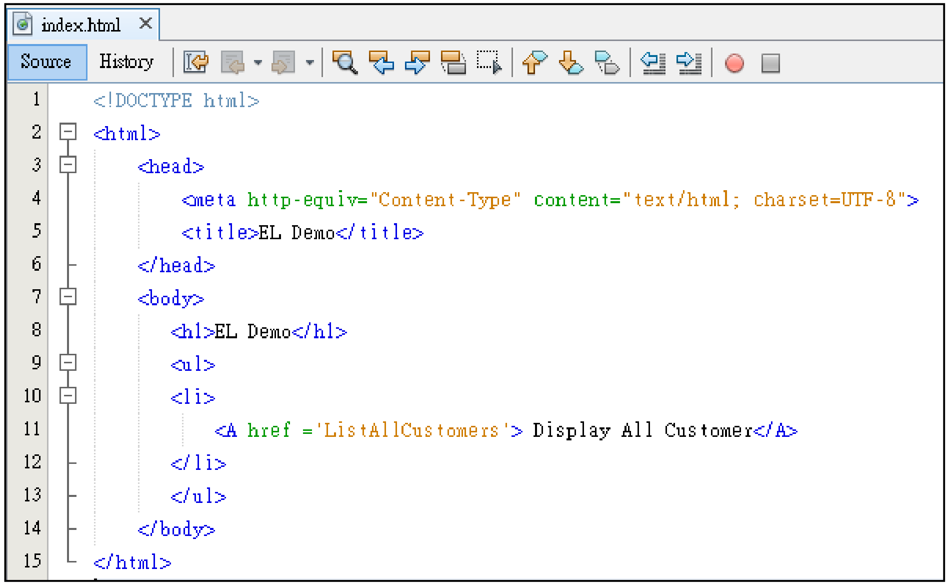
比較運算	運算符號
等於	== 和eq
不等於	!= 和 ne
小於	< 和 lt
小於等於	<= 和le
大於	> 和 gt
大於等於	>= 和ge

邏輯運算	運算符號
和	&& 和 and
或	|| 和or
非	! 和 not

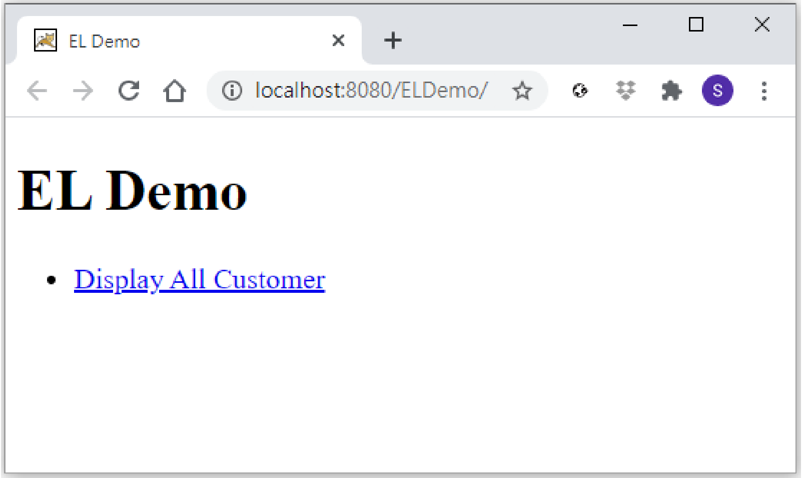
EL 保留字

and	eq	ne	true
or	ge	gt	false
not	le	lt	null
instanceof	empty	div	mod

ELDemo



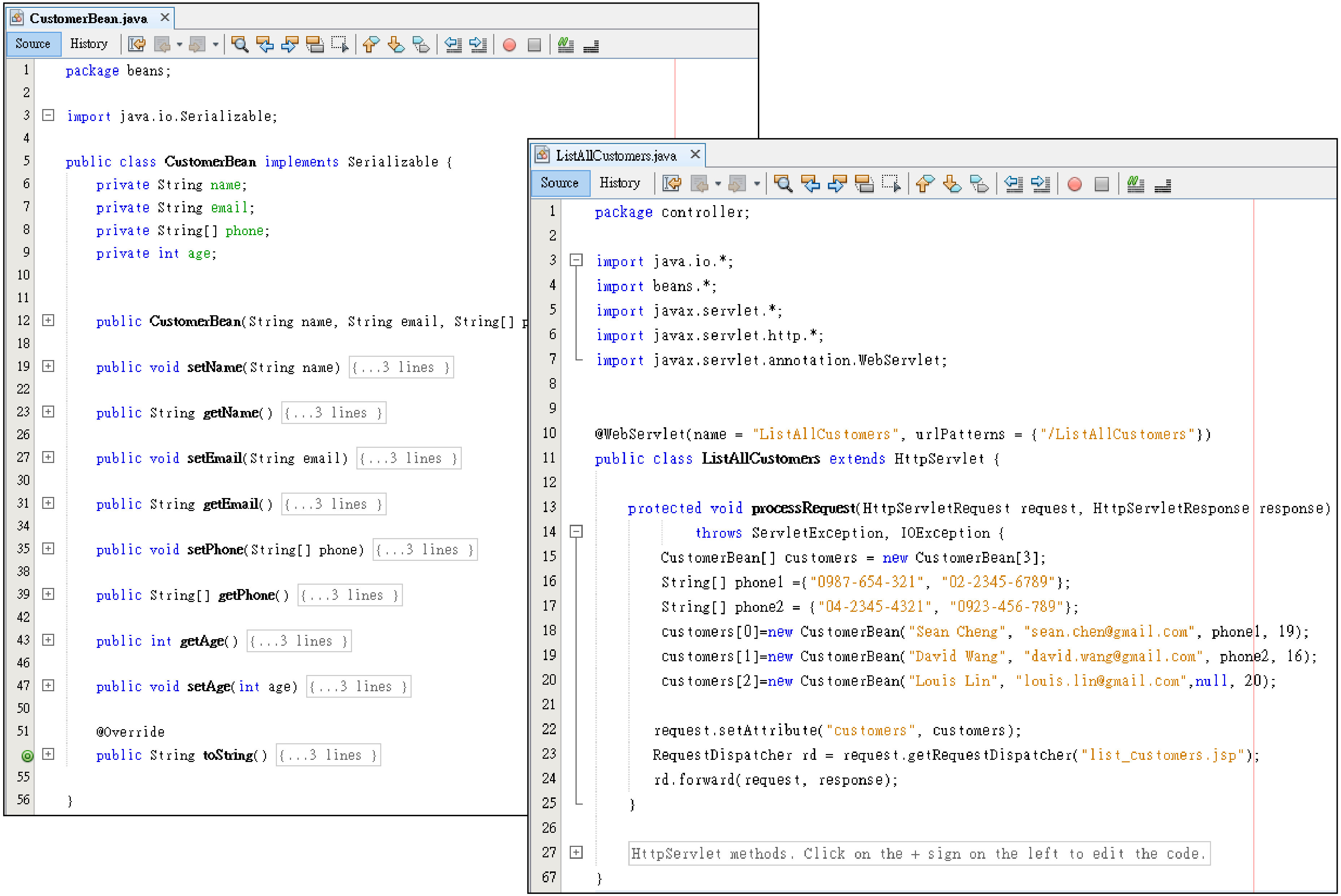
```
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>EL Demo</title>
    </head>
    <body>
       <h1>EL Demo</h1>
       <ul>
       <li>
           <A href ='ListAllCustomers'> Display All Customer</A>
       </li>
       </ul>
    </body>
</html>
```



EL Demo

- Display All Customer

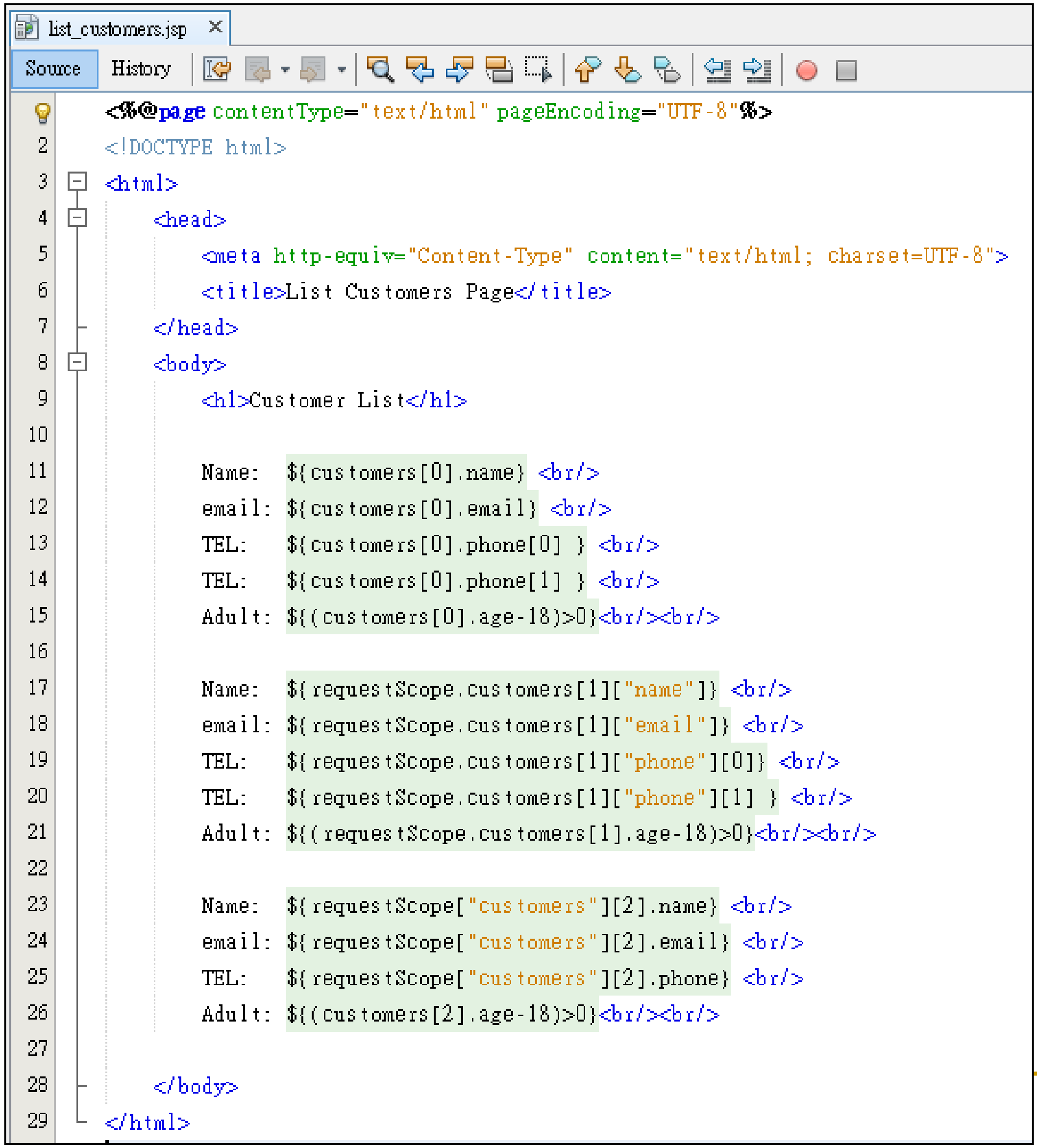
ELDemo



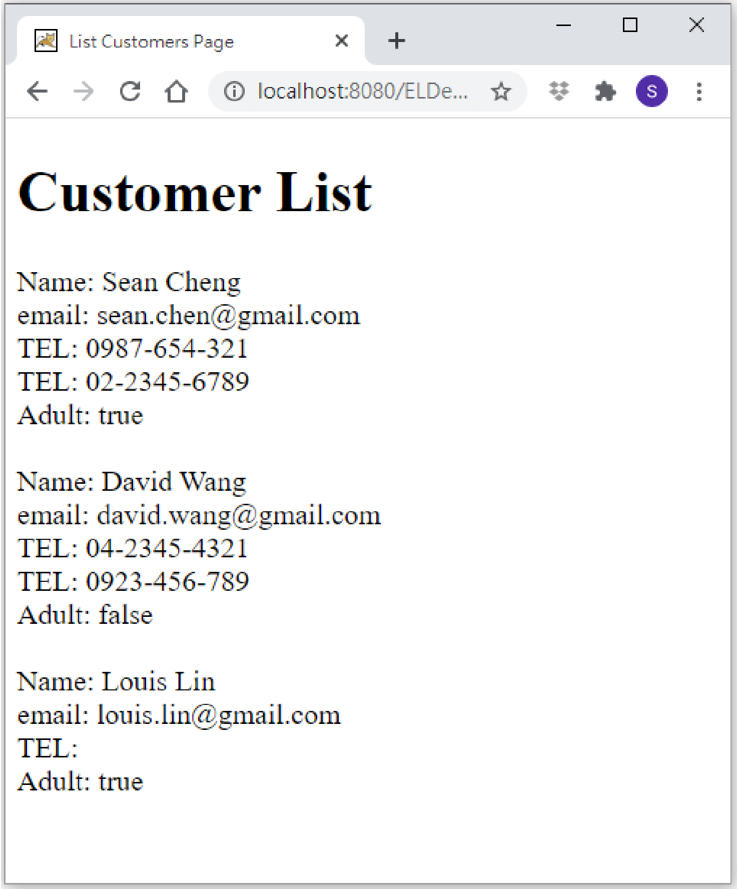
```java
package beans;

import java.io.Serializable;

public class CustomerBean implements Serializable {
    private String name;
    private String email;
    private String[] phone;
    private int age;


    public CustomerBean(String name, String email, String[] p

    public void setName(String name) {...3 lines }

    public String getName() {...3 lines }

    public void setEmail(String email) {...3 lines }

    public String getEmail() {...3 lines }

    public void setPhone(String[] phone) {...3 lines }

    public String[] getPhone() {...3 lines }

    public int getAge() {...3 lines }

    public void setAge(int age) {...3 lines }

    @Override
    public String toString() {...3 lines }

}
```

```java
package controller;

import java.io.*;
import beans.*;
import javax.servlet.*;
import javax.servlet.http.*;
import javax.servlet.annotation.WebServlet;


@WebServlet(name = "ListAllCustomers", urlPatterns = {"/ListAllCustomers"})
public class ListAllCustomers extends HttpServlet {

    protected void processRequest(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        CustomerBean[] customers = new CustomerBean[3];
        String[] phone1 ={"0987-654-321", "02-2345-6789"};
        String[] phone2 = {"04-2345-4321", "0923-456-789"};
        customers[0]=new CustomerBean("Sean Cheng", "sean.chen@gmail.com", phone1, 19);
        customers[1]=new CustomerBean("David Wang", "david.wang@gmail.com", phone2, 16);
        customers[2]=new CustomerBean("Louis Lin", "louis.lin@gmail.com",null, 20);

       request.setAttribute("customers", customers);
       RequestDispatcher rd = request.getRequestDispatcher("list_customers.jsp");
       rd.forward(request, response);
    }

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

ELDemo



```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>List Customers Page</title>
    </head>
    <body>
        <h1>Customer List</h1>

        Name:  ${customers[0].name} <br/>
        email: ${customers[0].email} <br/>
        TEL:   ${customers[0].phone[0] } <br/>
        TEL:   ${customers[0].phone[1] } <br/>
        Adult: ${(customers[0].age-18)>0}<br/><br/>

        Name:  ${requestScope.customers[1]["name"]} <br/>
        email: ${requestScope.customers[1]["email"]} <br/>
        TEL:   ${requestScope.customers[1]["phone"][0]} <br/>
        TEL:   ${requestScope.customers[1]["phone"][1] } <br/>
        Adult: ${(requestScope.customers[1].age-18)>0}<br/><br/>

        Name:  ${requestScope["customers"][2].name} <br/>
        email: ${requestScope["customers"][2].email} <br/>
        TEL:   ${requestScope["customers"][2].phone} <br/>
        Adult: ${(customers[2].age-18)>0}<br/><br/>

    </body>
</html>
```



```
Customer List

Name: Sean Cheng
email: sean.chen@gmail.com
TEL: 0987-654-321
TEL: 02-2345-6789
Adult: true

Name: David Wang
email: david.wang@gmail.com
TEL: 04-2345-4321
TEL: 0923-456-789
Adult: false

Name: Louis Lin
email: louis.lin@gmail.com
TEL:
Adult: true
```

設定JSP 網頁環境

```
<web-app>
      ……..
    <jsp-config>
          <jsp-property-group>
              <url-pattern>此路徑下之JSP不允許Script元素</url-pattern>
              <scripting-invalid>true</scripting-invalid>
          </jsp-property-group>
          <jsp-property-group>
              <url-pattern>此路徑下之JSP忽略EL語法</url-pattern>
              <el-ignored>true</el-ignored>
          </jsp-property-group>
          <jsp-property-group>
              <url-pattern>此路徑下之JSP包含頁首頁尾程式片段</url-pattern>
              <include-prelude>頁首程式片段</include-prelude>
              <include-coda>頁尾程式片段</include-coda>
          </jsp-property-group>
    </jsp-config>
      ……..
</web-app>
```

Soccer 範例

success.jsp

```
<%@ page session="false" %>
<%@ page import="model.League" %>
<%
League league = (League) request.getAttribute("league");
%>
<%-- Generate the HTML response --%>
<html>
<head>
   <title>Duke's Soccer League: Add League Success</title>
</head>
<body bgcolor='white'>
<%-- Generate page heading --%>
<!-- Page Heading -->
<table border='1‘ width='400'>
<tr bgcolor='#CCCCFF' height='20'>
   <td>
      <h3> Duke's Soccer League: Add League Success</h3>
  </td>
</tr>
</table>
<%-- Generate main body --%>
<p>
Your request to add the <i><%=league.getTitle()%></i>
league was successful.
</p>
</body>
</html>
```

success.jsp

```
<%@ page session="false" %>
<%@ page import="model.League" %>



<%-- Generate the HTML response --%>
<html>
<head>
 <title>Duke's Soccer League: Add League Success</title>
</head>
<body bgcolor='white'>
<%-- Generate page heading --%>
<!-- Page Heading -->
<table border='1‘ width='400'>
<tr bgcolor='#CCCCFF' height='20'>
   <td>
      <h3> Duke's Soccer League: Add League Success</h3>
   </td>
</tr>
</table>
<%-- Generate main body --%>
<p>
Your request to add the <i>  ${league.title} </i>
league was successful.
</p>
</body>
</html>
```

Soccer 範例

thank_you.jsp

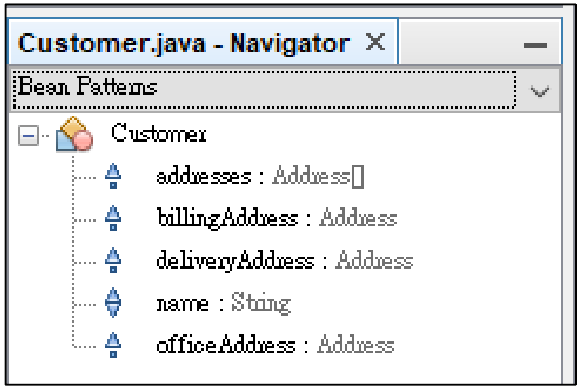
```
<%@ page session="true" %>
<%@ page import="model.League" %>
<%@ page import="model.Player" %>
<%
   League league = (League) session.getAttribute("league");
   Player player = (Player) session.getAttribute("player");
%>
<%-- Generate the HTML response --%>
<html>
<head>
   <title>Duke's Soccer League: Registration</title>
</head>
<body bgcolor='white'>
<%-- Generate page heading --%>
<!-- Page Heading -->
<table border='1' width='400'>
<tr bgcolor='#CCCCFF' height='20'>
   <td> <h3>Duke's Soccer League: Registration</h3> </td>
</tr>
</table>
<%-- Present the main body --%>
<p>
Thank you, <%=player.getName()%>. <br>
Your request to register the<i><%=league.getTitle()%></i>
league was successful.
</p><br>
</body>
</html>
```

thank_you.jsp

```
<%@ page session="true" %>
<%@ page import="model.League" %>
<%@ page import="model.Player" %>




<%-- Generate the HTML response --%>
<html>
<head>
   <title>Duke's Soccer League: Registration</title>
</head>
<body bgcolor='white'>
<%-- Generate page heading --%>
<!-- Page Heading -->
<table border='1' width='400'>
<tr bgcolor='#CCCCFF' height='20'>
   <td> <h3>Duke's Soccer League: Registration</h3> </td>
</tr>
</table>
<%-- Present the main body --%>
<p>
Thank you,  ${player.name}  <br>
Your request to register the<i>  ${league.title}  </i>
league was successful.
</p><br>
</body>
</html>
```

Lab 2

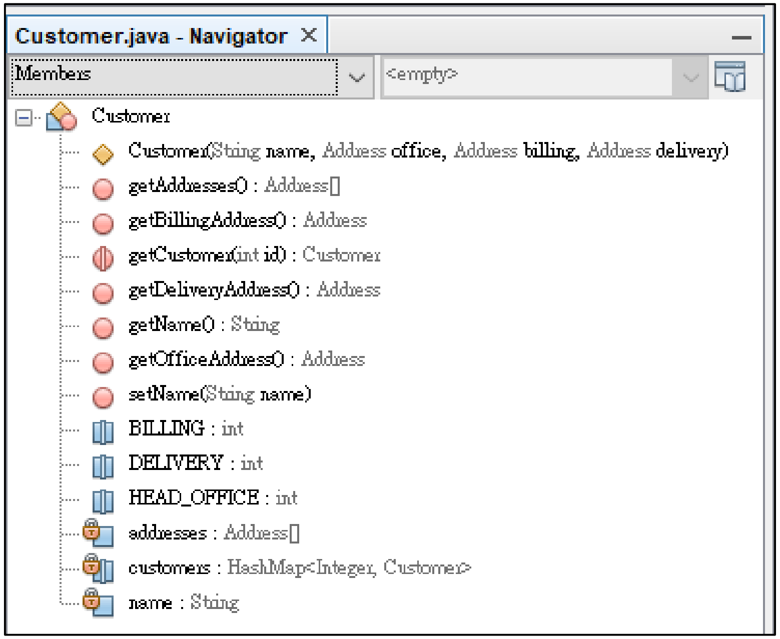
- 修改 ContactInfo 網路應用專案
- 檢視 domain.Address 模型元件
- 新增 domain.Customer.java 設計如右
  - 整數類別常數 HEAD_OFFICE / BILLING / DELIVERY
  - 字串屬性 name 及存取方法
  - Address[ ]屬性 addresses 及 getter
  - 建立靜態測試資料及方法
    - HashMap 類別屬性 customers
    - static block 初始化
    - Customer getCustomer(int id) 類別方法
- 修改 index.jsp
  - 呼叫 SelectCustomer 查詢客戶資料
  - 請求參數 custid



Customer.java - Navigator ×

Bean Patterns

```
Customer
    addresses : Address[]
    billingAddress : Address
    deliveryAddress : Address
    name : String
    officeAddress : Address
```



Customer.java - Navigator ×

Members

<empty>

```
Customer
    Customer(String name, Address office, Address billing, Address delivery)
    getAddresses() : Address[]
    getBillingAddress() : Address
    getCustomer(int id) : Customer
    getDeliveryAddress() : Address
    getName() : String
    getOfficeAddress() : Address
    setName(String name)
    BILLING : int
    DELIVERY : int
    HEAD_OFFICE : int
    addresses : Address[]
    customers : HashMap<Integer, Customer>
    name : String
```

Lab 2

- 撰寫 web.Controller.java 控制器元件
  - 取得請求參數 custid
  - getCustomer() 取得客戶物件
  - 轉送至 customerView.jsp
- 撰寫 customerView.jsp
  - 使用Expression Language(EL), 顯示客戶聯絡資料
  - 由請求中customer屬性取得客戶資料
  - OfficeAddress, BillingAddress, DeliveryAddress 屬性資料
  - Addresses[0], Addresses[1], Addresses[2] 資料
- 刪除 setAddress.jsp / showAddress.jsp
- 測試、執行