

JSP EL (Expression
Language) και
JSTL (JSP Standard Tag
Library)

Σημείωση

Τα χαρακτηριστικά JSP EL και JSP Standard Tag Libraries προσθέτουν κάποιες ευκολίες και αισθητικά χαρακτηριστικά στις εφαρμογές. Η λειτουργία τους μπορεί να αναπληρωθεί από τις πιο βασικές δυνατότητες των JSP.

Αναγνώριση

Τα ακόλουθα παραδείγματα προέρχονται κυρίως από το βιβλίο:

Java Servlets and JSP, Murach's, 3rd Edition



Παράδειγμα JSP EL

An example that accesses the currentDate attribute

Syntax

`${attribute}`

Servlet code

```
Date currentDate = new Date();  
request.setAttribute("currentDate", currentDate);
```

JSP code

```
<p>The current date is ${currentDate}</p>
```

An example that accesses the firstName property of the user attribute

Syntax

```
${attribute.property}
```

Servlet code

```
User user = new User(firstName, lastName, email);  
session.setAttribute("user", user);
```

JSP code

```
<p>Hello ${user.firstName}</p>
```

Εμβέλεις Αντικειμένων (Scopes)

The sequence of scopes that Java searches to find the attribute

Scope	Description
page	The bean is stored in the implicit PageContext object.
request	The bean is stored in the HttpServletRequest object.
session	The bean is stored in the HttpSession object.
application	The bean is stored in the ServletContext object.

Παραδείγματα ρητής Εμβέλειας

An example that specifies request scope

Syntax

```
${scope.attribute}
```

Servlet code

```
Date currentDate = new Date();  
request.setAttribute("currentDate", currentDate);
```

JSP code

```
<p>The current date is ${requestScope.currentDate}</p>
```

An example that specifies session scope

Syntax

```
${scope.attribute.property}
```

Servlet code

```
User user = new User(firstName, lastName, email);  
session.setAttribute("user", user);
```

JSP code

```
<p>Hello ${sessionScope.user.firstName}</p>
```

Ο τελεστής []

The syntax for the [] operator

```
${attribute["propertyKeyOrIndex"]}
```

An example that works with a JavaBean property

Servlet code

```
User user = new User("John", "Smith", "jsmith@gmail.com");  
session.setAttribute("user", user);
```

JSP code

```
<p>Hello ${user["firstName"]}</p>
```

Προσπέλαση Πίνακα (Array)

An example that works with an array

Servlet code

```
String[] colors = {"Red", "Green", "Blue"};  
ServletContext application = this.getServletContext();  
application.setAttribute("colors", colors);
```

JSP code

```
<p>The first color is ${colors[0]}<br>  
    The second color is ${colors[1]}  
</p>
```

Another way to write the JSP code

```
<p>The first color is ${colors["0"]}<br>  
    The second color is ${colors["1"]}  
</p>
```

Προσπέλαση Λίστας

An example that works with a list

Servlet code

```
ArrayList<User> users = UserIO getUsers(path);  
session.setAttribute("users", users);
```

JSP code

```
<p>The first address on our list is ${users[0].email}<br>  
    The second address on our list is ${users[1].email}  
</p>
```

Another way to write the JSP code

```
<p>The first address on our list is ${users["0"].email}<br>  
    The second address on our list is ${users["1"].email}  
</p>
```

Προσπέλαση Εμφωλευμένης Ιδιότητας

An example that accesses a nested property

Syntax

```
${attribute.property1.property2}
```

Servlet code

```
Product p = new Product();  
p.setCode("pf01");  
LineItem lineItem = new LineItem(p, 10);  
session.setAttribute("item", lineItem);
```

JSP code

```
<p>Product code: ${item.product.code}</p>
```

Εναλλακτικός τρόπος προσπέλασης

Another way to access the same property

Syntax

```
${attribute["property1"].property2}
```

Servlet code

```
Product p = new Product();  
p.setCode("pf01");  
LineItem lineItem = new LineItem(p, 10);  
session.setAttribute("item", lineItem);
```

JSP code

```
<p>Product code: ${item["product"].code}</p>
```

An example that uses an attribute within the [] operator

Syntax

```
${attribute[attribute].property}
```

Servlet code

```
HashMap<String, User> usersMap = UserIO.getUsersMap(path);  
session.setAttribute("usersMap", usersMap);
```

```
String email = request.getParameter("email");  
session.setAttribute("email", email);
```

JSP code

```
<p>First name: ${usersMap[email].firstName}</p>
```

JSP code that returns an empty string

```
<!-- this doesn't work because the attribute is enclosed in quotes -->  
<p>First name: ${usersMap["email"].firstName}</p>
```

Γνωστά Αντικείμενα (Implicit Objects)

Other implicit objects that you can use

EL implicit object	Description
param	A map that returns a value for the specified request parameter name.
paramValues	A map that returns an array of values for the specified request parameter name.
header	A map that returns the value for the specified HTTP request header. For a list of HTTP request headers, see chapter 18.
headerValues	A map that returns an array of values for the specified HTTP request header.
cookie	A map that returns the Cookie object for the specified cookie.
initParam	A map that returns the value for the specified parameter name in the context-param element of the web.xml file.
pageContext	A reference to the implicit pageContext object that's available from any JSP.

Παράδειγμα paramValues

How to get parameter values from the request

An HTML form that has two parameters with the same name

```
<form action="emailList" method="post">
  <p>First name: <input type="text" name="firstName"></p>
  <p>Email address 1: <input type="text" name="email"></p>
  <p>Email address 2: <input type="text" name="email"></p>
</form>
```

JSP code

```
<p>First name: ${param.firstName}<br>
  Email address 1: ${paramValues.email[0]}<br>
  Email address 2: ${paramValues.email[1]}
</p>
```

Παράδειγμα Header

How to get an HTTP header

JSP code

```
<p>MIME types: ${header.accept}<br>  
    Compression types: ${header["accept-encoding"]}</p>
```

The text that a browser might display

```
MIME types: text/html,application/xml;q=0.9,image/webp,*/*;q=0.8  
Compression types: gzip,deflate,sdch
```

Παράδειγμα Cookie

How to work with cookies

Servlet code

```
Cookie c = new Cookie("emailCookie", email);  
c.setMaxAge(60*60);    //set its age to 1 hour  
c.setPath("/");        //allow the entire application to access it  
response.addCookie(c);
```

JSP code

```
<p>The email cookie: ${cookie.emailCookie.value}</p>
```

Παράδειγμα Init Param

How to get a context initialization parameter

XML in the web.xml file

```
<context-param>
    <param-name>custServEmail</param-name>
    <param-value>custserv@murach.com</param-value>
</context-param>
```

JSP code

```
<p>The context init param: ${initParam.custServEmail}</p>
```

How to use the pageContext object

JSP code

```
<p>HTTP request method: ${pageContext.request.method}<br>
    HTTP response type: ${pageContext.response.contentType}<br>
    HTTP session ID: ${pageContext.session.id}<br>
    HTTP contextPath: ${pageContext.servletContext.contextPath}<br>
</p>
```

The text that a browser might display

```
HTTP request method: POST
HTTP response type: text/html
HTTP session ID: 4C1CFDB54B0339B53BE3AC8E9BADCF5
HTTP servletContext path: /ch8email
```

Αριθμητικοί Τελεστές EL

Arithmetic EL operators

Operator	Alternative	Description
+		Addition
-		Subtraction
*		Multiplication
/	div	Division
%	mod	Modulus (remainder)

Example

Result

<code>\${1+1}</code>	2
<code>\${17.5+10}</code>	27.5
<code>\${2.5E3}</code>	2500.0
<code>\${2.5E3+10.4}</code>	2510.4
<code>\${2-1}</code>	1
<code>\${7*3}</code>	21
<code>\${1 / 4}</code>	0.25
<code>\${1 div 4}</code>	0.25
<code>\${10 % 8}</code>	2
<code>\${10 mod 8}</code>	2
<code>\${1 + 2 * 4}</code>	9
<code>\${(1 + 2) * 4}</code>	12
<code>\${userID + 1}</code>	9 if userID equals 8; 1 if userID equals 0

Σχεσιακοί Τελεστές EL

Relational operators

Operator	Alternative	Description
<code>==</code>	<code>eq</code>	Equal to
<code>!=</code>	<code>ne</code>	Not equal to
<code><</code>	<code>lt</code>	Less than
<code>></code>	<code>gt</code>	Greater than
<code><=</code>	<code>le</code>	Less than or equal to
<code>>=</code>	<code>ge</code>	Greater than or equal to

Example

```
${"s1" == "s1"}  
${"s1" eq "s1"}  
${1 == 1}  
${1 != 1}  
${1 ne 1}  
${3 < 4}  
${3 lt 4}  
${3 > 4}  
${3 gt 4}  
${3 <= 4}  
${3 >= 4}  
${user.firstName == null}  
${user.firstName == ""}  
${isDirty == true}
```

Result

```
true  
true  
true  
false  
false  
true  
true  
false  
false  
true  
false  
true if firstName returns a null value  
true if firstName returns an empty string  
true if isDirty is true, false if isDirty is  
false, false if isDirty is null
```

Λογικοί Τελεστές EL

Logical operators

Operator	Alternative	Description
<code>&&</code>	<code>and</code>	And
<code> </code>	<code>or</code>	Or
<code>!</code>	<code>not</code>	Not

Example

<code>\${"s1" == "s1" && 4 > 3}</code>	<code>true</code>
<code>\${"s1" == "s1" and 4 > 3}</code>	<code>true</code>
<code>\${"s1" == "s1" && 4 < 3}</code>	<code>false</code>
<code>\${"s1" == "s1" 4 < 3}</code>	<code>true</code>
<code>\${"s1" != "s1" 4 < 3}</code>	<code>false</code>
<code>\${"s1" != "s1" or 4 < 3}</code>	<code>false</code>
<code>\${!true}</code>	<code>false</code>
<code>\${not true}</code>	<code>false</code>

Result

Άλλοι τελεστές

Other operators

Syntax	Description
<code>empty x</code>	Returns true if the value of x is null or equal to an empty string.
<code>x ? y : z</code>	If x evaluates to true, returns y. Otherwise, returns z.

Example

```
$(empty firstName)
```

```
$(true ? "s1" : "s2")
```

```
$(false ? "s1" : "s2")
```

Result

```
true if firstName returns a null value or an  
empty string
```

```
s1
```

```
s2
```

Keywords you can use in expressions

Keyword	Description
<code>null</code>	A null value
<code>true</code>	A true value
<code>false</code>	A false value

Απενεργοποίηση της EL

How to disable EL

For a single page (a page directive)

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

For the entire application (the web.xml file)

```
<jsp-config>  
  <jsp-property-group>  
    <url-pattern>*.jsp</url-pattern>  
    <el-ignored>true</el-ignored>  
  </jsp-property-group>  
</jsp-config>
```

How to disable scripting

For the entire application (the web.xml file)

```
<jsp-config>  
  <jsp-property-group>  
    <url-pattern>*.jsp</url-pattern>  
    <scripting-invalid>true</scripting-invalid>  
  </jsp-property-group>  
</jsp-config>
```

JSP Standard Tag Library

The primary JSTL libraries

Name	Prefix	URI	Description
Core	c	http://java.sun.com/jsp/jstl/core	Contains the core tags for common tasks such as looping and if/else statements.
Formatting	fmt	http://java.sun.com/jsp/jstl/fmt	Provides tags for formatting numbers, times, and dates so they work correctly with internationalization (i18n).
SQL	sql	http://java.sun.com/jsp/jstl/sql	Provides tags for working with SQL queries and data sources.
XML	x	http://java.sun.com/jsp/jstl/xml	Provides tags for manipulating XML documents.
Functions	fn	http://java.sun.com/jsp/jstl/functions	Provides functions that can be used to manipulate strings.

Δήλωση χρήσης της JSTL

The taglib directive that specifies the JSTL core library

```
<%@ taglib prefix="c" uri="http://java.sun.com/jsp/jstl/core" %>
```

An example that uses JSTL to escape output

```
<td><c:out value="${item.product.description}" /></td>
```

Για να χρησιμοποιηθεί η βιβλιοθήκη JSTL από τον Apache Tomcat θα πρέπει να προστεθεί μια υλοποίηση (jar files)

c:out

An example that escapes output entered by the user

```
<label>Email:</label>
<span><c:out value="${user.email}" /></span><br>
<label>First Name:</label>
<span><c:out value="${user.firstName}" /></span><br>
<label>Last Name:</label>
<span><c:out value="${user.lastName}" /></span><br>
```

The output for an XSS attack

Thanks for joining our email list

Here is the information that you entered:

Email: jsmith@gmail.com

First Name: John

Last Name: <script>This JavaScript is displayed, not
executed</script>

c:forEach

An example that escapes output that displays cookie names and values

```
<table>
  <tr>
    <th>Name</th>
    <th>Value</th>
  </tr>
  <c:forEach var="cook" items="${cookie}">
    <tr>
      <td><c:out value="${cook.value.name}" /></td>
      <td><c:out value="${cook.value.value}" /></td>
    </tr>
  </c:forEach>
</table>
```

An example that displays a default value

Using the default attribute

```
<p><c:out value="${message}" default="No message" /></p>
```

Using the tag's body

```
<p><c:out value="${message}">No message</c:out></p>
```

An example that uses single quotes

```
<input type="hidden" name="productCode"
      value="<c:out value='${item.product.code}' />">
```

c:forEach

An example that uses JSTL to loop through a collection

```
<c:forEach var="item" items="${cart.items}">
<tr>
  <td>${item.quantity}</td>
  <td>${item.product.description}</td>
  <td>${item.product.priceCurrencyFormat}</td>
  <td>${item.totalCurrencyFormat}</td>
</tr>
</c:forEach>
```

The result that's displayed in the browser for a cart that has two items

Your cart

Quantity	Description	Price	Amount
1	86 (the band) - True Life Songs and Pictures	\$14.95	\$14.95
1	Puddlefoot - The first CD	\$12.95	\$12.95

To change the quantity, enter the new quantity and click on the Update button.

c:forTokens

An example that uses JSTL to loop through a comma-delimited string

Servlet code

```
session.setAttribute("productCodes", "8601,pf01,pf02,jr01");
```

JSP code

```
<p>Product codes</p>
```

```
<ul>
```

```
<c:forTokens var="productCode" items="${productCodes}" delims="," >
```

```
    <li>${productCode}</li>
```

```
</c:forTokens>
```

```
</ul>
```

The result that's displayed in the browser

Product codes

- 8601
- pf01
- pf02
- jr01

c:forEach

Attributes that you can use for advanced loops

Attribute	Description
begin	Specifies the first index for the loop.
end	Specifies the last index for the loop.
step	Specifies the amount to increment the index each time through the loop.
varStatus	Specifies the name of a variable that can be used to get information about the status of the loop. This variable provides the first, last, index, and count properties.

c:forEach

An example that uses all four attributes

Servlet code

```
int[] numbers = new int[30];
for (int i = 0; i < 30; i++) {
    numbers[i] = i+1;
}
session.setAttribute("numbers", numbers);
```

JSP code

```
<p>Numbers</p>
<ul>
<c:forEach items="${numbers}" var="number"
           begin="0" end="9" step="1"
           varStatus="status">
    <li>${number} | First: ${status.first} | Last: ${status.last} |
        Index: ${status.index} | Count: ${status.count} </li>
</c:forEach>
</ul>
```

The result that's displayed in the browser

Numbers

- 1 | First: true | Last: false | Index: 0 | Count: 1
- 2 | First: false | Last: false | Index: 1 | Count: 2
- 3 | First: false | Last: false | Index: 2 | Count: 3
- 4 | First: false | Last: false | Index: 3 | Count: 4
- 5 | First: false | Last: false | Index: 4 | Count: 5
- 6 | First: false | Last: false | Index: 5 | Count: 6
- 7 | First: false | Last: false | Index: 6 | Count: 7
- 8 | First: false | Last: false | Index: 7 | Count: 8
- 9 | First: false | Last: false | Index: 8 | Count: 9
- 10 | First: false | Last: true | Index: 9 | Count: 10

c:if

An example that uses JSTL to code an if statement

```
<c:if test="${cart.count == 1}">
    <p>You have 1 item in your cart.</p>
</c:if>
<c:if test="${cart.count > 1}">
    <p>You have ${cart.count} items in your cart.</p>
</c:if>
```

The result that's displayed in the browser for a cart that has two items

Your cart

Quantity	Description	Price	Amount	
1 Update	SB (the band) - True Life Songs and Pictures	\$14.95	\$14.95	Remove Item
1 Update	Puddlefoot - The first CD	\$12.95	\$12.95	Remove Item

You have 2 items in your cart.

To change the quantity, enter the new quantity and click on the Update button.

c:choose

An example that uses JSTL to code an if/else statement

```
<c:choose>
  <c:when test="${cart.count == 0}">
    <p>Your cart is empty.</p>
  </c:when>
  <c:when test="${cart.count == 1}">
    <p>You have 1 item in your cart.</p>
  </c:when>
  <c:otherwise>
    <p>You have ${cart.count} items in your cart.</p>
  </c:otherwise>
</c:choose>
```

The result that's displayed in the browser for a cart that has two items

Your cart

Quantity		Description	Price	Amount	
1	Update	SB (the band) - True Life Songs and Pictures	\$14.95	\$14.95	Remove Item
1	Update	Puddlefoot - The first CD	\$12.95	\$12.95	Remove Item

You have 2 items in your cart.

To change the quantity, enter the new quantity and click on the Update button.

c:url

An example that doesn't use the url tag

```
<a href="cart">Continue Shopping</a>
```

An example that uses the url tag

```
<a href="<c:url value='/cart' />">Continue Shopping</a>
```

An example that adds a parameter

```
<a href="<c:url value='/cart?productCode=8601' />">
  Add To Cart
</a>
```

An example that uses EL to specify the value of a parameter

```
<a href="<c:url value='/cart?productCode=${product.code}' />">
  Add To Cart
</a>
```

Another way to code the previous example

```
<a href="<c:url value='/cart'>
  <c:param name='productCode' value='${product.code}' />
</c:url>">
  Add To Cart
</a>
```

A web browser with the session ID encoded in its URL



A web.xml file fragment that turns off URL encoding

```
<session-config>
  <session-timeout>30</session-timeout>
  <tracking-mode>COOKIE</tracking-mode>
</session-config>
```

Άλλες επικέτες

Other tags in the JSTL core library

Tag name	Description
set	Sets the value of an attribute in a scope.
remove	Removes an attribute from a scope.
catch	Catches any exception that occurs in its body and optionally creates an EL variable that refers to the Throwable object for the exception.
redirect	Redirects the client browser to a new URL.
param	Adds a parameter to the parent tag.

Άλλες Ετικέτες

A set tag that sets a value in an attribute

```
<c:set var="message" scope="session" value="Test message" />
```

A set tag that sets a value in a JavaBean

```
<c:set target="${user}" property="firstName" value="John" />
```

A remove tag that removes an attribute

```
<c:remove var="message" scope="session" />
```

A catch tag that catches an exception

```
<c:catch var="e">
    <% // this scriptlet statement throws an exception
        int i = 1/0;
    %>
    <p>Result: <c:out value="${i}" /></p>
</c:catch>
<c:if test="${e != null}">
    <p>An exception occurred. Message: ${e.message}</p>
</c:if>
```

A redirect tag that redirects to another page

```
<c:if test="${e != null}">
    <c:redirect url="/error_java.jsp" />
</c:if>
```