

JSTL

JSP Standard Tag Library

What is JSTL?

- **JSTL (JSP Standard Tag Libraries)** is a collection of JSP custom tags developed by Java Community Process, www.jcp.org. The reference implementation is developed by the Jakarta project, jakarta.apache.org.
- **Full JSTL**
 - Contains many common and useful JSP custom tags
- JSTL allows you to program your JSP pages using tags, rather than the scriptlet code that most JSP programmers are already accustomed to. JSTL can do nearly everything that regular JSP scriptlet code can do.

COUNT TO TEN EXAMPLE USING SCRIPTLET:

- JSTL was introduced to allow JSP programmers to program using tags rather than Java code.
- To show why this is preferable, a quick example is in order. We will examine a very simple JSP page that counts to ten.
- We will examine this page both as regular scriptlet-based JSP, and then as JSTL. When the count to ten example is programmed using scriptlet based JSP, the JSP page appears as follows.`

```
<html>
<head>
<title>Count to 10 in JSP scriptlet</title>
</head>
<body>
<% for(int i=1;i<=10;i++)
    {%>
    <%=i%><br/>
<%
    }
%>
</body>
</html>
```

COUNT TO TEN EXAMPLE USING JSTL:

The following code shows how the count to ten example would be written using JSTL. As you can see, this code listing is much more constant, as only tags are used. HTML and JSTL tags are mixed to produce the example.

```
<%@ taglib uri="http://java.sun.com/jstl/core" prefix="c" %>
<html>
<head>
<title>Count to 10 Example (using JSTL)</title>
</head>

<body>
<c:forEach var="i" begin="1" end="10" step="1">
<c:out value="{i}" />

<br />
</c:forEach>
</body>
</html>
```

COUNT TO TEN EXAMPLE USING JSTL:

- When you examine the preceding source code, you can see that the JSP page consists entirely of tags.
- The code makes use of HTML tags such as `<head>` and `
`. The use of tags is not confined just to HTML tags. We can modify that code to print numbers from 1 to n. The code is given in the next slide.
- This code also makes use of JSTL tags such as `<c:forEach>` and `<c:out>`. In this article you will be introduced to some of the basics of JSTL.

PRINT 1 TO N EXAMPLE USING JSTL:

The following code shows how the count to n example would be written using JSTL. As you can see, this code listing is much more constant, as only tags are used. HTML and JSTL tags are mixed to produce the example. You can just use <http://<jsp file>?number=10> to see the result.

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

</HEAD>
<BODY>
<c:set var="n" value="$ {param.number}" />
Hello ...Printing numbers till N=
<c:out value="$ {n}" />
<br/>
<br/>

<c:forEach var="i" begin="1" end="$ {n}" step="1">
    <c:out value="$ {i}" />
</c:forEach>
</BODY>
```

THE JSTL TAG LIBRARIES

- The JavaServer Pages Standard Tag Library (JSTL) is a collection of useful JSP tags which encapsulates core functionality common to many JSP applications. JSTL is often spoken of as a single-tag library.
- JSTL has support for common, structural tasks such as iteration and conditionals, tags for manipulating XML documents, internationalization tags, and SQL tags. It also provides a framework for integrating existing custom tags with JSTL tags.
- The JSTL tags can be classified, according to their functions, into following JSTL tag library groups that can be used when creating a JSP page:

THE JSTL TAG LIBRARIES

The JSTL tags can be classified, according to their functions, into following JSTL tag library groups that can be used when creating a JSP page:

- **Core Tags**
- **Formatting tags**
- **SQL tags**
- **XML tags**
- **JSTL Functions**

THE JSTL TAG LIBRARIES

- **Core Tag Library**—Contains tags that are essential to nearly any Web application. Examples of core tag libraries include looping, expression evaluation, and basic input and output.
- **Formatting/Internationalization Tag Library**—Contains tags that are used to parse data. Some of these tags will parse data, such as dates, differently based on the current locale.
- **Database Tag Library**—Contains tags that can be used to access SQL databases. These tags are normally used only to create prototype programs. This is because most programs will not handle database access directly from JSP pages. Database access should be embedded in EJBs that are accessed by the JSP pages.
- **XML Tag Library**—Contains tags that can be used to access XML elements. Because XML is used in many Web applications, XML processing is an important feature of JSTL.
- **JSTL Functions** --JSTL includes a number of standard functions, most of which are common string manipulation functions.

Core Tags:

The core group of tags are the most frequently used JSTL tags. Following is the syntax to include JSTL Core library in your JSP:

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

There are following Core JSTL Tags:

Tag	Description
<u><c:out ></u>	Like <%= ... >, but for expressions.
<u><c:set ></u>	Sets the result of an expression evaluation in a 'scope'
<u><c:remove ></u>	Removes a scoped variable (from a particular scope, if specified).
<u><c:catch></u>	Catches any Throwable that occurs in its body and optionally exposes it.
<u><c:if></u>	Simple conditional tag which evaluates its body if the supplied condition is true.
<u><c:choose></u>	Simple conditional tag that establishes a context for mutually exclusive conditional operations, marked by <when> and <otherwise>
<u><c:when></u>	Subtag of <choose> that includes its body if its condition evaluates to 'true'.
<u><c:otherwise ></u>	Subtag of <choose> that follows <when> tags and runs only if all of the prior conditions evaluated to 'false'.
<u><c:import></u>	Retrieves an absolute or relative URL and exposes its contents to either the page, a String in 'var', or a Reader in 'varReader'.
<u><c:forEach ></u>	The basic iteration tag, accepting many different collection types and supporting subsetting and other functionality .
<u><c:forTokens></u>	Iterates over tokens, separated by the supplied delimiters.
<u><c:param></u>	Adds a parameter to a containing 'import' tag's URL.
<u><c:redirect ></u>	Redirects to a new URL.
<u><c:url></u>	Creates a URL with optional query parameters

Formatting tags:

The JSTL formatting tags are used to format and display text, the date, the time, and numbers for internationalized Web sites. Following is the syntax to include Formatting library in your JSP:

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

Following is the list of Formatting JSTL Tags:

Tag	Description
<u><fmt:formatNumber></u>	To render numerical value with specific precision or format.
<u><fmt:parseNumber></u>	Parses the string representation of a number, currency, or percentage.
<u><fmt:formatDate></u>	Formats a date and/or time using the supplied styles and pattern
<u><fmt:parseDate></u>	Parses the string representation of a date and/or time
<u><fmt:bundle></u>	Loads a resource bundle to be used by its tag body.
<u><fmt:setLocale></u>	Stores the given locale in the locale configuration variable.
<u><fmt:setBundle></u>	Loads a resource bundle and stores it in the named scoped variable or the bundle configuration variable.
<u><fmt:timeZone></u>	Specifies the time zone for any time formatting or parsing actions nested in its body.
<u><fmt:setTimeZone></u>	Stores the given time zone in the time zone configuration variable
<u><fmt:message></u>	To display an internationalized message.
<u><fmt:requestEncoding></u>	Sets the request character encoding

SQL tags:

- The JSTL SQL tag library provides tags for interacting with relational databases (RDBMSs) such as Oracle, MySQL, or Microsoft SQL Server.
- Following is the syntax to include JSTL SQL library in your JSP:

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

Following is the list of SQL JSTL Tags:

Tag	Description
<u><sql:setDataSource></u>	Creates a simple DataSource suitable only for prototyping
<u><sql:query></u>	Executes the SQL query defined in its body or through the sql attribute.
<u><sql:update></u>	Executes the SQL update defined in its body or through the sql attribute.
<u><sql:param></u>	Sets a parameter in an SQL statement to the specified value.
<u><sql:dateParam></u>	Sets a parameter in an SQL statement to the specified java.util.Date value.
<u><sql:transaction ></u>	Provides nested database action elements with a shared Connection, set up to execute all statements as one transaction.

XML TAGS:

- The JSTL XML tags provide a JSP-centric way of creating and manipulating XML documents. Following is the syntax to include JSTL XML library in your JSP:

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

- The JSTL XML tag library has custom tags for interacting with XML data. This includes parsing XML, transforming XML data, and flow control based on XPath expressions.

Before you proceed with the examples, you would need to copy following two XML and XPath related libraries into your <Tomcat Installation Directory>\lib:

- **XercesImpl.jar**: Download it from <http://www.apache.org/dist/xerces/j/>
- **xalan.jar**: Download it from <http://xml.apache.org/xalan-j/index.html>

Following is the list of XML JSTL Tags:

Tag	Description
<u><x:out></u>	Like <%= ... >, but for XPath expressions.
<u><x:parse></u>	Use to parse XML data specified either via an attribute or in the tag body.
<u><x:set ></u>	Sets a variable to the value of an XPath expression.
<u><x:if ></u>	Evaluates a test XPath expression and if it is true, it processes its body. If the test condition is false, the body is ignored.
<u><x:forEach></u>	To loop over nodes in an XML document.
<u><x:choose></u>	Simple conditional tag that establishes a context for mutually exclusive conditional operations, marked by <when> and <otherwise>
<u><x:when ></u>	Subtag of <choose> that includes its body if its expression evaluates to 'true'
<u><x:otherwise ></u>	Subtag of <choose> that follows <when> tags and runs only if all of the prior conditions evaluated to 'false'
<u><x:transform ></u>	Applies an XSL transformation on a XML document
<u><x:param ></u>	Use along with the transform tag to set a parameter in the XSLT stylesheet

JSTL Functions:

JSTL includes a number of standard functions, most of which are common string manipulation functions. Following is the syntax to include JSTL Functions library in your JSP:

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

Following is the list of JSTL Functions:

Function	Description
fn:contains()	Tests if an input string contains the specified substring.
fn:containsIgnoreCase()	Tests if an input string contains the specified substring in a case insensitive way.
fn:endsWith()	Tests if an input string ends with the specified suffix.
fn:escapeXml()	Escapes characters that could be interpreted as XML markup.
fn:indexOf()	Returns the index within a string of the first occurrence of a specified substring.
fn:join()	Joins all elements of an array into a string.
fn:length()	Returns the number of items in a collection, or the number of characters in a string.
fn:replace()	Returns a string resulting from replacing in an input string all occurrences with a given string.
fn:split()	Splits a string into an array of substrings.

