

JSP - Actions

In this chapter, we will discuss Actions in JSP. These actions use constructs in XML syntax to control the behavior of the servlet engine. You can dynamically insert a file, reuse JavaBeans components, forward the user to another page, or generate HTML for the Java plugin.

There is only one syntax for the Action element, as it conforms to the XML standard –

```
<jsp:action_name attribute = "value" />
```

Action elements are basically predefined functions. The following table lists out the available JSP actions –

S.No.	Syntax & Purpose
1	jsp:include Includes a file at the time the page is requested.
2	jsp:useBean Finds or instantiates a JavaBean.
3	jsp:setProperty Sets the property of a JavaBean.
4	jsp:getProperty Inserts the property of a JavaBean into the output.
5	jsp:forward Forwards the requester to a new page.
6	jsp:plugin Generates browser-specific code that makes an OBJECT or EMBED tag for the Java plugin.
7	jsp:element Defines XML elements dynamically.
8	jsp:attribute Defines dynamically-defined XML element's attribute.
9	jsp:body Defines dynamically-defined XML element's body.
10	jsp:text Used to write template text in JSP pages and documents.

Common Attributes

There are two attributes that are common to all Action elements: the **id** attribute and the **scope** attribute.

Id attribute

The id attribute uniquely identifies the Action element, and allows the action to be referenced inside the JSP page. If the Action creates an instance of an object, the id value can be used to reference it through the implicit object `PageContext`.

Scope attribute

This attribute identifies the lifecycle of the Action element. The id attribute and the scope attribute are directly related, as the scope attribute determines the lifespan of the object associated with the id. The scope attribute has four possible values: **(a) page**, **(b)request**, **(c)session**, and **(d) application**.

The <jsp:include> Action

This action lets you insert files into the page being generated. The syntax looks like this –

```
<jsp:include page = "relative URL" flush = "true" />
```

Unlike the **include** directive, which inserts the file at the time the JSP page is translated into a servlet, this action inserts the file at the time the page is requested.

Following table lists out the attributes associated with the include action –

S.No.	Attribute & Description
1	page The relative URL of the page to be included.
2	flush The boolean attribute determines whether the included resource has its buffer flushed before it is included.

Example

Let us define the following two files **(a)date.jsp** and **(b) main.jsp** as follows –

Following is the content of the **date.jsp** file –

```
<p>Today's date: <%= (new java.util.Date()).toLocaleString()%></p>
```

Following is the content of the **main.jsp** file –

```
<html>
<head>
  <title>The include Action Example</title>
</head>

<body>
  <center>
    <h2>The include action Example</h2>
    <jsp:include page = "date.jsp" flush = "true" />
  </center>
</body>
</html>
```

Let us now keep all these files in the root directory and try to access **main.jsp**. You will receive the following output –

The include action Example

Today's date: 12-Sep-2010 14:54:22

The <jsp:useBean> Action

The **useBean** action is quite versatile. It first searches for an existing object utilizing the id and scope variables. If an object is not found, it then tries to create the specified object.

The simplest way to load a bean is as follows –

```
<jsp:useBean id = "name" class = "package.class" />
```

Once a bean class is loaded, you can use **jsp:setProperty** and **jsp:getProperty** actions to modify and retrieve the bean properties.

Following table lists out the attributes associated with the useBean action –

S.No.	Attribute & Description
1	class Designates the full package name of the bean.
2	type Specifies the type of the variable that will refer to the object.
3	beanName Gives the name of the bean as specified by the instantiate () method of the java.beans.Beans class.

Let us now discuss the **jsp:setProperty** and the **jsp:getProperty** actions before giving a valid example related to these actions.

The <jsp:setProperty> Action

The **setProperty** action sets the properties of a Bean. The Bean must have been previously defined before this action. There are two basic ways to use the setProperty action –

You can use **jsp:setProperty** after, but outside of a **jsp:useBean** element, as given below –

```
<jsp:useBean id = "myName" ... />
```

```
...
```

```
<jsp:setProperty name = "myName" property = "someProperty" .../>
```

In this case, the **jsp:setProperty** is executed regardless of whether a new bean was instantiated or an existing bean was found.

A second context in which jsp:setProperty can appear is inside the body of a **jsp:useBean** element, as given below –

```
<jsp:useBean id = "myName" ... >
```

```
...
```

```
<jsp:setProperty name = "myName" property = "someProperty" .../>
```

```
</jsp:useBean>
```

Here, the jsp:setProperty is executed only if a new object was instantiated, not if an existing one was found.

Following table lists out the attributes associated with the **setProperty** action –

S.No.	Attribute & Description
1	name

	Designates the bean the property of which will be set. The Bean must have been previously defined.
2	property Indicates the property you want to set. A value of "*" means that all request parameters whose names match bean property names will be passed to the appropriate setter methods.
3	value The value that is to be assigned to the given property. If the parameter's value is null, or the parameter does not exist, the setProperty action is ignored.
4	param The param attribute is the name of the request parameter whose value the property is to receive. You can't use both value and param, but it is permissible to use neither.

The <jsp:getProperty> Action

The **getProperty** action is used to retrieve the value of a given property and converts it to a string, and finally inserts it into the output.

The getProperty action has only two attributes, both of which are required. The syntax of the getProperty action is as follows –

```
<jsp:useBean id = "myName" ... />
...
<jsp:getProperty name = "myName" property = "someProperty" .../>
```

Following table lists out the required attributes associated with the **getProperty** action –

S.No.	Attribute & Description
1	name The name of the Bean that has a property to be retrieved. The Bean must have been previously defined.
2	property The property attribute is the name of the Bean property to be retrieved.

Example

Let us define a test bean that will further be used in our example –

```
/* File: TestBean.java */
package action;

public class TestBean {
    private String message = "No message specified";
```

```
public String getMessage() {  
    return(message);  
}  
public void setMessage(String message) {  
    this.message = message;  
}  
}
```

Compile the above code to the generated **TestBean.class** file and make sure that you copied the **TestBean.class** in **C:\apache-tomcat-7.0.2\webapps\WEB-INF\classes\action** folder and the **CLASSPATH** variable should also be set to this folder –

Now use the following code in **main.jsp** file. This loads the bean and sets/gets a simple String parameter –

```
<html>  
  
  <head>  
    <title>Using JavaBeans in JSP</title>  
  </head>  
  
  <body>  
    <center>  
      <h2>Using JavaBeans in JSP</h2>  
      <jsp:useBean id = "test" class = "action.TestBean" />  
      <jsp:setProperty name = "test" property = "message"  
        value = "Hello JSP..." />  
  
      <p>Got message....</p>  
      <jsp:getProperty name = "test" property = "message" />  
    </center>  
  </body>  
</html>
```

Let us now try to access **main.jsp**, it would display the following result –

Using JavaBeans in JSP

Got message....
Hello JSP...

The <jsp:forward> Action

The **forward** action terminates the action of the current page and forwards the request to another resource such as a static page, another JSP page, or a Java Servlet.

Following is the syntax of the **forward** action –

```
<jsp:forward page = "Relative URL" />
```

Following table lists out the required attributes associated with the forward action –

S.No.	Attribute & Description
1	page Should consist of a relative URL of another resource such as a static page, another JSP page, or a Java Servlet.

Example

Let us reuse the following two files **(a) date.jsp** and **(b) main.jsp** as follows –

Following is the content of the **date.jsp** file –

```
<p>Today's date: <%= (new java.util.Date()).toLocaleString()%></p>
```

Following is the content of the **main.jsp** file –

```
<html>
<head>
<title>The include Action Example</title>
</head>

<body>
<center>
<h2>The include action Example</h2>
<jsp:forward page = "date.jsp" />
</center>
</body>
</html>
```

Let us now keep all these files in the root directory and try to access **main.jsp**. This would display result something like as below.

Here it discarded the content from the main page and displayed the content from forwarded page only.

Today's date: 12-Sep-2010 14:54:22

The <jsp:plugin> Action

The **plugin** action is used to insert Java components into a JSP page. It determines the type of browser and inserts the **<object>** or **<embed>** tags as needed.

If the needed plugin is not present, it downloads the plugin and then executes the Java component. The Java component can be either an Applet or a JavaBean.

The plugin action has several attributes that correspond to common HTML tags used to format Java components. The **<param>** element can also be used to send parameters to the Applet or Bean.

Following is the typical syntax of using the plugin action –

```
<jsp:plugin type = "applet" codebase = "dirname" code = "MyApplet.class"
width = "60" height = "80">
<jsp:param name = "fontcolor" value = "red" />
<jsp:param name = "background" value = "black" />
```

```
<jsp:fallback>
  Unable to initialize Java Plugin
</jsp:fallback>

</jsp:plugin>
```

You can try this action using some applet if you are interested. A new element, the **<fallback>** element, can be used to specify an error string to be sent to the user in case the component fails.

The <jsp:element> Action

The <jsp:attribute> Action

The <jsp:body> Action

The **<jsp:element>**, **<jsp:attribute>** and **<jsp:body>** actions are used to define XML elements dynamically. The word dynamically is important, because it means that the XML elements can be generated at request time rather than statically at compile time.

Following is a simple example to define XML elements dynamically –

```
<% @page language = "java" contentType = "text/html"%>
<html xmlns = "http://www.w3c.org/1999/xhtml"
  xmlns:jsp = "http://java.sun.com/JSP/Page">

  <head><title>Generate XML Element</title></head>

  <body>
    <jsp:element name = "xmlElement">
      <jsp:attribute name = "xmlElementAttr">
        Value for the attribute
      </jsp:attribute>

      <jsp:body>
        Body for XML element
      </jsp:body>
    </jsp:element>
  </body>
</html>
```

This would produce the following HTML code at run time –

```
<html xmlns = "http://www.w3c.org/1999/xhtml" xmlns:jsp = "http://java.sun.com/JSP/Page">
  <head><title>Generate XML Element</title></head>
```

```

<body>
  <xmlElement xmlElementAttr = "Value for the attribute">
    Body for XML element
  </xmlElement>
</body>
</html>

```

The <jsp:text> Action

The **<jsp:text>** action can be used to write the template text in JSP pages and documents. Following is the simple syntax for this action –

```
<jsp:text>Template data</jsp:text>
```

The body of the template cannot contain other elements; it can only contain text and EL expressions (Note – EL expressions are explained in a subsequent chapter). Note that in XML files, you cannot use expressions such as **`${whatever > 0}`**, because the greater than signs are illegal. Instead, use the **gt** form, such as **`${whatever gt 0}`** or an alternative is to embed the value in a **CDATA** section.

```
<jsp:text><![CDATA[<br>]]></jsp:text>
```

If you need to include a **DOCTYPE** declaration, for instance for **XHTML**, you must also use the **<jsp:text>** element as follows –

```

<jsp:text><![CDATA[<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
  "DTD/xhtml11-strict.dtd">]]></jsp:text>

<head><title>jsp:text action</title></head>

<body>
  <books><book><jsp:text>
    Welcome to JSP Programming
  </jsp:text></book></books>
</body>
</html>

```

Try the above example with and without **<jsp:text>** action.