
<JSTORM>

J S P



JSTORM
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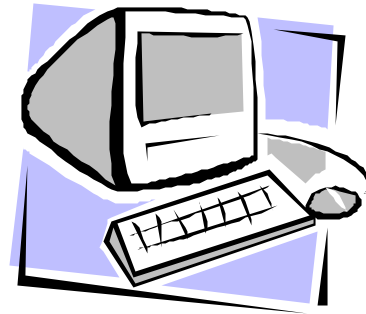
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J S P

Wrox Java Server Programming 7 “In
roducing JavaServer Pages”
가
. , JSP JS
P
.
.
- :



1. Java Server Pages

JSP
Java 2 Enterprise Edition

JavaServer Pages 가? HTML
XML markup . page JSP
JSP , ,

(, JavaBeans). 가
가
가 .

☞ JSP
☞ JSP
☞ JavaBean JSP
☞

2. JSP Architecture

JSP HTML XML JSP
JSP 가
가 JSP 가
가

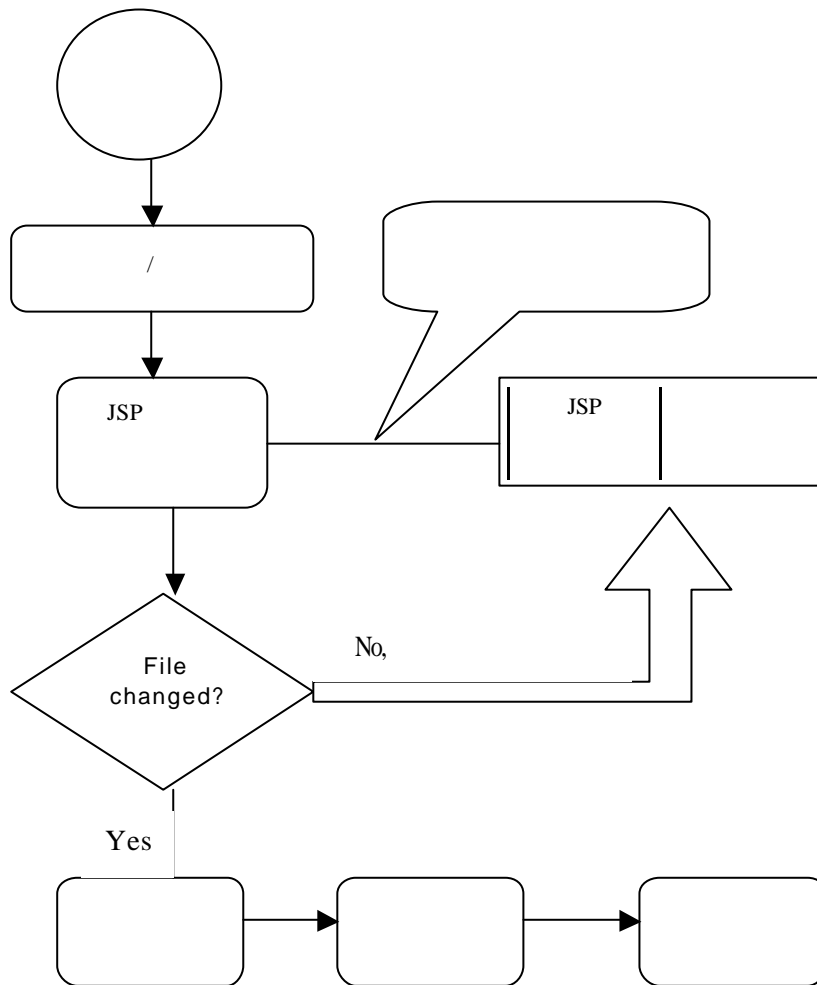
, Jrun
jrun/jsm-default/services/jse/servlets/jsp JSP 가

JSP
JSP가
_jspService(HttpServletRequest request, HttpServletResponse response) 가

JSP
JSP가

JSP
JSP가

JSPPage HttpJspPage
jspInit() . jspDestroy() ,
가



3. JSP Elements

page . . .
Directives : page
() import , error handling page , page session
* Java .
Declaratives :
Scriptlets : page
Expressions : page

```
 , JSP .  
  
<html>  
<head><title>Demo of a JSP page</title></head>  
<body>  
<!-- Directives : page -->  
<%@ page language="java" %>  
  
<!-- Declaratives : char -->  
<%! char c=0; %>  
  
<!-- Scriptlet : -->  
<%  
for (int i=0; i<26; i++){  
    for ( int j=0; j<26; j++){  
        c=(char)(0x41 + (26-i+j)%26);  
    }  
}%>  
  
<!-- Expression : HTML page c.toString() -->  
<%= c %>  
  
<% } %>  
<br>  
<% } %>  
</body>  
</html>
```

JSP element type action ,
XML syntax .
, <jsp:useBean ???? />
가 bean . JSP 1.1
tag action tags tag

4. JSP Directives

JSP directive page JSP syntax <%@
directive { attribute="value" } %> directive attribute
가 * 가

Attribute and possible values	
Language="java"	language가 Java JSP syntax , Java가
Extends="package.class"	
* import="package.* , package.class"	JSP top import (,) import packages classes
Session="true false"	가 page 가 true
isThreadSafe="true false"	JSP true가 JSP coder page false 가 page access single thread model
info="text"	Page Servlet.getServletInfo() 가 page
* errorPage="pathToErrorPage"	
isErrorPage="true false"	page가 error page true
* ContentType="text/html; charset=euc-kr"	JSP mime type character non-euc-kr characters가

5. JSP Declarations

```
JSP Declaration page
    <%! Declaration %>

    <%!
    String ;
    int count = 0;

    private void incrementCount(){
        count++;
    }
    %>

    jspInit() jspDestroy()
```

6. JSP Scriptlets

```
Scriptlets <% %>
    _jspService() . Scriptlet
    servlet
    beans

    scriptlet 가 objects
```

Implicit Object	
Request	HttpServletRequest request
response	HttpServletResponse JSP page response
pageContext	Page attributes implicit objects page JSP API 가
Session	Request HTTP session object
application	getServletConfig().getContext() return servlet context
Out	output stream object
Config	Page ServletConfig object
Page	page page
exception	Throwable

```
String      output stream      request object      가  
page  
  
<%  
    String var1 = request.getParameter("lname");  
    out.println(var1);  
%>  
  
Implicit object      JSP1.0 reference implementation  
PageContext source      comment      JSP 1.0  
reference      JSP page      _jspService()  
  
public void _jspService(HttpServletRequest request, HttpServletResponse  
response)  
throws IOException, ServletException {  
// JspFactory      _jspService()가      pageContext  
  
JspFactory factory = JspFactory.getDefaultFactory();  
PageContext pageContext = factory.getPageContext(  
    this, //servlet  
    request,  
    response,  
    null, //errorPageURL  
    false, //needsSession  
    JspWriter.DEFAULT_BUFFER,  
    true //autoFlush  
    );  
//      implicit  
    HttpSession session = pageContext.getSession();  
JspWriter out = pageContext.getOut();  
Object page = this;  
try{  
    // Body of translated JSP here...  
}catch(Exception e){  
    out.clear();  
pageContext.handlePageException(e);  
}finally{  
    out.close();  
factory.releasePageContext(pageContext);  
}  
}
```


7. JSP Expressions

JSP expression HTML Primitive String
String Primitive String
expression
JSP expression out.println()

The current price of item A100 is <%= quest.getParameter("price") %>

JSP scriplet HTML HTML
가
<% %>
<%
for(int i=0; i<10; i++){
%>

Counter value is <%= i %>
<%
}
%>

8. Coding JSP Page

JSP HTML HTML JSP 가 , JSP
JSP Bean() , Component
OOP
reference JSP implementation 가 bean
recompile Bean reload bean
restart ..

9. Using JavaBeans Components with JSP

JSP , 가

10. What is a JavaBean?

(javabeen)

Public class
Argument 7 } Public constructor
Property public set method get method
Property , property
getXXX() setXXX() . XXX property
(bean) bean import
bean
JSP page , bean .

```
// beanTest.java
package com.wrox.jspexamples;

import java.awt.Color;
import java.util.*;

public class AlphabetCode{
    HashMap map;
    char c = 0;
    Integer colorNumber;
    static int FIRST_LETTER = 0x41;
    static int ALPHABET_LENGTH = 26;
    float a = 0.9f;
    float b = 0.9f;
    public AlphabetCode(){
        this.map = new HashMap(ALPHABET_LENGTH);
        for (int i=0; i<ALPHABET_LENGTH; i++){
            this.c = (char)(FIRST_KETTER + i);
            float h = (float)i/ALPHABET_LENGTH;
            this.map.put(new Character(c),
                Color.getHSBColor(h,s,b) );
        }
    }
}
```

```
    }

    public void setCharacter(String nextChar){
        this.c = nextChar.charAt(0);
    }

    public String getCharacter (){
        return (new Character(this.c).toString());
    }
    public String getColor(){
        Color rgb = (Color)map.get(new Character(this.c));
        StringBuffer htmlColor = new StringBuffer
(colorNumber.toHexString(rgb.getRGB() & 0x00ffffff) );
        if (htmlColor.length() != 6){
            htmlColor.insert(0, "\#00");
        }else {
            htmlColor.insert(0, "\#");
        }
        htmlColor.append("\");
        return htmlColor.toString();
    }
}
```

```
bean public class constructor set get .
constructor
, JSP page .
```

```
<%-- beanTest.jsp -- >
<html>
<head><title>Color Demo 1</title></head>
<body>
<%@ page language="Java"%>
<%! char c = 0; %>
<jsp:useBean id="letterColor" scope="application"
class="com.wrox.jspexamples.AlphabetCode" />
<%
for (int i=0 ; i<26; i++){
for(int j=0; j<26; j++){
c=(char)(0x41+(26-i+j)%26);
```

```

        Character thisChar = new Character(c);
        letterColor.setCharacter(thisChar.toString());
    %>
    <font color= <%=letterColor.getColor() %> >
    <%= letterColor.getCharacter() %>
    </font>
    <%
        }
    %>
    <br>
    <%
        }
    %>
</body>
</html>

```

straight JSP page bean setCharacter(), getCharacter(), getColor() syntax <jsp:useBean .../>

```

<jsp:useBean id="letterColor" scope="application" class="com.wrox-
jspexamples.AlphabetCode" />

```

jsp:useBean scope class bean instance CLASSPATH package useBean attribute JSP page scope

UseBean Attributes	
id="name"	bean page
scope="page"	bean
class="package.class"	bean class full name import 가

Scope	
Page	page가
Request	bean instance client request instance ServletRequest object named bean attribute

	servlet/JSP page	request	.
Session	bean HttpSession.getValue(name)	session	,
	, page directive	session	false
			scope
application	ServletContext	object	attribute
			bean instance

jsp:getProperty jsp:setProperty - 가 JSP 가 -

```

<% -- beanTest2.jsp -- >
<html>
<head><title>Color Demo 2</title></head>
<body>
<%@ page language="Java"%>
<%! char c = 0; %>
<jsp:useBean id="letterColor" scope="application"
class="com.wrox.jspexamples.AlphabetCode" />
<%
for (int i=0 ; i<26; i++){
for(int j=0; j<26; j++){
c=(char)(0x41+(26-i+j)%26);
Character thisChar = new Character(c);
letterColor.setCharacter(thisChar.toString());
%>
<jsp:setProperty name="letterColor" property="character"
value=<%=thisChar.toString() %> />
<font color= <jsp:getProperty name="letterColor" property="Color" /> >
<jsp:getProperty name="letterColor" property="character" />
</font>
<%
}
%>
<br>
<%

```

```
}  
>  
</body>  
</html>
```

```
<jsp:setProperty .../> bean name, property name  
value, property name setXXX() XXX  
<jsp:getProperty .../> bean name property name  
, property name getXXX() XXX
```

11. Browsing and Querying Databases

JSP 가 ,
bean JSP

12. Ask the Right Question

```
page request . DataList.jsp  
page , right page  
<% -- DataList.jsp --% >  
<%@ page language="Java" errorPage="ErrorPage.jsp" %>  
<%  
    if (request.getParameterNames().hasMoreElements() == false){  
>  
<jsp:forward page="List1.jsp" />  
<% } %>
```

가 <http://localhost/DataList.jsp> , DataList.jsp가
Request object URL 가 ,
List1.jsp page <jsp:forward .../>
context/application URL

```
<% -- List1.jsp --% >  
<html>  
<head><title>DataBase Search</title></head>  
<body>  
<%@ page language="Java" errorPage="ErrorPage.jsp" %>  
Choose database:
```

```
<form method="get" action="DataList.jsp">
Database URL : <select name=dbURL size=1 >
<option>jdbc:odbc:employee
<option>jdbc:odbc:techlib
<option>jdbc:odbc:this_should_break
</select>
<p>
Database driver:<select name=dbDriver size=1">
<option>sun.jdbc.odbc.JdbcOdbcDriver
<option>com.imaginary.sql.mssql.MssqlDriver
</select>
<p>
Input SQL if you know your query:
<p>
<input type=text name=inputSQL size=40>
<p>
<input type=submit>
</form>
</body>
</html>
```

List1.jsp page
(query)

HTML

.(HTML)

가

13. Querying a Database

```
가 List1.jsp DataList.jsp request page
query ResultSet .

DataList.jsp . 가 else if .

<% -- DataList.jsp --% >
<%@ page language="Java" errorPage="ErrorPage.jsp" %>
<%
if (request.getParameterNames().hasMoreElements() == false){
```

```
%>
<jsp:forward page="List1.jsp" />
<%
}else if ( (request.getPatameter("dbDriver") != null) &&
           (request.getPatameter("dbURL") != null) &&
           (request.getPatameter("inputSQL") != null) ){
%>
<jsp:forward page="List3.jsp" />
<%
}
%>
```

bean , 가 URL

```
package com.wrox.jspexamples;
import java.sql.*;
import java.io.*;

public class DbBean{
    String dbURL;
    String dbDriver = "sun.jdbc.odbc.JdbcOdbcDriver";
    private Connection dbCon;

    public DbBean(){
        super();
    }
    public boolean connect() throws ClassNotFoundException, SQLException{
        Class.forName(this.getDbDriver());
        dbCon = DriverManager.getConnection(this.getDbURL());
        return true;
    }
    public void close() throws SQLException{
        dbCon.close();
    }
    public ResultSet execSQL(String sql) throws SQLException{
        statement s = dbCon.createStatement();
        ResultSet r = s.executeQuery(sql);
        return (r==null) ? null: r;
    }
}
```

```
// set method
public void setDbDriver(String newValue){
    this.dbDriver=newValue;
}
public void setDbURL(String newValue){
    this.dbURL = newValue;
}

// get method
public String getDbDriver(){
    return this.dbDriver;
}
public String getDbURL(){
    return this.dbURL;
}
}

(?) throws ,

import java.sql.*;
import com.wrox.jspexamples.DbBean;

public class TestDbBean{
public static void main(String[] args){
    DbBean mtDbBean = new DbBean();
    myDbBean.setDbDriver("sun.jdbc.odbc.JdbcOdbcDriver");
    myDbBean.setDbURL("jdbc:odbc:techlib");
    int numColumns = 0;
    String sql = "select authid, lasstname, firstname form authors";
    ResultSet rs = null;
    ResultSetMetaData rsmd = null;

    try{
        myDbBean.connect();
    }catch(ClassNotFoundException e){
        System.out.println("connect() ClassNotFoundException:" + e)
    }catch(SQLException e){
        System.out.println("connect() SQLException : "+e);
    }
}
```

```
try{
    rs.myDbBean.execSQL(sql);
}catch(SQLException){
    System.out.println("execSQL() SQLException : "+e);
}
try{
    rsmd= rs.getMetaData();
    numColumns = rsmd.getColumnCount();

    for(int column=1; column<=numColumns; column++){
        System.out.println(rsmd.getColumnName(column));
    }

    while (rs.next()){
        for(int column=1; column<=numColumns; column++){
            System.out.println(rs.getString(column));
        }
    }

    myDbBean.close();

}catch(SQLException){
    System.out.println("Problems with the database - SQLException : "+e);
}
}
```

가 가

가 , JSP 가? 가

ClassNotFoundException

dbURL DriverManager.getConnection() .

execSQL() SQLException .

List3.jsp .

<html>

```
<head><title>Database Search</title></head>
<body>
<%@ page language="Java" import="java.sql.*"
errorPage="ErrorPage.jsp" %>
<jsp:useBean id="db" scope="request"
class="com.wrox.jspexamples.DbBean" />
<jsp:setProperty name="db" property="*" />
<%!
    int numColumns;
    ResultSet rs = null;
    ResultSetMetadata rsmd = null;
%>
<center>
<h2> Result from</h2>
<h2><%=request.getParameter("inputSQL") %></h2>
<hr>
<br><br>
<table border="1" bgcolor="#cccc99" bordercolor="#003366">
<tr>
<%
    String sql = request.getParameter("inputSQL");

    try{
        db.connect();
    }catch(ClassNotFoundException e){
        throw new ServletException("Database drivers not available",e);
    }catch(SQLException e){
        throw new ServletException("Database URL is wrong",e);
    }

    try{
        rs = db.execSQL(sql);
    }catch(SQLException e){
        throw new ServletException("Your query isn't working. " +
            "Do you want to browse the database?" +
            "If so, leave the SQL input empty", e);
    }

    try{
        rsmd = rs.getMetaData();
        numColumns = rsmd.getColumnCount();
```

```
        for (int column = 1; column<=numColumns; column++){
    %>
    <th><%= rsmd.getColumnname(column) %> </th>
    <% } %>
</tr>
<% while (rs.next()){ %>
<tr>
<% for(int column=1; column<=numcolumns; column++){ %>
<td><%= rs.getString(column) %></td>
<% } %>
</tr>
}
rs.close();
db.close();
%>
<%
}catch(SQLException e){
    throw new ServletException("Database error. The query worked,"+
        "but the display didn't", e);
}
%>
</table>
</center>
<p>
<form method="get" action="DataList.jsp">
<input type="hidden" name="dbDriver" value=
<%=request.getParameter("dbDriver")%> >
<input type="hidden" name="dbURL" value=
<%=request.getParameter("dbURL")%> >
Input SQL<input type="text" name="inputSQL" size="40">
<p>
<input type="submit">
</form>
</body>
</html>
```

가 가 . jsp:setProperty

<jsp:setProperty name="db" property="*" />


```
<jsp:setProperty name="beanName" property="propertyName" param=parameterName />
shorthand ( propertyName parameterName ), request
db bean property . DriverManager DbURL
, request
(query) 가
DbURL DriverManager hidden input , SQL
```

```
<input type="hidden" name="dbDriver" value=
<%=request.getParameter("dbDriver")%> >
<input type="hidden" name="dbURL" value=
<%=request.getParameter("dbURL")%> >
Input SQL<input type="text" name="inputSQL" size="40">
```

```
page , ,
ServletException ErrorPage.jsp
isErrorPage page directive true
exception 가
가 가
```

```
<html>
<head><title>DataList Error Page</title></head>
<body>
<%@ page language="Java" isErrorPage="true" import="java.util.*,
java.sql.*" %>
<br>
<h4>Exception Details:</h4>
<p>
<%=exception.toString() %>
<br>
<%=exception.getMessage() %>
<p>
<a href="DataList.jsp">Want to try again?</a>
<p>
<%! Enumeration parameterList; %>
<%! Enumeration attributeList; %>
<p><h4>Parameter listing: </h4><p>
<%
parameterList = request.getParameterName();
while (parameterList.hasMoreElements()){
%>
<%=parameterList.nextElement().toString() %><br>
```

```
<% } %>  
<p><h4>Attribute listing:</h4><p>  
<%  
Enumeration attributeList = request.getAttributeName();  
while (attributeList.hasMoreElements()){  
%>  
<%=attributeList.nextElement().toString()%><br>  
<% } %>  
</body>  
</html>
```

14. Browsing Database

```
database driver SQL query  
SQL query table details 가 SQL query  
가  
,  
connection metadata가 . java.sql.DatabaseMetaData
```

```
Private DatabaseMetaData dbMetaData;  
Static String[] tableTypes = {"TABLES"};  
...  
dbMetaData.getTables(catalog, schema, tableName, tableTypes)  
dbMetaData.getColumns(catalog, schema, tableName, columnName)
```

```
tableType dbMetaData JSP ResultSet  
DbBean 가 SQLException
```

```
Public ResultSet getTables() throws SQLException{  
DbMetaData = dbCon.getMetaData();  
Return dbMetaData.getTables(null,null,null,tableTypes);  
}  
Public ResultSet getTable(String tableName) throws SQLException{  
DbMetaData = dbCon.getMetaData();  
Return dbMetaData.getColumns(null,null,null,tableName,null);
```

```
DbBean 가 .
```

```
while (rs.next() ){
```

```
for (int column = 1; column <= numColumns; column--){
    System.out.println(rs.getString(column));
}
catch(SQLException e){
    System.out.println("Problems with the database – SQLException:" + e);
}
//Text for List2.jsp
ResultSet tables = null;
try{
    tables = myDbBean.getTables();
}catch(SQLException e){
    System.out.println("getTables() SQLException : " + e)
}
try{
    while (tables.next()){
        String current_table = tables.getString("TABLE_NAME");
        System.out.println(current_table + " ");
        ResultSet table = myDbBean.gettable(current_table);
        while ( table.next() ){
            System.out.println(table.getString("COLUMN_NAME "));
        }
        System.out.println(" ");
    }
    myDbBean.close();
}catch(SQLException e){
    System.out.println("Table listing failed : " + e );
}
}
```

List2.jsp ..

```
<html>
<head><title>Database Details</title></head>
<body>
<%@ page language="Java" import="java.sql.*"
errorPage="ErrorPage.jsp" %>
<jsp:useBean id="db" scope="request" class="com.wrox.jspexamples.DbBean" />
<jsp:setProperty name="db" property="*" />
<%!
    int numColumns;
```

```
String current_table;
%>
The database ( <%=request.getParameter("dbURL") %> ) you have selected
has the following tables:
<%
try{
    db.connect();
}catch(ClassNotFoundException e){
    throw new ServletException("Database drivers not available",e);
}catch(Exception e){
    throw new ServletException("Database URL is wrong",e);
}

try{
    ResultSet tables = db.getTables();
    while(tables.next()){
        current_table = tables.getString("TABLES_NAMES");
%>
<p>
<h4><%= current_table %></h4>
<table border="1" bgcolor="#cccc99" bordercolor="#003366">
<tr>
<%
        ResultSet table = db.getTable(current_table);
        while(table.next()){
%>
<td><%=table.getString("COLUMN_NAME")%></td>
<% } %>
</tr>
</table>
<%
        table.close();
    }
    tables.close();
    db.close();
}catch(SQLException e){
    throw new ServletException("Database problems",e);
}
%>
<p>
<form method="get" action="DataList.jsp">
```

```
<input type="hidden" name="dbDriver"
value="<%=request.getParameter("dbDriver") %>">
<input type="hidden" name="dbURL"
value="<%=request.getParameter("dbURL") %>">
Input SQL:<input type="text" name="inputSQL" size="40">
<p>
<input type="submit">
</form>
</body>
</html>
```

```
가
.
가
empty
string
가
가
가
가
InputSQL SQL
가 non-empty string
DataList.jsp 가 DataList.jsp
```

```
<% -- DataList.jsp --% >
<%@ page language="Java" errorPage="ErrorPage.jsp" %>
<%!
boolean emptySQL(String sql){
    if (sql!=null){
        if(sql.trim().length()==0) return true;
        else return false;
    }
    return true;
}
%>
<%
if (request.getParameterNames().hasMoreElements() == false){
%>
<jsp:forward page="List1.jsp" />
<%
}else if ( (request.getParameter("dbDriver") != null) &&
(request.getParameter("dbURL") != null) &&
(emptySQL( request.getParameter("inputSQL") ) ) ){
%>
<jsp:forward page="List2.jsp" />
<%
```

```
}else if ( (request.getParameter("dbDriver") != null) &&  
           (request.getParameter("dbURL") != null) &&  
           (emptySQL( request.getParameter("inputSQL") ) == false){  
%>  
<jsp:forward page="List3.jsp" />  
<% } %>
```

15. Summary

JavaServer Pages

HTML

server-side

JSP Java World 가

JSP markup tags, content, JSP directives, JSP declaration, JSP scriptlets

actions tags

JSP

JSP

JavaBeans

JSP

, OOP