PRACTICAL **NO. 02**

**Introduction to Java EE Programming**

|  |  |
| --- | --- |
| LOB2 | Develop web applications using JSP and JSTL. |
| LO2 | Develop JSP web application using standard actions, custom tags and JSTL Tags. |

Java Server Pages (JSP) is a technology for developing web pages that support dynamic content which helps developers insert java code in HTML pages by making use of special JSP tags, most of which start with <% and end with %>.

JSP tags can be used for a variety of purposes, such as retrieving information from a database or registering user preferences, accessing JavaBeans components, passing control between pages, and sharing information between requests, pages etc.

|  |  |
| --- | --- |
| **Syntax** | **Purpose** |
| <%-- comment --%> | A JSP comment. Ignored by the JSP engine. |
| <!-- comment --> | An HTML comments. Ignored by the browser. |
| <\% | Represents static <% literal. |
| %\> | Represents static %> literal. |
| \' | A single quote in an attribute that uses single quotes. |
| \" | A double quote in an attribute that uses double quotes. |

1. **JSP elements:**
2. **JSP Directives:**

A JSP directive affects the overall structure of the servlet class. It usually has the following form:

<%@ directive attribute="value" %>

There are three types of directive tag:

|  |  |
| --- | --- |
| **Directive** | **Description** |
| <%@ page ... %> | Defines page-dependent attributes, such as scripting language, error page, and buffering requirements. |
| <%@ include ... %> | Includes a file during the translation phase. |
| <%@ taglib ... %> | Declares a tag library, containing custom actions, used in the page |

**3.Steps to implements simple jsp program:**

1. Write jsp program. Save this program with .jsp extension under the following path. C:\Program Files\Apache Software Foundation\Tomcat 6.0\webapps\

For e.g.

<html> <head>  <title>Hello World</title> </head>

<body>  <%@page language = "java" %>

<% out.println("<b>Welcome to the world of jsp!</b>");

out.close(); %>  </body>

</html>

2. Then start apache tomcat server then open any browser and type following in address bar:

http://server address:port-number/jsp\_program\_name with .jsp extension

for e.g., http://localhost:8080/hello.jsp and press enter key.

1. **HTML form – data handling in JSP**

**Reading Form Data using JSP**

JSP handles form data parsing automatically using the following methods depending on the situation:

* **getParameter():** You call request.getParameter() method to get the value of a form parameter.
* **getParameterValues():** Call this method if the parameter appears more than once and returns multiple values, for example checkbox.
* **getParameterNames():** Call this method if you want a complete list of all parameters in the current request.
* **getInputStream():** Call this method to read binary data stream coming from the client.

**For example:**

<input type="text" name="name">

**To access values use getParameter() method :**

<%= request.getParameter("name")%>

1. **JSP Actions:**

JSP actions use constructs in XML syntax to control the behavior of the servlet engine. We 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 and they are jsp:forward action tag, jsp:include action tag, jsp:useBean action tag, jsp:setProperty and jsp:getProperty action tags, and jsp:plugin action tag

**JSP Implicit Objects:**

  JSP Implicit Objects are the Java objects that the JSP Container makes available to developers on each page and developer can call them directly without being explicitly declared. JSP Implicit Objects are also called pre-defined variables. JSP supports request nine Implicit Objects, and they are – response, out, session, application, config, pageContext, page, and exception.

1. **Session Management:**

HTTP is a "stateless" protocol which means each time a client retrieves a Web page, the client opens a separate connection to the Web server and the server automatically does not keep any record of previous client request. Still there are following four ways to maintain session between web client and web server:

1. **Cookies**
2. **Hidden Form Fields**
3. **URL Rewriting**
4. **The session Object.**

**Exercise:**

**1 .** **Write a JSP program that demonstrates the use of JSP declaration, scriptlet, directives, expression, header, and footer.**

**Program:**

**program1.jsp**

<%@ page language=*"java"* contentType=*"text/html; charset=UTF-8"* pageEncoding=*"UTF-8"*%>

<!DOCTYPE html>

<html>

<head>

<meta charset=*"UTF-8"*>

<title>JSP Demonstration</title>

<style>

**body** {

font-family: *Arial, sans-serif*;

margin: *0*;

padding: *0*;

min-height: *100vh*;

display: *flex*;

flex-direction: *column*;

}

*.content* {

flex: *1*;

padding: *20px*;

}

*.header* {

background-color: *#f1f1f1*;

padding: *20px*;

text-align: *center*;

}

*.footer* {

background-color: *#f1f1f1*;

padding: *10px*;

text-align: *center*;

position: *relative*;

bottom: *0*;

width: *100%*;

margin-top: *auto*;

}

</style>

</head>

<body>

<div class=*"header"*>

<h1>Welcome to the JSP Demo Page</h1>

</div>

<div class=*"content"*>

<h2>JSP Demonstration of Declarations, Scriptlet, Directives, and Expression</h2>

<%! **int** counter = 0; %>

<%

counter++;

out.println("<p>This page has been visited " + counter + " times.</p>");

%>

<p>Current Counter Value: <%= counter %></p>

</div>

<div class=*"footer"*>

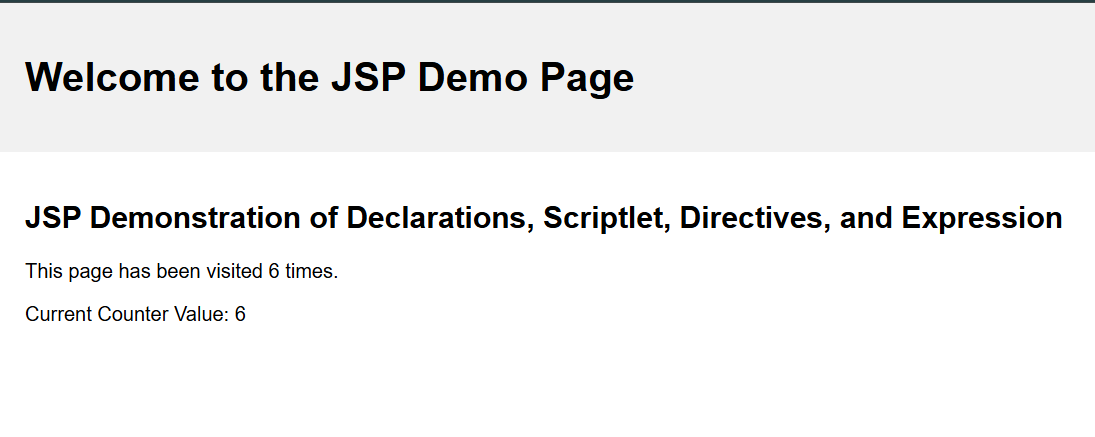
<p>&copy; 2024 Your WebSite</p>

</div>

</body>

</html>

**Output:**

****

**2. Create a student database and using JSP store all the student information within the database, so that later can be retrieved as per the requirement. Make your own assumptions..**

**Program:**

**Index.html**

<!DOCTYPE html>

<html>

<head>

<meta charset="UTF-8">

<title>Insert title here</title>

</head>

<body>

<form action="JspDbDemo.jsp" method="post">

<table>

<tr><td>Enter Students details</td><br></tr>

<tr>

<td>Roll No.</td>

<td><input type="text" name="rollno" size="15"/></td>

</tr>

<tr>

<td>Student Name</td>

<td><input type="text" name="Nm" size="15"/></td>

</tr>

<tr>

<td></td>

<td><input type="submit" name="insert" value="save"/></td>

</tr>

</table>

</form>

<a href="selectAllRecord.jsp">Click here to see all records</a>

</body>

</html>

**JspDbDemo.jsp**

<%@page import="java.sql.Statement"%>

<%@page import="java.sql.DriverManager"%>

<%@page import="java.sql.Connection"%>

<%@ page language="java" contentType="text/html; charset=UTF-8"

pageEncoding="UTF-8"%>

<!DOCTYPE html>

<html>

<head>

<meta charset="UTF-8">

<title>Insert title here</title>

</head>

<body>

<%

String rollno=request.getParameter("rollno");

String nm=request.getParameter("Nm");

String dNm=application.getInitParameter("dNm");

String connectionUrl=application.getInitParameter("connectionUrl");

String dbName=application.getInitParameter("dbName");

String userId=application.getInitParameter("userId");

String password=application.getInitParameter("password");

String url=connectionUrl+dbName;

out.println("\nRollNo="+rollno+"Nm"+nm+"<br>");

try{

Class.forName("com.mysql.cj.jdbc.Driver");

out.print("sql driver loaded..");

Connection connection=DriverManager.getConnection(url,userId,password);

out.print("sql connection done..");

Statement statement=connection.createStatement();

int r=Integer.parseInt(rollno);

String sql="INSERT INTO student VALUES ("+r+",'"+nm+"')";

int noOfRowsAffected=statement.executeUpdate(sql);

if(noOfRowsAffected!=0){

out.print("Values inserted..");

}else{

out.print("Values not inserted..");

}

}

catch(Exception e){

out.println("Exception -"+e);

}

%>

<a href="selectAllRecord.jsp">Click here to see all records</a>

</body>

</html>

**selectAllRecord.jsp**

<%@page import="java.sql.ResultSet"%>

<%@page import="java.sql.Statement"%>

<%@page import="java.sql.DriverManager"%>

<%@page import="java.sql.Connection"%>

<%@ page language="java" contentType="text/html; charset=UTF-8"

pageEncoding="UTF-8"%>

<!DOCTYPE html>

<html>

<head>

<meta charset="UTF-8">

<title>Insert title here</title>

</head>

<body>

<%

String dNm=application.getInitParameter("dNm");

out.print(dNm);

try{

Class.forName(dNm);

Connection connection=DriverManager.getConnection("jdbc:mysql://localhost:3306/studinfo","root","");

Statement statement=connection.createStatement();

String sql="SELECT \* FROM student";

ResultSet resultSet=statement.executeQuery(sql);

%><table border="1">

<br><br><%="Students Information" %>

<% while(resultSet.next()) {%>

<tr>

<td><%=resultSet.getString("rollno") %></td>

<td><%=resultSet.getString("nm") %></td>

</tr>

<% }%>

</table>

<% resultSet.close();

connection.close();

}

catch(Exception e){

out.print(e.getMessage());

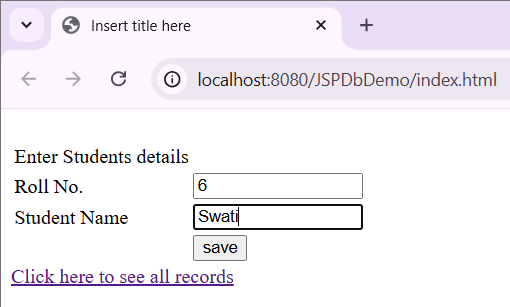
}

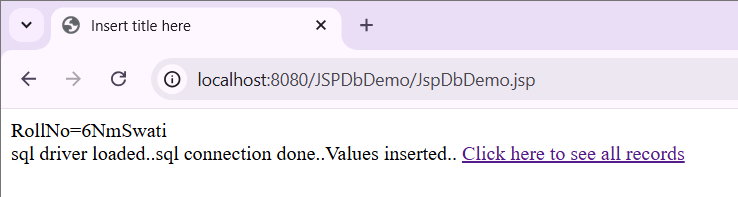
%>

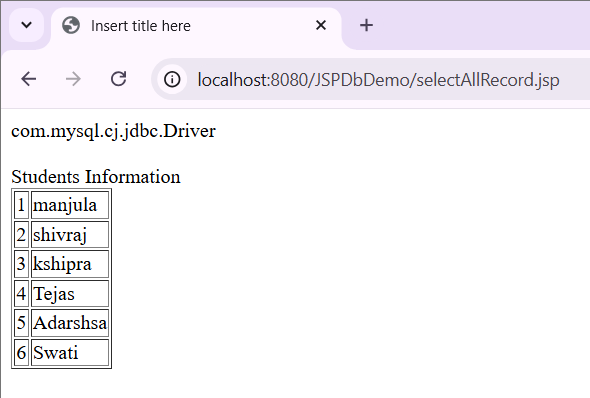
</body>

</html>

**Output:**

****

****

****

**3.** **Develop a JSP program that reads a list of names from an array and displays them on the web page.**

**Program:**

**program3.jsp**

<%@ page language=*"java"* contentType=*"text/html; charset=UTF-8"* pageEncoding=*"UTF-8"*%>

<!DOCTYPE html>

<html>

<head>

<meta charset=*"UTF-8"*>

<title>Display Names</title>

<style>

**body** {

font-family: *Arial, sans-serif*;

margin: *0*;

padding: *20px*;

}

**h1** {

color: *#333*;

}

**ul** {

list-style-type: *none*;

padding: *0*;

}

**li** {

background-color: *#f1f1f1*;

margin: *5px 0*;

padding: *10px*;

border-radius: *5px*;

width: *60px*;

}

</style>

</head>

<body>

<h1>List of Names</h1>

<ul>

<%

String[] names = {"Alice", "Bob", "Charlie", "David", "Eve"};

**for** (**int** i = 0; i < names.length; i++) {

out.println("<li>" + names[i] + "</li>");

}

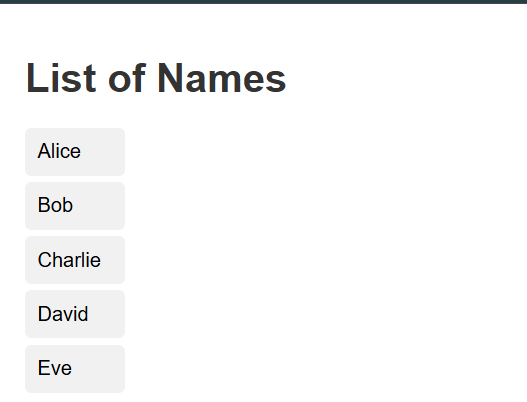
%>

</ul>

</body>

</html>

**Output:**

****

**4.** **Implement a custom tag that converts a given string to lowercase and displays it on the page**

**Program:**

**Output:**

**5.** **Build an online shopping cart using JSP. Each time a user adds an item to the cart, store the items in the session. Display the items in the cart on a separate page.**

**Program:**

**addToCart.jsp**

<%@ page language=*"java"* contentType=*"text/html; charset=UTF-8"* pageEncoding=*"UTF-8"*%>

<%@ page import=*"java.util.ArrayList"* %>

<!DOCTYPE html>

<html>

<head>

<title>Add to Cart</title>

</head>

<body>

<h1>Online Shopping Cart</h1>

<form action=*"addToCart.jsp"* method=*"POST"*>

<label for=*"item"*>Enter Item Name:</label>

<input type=*"text"* name=*"item"* id=*"item"* required>

<button type=*"submit"*>Add to Cart</button>

</form>

<%

// Initialize or retrieve the cart from the session

ArrayList<String> cart = (ArrayList<String>) session.getAttribute("cart");

**if** (cart == **null**) {

cart = **new** ArrayList<>();

}

// Check if an item has been submitted

String item = request.getParameter("item");

**if** (item != **null** && !item.trim().isEmpty()) {

cart.add(item); // Add the item to the cart

session.setAttribute("cart", cart); // Update the session attribute

out.println("<p style='color: green;'>Item added to cart successfully!</p>");

}

%>

<hr>

<h2>Current Items in the Cart</h2>

<ul>

<%

**if** (cart != **null** && !cart.isEmpty()) {

**for** (String cartItem : cart) {

out.println("<li>" + cartItem + "</li>");

}

} **else** {

out.println("<p>Your cart is empty.</p>");

}

%>

</ul>

<hr>

<a href=*"viewCart.jsp"*>View Full Cart</a>

</body>

</html>

**viewCart.jsp**

<%@ page language=*"java"* contentType=*"text/html; charset=UTF-8"* pageEncoding=*"UTF-8"*%>

<%@ page import=*"java.util.ArrayList"* %>

<!DOCTYPE html>

<html>

<head>

<title>View Cart</title>

</head>

<body>

<h1>Your Shopping Cart</h1>

<%

// Retrieve the cart from the session

ArrayList<String> cart = (ArrayList<String>) session.getAttribute("cart");

**if** (cart == **null** || cart.isEmpty()) {

%>

<p>Your cart is empty. <a href=*"addToCart.jsp"*>Add Items</a></p>

<%

} **else** {

%>

<ul>

<%

**for** (String item : cart) {

out.println("<li>" + item + "</li>");

}

%>

</ul>

<%

}

%>

<hr>

<a href=*"addToCart.jsp"*>Add More Items</a>

</body>

</html>

**Output:**

