

Practical – 2

Aim :- Develop web applications using JSP and JSTL.

Theory:

JSP (Java Server Pages):

JSP technology is used to create web application just like Servlet technology. It can be thought of as an extension to Servlet because it provides more functionality than servlet such as expression language, JSTL, etc.

A JSP page consists of HTML tags and JSP tags. The JSP pages are easier to maintain than Servlet because we can separate designing and development. It provides some additional features such as Expression Language, Custom Tags, etc.

The Lifecycle of a JSP Page:

1. Translation of JSP Page
2. Compilation of JSP Page
3. Classloading (the classloader loads class file)
4. Instantiation (Object of the Generated Servlet is created).
5. Initialization (the container invokes `jspInit()` method).
6. Request processing (the container invokes `_jspService()` method).
7. Destroy (the container invokes `jspDestroy()` method).

Scriptlet Tag:

This tag allow user to insert java code in JSP. The statement which is written will be moved to `jspService()` using JSP container while generating servlet from JSP. When client make a request, JSP service method is invoked and after that the content which is written inside the scriptlet tag executes.

Syntax: `<%Java Code%>`

Expression Tag:

Expression tag is one of the scripting elements in JSP. Expression Tag in JSP is used for writing your content on the client-side. We can use this tag for displaying information on the client's browser. The JSP Expression tag transforms the code into an expression statement that converts into a value in the form of a string object and inserts into the implicit output object.

Syntax: `<%= Expression %>`

Declaration Tag:

This Tag is used for declare the variables. Along with this, Declaration Tag can also declare method and classes. Jsp initializer scans the code and find the declaration tag and initializes all the variables, methods, and classes. JSP container keeps this code outside of the service method (`_jspService()`) to make them class level variables and methods.

Syntax: `<%=! Initialize variables, methods %>`

JSP Implicit Objects

A list of the 9 implicit objects is given below:

Object	Type
out	JspWriter
request	HttpServletRequest
response	HttpServletResponse
config	ServletConfig
application	ServletContext
session	HttpSession
pageContext	PageContext
page	Object
exception	Throwable

JSP Action Tags:

There are many JSP action tags or elements. Each JSP action tag is used to perform some specific tasks.

JSP Action Tags	Description
jsp:forward	forwards the request and response to another resource.
jsp:include	includes another resource.
jsp:useBean	creates or locates bean object.
jsp:setProperty	sets the value of property in bean object.
jsp:getProperty	prints the value of property of the bean.
jsp:plugin	embeds another components such as applet.
jsp:param	sets the parameter value. It is used in forward and include mostly.
jsp:fallback	can be used to print the message if plugin is working. It is used in jsp:plugin.

1 Create a JSP page to display current date and time.

Code:

date.jsp

```
<%@page import="java.time.LocalDate"%>

<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
pageEncoding="ISO-8859-1"%>

<!DOCTYPE html>

<html>

<head>

<meta charset="ISO-8859-1">

<title>Insert title here</title>
```

```
</head>

<body>

<h1>Current Date is</h1>

<% out.println(LocalDate.now()); %>

</body>

</html>
```

Output :-

Current Date is

2022-12-27

2 Create a menu driven JSP page that will take input from the user sides and display area of a shape.

Code:-

Index.jsp

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
```

```
<body>
<form action="logic.jsp">
Enter shape <input type="text" name="shape"/><br/>
<input type="submit" value="submit"/>
</form>
</body>

</html>
```

logic.jsp

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
    <%
        String s = request.getParameter("shape");
        if(s.equals("triangle"))
        {
            String redirectURL = "http://localhost:8080/jspPrac/tri.jsp";
            response.sendRedirect(redirectURL);
        }
        else if(s.equals("circle"))
        {
            String redirectURL = "http://localhost:8080/jspPrac/cir.jsp";
            response.sendRedirect(redirectURL);
        }
    %>
</body>

</html>
```

cir.jsp

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
<h2>Give the below details</h2><br/>

<form action="cirlogic.jsp">
Enter Radius<input type="text" name="radius"/><br/>
```

```
<input type="submit" value="submit"/>
</form>
```

```
</body>
```

```
</html>
```

cirlogic.jsp

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
Area of Triangle is
<%
out.print(Integer.parseInt(request.getParameter("radius"))) *3.14);
%>

</body>

</html>
```

tri.jsp

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
<h2>Give the below details</h2><br/>

<form action="trilogic.jsp">
Enter Base<input type="text" name="base"/><br/>
Enter Height<input type="text" name="height"/><br/>
<input type="submit" value="submit"/>
</form>

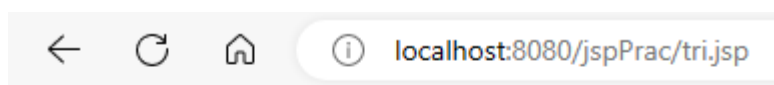
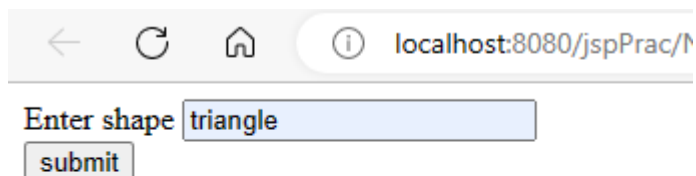
</body>
</html>
```

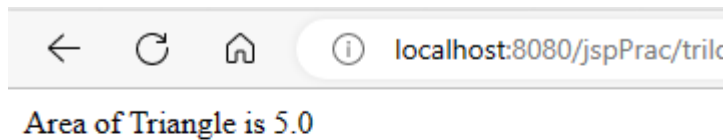
trilogic.jsp

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
Area of Triangle is
<%
out.print(Integer.parseInt(request.getParameter("base"))
*Integer.parseInt(request.getParameter("height"))*0.5);
%>

</body>

</html>
```

Output :-**Give the below details**



3 Create JSP page to demonstrate the use of scriptlet, expression and declaration tag.

Code:

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"pageEncoding="ISO-8859-1"%>

<!DOCTYPE html>

<html>

<head>

<meta charset="ISO-8859-1">

<title>Insert title here</title>

</head>

<body>

<%!

int square(int a)

{

a = a * a;

return a;

}

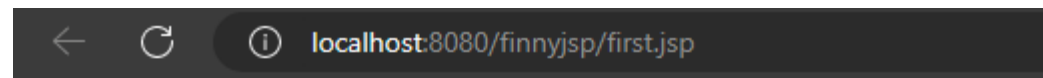
%>

<h4> Multiplication of 5 is</h4>

<%

for(int i=1;i<=10;i++)
```

```
{  
out.println("5 * "+i+ " = " + 5*i );  
%>  
<br>  
<%  
}  
%>  
<h4> Cube of 5 is</h4>  
<%=square(5) %>  
</body>  
</html>
```

Output :-**Multiplication of 5 is**

5 * 1 = 5
5 * 2 = 10
5 * 3 = 15
5 * 4 = 20
5 * 5 = 25
5 * 6 = 30
5 * 7 = 35
5 * 8 = 40
5 * 9 = 45
5 * 10 = 50

Cube of 5 is

25

4 Create a JSP page to demonstrate the use of config, request, response, out and session directive.**Code:****a)config****Code:****Web.xml**

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://xmlns.jcp.org/xml/ns/javaee"
xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
http://xmlns.jcp.org/xml/ns/javaee/web-app_3_1.xsd" id="WebApp_ID" version="3.1">
  <display-name>ConfigObjectPrac</display-name>

  <servlet>
    <servlet-name>Sunny</servlet-name>
    <jsp-file>/welcome.jsp</jsp-file>

    <init-param>
      <param-name>drivername</param-name>
      <param-value>sun.jdbc.odbc.JdbcOdbcDriver</param-value>
    </init-param>

  </servlet>

  <servlet-mapping>
    <servlet-name>Sunny</servlet-name>
    <url-pattern>/welcome</url-pattern>
  </servlet-mapping>

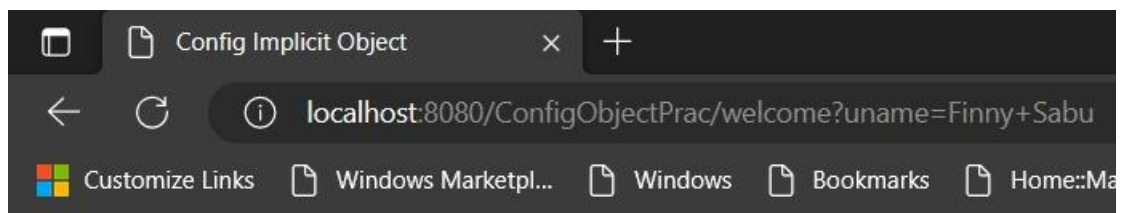
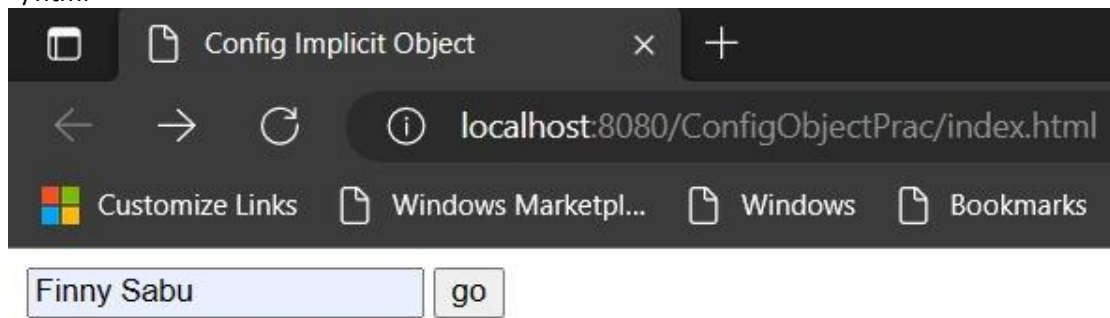
</web-app>
```

Index.js

```
<%@ 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>
<%
out.print("Welcome "+request.getParameter("uname"));

String driver=config.getInitParameter("drivername");
out.print("driver name is="+driver);
%>
```

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



Welcome =Finny Sabu
driver name is=sun.jdbc.odbc.JdbcOdbcDriver

b) Session

Code:

The 'index.html' page given below will display a text box together with a go button. On clicking go button, the control is transferred to welcome.jsp page. All the outputs are appended at last.

```
<!DOCTYPE html>  
  
<html>  
  
<head>  
  
<meta charset="ISO-8859-1">  
  
<title>Implicit Object - Session</title>  
  
</head>  
  
<body>  
  
<form action="welcome.jsp">  
  
<h3>Enter your name</h3><br>  
  
<input type="text" name="uname">  
  
<input type="submit" value="go"><br/>  
  
</form>  
  
</body>
```

```
</html>
```

welcome.jsp

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
pageEncoding="ISO-8859-1"%>

<!DOCTYPE html>

<html>

<head>

<meta charset="ISO-8859-1">

<title>Session</title>

</head>

<body>

<%

String name=request.getParameter("uname");

out.print("Welcome "+name);

session.setAttribute("user",name);

%>

<a href="second.jsp">Display the value</a>

</body>

</html>
```

In **second.jsp** page, the value of variable is retrieved from the session and displayed.

second.jsp

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

<!DOCTYPE html>

<html>

<head>

<meta charset="UTF-8">

<title>Session</title>
```

```
</head>

<body>

<h3>Display the session value on this page</h3>

<%

String name=(String)session.getAttribute("user");

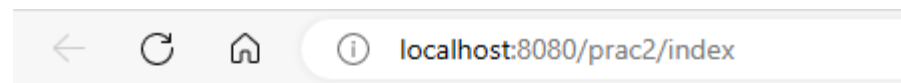
out.print("Hello "+name);

%>

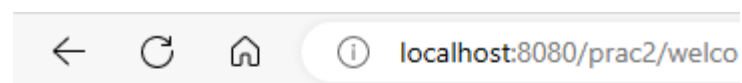
</body>

</html>
```

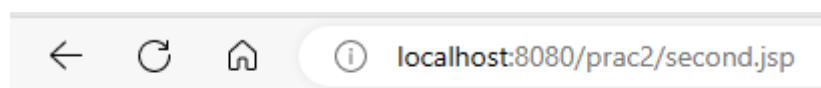
Output:



Enter your name



Welcome Finny Sabu [Display the value](#)



Display the session value on this page

Hello Finny Sabu

c) response

This is the HttpServletResponse object associated with the response to the client. The response object also defines the interfaces that deal with creating new HTTP headers. Through this object the JSP programmer can add new cookies or date stamps, HTTP status codes, etc.

Code:

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>

<!DOCTYPE html>

<html>

<head>

<meta charset="ISO-8859-1">

<title>Session</title>

</head>

<body>

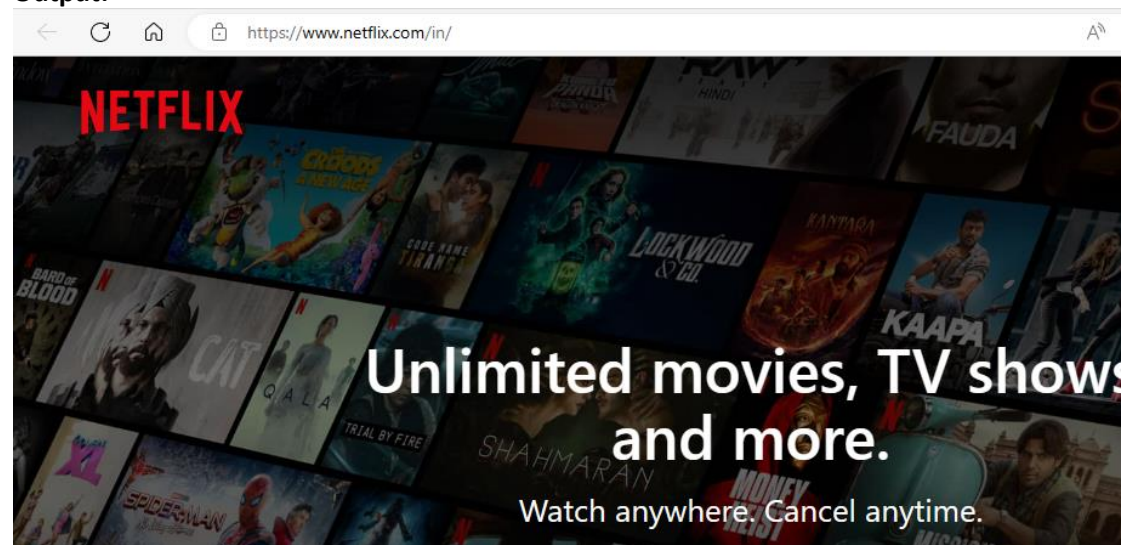
<%

response.sendRedirect("https://www.netflix.com/");

%>

</body>

</html>
```

Output:

d) request**Code:****index.html**

```
<html>

<head>

<title>Enter UserName and Password</title>

</head>

<body>

<form action="welcome.jsp">

Enter User Name: <input type="text" name="uname" /> <br><br>

Enter Password: <input type="text" name="pass" /> <br><br>

<input type="submit" value="Submit Details"/>

</form>

</body>

</html>
```

welcome.jsp

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>

<!DOCTYPE html>

<html>

<head>

<meta charset="ISO-8859-1">

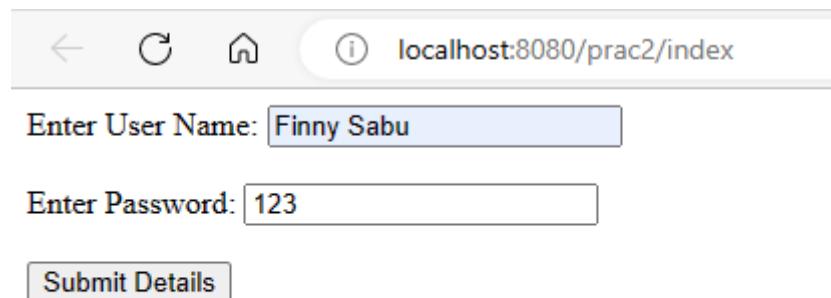
<title>request</title>

</head>

<body>

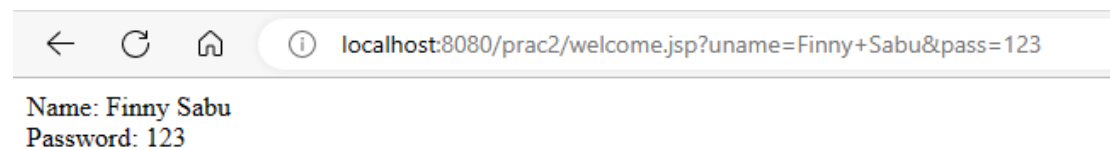
<%
```

```
String username = request.getParameter("uname");  
String password = request.getParameter("pass");  
out.print("Name: "+username+"<br> Password: "+password);  
%>  
</body>  
</html>
```

Output:

Enter User Name:

Enter Password:



Name: Finny Sabu
Password: 123

**e) out
Code**

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"  
pageEncoding="ISO-8859-1"%>  
  
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"  
"http://www.w3.org/TR/html4/loose.dtd">  
  
<html>  
  
<head>  
  
<meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">  
  
<title>out</title>
```

```
</head>

<body>

<%

int num1=10;int num2=20;

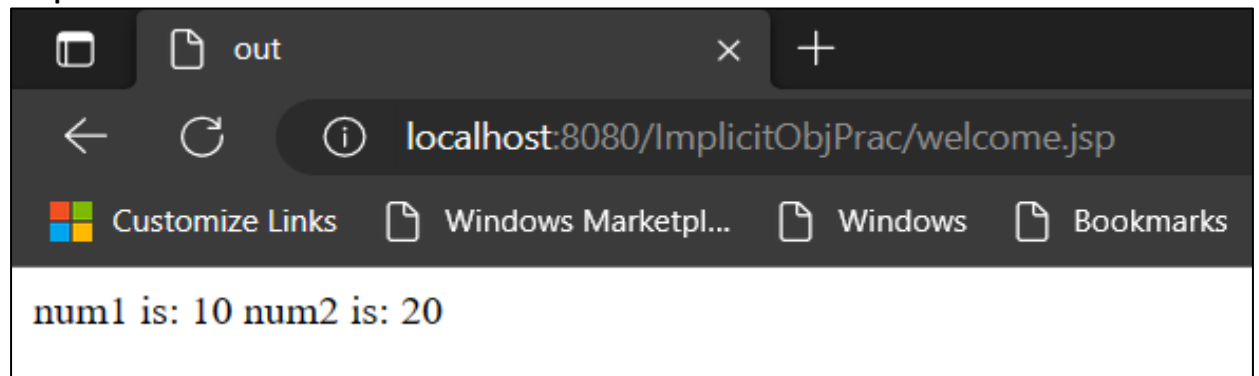
out.println("num1 is: " +num1);

out.println("num2 is: "+num2);

%>

</body>

</html>
```

Output:**5 Create a JSP page to UseBean tag and taglib Tag in JSP.****a) usebean****Code:****Calculator.java**

```
package jspq5;

public class Calculator {
    public int cube(int n)
    {
        return n*n*n;
    }
}
```

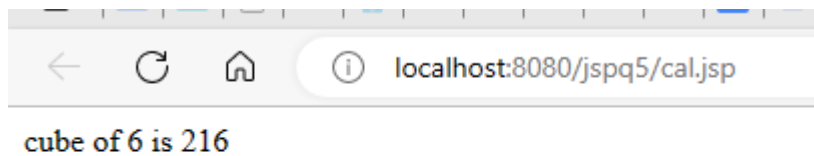
Cal.jsp

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<jsp:useBean id="cal" class="jspq5.Calculator"/>
```



```
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
<%
int m=cal.cube(6);
out.print("cube of 6 is "+m);
%>

</body>
</html>
```

**b) taglib****Code:****HelloTag.java**

```
package com.sunny;

import javax.servlet.jsp.tagext.*;
import javax.servlet.jsp.*;
import java.io.*;

public class HelloTag extends SimpleTagSupport {

    public void doTag() throws JspException, IOException {

        JspWriter out = getJspContext().getOut();

        out.println("Hello Custom Tag!");

    }

}
```

mytags.tld

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

<%@ taglib prefix = "ex" uri = "WEB-INF/mytags.tld"%>

<!DOCTYPE html>

<html>

<head>

<meta charset="UTF-8">

<title>Taglib</title>

</head>

<body>

<ex:Hello/>

</body>

</html>
```

taglibs.jsp

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

<%@ taglib prefix = "ex" uri = "WEB-INF/mytags.tld"%>

<!DOCTYPE html>

<html>

<head>

<meta charset="UTF-8">

<title>Taglib</title>

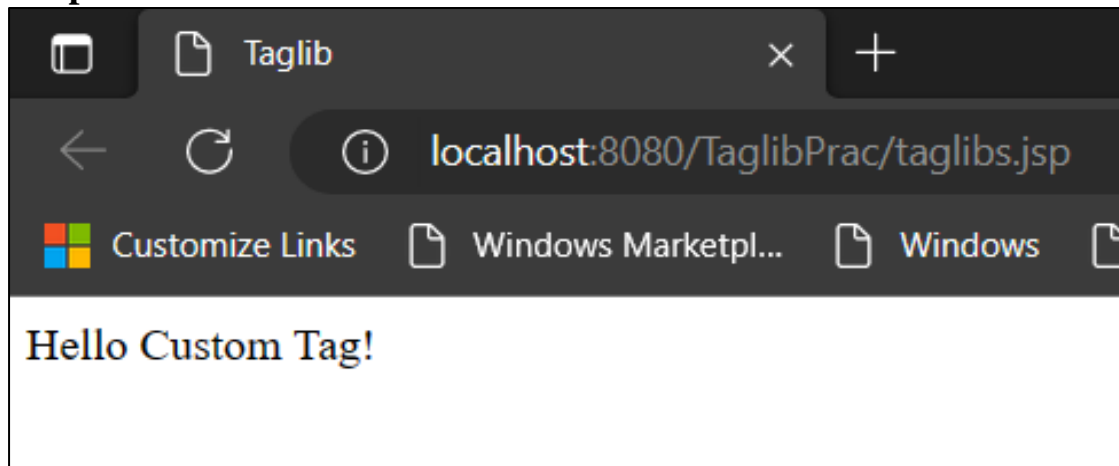
</head>

<body>

<ex:Hello/>

</body>

</html>
```

Output:**Conclusions:**

We have implemented different jsp scripting elements, jsp action tags, jsp implicit objects successfully in this practical.