

## Practical 2 - Implementing Servlet applications with Request Dispatcher, Cookies and Sessions.

### Theory –

#### What is Servlet?

#### Request Dispatcher, Cookies and Sessions

2a. Using Request Dispatcher Interface create a Servlet which will validate the password entered by the user, if the user has entered "Servlet" as password, then he will be forwarded to Welcome Servlet else the user will stay on the index.html page and an error message will be displayed.

#### Index.html

```
<html><head><title>Login Form</title></head>
<form action="LoginValidate" >
  Enter User ID<input type="text" name="txtId"><br>
  Enter Password<input type="password" name="txtPass"><br>
  <input type="reset">
  <input type="submit" value=" Click to Login " >
</form>
</html>
```

#### LoginValidate.java

```
package MyPack;
import java.io.IOException;
import java.io.PrintWriter;
import jakarta.servlet.ServletException;
import jakarta.servlet.annotation.WebServlet;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;
import jakarta.servlet.RequestDispatcher;
@WebServlet(urlPatterns = "/LoginValidate")
public class LoginValidate extends HttpServlet {
    @Override
    public void doGet(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        PrintWriter out = response.getWriter();
        out.println("<html><head><title>Servlet LoginServlet</title></head>");
        String uname = request.getParameter("txtId");
        String upass = request.getParameter("txtPass");
        if(uname.equals("admin") && upass.equals("servlet"))
        {
            RequestDispatcher rd = request.getRequestDispatcher("/WelcomeServlet");
            rd.forward(request, response);
        }
        else
        {
            out.println("<body bgcolor=red >");
        }
    }
}
```

```

out.println("<h1> Login Fail !!! </h1>");
RequestDispatcher rd = request.getRequestDispatcher("index.html");
rd.include(request, response);
}
out.println("</body>");
out.println("</html>");
}
}

```

#### **WelcomeServlet.java**

```

package MyPack;

import jakarta.servlet.RequestDispatcher;
import java.io.IOException;
import java.io.PrintWriter;
import jakarta.servlet.ServletException;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;
import jakarta.servlet.annotation.WebServlet;
@WebServlet("/WelcomeServlet")
public class WelcomeServlet extends HttpServlet {
    public void doGet(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        PrintWriter out = response.getWriter();
        out.println("<html><head>");
        out.println("<title>Servlet LoginServlet</title></head>");
        out.println("<body bgcolor=orange text=blue >");
        out.println("<h1> Welcome to the world of Servlet !!! </h1>");
        out.println("</body>");
        out.println("</html>");
    }
}

```

**2b. Create a servlet that uses Cookies to store the number of times a user has visited servlet.**

**Index.html**

```
<html>
<head><title>Cookie Demo</title></head>
<body>
<form action="Page1" >
  Enter Your Name <input type="text" name="txtName"><br>
<input type="submit" value="~~~ Click to Enter ~~~">
</form>
</body>
</html>
```

**Page1.java**

```
package MyPack;

import java.io.IOException;
import java.io.PrintWriter;
import jakarta.servlet.ServletException;
import jakarta.servlet.annotation.WebServlet;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;
import jakarta.servlet.http.Cookie;
@WebServlet(urlPatterns = "/Page1")
public class Page1 extends HttpServlet {
    @Override
    public void doGet(HttpServletRequest request, HttpServletResponse response)
throws ServletException, IOException {
    response.setContentType("text/html;charset=UTF-8");
    PrintWriter out = response.getWriter();
    out.println("<html><head><title>Page1</title></head>");
    out.println("<body bgcolor=pink text=blue >");
    String uname = request.getParameter("txtName");
    out.println("<h1>~~~ Welcome "+uname+"</h1>");
    Cookie ck1 = new Cookie("username", uname);
    Cookie ck2 = new Cookie("visit", "1");
    response.addCookie(ck1); response.addCookie(ck2);
    out.println("<h1><a href=Page2 >Click to visit Page 2 </a></h1>");
    out.println("</body>");
    out.println("</html>");
}
}
```

**Page2.java**

```
package MyPack;

import java.io.IOException;
import java.io.PrintWriter;
import jakarta.servlet.ServletException;
import jakarta.servlet.annotation.WebServlet;
```

```

import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;
import jakarta.servlet.http.Cookie;
@WebServlet(urlPatterns = {"/Page2"})
public class Page2 extends HttpServlet {

    public void doGet(HttpServletRequest request, HttpServletResponse response)
    throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        PrintWriter out = response.getWriter();
        out.println("<html><head><title>Page2</title></head>");
        out.println("<body bgcolor=yellow text=green >");
        Cookie [] ck = request.getCookies();
        for(int i=0;i<ck.length;i++){
            if(ck[i].getName().equals("visit")){
                int count = Integer.parseInt(ck[i].getValue())+1;
                out.println("<h1>Visit No : "+count+"</h1>");
                ck[i] = new Cookie("visit",count+"");
                response.addCookie(ck[i]);
            }
            else {
                out.println(ck[i].getName()+ " = "+ck[i].getValue()); }
            out.println("<h1><a href=Page3 >Click to visit Page 3 </a></h1>");
            out.println("</body>");
            out.println("</html>");
        }
    }
}

```

### **Page3.java**

```

package MyPack;

import java.io.IOException;
import java.io.PrintWriter;
import jakarta.servlet.ServletException;
import jakarta.servlet.annotation.WebServlet;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;
import jakarta.servlet.http.Cookie;
@WebServlet(urlPatterns = {"/Page3"})
public class Page3 extends HttpServlet {

    public void doGet(HttpServletRequest request, HttpServletResponse response)
    throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        PrintWriter out = response.getWriter();
        out.println("<html><head><title>Page2</title></head>");
        out.println("<body bgcolor=red text=yellow >");
    }
}

```

```

Cookie [] ck = request.getCookies();
for(int i=0;i<ck.length;i++){
if(ck[i].getName().equals("visit")){
int count = Integer.parseInt(ck[i].getValue())+1;
out.println("<h1>Visit No : "+count+"</h1>");
ck[i] = new Cookie("visit",count+"");
response.addCookie(ck[i]);
}
else {
out.println(ck[i].getName()+" = "+ck[i].getValue()); }
out.println("<h1><a href=Page4 >Click to visit Page 4 </a></h1>");
out.println("</body>");
out.println("</html>");
}
}
}

```

#### **Page4.java**

```

package MyPack;

import java.io.IOException;
import java.io.PrintWriter;
import jakarta.servlet.ServletException;
import jakarta.servlet.annotation.WebServlet;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;
import jakarta.servlet.http.Cookie;
@WebServlet(urlPatterns = {"/Page4"})
public class Page4 extends HttpServlet {

    public void doGet(HttpServletRequest request, HttpServletResponse response)
throws ServletException, IOException {
response.setContentType("text/html;charset=UTF-8");
PrintWriter out = response.getWriter();
out.println("<html><head><title>Page2</title></head>");
out.println("<body bgcolor=orange text=blue >");
Cookie [] ck = request.getCookies();
for(int i=0;i<ck.length;i++){
if(ck[i].getName().equals("visit")){
int count = Integer.parseInt(ck[i].getValue())+1;
out.println("<h1>Visit No : "+count+"</h1>");
ck[i] = new Cookie("visit",count+"");
response.addCookie(ck[i]);
}
else {
out.println(ck[i].getName()+" = "+ck[i].getValue()); }
out.println("<h1><a href=Page5 >Click to visit Page 5 </a></h1>");
out.println("</body>");
out.println("</html>");
}
}
}

```

```
}  
}  
}
```

#### Page5.java

```
package MyPack;
```

```
import java.io.IOException;  
import java.io.PrintWriter;  
import jakarta.servlet.ServletException;  
import jakarta.servlet.annotation.WebServlet;  
import jakarta.servlet.http.HttpServlet;  
import jakarta.servlet.http.HttpServletRequest;  
import jakarta.servlet.http.HttpServletResponse;  
import jakarta.servlet.http.Cookie;  
@WebServlet(urlPatterns = {"/Page5"})  
public class Page5 extends HttpServlet {  
  
    public void doGet(HttpServletRequest request, HttpServletResponse response)  
    throws ServletException, IOException {  
        response.setContentType("text/html;charset=UTF-8");  
        PrintWriter out = response.getWriter();  
        out.println("<html><head><title>Page2</title></head>");  
        out.println("<body bgcolor=cyan text=blue >");  
        Cookie [] ck = request.getCookies();  
        for(int i=0;i<ck.length;i++){  
            if(ck[i].getName().equals("visit")){  
                int count = Integer.parseInt(ck[i].getValue())+1;  
                out.println("<h1>Visit No : "+count+"</h1>");  
                ck[i] = new Cookie("visit",count+"");  
                response.addCookie(ck[i]);  
            }  
            else {  
                out.println(ck[i].getName()+" = "+ck[i].getValue()); }  
            out.println("<h1><a href=Page1 >Click to visit Page 1 </a></h1>");  
            out.println("</body>");  
            out.println("</html>");  
        }  
    }  
}
```

**2c. Create a servlet demonstrating the use of session creation and destruction. Also check whether the user has visited this page first time or has visited earlier also using sessions.**

**Index.html**

```
<html>
<head><title>Session Demo</title></head>
<form action="Page1" method="get" >
Enter User ID <input type="text" name="txtName"><br>
<input type="reset" ><input type="submit" >
</form>
</html>
```

**Page1.java**

```
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.HttpSession;
@WebServlet(urlPatterns = {"/Page1"})
public class Page1 extends HttpServlet {
    public void doGet(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        PrintWriter out = response.getWriter();
        out.println("<html><head><title>Servlet Page1</title></head>");
        HttpSession hs = request.getSession(true);
        if(hs.isNew()){
            out.println("<body bgcolor=yellow>");
            String name = request.getParameter("txtName");
            hs.setAttribute("uname", name);
            hs.setAttribute("visit", "1");
            out.println("<h1>Welcome First Time</h1>");
        }
        else{
            out.println("<h1>Welcome Again</h1>");
            int visit = Integer.parseInt((String)hs.getAttribute("visit"))+1;
            out.println("<h1>You Visited "+visit+"Times</h1>");
            hs.setAttribute("visit", ""+visit);
        }
        out.println("<h1>Your Session ID "+hs.getId()+"</h1>");
        out.println("<h1>You Logged in at "+new java.util.Date(hs.getCreationTime())+"</h1>");
        out.println("<h1><a href=Page2>Click for Page 2 </a></h1>");
        out.println("<h1><a href=Page3>Click for Page 3 </a></h1>");
        out.println("<h1><a href=Page4>Click for Page 4 </a></h1>");
        out.println("<h1><a href=LogoutServlet>Click to Terminate Session </a></h1>");
        out.println("</body>");
        out.println("</html>");
    }
}
```

```
}  
}
```

#### **Page2.java**

```
import java.io.IOException;  
import java.io.PrintWriter;  
import javax.servlet.ServletException;  
import javax.servlet.annotation.WebServlet;  
import javax.servlet.http.HttpServlet;  
import javax.servlet.http.HttpServletRequest;  
import javax.servlet.http.HttpServletResponse;  
import javax.servlet.http.HttpSession;  
@WebServlet(urlPatterns = {"/Page2"})  
public class Page2 extends HttpServlet {  
    public void doGet(HttpServletRequest request, HttpServletResponse response)  
        throws ServletException, IOException {  
        response.setContentType("text/html;charset=UTF-8");  
        PrintWriter out = response.getWriter();  
        out.println("<html><head><title>Servlet Page2</title></head>");  
        HttpSession hs = request.getSession(false);  
        out.println("<h1>Welcome Again on Page No. 2</h1>");  
        int visit = Integer.parseInt((String)hs.getAttribute("visit"))+1;  
        out.println("<h1>You Visited "+visit+"Times</h1>");  
        hs.setAttribute("visit", ""+visit);  
        out.println("<h1>Your Session ID "+hs.getId()+"</h1>");  
        out.println("<h1>You Logged in at "+new java.util.Date(hs.getCreationTime())+"</h1>");  
        out.println("<h1><a href=Page1>Click for Page 1 </a></h1>");  
        out.println("<h1><a href=Page3>Click for Page 3 </a></h1>");  
        out.println("<h1><a href=Page4>Click for Page 4 </a></h1>");  
        out.println("<h1><a href=LogoutServlet>Click for Terminate Session </a></h1>");  
        out.println("</body>");  
        out.println("</html>");  
    }  
}
```

#### **Page3.java**

```
import java.io.IOException;  
import java.io.PrintWriter;  
import javax.servlet.ServletException;  
import javax.servlet.annotation.WebServlet;  
import javax.servlet.http.HttpServlet;  
import javax.servlet.http.HttpServletRequest;  
import javax.servlet.http.HttpServletResponse;  
import javax.servlet.http.HttpSession;  
@WebServlet(urlPatterns = {"/Page3"})  
public class Page3 extends HttpServlet {  
    public void doGet(HttpServletRequest request, HttpServletResponse response)  
        throws ServletException, IOException {  
        response.setContentType("text/html;charset=UTF-8");  
        PrintWriter out = response.getWriter();  
        out.println("<html><head><title>Servlet Page3</title></head>");  
    }  
}
```



```

HttpSessionhs = request.getSession(false);
out.println("<h1>Welcome Again on Page No. 3</h1>");
int visit = Integer.parseInt(((String)hs.getAttribute("visit"))+1);
out.println("<h1>You Visited "+visit+"Times</h1>");
hs.setAttribute("visit", ""+visit);
out.println("<h1>Your Session ID "+hs.getId()+"</h1>");
out.println("<h1>You Logged in at "+new java.util.Date(hs.getCreationTime())+"</h1>");
out.println("<h1><a href=Page1>Click for Page 1 </a></h1>");
out.println("<h1><a href=Page2>Click for Page 2 </a></h1>");
out.println("<h1><a href=Page4>Click for Page 4 </a></h1>");
out.println("<h1><a href=LogoutServlet>Click for Terminate Session </a></h1>");
out.println("</body>");
out.println("</html>");
}
}

```

#### Page4.java

```

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.HttpSession;
@WebServlet(urlPatterns = {"/Page4"})
public class Page4 extends HttpServlet {
    public void doGet(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        PrintWriter out = response.getWriter();
        out.println("<html><head><title>Servlet Page4</title></head>");
        HttpSessionhs = request.getSession(false);
        out.println("<h1>Welcome Again on Page No. 4</h1>");
        int visit = Integer.parseInt(((String)hs.getAttribute("visit"))+1);
        out.println("<h1>You Visited "+visit+"Times</h1>");
        hs.setAttribute("visit", ""+visit);
        out.println("<h1>Your Session ID "+hs.getId()+"</h1>");
        out.println("<h1>You Logged in at "+new java.util.Date(hs.getCreationTime())+"</h1>");
        out.println("<h1><a href=Page1>Click for Page 1 </a></h1>");
        out.println("<h1><a href=Page2>Click for Page 2 </a></h1>");
        out.println("<h1><a href=Page3>Click for Page 3 </a></h1>");
        out.println("<h1><a href=LogoutServlet>Click for Terminate Session </a></h1>");
        out.println("</body>");
        out.println("</html>");
    }
}

```

#### LogoutServlet.java

```

import java.io.IOException;

```

```
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
@WebServlet(urlPatterns = {"/LogoutServlet"})
public class LogoutServlet extends HttpServlet {
    public void doGet(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        PrintWriter out = response.getWriter();
        out.println("<html><head><title>Servlet LogoutServlet</title></head>");
        out.println("<body>");
        javax.servlet.http.HttpSession hs = request.getSession();
        if(hs != null) hs.invalidate();
        out.println("<h1>You are Logged out now.....</h1>");
        out.println("</body>");
        out.println("</html>");
    }
}
```