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## **Program : 1**

### **Introduction**

#### **Advanced Java**

It is a part of Java programming language. It is an advanced technology or advance version of Java specially designed to develop web-based.

It includes the concepts like Servlet, JSP, JDBC, etc.

Most of the applications developed using advance Java uses tow-tier architecture i.e. Client and Server. All the applications that runs on Server can be considered as advance Java applications.

#### **Benefits of Advanced Java**

- JEE (advance Java) provides libraries to understand the concept of Client-Server architecture for web- based applications.
- We can also work with web and application servers such as Apache Tomcat and Glassfish Using these servers, we can understand the working of HTTP protocol. It cannot be done in core Java.
- It is also important understand the advance Java if you are dealing with trading technologies like Hadoop, cloud-native and data science.
- It provides a set of services, API and protocols, that provides the functionality which is necessary for developing multi-tiered application, web-based application.
- There is a number of advance Java frameworks like, Spring, Hibernate, Struts, that enables us to develop secure transaction-based web applications such as banking application, inventory management application.

#### **Three Tier Architecture**

A 3-tier application architecture is a modular client-server architecture that consists of a presentation tier, an business tier and a data tier. The data tier stores information, the business tier handles logic and the presentation tier is a graphical user interface (GUI) that communicates with the other two tiers. The three tiers are logical, not physical, and may or may not run on the same physical server



#### **Servlet and JSP**

Servlets and JSPs (Java Server pages) are server side programs that run on web container.

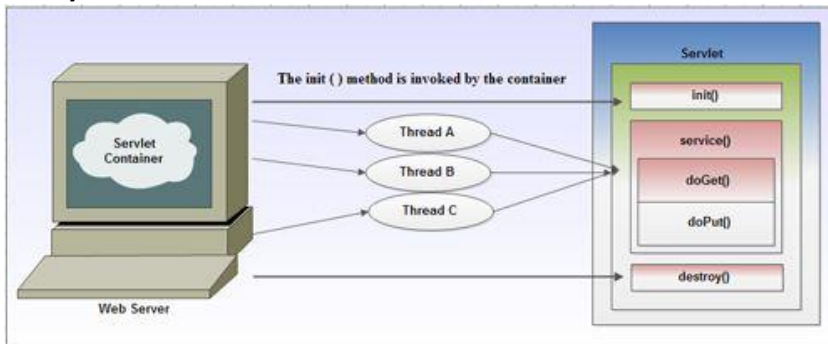
They are used to generate dynamic web pages.

Java servlets are Java classes that are designed to respond to HTTP requests in the context of a Web application.

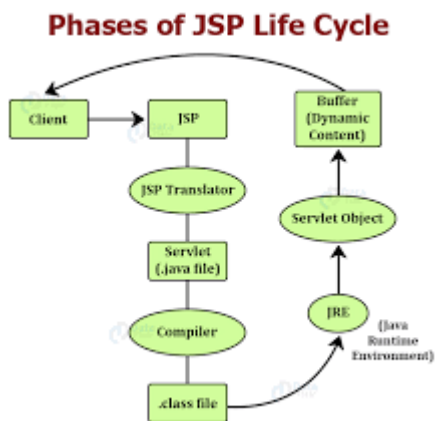
JSP is an extension of HTML that gives you the ability to embed snippets of Java code within your HTML pages. These bits of Java code generate dynamic content, which is embedded within the other HTML/XML content. A JSP is translated into

a Java servlet and executed on the server. JSP statements embedded in the JSP become part of the servlet generated from the JSP. The resulting servlet is executed on the server.

### Life cycle of Servlet



### Life cycle of JSP



## **Program : 2**

### **Simple Calculator Using Servlet**

#### **SimpleCalculator.html**

```
<!DOCTYPE html>
<html>
<head><meta charset="ISO-8859-1"><title>Simple Calculator</title></head>
<body>
<form action="SimpleCalculatorServlet" method="post">
<h1>SIMPLE CALCULATOR</h1>
Input A : <input type="text" name="inputA"><br>
Input B : <input type="text" name="inputB"><br>
Select the operation:<br>
<input type="radio" value="add" name="operation"> Addition<br>
<input type="radio" value="sub" name="operation"> Subtraction<br>
<input type="radio" value="mul" name="operation"> Multiplication <br>
<input type="radio" value="div" name="operation"> Division<br>
<input type="submit" value="Check result">
</form>
</body>
</html>
```

#### **SimpleCalculatorServlet.java**

```
package servlets;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.*;
import javax.servlet.http.*;

public class SimpleCalculatorServlet extends HttpServlet {
protected void doPost(HttpServletRequest request, HttpServletResponse response) throws ServletException,
IOException {
PrintWriter writer=response.getWriter();
response.setContentType("text/html");
double a=Double.parseDouble(request.getParameter("inputA"));
double b=Double.parseDouble(request.getParameter("inputB"));
double result=0.0;
String operation=request.getParameter("operation");
switch(operation)
{
case "add":result=a+b;
break;
case "sub":result=a-b;
break;
case "mul":result=a*b;
break;
case "div":result=a/b;
```

```

}
RequestDispatcher rd=request.getRequestDispatcher("SimpleCalculator.html");
rd.include(request, response);
writer.println("Result is : " + result);
}}

```

**Web.xml**

```

<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://java.sun.com/xml/ns/javaee"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-app_2_5.xsd"
id="WebApp_ID" version="2.5">
  <display-name>ServletBasic</display-name>
  <welcome-file-list><welcome-file>SimpleCalculator.html</welcome-file></welcome-file-list>
  <servlet>
    <description></description>
    <display-name>SimpleCalculatorServlet</display-name>
    <servlet-name>SimpleCalculatorServlet</servlet-name>
    <servlet-class>servlets.SimpleCalculatorServlet</servlet-class>
  </servlet>
  <servlet-mapping>
    <servlet-name>SimpleCalculatorServlet</servlet-name>
    <url-pattern>/SimpleCalculatorServlet</url-pattern>
  </servlet-mapping>
</web-app>

```

**Output:****SIMPLE CALCULATOR**

Input A :

Input B :

Select the operation:

☒ Addition

☐ Subtraction

☐ Multiplication

☐ Division

**SIMPLE CALCULATOR**

Input A :

Input B :

Select the operation:

☐ Addition

☐ Subtraction

☐ Multiplication

☐ Division

Result is : 7.5

### **Program : 3**

#### **Session Tracking Using Servlet**

**Index.html**

```
<!DOCTYPE html>
<html>
<head><meta charset="ISO-8859-1"><title>LoginServlet</title></head>
<body>
<form method="post" action="LoginServlet">
<fieldset>
<legend>LoginForm</legend>
<input type="text" name="name" placeholder="enter username"><br><br>
<input type="password" name="pwd" placeholder="enter password"><br><br>
<input type="submit">
</fieldset>
</form>
</body>
</html>
```

**LoginServlet.java**

```
package servlets;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.*;
import javax.servlet.http.*;

public class LoginServlet extends HttpServlet {
    protected void doPost(HttpServletRequest request, HttpServletResponse response) throws ServletException,
        IOException {
        PrintWriter writer=response.getWriter();
        response.setContentType("text/html");
        String username=request.getParameter("name");
        String pwd=request.getParameter("pwd");
        RequestDispatcher rd;
        if(username.equals("payal")&&pwd.equals("payal@123"))
        {
            HttpSession session=request.getSession();
            rd=request.getRequestDispatcher("WelcomeServlet");
            rd.forward(request, response);
        }
        else
        {
            writer.println("<p style='background-color:red'>Enter valid details!</p>");
            rd=request.getRequestDispatcher("index.html");
            rd.include(request, response);
        }
    }
}
```

**WelcomeServlet.java**

```
package servlets;

Payal CSE 2
```

```
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.*;
import javax.servlet.http.*;

public class WelcomeServlet extends HttpServlet {
    protected void service(HttpServletRequest request, HttpServletResponse response) throws ServletException,
        IOException {
        PrintWriter writer=response.getWriter();
        response.setContentType("text/html");
        String name=request.getParameter("name");
        writer.println("Welcome "+name);
        writer.println("<a href=\"LogoutServlet\">Logout</a>");
    }
}
```

**LogoutServlet.java**

```
package servlets;
import java.io.IOException;
import javax.servlet.*;
import javax.servlet.http.*;

public class LogoutServlet extends HttpServlet {
    protected void service(HttpServletRequest request, HttpServletResponse response) throws ServletException,
        IOException {
        HttpSession session=request.getSession();
        session.invalidate();
        response.sendRedirect("index.html");
    }
}
```

**Web.xml**

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://java.sun.com/xml/ns/javaee"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-app_2_5.xsd"
id="WebApp_ID" version="2.5">
    <display-name>SessionTracking</display-name>
    <welcome-file-list><welcome-file>index.html</welcome-file></welcome-file-list>
    <servlet>
        <description></description>
        <display-name>LoginServlet</display-name>
        <servlet-name>LoginServlet</servlet-name>
        <servlet-class>servlets.LoginServlet</servlet-class>
    </servlet>
    <servlet-mapping>
        <servlet-name>LoginServlet</servlet-name>
        <url-pattern>/LoginServlet</url-pattern>
    </servlet-mapping>
    <servlet>
        <description></description>
        <display-name>WelcomeServlet</display-name>
```

```
<servlet-name>WelcomeServlet</servlet-name>
<servlet-class>servlets.WelcomeServlet</servlet-class>
</servlet>
<servlet-mapping>
  <servlet-name>WelcomeServlet</servlet-name>
  <url-pattern>/WelcomeServlet</url-pattern>
</servlet-mapping>
<servlet>
  <description></description>
  <display-name>LogoutServlet</display-name>
  <servlet-name>LogoutServlet</servlet-name>
  <servlet-class>servlets.LogoutServlet</servlet-class>
</servlet>
<servlet-mapping>
  <servlet-name>LogoutServlet</servlet-name>
  <url-pattern>/LogoutServlet</url-pattern>
</servlet-mapping>
</web-app>
```

**Output:**

LoginForm

LoginForm

---

Welcome payal [Logout](#)



## **Program : 4**

### **Listeners**

**Index.html**

```
<!DOCTYPE html>
<html>
<head><meta charset="ISO-8859-1"><title>CountUsers</title></head>
<body>
<marquee>Welcome</marquee>
<a href="FirstServlet">See users</a>
<a href="LogoutServlet">logout</a>
</body>
</html>
```

**FirstServlet.java**

```
package servlets;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.*;
import javax.servlet.http.*;

public class FirstServlet extends HttpServlet {
    protected void doGet(HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException
    {
        PrintWriter w=response.getWriter();
        ServletContext ctx=getServletContext();
        HttpSession session=request.getSession();
        w.println("Total users:"+ctx.getAttribute("totalUsers"));
        w.println("Active users:"+ctx.getAttribute("activeUsers"));
    }
}
```

**LogoutServlet.java**

```
package servlets;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.*;
import javax.servlet.http.*;

public class LogoutServlet extends HttpServlet {
    protected void doGet(HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException
    {
        HttpSession session =request.getSession();
        session.invalidate();
        PrintWriter w=response.getWriter();
        ServletContext ctx=getServletContext();
        w.println("Total users:"+ctx.getAttribute("totalUsers"));
        w.println("Active users:"+ctx.getAttribute("activeUsers"));
    }
}
```

```
}}
```

### MyHttpListener.java

```
package listeners;
import javax.servlet.*;
import javax.servlet.http.*;

public class MyHttpListener implements HttpSessionListener {
    public void sessionCreated(HttpSessionEvent arg0) {
        ServletContext ctx=arg0.getSession().getServletContext();
        Integer totalUsers=(Integer)ctx.getAttribute("totalUsers");
        if(totalUsers==null) totalUsers=1;
        else totalUsers++;

        Integer activeUsers=(Integer)ctx.getAttribute("activeUsers");
        if(activeUsers==null)activeUsers=1;
        else activeUsers++;

        ctx.setAttribute("totalUsers", totalUsers);ctx.setAttribute("activeUsers", activeUsers);
    }
    public void sessionDestroyed(HttpSessionEvent arg0) {
        ServletContext ctx=arg0.getSession().getServletContext();
        Integer activeUsers=(Integer)ctx.getAttribute("activeUsers");
        activeUsers--;
        ctx.setAttribute("activeUsers", activeUsers);
    }
}
```

### Web.xml

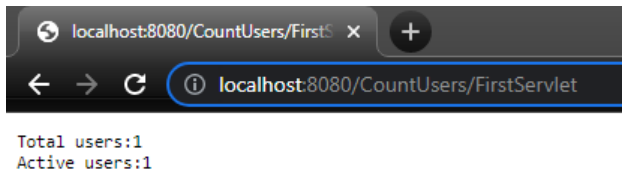
```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://java.sun.com/xml/ns/javaee"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-app_2_5.xsd"
id="WebApp_ID" version="2.5">
    <display-name>Listeners</display-name>
    <welcome-file-list><welcome-file>index.html</welcome-file></welcome-file-list>
    <listener><listener-class>listeners.MyContextListener</listener-class></listener>
    <listener><listener-class>listeners.MyRequestListener</listener-class></listener>
</web-app>
```

### Output:

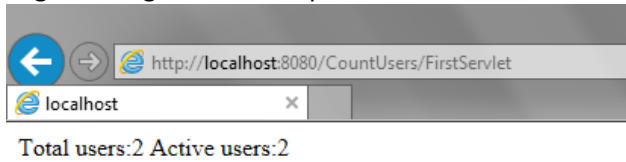
Welcome

[See users logout](#)

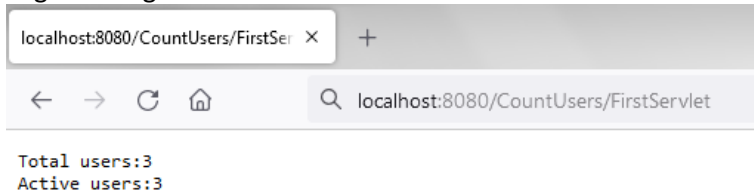
Login through google chrome browser:



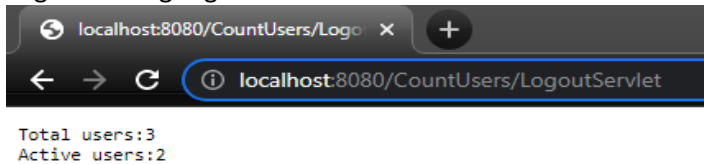
Login through internet explorer:



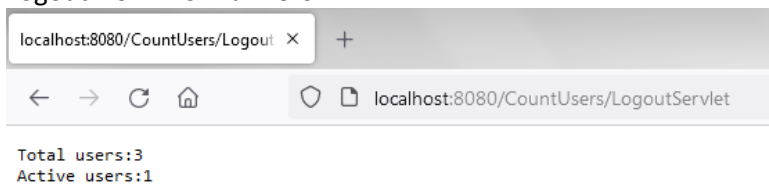
Login through mozilla firefox:



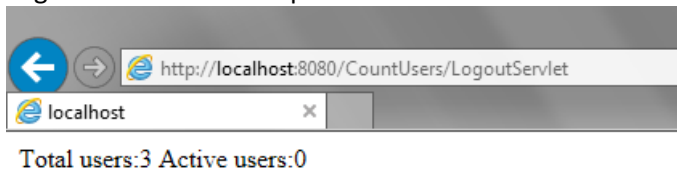
Logout from google chrome



Logout from mozilla firefox:



Logout from internet explorer:



## **Program : 5**

### **Filters**

#### **Index.html**

```
<!DOCTYPE html>
<html>
<head><meta charset="ISO-8859-1"><title>Insert title here</title></head>
<body>
<marquee>WELCOME</marquee>
<form method="post" action="MyServlet"><input type="text" name="name"><input type="submit"></form>
</body>
</html>
```

#### **MyFilter.java**

```
package filter;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.*;

public class MyFilter implements Filter {
    public void destroy() {System.out.println("start");}
    public void doFilter(ServletRequest request, ServletResponse response, FilterChain chain) throws IOException,
        ServletException {
        PrintWriter w=response.getWriter();
        long before=System.nanoTime();
        chain.doFilter(request, response);
        long after=System.nanoTime();
        w.println("Total time spent: "+(after-before));
    }
    public void init(FilterConfig fConfig) throws ServletException {System.out.println("end");}
}
```

#### **MyServlet.java**

```
package servlet;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.*;
import javax.servlet.http.*;

public class MyServlet extends HttpServlet {
    protected void doPost(HttpServletRequest request, HttpServletResponse response) throws ServletException,
        IOException {
        PrintWriter w=response.getWriter();
        w.println("hello "+request.getParameter("name")+"!");
    }
}
```

#### **Web.xml**

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://java.sun.com/xml/ns/javaee"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-app_2_5.xsd"
id="WebApp_ID" version="2.5">
  <display-name>Filterss</display-name>
  <welcome-file-list><welcome-file>index.html</welcome-file></welcome-file-list>
  <servlet>
    <description></description>
    <display-name>MyServlet</display-name>
    <servlet-name>MyServlet</servlet-name>
    <servlet-class>servlet.MyServlet</servlet-class>
  </servlet>
  <servlet-mapping>
    <servlet-name>MyServlet</servlet-name>
    <url-pattern>/MyServlet</url-pattern>
  </servlet-mapping>
  <filter>
    <display-name>MyFilter</display-name>
    <filter-name>MyFilter</filter-name>
    <filter-class>filter.MyFilter</filter-class>
  </filter>
  <filter-mapping>
    <filter-name>MyFilter</filter-name>
    <url-pattern>/MyServlet</url-pattern>
  </filter-mapping>
</web-app>
```

Output:

---

```
hello payal!
Total time spent: 2440184
```

## Program : 6

### Registration Form Using Jsp

**Index.jsp**

```
<%@ 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>RegisterForm</title></head>
<body>
<h1>Register</h1>
<form method="post" action="Register.jsp">
<input type="text" name="name" placeholder="enter your name"><br><br>
<input type="text" name="email" placeholder="enter your email"><br><br>
<input type="password" name="pwd" placeholder="enter password"><br><br>
<input type="password" name="pwd" placeholder="confirm password"><br><br>
<input type="submit" value="register">
</form>
</body>
</html>
```

**Register.jsp**

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<%@page import="dao.RegisterDao" %>
<!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>Register</title></head>
<body>
<jsp:useBean id="registerBean" class="beans.RegisterBean"></jsp:useBean>
<jsp:setProperty property="*" name="registerBean"/>
<%
boolean isRegistered=RegisterDao.register(registerBean);
if(isRegistered) out.println("You are successfully registered!");
else out.println("Registration Failed! Try Again.");
%>
</body>
</html>
```

**RegisterBean.java**

```
package beans;
public class RegisterBean {
    private String name,email,pwd;
    public String getName() {return name;}
    public void setName(String name) {this.name = name;}
    public String getEmail() {return email;}
    public void setEmail(String email) {this.email = email;}
```

```

public String getPwd() {return pwd;}
public void setPwd(String pwd) {this.pwd = pwd;}
}

```

**RegisterDao.java**

```

package dao;
import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.SQLException;
import beans.RegisterBean;
import connections.ConnectionProvider;

public class RegisterDao {
    public static boolean register(RegisterBean b)
    {
        boolean isRegistered=false;Connection con=null;

        try
        {
            con=ConnectionProvider.provideConnection();
            PreparedStatement p=con.prepareStatement("insert into user values(?,?,?);");
            p.setString(1, b.getName());p.setString(2, b.getEmail());p.setString(3, b.getPwd());
            int r=p.executeUpdate();
            if(r>0) isRegistered=true;
        }
        catch(SQLException e){System.out.println(e);}
        finally{try{con.close();}catch(SQLException e){System.out.println(e);}}
        return isRegistered;
    }
}

```

**package connections;**

```

import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.SQLException;

public interface DBInfo {
    String DB_DRIVER="com.mysql.jdbc.Driver";
    String DB_URL="jdbc:mysql://localhost:3306/demo";String DB_USER="root";String DB_PWD="payal";
}

public class ConnectionProvider {
    public static Connection provideConnection()
    {Connection con=null;
        try
        {
            Class.forName(DBInfo.DB_DRIVER);
            con= DriverManager.getConnection(DBInfo.DB_URL,DBInfo.DB_USER,DBInfo.DB_PWD);
            return con;
        }
    }
}

```

```
    catch(Exception e){System.out.println(e);return con;}  
}}
```

**Web.xml**

```
<?xml version="1.0" encoding="UTF-8"?>  
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://java.sun.com/xml/ns/javaee"  
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-app_2_5.xsd"  
id="WebApp_ID" version="2.5">  
    <display-name>RegisterForm</display-name>  
    <welcome-file-list><welcome-file>index.jsp</welcome-file></welcome-file-list>  
</web-app>
```

**Output:**

---

# Register

---

You are successfully registered!

```
mysql> select * from user;  
+-----+-----+-----+  
| name | email | pwd |  
+-----+-----+-----+  
| payal | payalrathee35@gmail.com | payal@123 |  
+-----+-----+-----+  
1 row in set (0.03 sec)
```



## Program : 7

### Exception Handling In Jsp

#### Index.jsp

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1" errorPage="errorPage.jsp"%>
<!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>Exception Handling</title>
</head>
<body>
<%int x=10/0;%>
</body>
</html>
```

#### Errorpage.jsp

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1" isErrorPage="true"%>
<!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>Errorpage</title></head>
<body>
<%=exception%>
</body>
</html>
```

#### Web.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://java.sun.com/xml/ns/javaee"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-app_2_5.xsd"
id="WebApp_ID" version="2.5">
    <display-name>demo1</display-name>
    <welcome-file-list><welcome-file>index.jsp</welcome-file></welcome-file-list>
</web-app>
```

#### Output:

---

java.lang.ArithmeticException: / by zero

## Program : 8

### Fetch Data From Database Using Jsp

**Index.jsp**

```
<%@ 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>Footwears</title></head>
<body><a href="view.jsp" >view products</a></body>
</html>
```

**View.jsp**

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<%@page import ="java.sql.*" %>
<%@page import="connections.*" %>
<!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>Footwears</title>
<style>
div{display:inline-block;margin:10px;width:200px;height:200px;box-shadow:0px 0px 5px #aaa;}
img{width:100%;height:100%;}
</style>
</head>
<body><h1>Our Footwear Collections</h1>
<%Connection con=null;ResultSet rs=null;
try
{
con=ConnectionProvider.provideConnection();
Statement s=con.createStatement();
rs=s.executeQuery("select * from products");
while(rs.next()){
%>
<div></div>
<%
}}
catch(SQLException e){System.out.println(e);}
finally{try{con.close();}catch(SQLException e){System.out.println(e);}}
%>
</body></html>
```

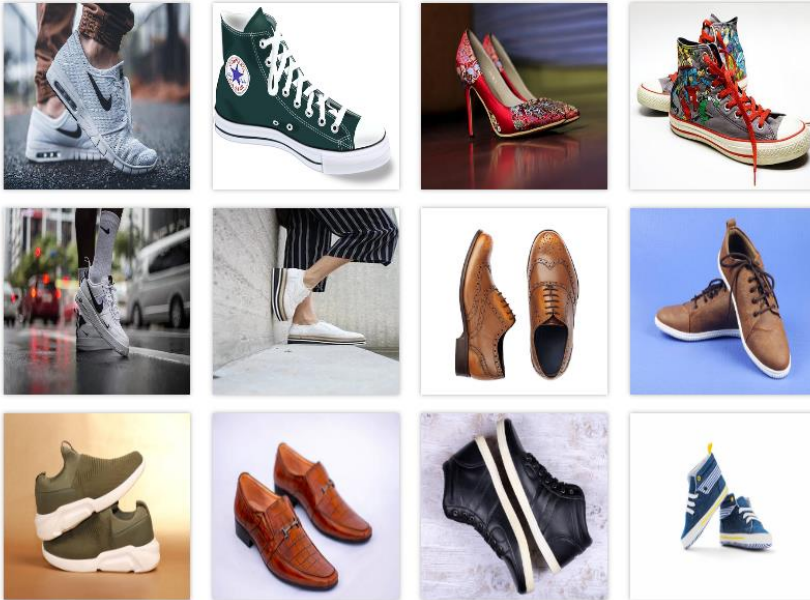
**Web.xml**

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://java.sun.com/xml/ns/javaee"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-app_2_5.xsd"
id="WebApp_ID" version="2.5">
```

```
<display-name>FetchData</display-name>  
<welcome-file-list><welcome-file>index.jsp</welcome-file></welcome-file-list>  
</web-app>
```

## Output

### Our Footwear Collections



## Program : 9

### Custom Tags In Jsp

**Index.jsp**

```
<%@ 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>Index</title></head>
<body><h1>Addition</h1>
<form method="post" action="sum.jsp">
<input type="text" name="num1" placeholder="enter first number"><br><br>
<input type="text" name="num2" placeholder="enter second number"><br><br>
<input type="submit">
</form></body></html>
```

**Sum.jsp**

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
    <%@taglib uri="/WEB-INF/math.tld" prefix="math" %>
<!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>Sum</title></head>
<body>
<%String num1=request.getParameter("num1");String num2=request.getParameter("num2");%>
<%= "num1 is : "+num1 %><br><%= "num2 is : "+num2 %><br>
    <math:sum num2="<%=num1 %>" num1="<%=num2 %>"></math:sum>
</body></html>
```

**Math.tld**

```
<taglib>
<tlib-version>1.0</tlib-version><jsp-version>2.5</jsp-version>
<tag>
<name>sum</name>
<tagclass>p1.SumHandler</tagclass>
<attribute><name>num1</name><required>true</required><rtexprvalue>true</rtexprvalue></attribute>
<attribute><name>num2</name><required>true</required><rtexprvalue>true</rtexprvalue></attribute>
</tag>
</taglib>
```

**SumHandler.java**

```
package p1;
import javax.servlet.jsp.JspWriter;
import javax.servlet.jsp.tagext.Tag;
import javax.servlet.jsp.tagext.TagSupport;

public class SumHandler extends TagSupport {
    private int num1,num2;
    public void setNum1(String num1) {this.num1 = Integer.parseInt(num1);}
```

```
public void setNum2(String num2) {this.num2 = Integer.parseInt(num2);}
public int doStartTag()
{int result=num1+num2;
try{JspWriter out=pageContext.getOut();out.println("Result is : "+result);}
catch(Exception e){System.out.println(e);}
return Tag.EVAL_BODY_INCLUDE;
}}
```

**Web.xml**

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://java.sun.com/xml/ns/javaee"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-app_2_5.xsd"
id="WebApp_ID" version="2.5">
  <display-name>CustomTags</display-name>
  <welcome-file-list><welcome-file>index.jsp</welcome-file></welcome-file-list>
</web-app>
```

Output:

---

## Addition

---

num1 is : 3  
num2 is : 4  
Result is : 7

## Program : 10

### Server Side Includes(SSI)

**Index.shtml**

```
<!DOCTYPE html>
<html>
<head><meta charset="ISO-8859-1"><title>SSI</title></head><body><servlet code="MyServlet"></servlet></body>
</html>
```

**MyServlet.java**

```
package servlet;
import java.io.*;
import java.text.DateFormat;
import java.util.Date;
import javax.servlet.ServletException;
import javax.servlet.http.*;
public class MyServlet extends HttpServlet {
protected void service(HttpServletRequest request, HttpServletResponse response) throws ServletException,
IOException {
    PrintWriter out = response.getWriter();Date date = new Date();DateFormat df = DateFormat.getInstance();
    out.println("Current time is:"); out.println(df.format(date));}}
```

**Web.xml**

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://java.sun.com/xml/ns/javaee"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-app_2_5.xsd"
id="WebApp_ID" version="2.5">
    <display-name>SSI</display-name>
    <welcome-file-list><welcome-file>index.shtml</welcome-file></welcome-file-list>
    <servlet>
        <description></description><display-name>MyServlet</display-name>
        <servlet-name>MyServlet</servlet-name><servlet-class>servlet.MyServlet</servlet-class>
    </servlet>
    <servlet-mapping>
        <servlet-name>MyServlet</servlet-name><url-pattern>/index.shtml</url-pattern>
    </servlet-mapping>
</web-app>
```

**Output :**

---

```
Current time is:
5/29/22 7:07 AM
```

**Program : 11**  
**Send Mail Using Java Mail Api**

**Index.html**

```
<!DOCTYPE html>
<html>
<head><meta charset="ISO-8859-1"><title>Insert title here</title></head>
<body>
<form method="post" action="MailServlet">
<input type="text" name="email" placeholder="enter your email"><br><br>
<input type="submit" value="Forgot Password">
</form></body></html>
```

**MailServlet.java**

```
package servlet;
import java.io.IOException;
import java.io.PrintWriter;
import java.sql.*;
import java.util.Properties;
import javax.mail.*;
import javax.mail.internet.*;
import javax.servlet.ServletException;
import javax.servlet.http.*;
import connections.ConnectionProvider;

public class MailServlet extends HttpServlet {
protected void doPost(HttpServletRequest request, HttpServletResponse response) throws ServletException,
IOException {
String email=request.getParameter("email");
PrintWriter writer=response.getWriter();
Connection con=null;String pwd=null;
try
{
con=ConnectionProvider.provideConnection();
PreparedStatement p=con.prepareStatement("select password from users where email=?;");
p.setString(1, email);
ResultSet rs=p.executeQuery();
rs.next();
pwd=rs.getString(1);
}
catch(SQLException e){System.out.println(e);}
finally{try{con.close();}catch(SQLException e){System.out.println(e);}
}
String to=email;
String from="payalrathee35@gmail.com";
String subject="Password Recovery";
String message="Your password is:"+pwd;
boolean isMailSent=sendMail(from,to,subject,message);
if(isMailSent) writer.println("Check your inbox for password");
}
}

Payal CSE 2                                     23                                     Roll no : 23609
```

```

else writer.println("Some error occurred. Please try again later.");
}
public boolean sendMail(String from,String to,String subject,String message)
{
boolean isMailSent=false;
String host="smtp.gmail.com";

Properties p=new Properties();
p.put("mail.smtp.host", host);p.put("mail.smtp.port", "465");
p.put("mail.smtp.ssl.enable", "true");p.put("mail.smtp.auth", "true");

Session session=Session.getInstance(p,new Authenticator() {
protected PasswordAuthentication getPasswordAuthentication() {
return new PasswordAuthentication(from,"xxxxxxxxxxxxx");
}});
session.setDebug(true);
try
{
MimeMessage m=new MimeMessage(session);
m.setFrom(new InternetAddress(from));
m.addRecipient(Message.RecipientType.TO, new InternetAddress(to));
m.setSubject(subject);m.setText(message);
Transport.send(m);
isMailSent=true;
}
catch(Exception e){System.out.println(e);}
return isMailSent;
}}

```

**Web.xml**

```

<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://java.sun.com/xml/ns/javaee"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-app_2_5.xsd"
id="WebApp_ID" version="2.5">
  <display-name>mailing</display-name>
  <welcome-file-list><welcome-file>index.html</welcome-file></welcome-file-list>
  <servlet>
    <description></description>
    <display-name>MailServlet</display-name>
    <servlet-name>MailServlet</servlet-name>
    <servlet-class>servlet.MailServlet</servlet-class>
  </servlet>
  <servlet-mapping>
    <servlet-name>MailServlet</servlet-name>
    <url-pattern>/MailServlet</url-pattern>
  </servlet-mapping>
</web-app>

```

**package connections;**



```
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.SQLException;

public interface DBInfo {
String DB_DRIVER="com.mysql.jdbc.Driver";
String DB_URL="jdbc:mysql://localhost:3306/maills";String DB_USER="root";String DB_PWD="payal";
}

public class ConnectionProvider {
public static Connection provideConnection()
{Connection con=null;
try
{
Class.forName(DBInfo.DB_DRIVER);
con= DriverManager.getConnection(DBInfo.DB_URL,DBInfo.DB_USER,DBInfo.DB_PWD);
return con;
}
catch(Exception e){System.out.println(e); return con;}
}}
```

**Output:****payalrathee35@gmail.com**

to me ▼

Your password is:rathee@123

## Program : 12

### Send Attachment Using Java Mail Api

#### **Index.html**

```
<!DOCTYPE html>
<html>
<head><meta charset="ISO-8859-1"><title>Insert title here</title></head>
<body>
<form method="post" action="MailServlet">
<input type="text" name="email" placeholder="enter your email"><br><br><input type="submit" value="Submit">
</form></body></html>
```

#### **MailServlet.java**

```
package servlet;
import java.io.*;
import java.util.Properties;
import javax.mail.*;import javax.mail.internet.*;
import javax.servlet.*;import javax.servlet.http.*;

public class MailServlet extends HttpServlet {
protected void doPost(HttpServletRequest request, HttpServletResponse response) throws ServletException,
IOException {
String email=request.getParameter("email");
PrintWriter writer=response.getWriter();
String to=email,from="payalrathee35@gmail.com",subject="Password Recovery";
boolean isMailSent=sendAttachment(from,to,subject);
if(isMailSent) writer.println("File Sent.");
else writer.println("Some error ocured. Please try again later.");}
public boolean sendAttachment(String from,String to,String subject)
{boolean isMailSent=false;
String host="smtp.gmail.com";
Properties p=new Properties();
p.put("mail.smtp.host", host);p.put("mail.smtp.port", "465");
p.put("mail.smtp.ssl.enable", "true");p.put("mail.smtp.auth", "true");
Session session=Session.getInstance(p,new Authenticator() {
protected PasswordAuthentication getPasswordAuthentication() {
return new PasswordAuthentication(from,"xxxxxxxxxx");
}});
session.setDebug(true);
try
{MimeMessage m=new MimeMessage(session);
m.setFrom(new InternetAddress(from));
m.addRecipient(Message.RecipientType.TO, new InternetAddress(to));
m.setSubject(subject);
String path="C:\\Users\\Public\\Pictures\\Sample Pictures\\Jellyfish.jpg";
MimeMultipart mime=new MimeMultipart();
MimeBodyPart text=new MimeBodyPart();text.setText("This is your requested file.");
```

```

MimeBodyPart file=new MimeBodyPart();File f=new File(path);file.attachFile(f);
mime.addBodyPart(text);mime.addBodyPart(file);m.setContent(mime);
Transport.send(m);isMailSent=true;
catch(Exception e){System.out.println(e);}
return isMailSent;}}

```

**Web.xml**

```

<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://java.sun.com/xml/ns/javaee"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-app_2_5.xsd"
id="WebApp_ID" version="2.5">
  <display-name>attachment</display-name>
  <welcome-file-list><welcome-file>index.html</welcome-file></welcome-file-list>
  <servlet>
    <description></description> <display-name>MailServlet</display-name>
    <servlet-name>MailServlet</servlet-name><servlet-class>servlet.MailServlet</servlet-class>
  </servlet>
  <servlet-mapping>
    <servlet-name>MailServlet</servlet-name><url-pattern>/MailServlet</url-pattern>
  </servlet-mapping>
</web-app>

```

**Output:**




---

File Sent.



payalrathee35@gmail.com

to me ▾

This is your requested file.



## Program : 13

### Struts2 Application Example

**Index.jsp**

```
<%@ taglib uri="/struts-tags" prefix="s" %>
<s:form action="product">
<s:textfield name="id" label="Product Id"></s:textfield>
<s:textfield name="name" label="Product Name"></s:textfield>
<s:textfield name="price" label="Product Price"></s:textfield>
<s:submit value="save"></s:submit>
</s:form>
```

**Web.xml**

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app>
  <filter><filter-name>struts2</filter-name>
    <filter-class>org.apache.struts2.dispatcher.ng.filter.StrutsPrepareAndExecuteFilter </filter-class>
  </filter>
  <filter-mapping> <filter-name>struts2</filter-name><url-pattern>/*</url-pattern></filter-mapping>
</web-app>
```

**Product.java**

```
package p1;
public class Product {
private int id; private String name; private float price;
public int getId() {return id;}
public void setId(int id) {this.id = id; }
public String getName() {return name; }
public void setName(String name) {this.name = name; }
public float getPrice() { return price; }
public void setPrice(float price) { this.price = price; }
public String execute(){return "success"; }
}
```

**Struts.xml**

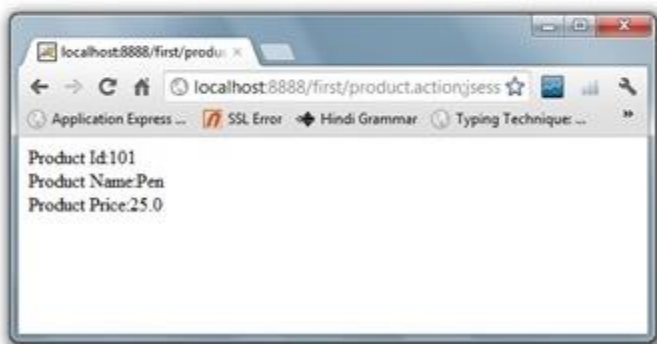
```
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE struts PUBLIC "-//Apache Software Foundation//DTD Struts
Configuration 2.1//EN" "http://struts.apache.org/dtds/struts-2.1.dtd">
<struts>
<package name="default" extends="struts-default">
<action name="product" class="p1.Product"> <result name="success">welcome.jsp</result> </action>
</package></struts>
```

**Welcome.jsp**

```
<%@ taglib uri="/struts-tags" prefix="s" %>
Product Id:<s:property value="id"/><br/>
Product Name:<s:property value="name"/><br/>
Product Price:<s:property value="price"/><br/>
```

**Output:**

A screenshot of a web browser window at the URL `localhost:8888/first/`. The browser's address bar shows the URL and several tabs: "Application Express ...", "SSL Error", and "Hindi Grammar". The main content area displays a form with three input fields: "Product Id:", "Product Name:", and "Product Price:". Below these fields is a "save" button.



A screenshot of a web browser window at the URL `localhost:8888/first/product.action.jsess`. The browser's address bar shows the URL and several tabs: "Application Express ...", "SSL Error", "Hindi Grammar", and "Typing Technique: ...". The main content area displays the following text:

```
Product Id:101  
Product Name:Pen  
Product Price:25.0
```

## **Program : 14**

### **Hibernate**

**Employee.java**

```
Package p1;
public class Employee {
private int id; private String firstName,lastName;

public int getId() {return id; }
public void setId(int id) {this.id = id; }
public String getFirstName() {return firstName; }
public void setFirstName(String firstName) { this.firstName = firstName; }
public String getLastName() { return lastName; }
public void setLastName(String lastName) {this.lastName = lastName; }
}
```

**employee.hbm.xml**

```
<?xml version='1.0' encoding='UTF-8'?>
<!DOCTYPE hibernate-mapping PUBLIC
"-//Hibernate/Hibernate Mapping DTD 5.3//EN"
"http://hibernate.sourceforge.net/hibernate-mapping-5.3.dtd">
<hibernate-mapping>
<class name="p1.Employee" table="emp1000">
<id name="id"><generator class="assigned"></generator></id>
<property name="firstName"></property><property name="lastName"></property>
</class>
</hibernate-mapping>
```

**hibernate.cfg.xml**

```
<?xml version='1.0' encoding='UTF-8'?>
<!DOCTYPE hibernate-configuration PUBLIC
"-//Hibernate/Hibernate Configuration DTD 5.3//EN"
"http://hibernate.sourceforge.net/hibernate-configuration-5.3.dtd">
<hibernate-configuration>
<session-factory>
<property name="hbm2ddl.auto">update</property>
<property name="dialect">org.hibernate.dialect.Oracle9Dialect</property>
<property name="connection.url">jdbc:oracle:thin:@localhost:1521:xe</property>
<property name="connection.username">system</property>
<property name="connection.password">jtp</property>
<property name="connection.driver_class">oracle.jdbc.driver.OracleDriver</property>
<mapping resource="employee.hbm.xml"/>
</session-factory>
</hibernate-configuration>
```

**StoreData.java**

```
import org.hibernate.Session;
```

```
import org.hibernate.SessionFactory;
import org.hibernate.Transaction;
import org.hibernate.boot.Metadata;
import org.hibernate.boot.MetadataSources;
import org.hibernate.boot.registry.StandardServiceRegistry;
import org.hibernate.boot.registry.StandardServiceRegistryBuilder;

public class StoreData {
public static void main(String[] args) {
    StandardServiceRegistry ssr = new StandardServiceRegistryBuilder().configure("hibernate.cfg.xml").build();
    Metadata meta = new MetadataSources(ssr).getMetadataBuilder().build();
    SessionFactory factory = meta.getSessionFactoryBuilder().build();
    Session session = factory.openSession();
    Transaction t = session.beginTransaction();
    Employee e1=new Employee();
    e1.setId(101);e1.setFirstName("Payal");e1.setLastName("Rathee");
    session.save(e1);t.commit();
    System.out.println("successfully saved");
    factory.close();session.close();
    }}
}
```

### **Program : 15**

### **Spring Example**

**Student.java**

```
package p1;
public class Student {
    private String name;
    public String getName() {return name; }
    public void setName(String name) {this.name = name;}
    public void displayInfo(){System.out.println("Hello: "+name);
    }}
}
```

**ApplicationContext.xml**

```
<?xml version="1.0" encoding="UTF-8"?>
<beans
    xmlns="http://www.springframework.org/schema/beans"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:p="http://www.springframework.org/schema/p"
    xsi:schemaLocation="http://www.springframework.org/schema/beans
        http://www.springframework.org/schema/beans/spring-beans-3.0.xsd">
    <bean id="studentbean" class="p1.Student">
    <property name="name" value="Payal"></property>
    </bean>
</beans>
```

**Test.java**

```
import org.springframework.beans.factory.BeanFactory;
import org.springframework.beans.factory.xml.XmlBeanFactory;
import org.springframework.core.io.ClassPathResource;
import org.springframework.core.io.Resource;
public class Test {
    public static void main(String[] args) {
        Resource resource=new ClassPathResource("applicationContext.xml");
        BeanFactory factory=new XmlBeanFactory(resource);
        Student student=(Student)factory.getBean("studentbean");
        student.displayInfo();
    }}
}
```