Server-side Web Development and Programming

Lecture 3: Introduction to Java Server Pages

Form Handling

- Form data appended to request string

```html
<FORM NAME="purchaseform" METHOD=GET ACTION="http://localhost:8080/WidgetSite/receipt.jsp">
Quantity: <INPUT TYPE="text" SIZE="8" NAME="quantity" /><BR /><BR /><INPUT TYPE="submit" VALUE="SUBMIT">
</FORM>
```

Generates the request:

Form Handling

Goal:
- Extract values of parameters from the request
- Generate appropriate response page based on parameter values
- Take other appropriate action based on request
  - Add to shopping cart
  - Modify or query database

Server Page Model

- Html document with executable code interspersed
- When page requested:
  - Code executed
  - Html generated and inserted in its place
  - Final all html document sent back as response
Java Server Pages

```html
<HTML>
<HEAD><TITLE>Widget Purchase Page</TITLE></HEAD>
<BODY><P>Thank you for your order of
<%= request.getParameter("quantity") %>
widgets!</P></BODY></HTML>
```

JSP Syntax

- Basic tag form: `<% ... %>`
- Simplest form:
  `<%= some Java expression %>`
  - Tomcat evaluates expression to get value
  - Inserts that value in place of expression in generated html page

JSP Simple Example

- Simple example:
  ```html
  <html>
  <body>
  <p>Two plus two is <%= 2 + 2 %>.</p>
  </body>
  </html>
  ```

Java Server Page

- `2 + 2` evaluated to value of 4

Resulting html Page

```html
<html>
<body>
<p>Two plus two is 4.</p>
</body>
</html>
```
JSP Syntax

```html
<html>
<body>
<p>Two plus two is <%= sum %>.</p>
</body>
</html>
```

Stores value of 4 in sum variable

Value of 4 in sum used in this JSP

JSP Scoping

- Variable declared in a block of JSP on a page
- May be accessed by any other JSP on same page
- No access to variable from any other page (purpose of sessions)

```html
<html>
<body>
<p>Two plus two is <%= sum %>.</p>
</body>
</html>
```

Html Forms

- The FORM tag
  ```html
  <form action="url of response page" method="get or post">
    ... 
  </form>
  ```

  Method by which form data is passed

  Relative url if response page is part of same webapp

Get vs. Post Method

<table>
<thead>
<tr>
<th>Get method</th>
<th>Post method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default method</td>
<td>Must specify in FORM</td>
</tr>
<tr>
<td>Append form data to end of URL</td>
<td>Form data not visible (some security against shoulder surfing, but still need encryption for total security)</td>
</tr>
<tr>
<td>Faster</td>
<td>Parameters limited to ~4k of data</td>
</tr>
<tr>
<td>No fixed limit to length of form data passed</td>
<td>Prevents bookmarking (good if part of session that user should not be able to enter in middle)</td>
</tr>
</tbody>
</table>
Simple Form Elements

- **TEXT tag**
  `<input type="text" name="elementname"/>

  Necessary for value to be sent to server

- **SUBMIT tag**
  `<input type="submit" value="buttonlabel"/>

Necessary for value to be sent to server

Form Element Example

```html
<form action="orderReply.jsp" method="get">
  <table cellspacing="5">
    <tr>
      <td align="right">Number to purchase:</td>
      <td><input type="text" name="quantity"></td>
    </tr>
    <tr>
      <td align="right">Your name:</td>
      <td><input type="text" name="customerName"></td>
    </tr>
    <tr>
      <td align="right">Your email:</td>
      <td><input type="text" name="customerEmail"></td>
    </tr>
    <tr>
      <td></td>
      <td><input type="submit" value="Place Order"></td>
    </tr>
  </table>
</form>
```

Form Parameter Passing

Parameter string passed:
`quantity=137&customerName=John+Sullins&customerEmail=john@cis.ysu.edu`
Handling Form Data

• request object in JSP
  – Java object created from request string
  – Contains request data and methods to easily access that data
  – Accessed by JSP code

  - Data from form
  - Other data about request
  - methods to access data about the request
  - Code in JSP

  request

Handling Form Data

• Most useful method:
  String request.getParameter(String)
  
  - Returns the corresponding value passed to the server
  - Takes name of form element as parameter

• Example:
  String name =
  request.getParameter("customerName");
  sets the value of "name" to "John Sullins"

Example JSP

```
<%    
    String name = request.getParameter("customerName");
    String email = request.getParameter("customerEmail");
    String quantity = request.getParameter("quantity");
%>

<h2>Order Confirmation</h2>
<p>
    Thank you for your order of <%= quantity %> widgets, <%= name %>. 
</p>
<p>
    You will shortly receive an email confirmation at <%= email %>. 
</p>
```

Acquiring Form Data

• Statements to get and store form data:

```
<%    
    String name =
        request.getParameter("customerName");
    String email =
        request.getParameter("customerEmail");
    String quantity =
        request.getParameter("quantity");
%>

<table>
<thead>
<tr>
<th>name</th>
<th>&quot;John Sullins&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>email</td>
<td>&quot;<a href="mailto:john@cis.ysu.edu">john@cis.ysu.edu</a>&quot;</td>
</tr>
<tr>
<td>quantity</td>
<td>&quot;137&quot;</td>
</tr>
</tbody>
</table>
Displaying Values in Response

Thank you for your order of <% quantity %> widgets, <% name %>.

You will shortly receive an email confirmation at <% email >::

Commenting JSP Files

- Crucial to future maintenance of site

- Inside of JSP code (between <% and %>):
  // comment
  */ comment */

- Outside of JSP code (that is, in html)
  <!-- comment -->

Importing Library Classes

- Much of Java classes in separate libraries
- Must be imported to be used in JSP
- Syntax:
  <% page import="list of Java classes" %>
- Example:
  <% page import="java.util.Date,\n  java.io.*" %>
  Date class in the util library
  All classes in the io library