MIT AITI 2004
JSP – Lecture 4

Sessions and Cookies
What we can do . . .

• Build a static Web page
  – HTML

• Add dynamic content to a Web page
  – JSP Expressions, Scriptlets, Declarations, Directives

• Enable user interaction
  – Send parameters in request with GET and POST

• Reduce code duplication
  – Includes, forwards, request attributes
Request-Response Cycle

How do we remember information across requests?
For example, how do you recognize later that a user is logged in?
Another example: How do you remember what the user has added to an online shopping cart?
What we can’t do . . .

• Associate data with a visitor
• Remember info across requests
• Remember info across visits

• Examples
  – Keep a user logged in
  – Store a user’s shopping cart
  – Remember user’s name for next visit
Sessions

• Data associated with a given visitor

• Maintained on the Web server across requests

• Times out if user is idle for a while

• Perfect for . . .
  – Keeping a user logged in
  – Storing a user’s shopping cart
Session Object

- Implicit `session` object
- Maps `Strings` to `Objects`
- Add data to the session with `setAttribute`
  ```
  <% Data d = new Data();
      session.setAttribute("dataname", d); %>
  ```
- Retrieve data from session with `getAttribute`
  ```
  <% Data d = (Data)session.getAttribute("dataname"); %>
  ```
- Remove data from session with `removeAttribute`
  ```
  <% session.removeAttribute("dataname"); %>
  ```
Session Example 1

• Home page **home.jsp**

```java
<% 
    String username = 
        (String)session.getAttribute("name"); 
    if (username == null) {
        %> <jsp:forward page="login.html" /> <% 
    }
%>

<HTML>
<BODY>
    Welcome, <%=username%!><BR><BR>
    <A HREF="logout.jsp">Logout</A>
</BODY>
</HTML>
```
Session Example 2

• Login page login.html

```html
<HTML>
<HEAD><TITLE>Login Page</TITLE></HEAD>
<BODY>

<FORM ACTION="checklogin.jsp" METHOD="post">
Username:
<INPUT TYPE="text" NAME="username" SIZE=30><BR>
Password:
<INPUT TYPE="password" NAME="passwd" SIZE=30><BR>
<INPUT TYPE="submit" VALUE="Login">
</FORM>

</BODY>
</HTML>
```
Login Page Snapshot
Session Example 3

- Check login page `checklogin.jsp`

```jsp
<% 
    String username = request.getParameter("username");
    String password = request.getParameter("passwd");

    if (!password.equals("myPassword")) { 
        %> Error: incorrect password. <%
    } else if (username.length() == 0) { 
        %> Error: must provide a username. <%
    } else { 
        session.setAttribute("name", username);
        %> <jsp:forward page="home.jsp" /> <%
    }
%>
```
Incorrect Password Snapshot

Error: incorrect password.
Empty Username Snapshot

Error: must provide a username.
Correct Password Snapshot

Welcome, Greg!

Logout
Session Example 4

- Logout Page `logout.jsp`

```jsp
<%  
    session.removeAttribute("name");  
%>

<HTML>
<HEAD><TITLE>Logout Page</TITLE></HEAD>
<BODY>
    You have been logged out.
</BODY>
</HTML>
```
Logout Snapshot

You have been logged out.
Session Recap

• Request parameters and attributes allow us to send data from page to page across a single request.

• Sessions allow us to maintain data for a given visitor across multiple requests.

• But we still cannot maintain data for a given visitor across visits.
Cookies

- Cookie sits on the client computer
- Persists, unless specifically deleted by user
- JSP page can get, set, and delete cookie data
- Easy way to recognize user across visits without login
Using Cookies

• Create new `Cookie` object

• Add cookie to implicit `response` object
  ```
  <% 
      Cookie c = new Cookie("site.com", "Greg"); 
      response.addCookie(c); 
  %>
  ```

• Get cookies in `request` object
  ```
  <% Cookies[] cookies = request getCookies(); %> 
  ```

• Delete cookies by setting their max age to zero
  ```
  <% c.setMaxAge(0); %> 
  ```
Cookie Example 1

- **home.jsp** with cookies

```jsp
String username = (String)session.getAttribute("name");
if (username == null) {
    Cookie[] cookies = request.getCookies();
    for (int i = 0; i < cookies.length; i++) {
        if (cookies[i].getName().equals("site.com-name")) {
            username = cookies[i].getValue();
            session.setAttribute("name", username);
        }
    }
}
if (username == null) {
    <jsp:forward page="login.html"/>
}

. . . Welcome, <%=username%!><BR><BR> . . .
```
Cookie Example 2

• `checklogin.jsp` with cookies

```java
<% 
    String password = request.getParameter("passwd");
    if (!password.equals("myPassword")) {
        <jsp:forward page="home.jsp" />
    }

    String username = request.getParameter("username");
    if (username.length() == 0) {
        <jsp:forward page="home.jsp" />
    } else {
        session.setAttribute("name", username);
        response.addCookie("site.com-name", username);
        <jsp:forward page="home.jsp" />
    }
%
```
Cookie Example 3

• `logout.jsp` with cookies

```jsp
<% session.removeAttribute("name");
    Cookie[] cookies = request.getCookies();
    for (int i = 0; i < cookies.length; i++) {
        if (cookies[i].getName().equals("site.com-name")) {
            cookies[i].setMaxAge(0);
        }
    }
%>

<HTML>
<HEAD><TITLE>Logout Page</TITLE></HEAD>
<BODY> You have been logged out. </BODY>
</HTML>
```
In Summary

• Send data between pages within a single request
  – Request parameters and attributes

• Maintain data for a visitor across requests
  – Sessions (temporary data on the server)

• Maintain data for a visitor across visits from a single client computer
  – Cookies (data on the client)

• We cannot maintain data for across visits from multiple computers that is guaranteed to persist
  – Need a database (permanent data on the server)