Servlet and JSP 2

Datamatiker / Computer Science

2nd semester

Tine Marbjerg

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Today's Agenda

- JSP Expression Language (EL)
- JSP Standard Tag Language (JSTL)

- Book Shop Example
  - Understand
  - Improve!

Recap: Sharing Data between Pages

- JSPs can share data with other JSPs, and Servlets

- But how? HTTP is stateless protocol, i.e. in web environment 'nobody' remembers 'anything' ☺

JSP	Servlet	Scope
session	HttpSession	user session
application	ServletContext	entire application

A note on `getSession()` method in Servlet

- **getSession(true)** will check whether a session already exists for the user. If yes, it will return that session object else it will create a new session object and return it:

    HttpSession session = request.getSession(true);

- **getSession(false)** will check existence of session. If session exists, then it returns the reference of that session object, if not, this methods will return null:

    HttpSession session = request.getSession(false);

OBS! getSession() is convenience shortcut for true version

Alternative Ways to Access a Bean

<jsp:useBean id="per" class="beans.Person" scope="page"/>

Via Scriptlets or Expressions

<p><%= person.getName()%></p>

<% person.setName("Clint Eastwood"); %>

Person
getName
setName
getAge
setAge

Bean

Or more elegantly – via EL:

<p>${person.firstName}</p>

Note: EL doesn't create the JavaBean if it has not already been stored as an attribute, and neither <u>does it provide a way to set the properties</u>.

Expression Language

The JSP technology version 2.0 supports a simple expression language (EL) for accessing variables.

Syntax: Starts with the ${ delimiter and ends with }

Examples:

${person.firstName} $\longrightarrow$ Prints the firstName property from person.

3 > 4 is ${3 > 4} $\longrightarrow$ Prints: "3 > 4 is False "

http://mySite/JSP/?text=Hello

${param['text']}
${param.text}
Both print: "Hello"

Using Expressions

In static text

The value of the expression is computed and inserted into the current output

${expr}

In any standard or custom tag attribute that accepts an expression

<some:tag value="${expr}"/>

Using Expressions

In a servlet:
```
Date d = new Date();
request.setAttribute("DATE", d);
session.setAttribute("DATE", "Today is today");
```

JSP-code:
```
<p> Today: ${DATE} </p>
<p> Today: ${sessionScope.DATE} </p>
```

The sequence of scopes that Java searches to find an attribute

Scope	Description
page	The bean is stored in the implicit PageContext object.
request	The bean is stored in the HttpServletRequest object.
session	The bean is stored in the HttpSession object.
application	The bean is stored in the ServletContext object.

The Implicit EL objects for specifying scope

Scope	Implicit EL object
page	pageScope
request	requestScope
session	sessionScope
application	applicationScope

Only neccesary if the same key is used in more than one scope

EL Implicit Objects

EL implicit object	Description
param	A map that returns a value for the specified request parameter name.
paramValues	A map that returns an array of values for the specified request parameter name.
header	A map that returns the value for the specified HTTP request header. For a list of HTTP request headers, see chapter 18.
headerValues	A map that returns an array of values for the specified HTTP request header.
cookie	A map that returns the Cookie object for the specified cookie.
initParam	A map that returns the value for the specified parameter name in the context-param element of the web.xml file.
pageContext	A reference to the implicit pageContext object that's available from any JSP.

Example: Through the pageContext object, you can access the request object.

```
${pageContext.request.queryString}
```

The JSP Standard Tag Library

The JavaServer Pages Standard Tag Library (JSTL) is a collection of JSP tags which encapsulates core functionality common to many JSP applications.

JSTL has support for common, structural tasks such as iteration and conditionals, manipulating XML documents, internationalization tags, and SQL tags.

The JSTL tags can be classified, according to their functions, into following JSTL tag library groups that can be used in JSP:

- **Core Tags**
- **Formatting tags**
- **SQL tags**
- **XML tags**
- **JSTL Functions**

HTML designers find JSTL easier to use than Java

JSTL Example

```
<%@ taglib
  uri="http://java.sun.com/jsp/jstl/core" prefix="c"%>
<html>
<head><title>Alder med JSTL</title></head>
<body>
<p>
<c:set var="alder" value="31" />
Søren er ${alder} år gammel.
Det svarer til ${12*alder} måneder.<br>
<c:set var="alder" value="3" />
Julie er ${alder} år gammel.
<c:set var="alder" value="${alder*365}" />
Det svarer cirka til ${12*alder} dage.<br>
</p>
</body>
</html>
```

Søren er 31 år gammel. Det svarer til 372 måneder.
Julie er 3 år gammel. Det svarer cirka til 13140 dage.

Why JSTL and EL

Using JSTL and EL we can create "Java free" pages which can easily be set up and manipulated by designers with other skills than Java.

Our goal:

Java and business logic should go into the model/beans and presentation should be done solely via scripting.

To use the JSTL tags the Jar files must be incorporated into our web applications.

When the tags are available to the web application we need to map them to a namespace for each JSP

Ebookshop - exercise time!

- Example without DB from Zambon chap. 3 (slightly improved version) - Find on Fronter: `sem2Chap3NoDB.zip`

WHAT TO DO:

- Import zip file in NetBeans and run program (`ShoppingServlet`)

- Investigate the code in order to understand the implementation. You may want sketch the design in UML to get overview.

- Answer the following questions:
  - How is communication between pages/servlet implemented?
  - How do pages/servlet share data?
  - Which component(s) are in charge of presentation logic?
    - Better ways of writing presentation code?
  - Which component(s) are in charge of business logic?
    - Better alternatives? Why?
  - What is the name of the program architecture?
  - 'Who' should be in charge of book list in improved version of program?
  - What is a hidden field?
  - What is the difference between HTTP redirect and forward?

- You are welcome to improve the code!