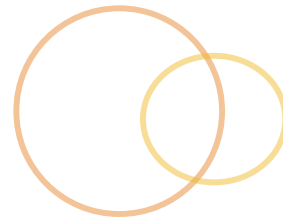
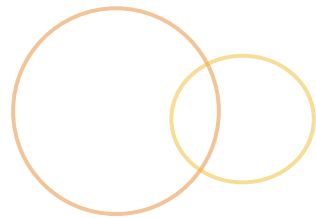


# Introduction to Java Server Pages



# Problems with Servlets



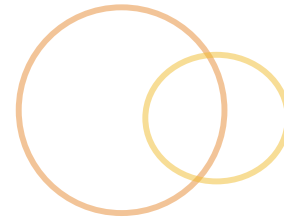
- ⦿ Servlet development requires high-level of understanding of many concepts
- ⦿ Too much overhead in development cycle
- ⦿ Limited built-in productivity mechanisms
- ⦿ Clunky syntax

# What are Java Server Pages?

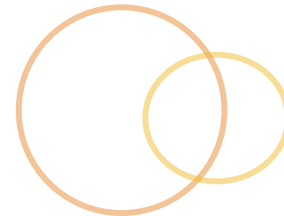
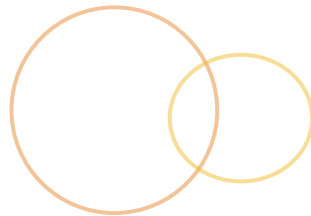


- ◎ Conceptually seen as “scripts”
  - ◎ Adopt more procedural style of coding
  - ◎ OO techniques are still possible
- ◎ Adopt a modern web development style
  - ◎ Simplified syntax
  - ◎ Many built-in short-cuts
- ◎ Text files containing
  - ◎ HTML
  - ◎ Java code
- ◎ Address many of the problems with servlets
  - ◎ Allow developers to focus on HTML and not Java
  - ◎ Simplify development-packaging-deployment process

# JSP Specification

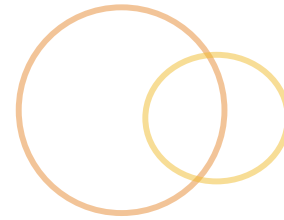


- Five main specifications
  - 1999 - 1.0
  - 2000 - 1.1
  - 2002 - 1.2
  - 2003 - 2.0
  - 2006 - 2.1
- Considered an extension of Servlet specification
- Specification defines:
  - JSP API and supporting technologies
  - JSP lifecycle
  - JSP development requirements
  - JSP packaging and deployment



- ◎ Fundamental facilities provided in three packages
  - ◎ `javax.servlet.jsp` - core package
  - ◎ `javax.servlet.jsp.el` - Package outlining classes and interfaces for the Expression Language
  - ◎ `javax.servlet.jsp.tagext` - Package outlining classes and interfaces for creating tag libraries
- ◎ Typically developers don't interact with packages directly

# JSP Lifecycle



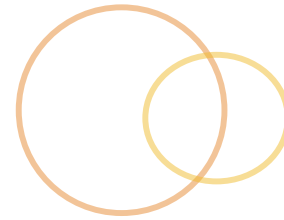
- ⦿ JSP lifecycle very similar to Servlet
- ⦿ Four basic phases:
  - ⦿ Creation
  - ⦿ Initialization
  - ⦿ Servicing requests
  - ⦿ Destruction

# JSP Development Requirements



- ◎ JSP supports two syntaxes:
  - ◎ JSP syntax (somewhat Java-like)
  - ◎ XML syntax (tag oriented)
- ◎ JSP syntax
  - ◎ `<% ... . %>`
  - ◎ Comfortable for Java developers
  - ◎ Confusing for HTML developers
- ◎ XML syntax
  - ◎ `<jsp:scriptlet> . . . </jsp:scriptlet>`
  - ◎ Create true XML representation of JSP
  - ◎ Theoretically enables implementation in language other than Java

# JSP Syntax Tags



## 6 primary JSP syntax tags

- ⦿ `<%-- ... --%>`

- ⦿ Comment
- ⦿ Server side comment style
- ⦿ Single or multi-line

- ⦿ `<%@ ... %>`

- ⦿ Directive
- ⦿ Used to describe page characteristics
- ⦿ Provides execution information to container

- ⦿ `<%! ... %>`

- ⦿ Declaration
- ⦿ Used to declare variables or methods
- ⦿ Can inadvertently create a non-thread safe JSP

# JSP Syntax Tags [cont.]



- 6 primary JSP syntax tags

- `<% ... %>`

- Scriptlet

- Used to apply “business logic” to HTML generation

- Typically intermixed with HTML throughout page

- `<%= ... %>`

- Expression

- Used to convert Java value into HTML text

- Easy way to write out a value

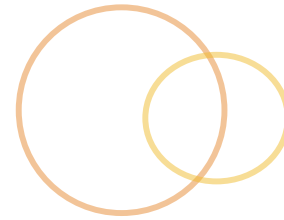
- `<jsp:...> ... </jsp:...>`

- JSP action

- Predefined executable tags

- Simplifies JSP syntax

# JSP Development



- ⦿ Like writing an HTML document
  - ⦿ JSP has its own set of tags
  - ⦿ Contains HTML presentation logic
  - ⦿ Includes conditional Java logic
  - ⦿ Can include JavaScript or XML
- ⦿ Normally stored in a `.jsp` file
  - ⦿ Handles request
  - ⦿ Generates response

# JSP Development Cycle

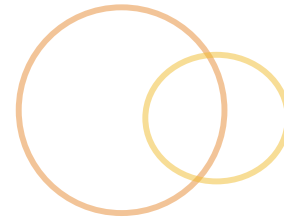


1. Create static HTML
2. Integrate dynamic logic
3. Package
4. Deploy
5. Test
6. Repeat 2 - 5 until satisfied

# Packaging JSPs

- ⦿ Package JSPs inside of a WAR
  - ⦿ No “location” constraints
  - ⦿ Can pre-compile JSPs into .class files
  - ⦿ Or allow container to compile into .class files after deployment
- ⦿ JSPs can be configured within `web.xml`
- ⦿ Access JSPs directly using filename as part of URL

# JSP Example



## **date.jsp**

```
<%@ page import="java.util.Calendar" /%>
<%
    Calendar date = Calendar.getInstance();
    int day = date.get(Calendar.DAY_OF_MONTH);
    int month = date.get(Calendar.MONTH) + 1;
    int year = date.get(Calendar.YEAR);
    String today = month + "/" + day + "/" + year;
%>
The date is: <%= today %>
```

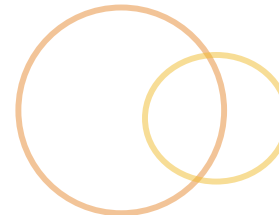
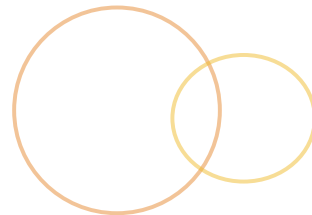


# JSP or Servlets: How do I choose?



- Servlets usage
  - Minimal HTML generation
  - Somewhat constant logic
  - Complex Java logic
- Servlet disadvantages
  - No pre-built set of reusable components
  - Hard to maintain when HTML intensive
  - Require Java expertise
  - Development cycle
- Servlet benefits
  - Complete control
  - Advanced development
  - Flexible
- JSP usage
  - Complex HTML
  - Dynamic logic
  - “simple” Java logic
- JSP disadvantages
  - Can get messy
  - Can be misused
- JSP benefits
  - Pre-built components
  - Expression language
  - Convenience features
  - Requires minimal Java knowledge
  - Development cycle
  - Flexible

JSTL



JSP Standard Tag Libraries

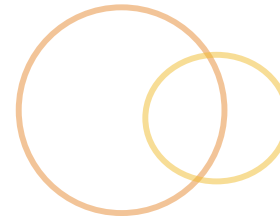


# JSP Standard Tag Library



- ⦿ Standard “extensions” for JSP development
- ⦿ Reusable logic encapsulated in *tag libraries*
  - ⦿ Database interactions
  - ⦿ Iterations, parsing, conditionals, evaluation
  - ⦿ Accessing resources
  - ⦿ XML

# JSTL [cont.]

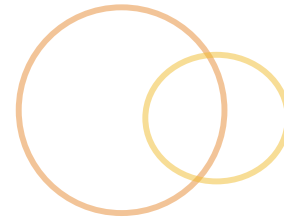


- Co-operative technology
- Simplify JSP development
  - HTML like syntax
  - Requires very little Java experience

```
<c:if test="{status.totalVisits == 1000000}" var="visits">  
    You are the millionth visitor to our  
    site! Congratulations!  
</c:if>
```

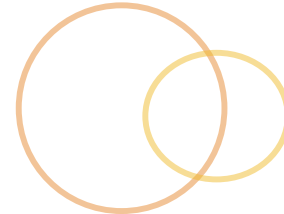
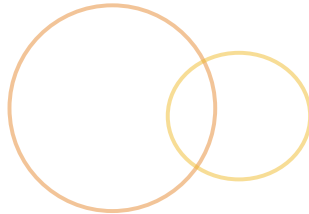
- Impact
  - Same performance
  - Same scalability
  - Faster development and easier maintenance
- Use whenever possible

# Custom Tag libraries



- ⦿ Reusable logic specific to domain
- ⦿ Can be whatever and do whatever; no restrictions
- ⦿ Included in JSP like JSTL
- ⦿ Used in JSP like JSTL
- ⦿ Two ways to create
  - ⦿ 'old style'
  - ⦿ 'new style'

# Resources



## ⦿ Web

### ⦿ JSP

<http://java.sun.com/products/jsp/>

### ⦿ JSTL

<http://java.sun.com/products/jsp/jstl/>

### ⦿ JSF

<http://java.sun.com/javaee/javaserverfaces/>

## ⦿ Books

⦿ “Head First Servlets and JSP” : ISBN 0596005407

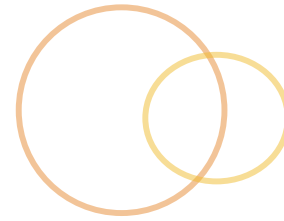
⦿ “JSF in Action” : ISBN 1932394125

# About DevelopIntelligence



- ◎ Founded in 2003
- ◎ Provides outsourced services to learning organizations in area of software development
- ◎ Represents over 35 years of combined experience, enabling software development community through educational and performance services
- ◎ Represents over 50 years of combined software development experience
- ◎ Delivered training to over 40,000 developers worldwide

# Areas of Expertise



## ◎ Instruction

- ◎ Java
- ◎ J2EE
- ◎ WebServices / SOA
- ◎ Web Application Development
- ◎ Database Development
- ◎ Open Source Frameworks
- ◎ Application Servers

## ◎ Courseware

- ◎ Java Application Development
- ◎ Java Web App Development
- ◎ Enterprise Java Development
- ◎ OOAD / UML
- ◎ IT Managerial
- ◎ Emerging Technologies and Frameworks

# Contact Us

The header features the text "Contact Us" in a bold, orange font. To the right of the text are three decorative elements: two pairs of overlapping circles (one orange, one yellow) and a logo consisting of a large orange 'D' shape with a yellow and orange circular element inside.

- ◎ For more information about our services, please contact us:
  - ◎ Kelby Zorgdrager
  - ◎ [Kelby@DevelopIntelligence.com](mailto:Kelby@DevelopIntelligence.com)
  - ◎ 303-395-5340