Java Server Pages

 Simply an HTML web page that contains additional bits of code that execute application logic to generate dynamic content.

 Java Server Pages Actions (JSP tags) perform a variety of functions and extend the capabilities of JSP.

 Java Server Pages Actions use XML-like syntax, and are used to manage JavaBeans component.

 Directives are instructions that are processed by the JSP engine when the page is compiled to a servlet.

 Directives are used to set page-level instructions, insert data from external files, and specify custom tag libraries

o <%@ %>

 Motivation

o It is typically a good idea to separate business logic from presentation concern

 Allows modern web development teams to be divided up into programmers and web page authors / designers

 Fosters component reuse (e.g. the same data object can be consumed by user agents of varying capabilities and needs)

o Servlets can be very powerful for programming business logic, but are very awkward to use when generating static (i.e. template) content.

o (X)HTML marked-up documents are very convenient for static content generation but cannot be used to program business logic (or generate dynamic content arising from data produced by the business logic).

 Features

o Text-based document capable of generating both static and dynamic content (typically intermixed)

o Mark-up based document syntax (JSP-style or XML-style), combining (X) HTML elements as well as standard and custom JSP elements; thus, web page authors can feel right “at home” with the mark-up syntax.

o Embedded Java Coding support via “scriptlets”

 <% %>

o Template text are converted into JSPWriter

 Components

o Template (i.e. static) text

o JSP elements

 Directives

 <%@ page ContentType=”text/html” pageEncoding=”UTF-8” %>

 <%@ page import=”java.util.Random” %>

o autoFlush

o buffer

o contentType

o errorPage

o extends

o import

o info

o isELIgnored

o isErrorPage

o isThreadSafe

o language

o pageEncoding

o session

 <%@ taglib uri=”http://java.sun.com/jsp/jstl/core” prefix=”c” %>

o prefix

o taglib

o uri

 Scripting Elements

 Declarations

o <%! int a = 100; %>

o <%! int square(int n) { return n\*n ; } %>

 Expressions

o <% String s = new java.util.Date().toString(); %>

 Scriptlets

o <% for(int i = 0; i < 10 ; i++) { out.println(i); } %>

 Actions

 Standard actions

o <jsp:directive.include>, <jsp:directive.page>

o <jsp:declarations>

o <jsp:scriptlet>

o <jsp:expression>

o <jsp:include>, <jsp:forward>

o <jsp:useBean>, <jsp:setProperty>, <jsp:getProperty>

o <jsp:plugin>, <jsp:param>, <jsp:params>, <jsp:fallback>

o <jsp:element>, <jsp:attribute>, <jsp:body>

o <jsp:text>

 Custom Actions (JSTL)

o JSTL, user-written custom tag libraries

 Expression Language (EL)

o ${ }

 Implicit Scripting Objects

o request, response, out, pageContext

o session, pageContext, application

o config, page, exception

 Implicit EL Objects

o pageContext

o pageScope

o requestScope

o sessionScope

o applicationScope

o param, paramValues

o header, headervalues

o cookie

o initparam

 Comments

o <%-- this is a JSP comment --%>

Servlets or JSPs?

 The common practice is to leverage both technologies to implement the MVC design pattern

Model-View-Controller (MVC) Design Pattern

 Model

o Represents business objects (logic and state)

 View

o Presentation of the model in some appropriate way

 Controller

o Mediates application flow

A sample web MVC framework can use

 JavaBeans for the model

 JSPs for the View

 Servlets for the controller

JSP Standard Tag Library (JSTL)

 Set of custom JSP elements that provide various programmatic functionality via markup syntax

o Core Tag Library

 variable support, flow control, URL management

o SQL Tag Library

 Database connections, queries, updates

o Internationalization Tag Library

 Locate setting, message bundling, number formatting, date formatting

o XML

 Core XML processing, flow control, transformation

o JSTL Function

 String functions, collection lengths

 In addition to the JSTL, developers can also create their own tag libraries for commonly occurring tasks