



Java Servlet Programming

Description This course teaches developers how to write Java2 Enterprise Edition (J2EE) applications using servlets and related technologies.

Audience Developers who will write J2EE applications

Prerequisites Java programming skills are mandatory.

Length 4 days

Format Instructor-led; lecture and hands-on lab exercises. Choice of lab environments including IBM RAD6 or RAD7, Eclipse/JBoss 4 and Netbeans 4.

Agenda

Day 1

1. Introduction to the Course
 - Programming Java Servlets
 - Legal Information
 - Programming Java Servlets
 - Introductions
 - Course Description
 - Course Objectives
 - Sample Agenda
 - Sample Agenda, cont'd
 - Sample Agenda, cont'd
 - Sample Agenda, cont'd
2. Web Architecture Review
 - Web Architecture Review
 - What is HTML?
 - What is HTTP?
 - Common HTTP Methods
 - What is a URL?
 - HTML Forms
 - HTML Forms, cont'd
 - What is CGI?
 - A Sample Perl CGI Script
 - What's Wrong with CGI?
 - CGI Enhancements and Alternatives
 - Microsoft's ASP
 - A Sample ASP
 - What is Java2 Enterprise Edition?
 - Chapter Summary

- 3. Introduction to Servlets
 - Introduction to Servlets
 - What is a Servlet?
 - Why Use Servlets?
 - Servlet Containers
 - The Servlet API
 - Servlet Lifecycle
 - Servlet Lifecycle, cont'd
 - Servlet Lifecycle, cont'd
 - Writing a Servlet
 - A Sample Servlet
 - Chapter Summary

Lab 1: A Simple Servlet

- Part 1: First Servlet

- 4. Installing and Configuring a Servlet Container
 - Installing and Configuring a Container
 - Basic Requirements
 - Additional Support
 - Basic Installation
 - Configuring the Container
 - Logging Console Output
 - Developing Servlets
 - Deploying Servlets
 - Introduction to Web Applications
 - Lab Exercise
 - Chapter Summary
- 5. Programming Servlets
 - Programming Servlets
 - Servlet Class Diagram
 - The Servlet Interface
 - The ServletConfig Interface
 - The GenericServlet Abstract Class
 - The HttpServlet Abstract Class
 - Initialization
 - Termination
 - Processing Requests
 - The HttpServletRequest Interface
 - Get versus Post
 - Accessing Client Arguments
 - Accessing Client Arguments, cont'd
 - Accessing Client Arguments, cont'd
 - Accessing Client Arguments, cont'd
 - The HttpServletResponse Class
 - Setting the Content Type
 - Obtaining an Output Stream
 - Generating Output
 - Using HTML Forms
 - Servlet Example: The HTML Form
 - Servlet Example: The Desired Output
 - Servlet Example: The Servlet
 - Servlet Example: The Servlet, cont'd
 - Accessing the Request Headers

- Accessing Headers: Example
- Access Headers: Example, cont'd
- User Agent Strings
- Output Buffering
- Using StringBuffer instead of Strings
- Servlet Instances and Multithreading
- Servlet Multithreading, cont'd
- Chapter Summary

6. Servlet Error Handling

- Servlet Error Handling
- Handling Errors
- Uncaught Exceptions Example
- Uncaught Exceptions, cont'd
- Uncaught Exceptions, cont'd
- Catching the Exception
- Generating HTTP Response Codes
- Common HTTP Response Codes
- Servlet Exceptions
- Lab Exercise
- Chapter Summary

Lab 2: Writing a Servlet

7. Web Applications

- Web Applications
- What is a Web Application?
- Web Application Directory Structure
- The URL for the Web Application
- The Deployment Descriptor
- Deployment Descriptor Elements
- Using Initialization Parameters
- Using Initialization Parameters, cont'd
- Packaging the Web App into a .war File
- Deploying the Web Application
- The Servlet Context
- Lab Exercise
- Chapter Summary

Lab 3: Web Applications

Day 2

8. Sessions

- Sessions
- HTTP is a Stateless Protocol
- What is a Session?
- Remembering State
- The Servlet Session API
- How Does the Session API Work?
- The Servlet Session API, cont'd
- The Servlet Session API, cont'd
- Creating or Retrieving a Session
- Saving State in a Session

- Retrieving State from a Session
- Configuring Sessions
- Using URL Rewriting
- Using URL Rewriting, cont'd
- Using Cookies Explicitly
- Cookie Example: Setting a Cookie
- Cookie Example: Retrieving a Cookie
- Lab Exercise
- Chapter Summary

Lab 4: Sessions

9. JDBC Programming
 - JDBC Programming
 - Database Fundamentals
 - Introduction to ODBC
 - Introduction to JDBC
 - What Can You Do with JDBC?
 - JDBC Driver Types
 - JDBC History
 - Connection Pools
 - JDBC URLs
 - SQL Exceptions
 - The JDBC API for Data Sources
 - Loading a Driver Class, JDBC 1.x
 - Opening a Connection, JDBC 1.x
 - Configuring a Datasource, JDBC 2.x
 - Locating a Datasource, JDBC 2.x
 - Opening a Connection, JDBC 2.x
 - The JDBC API for Connections
 - The JDBC API for Statements
 - Executing a Simple Query
 - Processing a ResultSet
 - SQL Types and Java Types
 - Processing a ResultSet, cont'd
 - Closing a Connection
 - Inserting a Record
 - Updating a Record
 - Removing a Record
 - Retrieving Metadata
 - Retrieving Column Names
 - Using Prepared Statements
 - Using Prepared Statements, cont'd
 - Stored Procedures
 - JDBC Support for Stored Procedures
 - Steps for Calling a Stored Procedure
 - Call to a Stored Procedure Example
 - Lab Exercise
 - Chapter Summary

Lab 5: Servlets and JDBC

10. Web Application Security
 - Web Application Security
 - What is Security?
 - Authentication and Authorization

- Programmatic versus Declarative Security
- Security Roles
- Security Interaction Diagram
- Steps for Declarative Security
- Authentication Techniques
- HTTP Basic Authentication
- Form Validation
- Form Validation, cont'd
- Secure Authentication
- Restricting Resources by Role
- Assigning Users to Roles
- Programmatic Security
- Chapter Summary

Day 3

11. Introduction to JavaServer Pages

- Introduction to JavaServer Pages
- What are JavaServer Pages?
- JSPs Are Actually Servlets
- Why Use JSPs?
- A JSP Consists Of...
- Writing Scriptlets
- Implicit Variables
- Deploying JSPs
- Separating Content From Presentation
- What is a JavaBean?
- What is a JavaBean Property?
- Using a JavaBean from a JSP
- Referencing a JavaBean
- JavaBean Scope
- Setting Properties
- Retrieving Properties
- Calling JavaBean Methods
- Lab Exercise
- Chapter Summary

Lab 6: A Simple JSP

12. Combining Servlets and JSPs

- Combining Servlets and JSPs
- Servlets versus JSPs
- Combining Servlets and JSPs
- What is the MVC Architecture?
- MVC and Web Applications
- MVC Tradeoffs
- Transferring Control
- Forwarding Requests
- Forwarding Requests, cont'd
- Redirecting Requests
- Redirecting Requests, cont'd
- MVC Example: Student Information System
- MVC Example User Interface
- MVC Example User Interface, cont'd

- The Find Student HTML
- The List All Students HTML
- The Controller Servlet
- The Display Student JSP
- Deploying the Web Application
- Lab Exercise
- Chapter Summary

Lab 7: Combining Servlets and JSPs

13. Servlet Filters

- Servlet Filters
- What is a Filter?
- Uses of Filters
- Filter Chains
- Mapping Filters to URLs and Servlets
- The Filter API
- Filter Interaction Diagram
- The doFilter Method
- Invoking the Next Filter or Web Resource
- Deployment Descriptor for Filters
- Additional Filtering Topics
- Lab Exercise
- Chapter Summary

Lab 8: Servlet Filters

Day 4

14. Web Application Performance

- Web Application Performance
- Web Application Performance
- Finding Bottlenecks
- General Tips, Part 1
- General Tips, Part 2
- MVC Architecture Performance Tips
- JSP Performance Tips
- Servlet Performance Tips
- Chapter Summary

15. Debugging Strategies

- Debugging Strategies
- Debugging Strategies
- Logging
- Using System.out.println for Logging
- Using The ServletContext for Logging
- Using J2SE 1.4 Logging API
- J2SE 1.4 Logging Architecture
- Standard Logging Classes
- J2SE 1.4 Logging Levels
- J2SE 1.4 Logging Example
- J2SE 1.4 Logging Example Output
- Using Servlet Filters

- Writing a Filter
- Filter Example
- Filter Example, cont'd
- Filter Example, cont'd
- Filter Example, cont'd
- The Deployment Descriptor for a Filter
- Using Your IDE
- Lab Exercise
- Chapter Summary

Lab 9: Logging