

## **J2EE Struts Programming using RAD**

### **Course Summary**

#### **Description**

This class introduces the student to Model-View-Controller architectures using the Apache Struts framework using the IBM RAD7 Integrated Development Environment (IDE).

#### **Topics**

- Introduction to the Course
- J2EE Review
- The Model-View-Controller Architecture
- Introduction to Struts
- Creating the View
- Struts Validation
- Creating the Model
- Exception Handling and Global Forwarding
- Internationalization and Struts
- Introduction to Tiles
- Struts Security
- Advanced Struts Topics
- Extending Struts
- Beyond Struts

#### **Audience**

This course is designed for experienced J2EE developers that wish to learn how to use the Struts framework to create object-oriented, maintainable Web applications.

#### **Prerequisites**

Students should have previous Java and HTML experience.

#### **Duration**

Five days

## J2EE Struts Programming using RAD

### Course Outline

#### I. Introduction to the Course

- A. Programming Apache Struts
- B. Legal Information
- C. Programming Apache Struts
- D. Introductions
- E. Course Description
- F. Course Objectives
- G. Sample Agenda
- H. Sample Agenda, cont'd
- I. Sample Agenda, cont'd
- J. Sample Agenda, cont'd

#### II. J2EE Review

- A. J2EE Review
- B. What is Java2 Enterprise Edition?
- C. Introduction to Servlets
- D. Why Use Servlets?
- E. Writing a Servlet
- F. A Simple Servlet
- G. A Simple Servlet, cont'd
- H. Generating HTML in a Servlet
- I. Introduction to JavaServer Pages
- J. Why Use JSPs?
- K. Separating Content from Presentation
- L. The Model-View-Controller Architecture
- M. What is a JavaBean?
- N. Using JavaBeans with JSPs
- O. JavaBeans vs Enterprise JavaBeans
- P. JavaBean Requirements
- Q. What is a Property?
- R. A Sample JavaBean
- S. A Sample JavaBean, cont'd
- T. A Sample JavaBean, cont'd
- U. A Sample JavaBean, cont'd
- V. Using a JavaBean from a JSP
- W. Bean Scopes
- X. Referencing a Bean
- Y. The useBean Action Syntax
- Z. The useBean Action Flowchart
- AA. Setting Properties
- BB. Retrieving Properties
- CC. Retrieving Properties, Another Way
- DD. Property Type Conversion
- EE. Custom JSP Actions - Tag Libraries
- FF. Uses of Custom Actions
- GG. Custom Actions vs JavaBeans

HH. Using a Tag Library

II. Chapter Summary

#### III. The Model-View-Controller Architecture

- A. The Model-View-Controller Architecture
- B. Servlets versus JSPs
- C. Combining Servlets and JSPs
- D. What is the MVC Architecture?
- E. MVC and Web Applications
- F. MVC Tradeoffs
- G. Transferring Control
- H. Forwarding Requests
- I. Forwarding Requests, cont'd
- J. Redirecting Requests
- K. Redirecting Requests, cont'd
- L. MVC Example: Student Information System
- M. MVC Example User Interface
- N. MVC Example User Interface, cont'd
- O. The Find Student HTML
- P. The List All Students HTML
- Q. The Controller Servlet
- R. The Controller Servlet, cont'd
- S. The Display Student JSP
- T. The Display Student JSP, Alternate
- U. The List All Students JSP
- V. Chapter Summary

#### IV. Introduction to Struts

- A. Introduction to Struts
- B. What is Apache Struts?
- C. Struts Version History
- D. Struts Architecture Highlights
- E. A Simple Request
- F. A Closer Look at ActionForm and Action
- G. ActionForm and Action Inheritance
- H. Development Steps
- I. Struts Custom Actions for HTML Forms
- J. Writing a Struts HTML Form
- K. Writing an ActionForm Class
- L. ActionForm Example
- M. ActionForm Example, cont'd
- N. Writing an Action
- O. Forwarding After an Action
- P. Action Example
- Q. Action Example, cont'd

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## J2EE Struts Programming using RAD

### Course Outline (cont'd)

- R. The struts-config.xml File
- S. struts-config.xml Example
- T. struts-config.xml Example, cont'd
- U. Web Application Deployment Descriptor
- V. Chapter Summary

#### V. Creating the View

- A. Creating the View
- B. The View
- C. Struts Custom Tags
- D. Struts Bean Tags
- E. Struts Page Construction Tags
- F. Struts Page Construction Tags, cont'd
- G. Struts Page Tags Example
- H. Struts Logic Tags
- I. Struts Logic Tags, cont'd
- J. Struts Nested Tags
- K. Struts Nested Tags, cont'd
- L. Struts ActionForms
- M. Dynamic ActionForms
- N. Retrieving DynaForm Properties
- O. The JSP Standard Tag Library
- P. Categories of JSTL Tags

#### Introduction to Expression Languages

- Q. JSP EL Operators
- R. JSTL EL Implicit Objects
- S. EL Operator Examples
- T. Accessing Variables
- U. Core Tags
- V. Core Tags: The c:if Tag
- W. c:if Tag Example
- X. Core Tags: c:choose, c:when, c:otherwise
- Y. c:choose Example
- Z. Core Tags: The c:forEach Tag
- AA. c:forEach Tag Example
- BB. c:forEach Tag Example 2
- CC. Sample View with DynaForm and JSTL
- DD. Sample: Input Form
- EE. Sample: Input Form, cont'd
- FF. Sample: Confirmation Page
- GG. Sample: Action Class
- HH. Sample: Action Class, cont'd
- II. Sample: Action Class, cont'd

- JJ. Sample: struts-config.xml
- KK. Sample: struts-config.xml, cont'd
- LL. Chapter Summary

#### VI. Struts Validation

- A. Struts Validation
- B. What is Validation?
- C. Validation Scenarios
- D. Using Client-Side Validation
- E. Using Server-Side Validation
- F. Client-Side vs Server-Side Summary
- G. Struts Validation Techniques
- H. Programmatic ActionForm Validation
- I. Programmatic ActionForm Validation, cont'd
- J. Displaying Validation Errors
- K. Programmatic Action Validation
- L. Configuring Validation
- M. The Struts Validation Framework
- N. Validation Framework History
- O. Validations Supported by the Validation Framework
- P. Configuring Struts Validation Framework
- Q. The Validator-rules.xml File
- R. The Validator.xml File
- S. Error Message Strings
- T. Error Message String Construction
- U. Required-Field Validator
- V. Data Type Validators
- W. Range Validators
- X. String Length Validators
- Y. Regular Expression Validators
- Z. ValidateWhen Validator
- AA. ValidateWhen Validator Grammar
- BB. ValidateWhen Validator Configuration
- CC. Miscellaneous Validators
- DD. Enabling JavaScript in the Input Form
- EE. Client-Side Validation
- FF. Chapter Summary

#### VII. Creating the Model

- A. Creating the Model
- B. Model Review
- C. Scopes Review
- D. Servlet API for Scoped Variables

## J2EE Struts Programming using RAD

### Course Outline (cont'd)

- E. Storing a Reference at Session Scope
- F. Retrieving a Session-Scoped Reference
- G. JSP Expression Language Review
- H. Forwarding versus Redirecting Review
- I. Requesting a Transfer
- J. Separating Business Logic from Struts
- K. Accessing Relational Data
- L. The Data Access Object Pattern
- M. Using an Object/Relational Mapper
- N. Chapter Summary

#### **VIII. Exception Handling and Global Forwarding**

- A. Exception Handling and Global Forwarding
- B. Exception Handling: Ostrich Approach
- C. Exception Handling: Programmatic
- D. Exception Handling: Declarative
- E. Exception Handling: Declarative, cont'd
- F. Exception Handling: Global
- G. Global Forwarding
- H. Writing a Custom Exception Handler
- I. Custom Exception Handler, cont'd
- J. Custom Exception Handler, cont'd
- K. Chapter Summary

#### **IX. Internationalization and Struts**

- A. Internationalization and Struts
- B. What is Internationalization?
- C. J2SE Support for I18N
- D. Language and Country Codes
- E. Message Bundle Property Files
- F. Struts Support for I18N
- G. How Does Struts Determine Locale?
- H. Using the bean:message Struts Action
- I. bean:message Struts Action, cont'd
- J. JSTL Support for I18N
- K. Chapter Summary

#### **X. Introduction to Tiles**

- A. Introduction to Tiles
- B. Common Layouts and Content
- C. Introduction to Tiles
- D. Alternatives to Tiles
- E. What is a Tile?

- F. Steps for Using Tiles
- G. Tiles Layouts
- H. Tiles Layouts, cont'd
- I. Tiles Layouts, cont'd
- J. Common Content Tiles
- K. A Tiles Page
- L. Another Tiles Page
- M. Tiles Redundancy
- N. Page Definitions
- O. Writing a Definition
- P. Using XML-Based Definitions
- Q. An XML-Based Definitions File
- R. Using the Definition
- S. Configuring the Tiles Plugin
- T. Extending a Definition
- U. Tiles: Behind the Scenes
- V. Tiles: Behind the Scenes, cont'd
- W. Chapter Summary

#### **XI. Struts Security**

- A. Struts Security
- B. Security and Struts
- C. What is Security?
- D. Authentication and Authorization
- E. Programmatic versus Declarative Security
- F. Security Roles
- G. Security Interaction Diagram
- H. Steps for Declarative Security
- I. Authentication Techniques
- J. HTTP Basic Authentication
- K. Form Validation
- L. Form Validation, cont'd
- M. Secure Authentication
- N. Restricting Resources by Role
- O. Assigning Users to Roles
- P. Programmatic Security
- Q. Chapter Summary

#### **XII. Advanced Struts Topics**

- A. Advanced Struts Topics
- B. Introduction to Modules
- C. What Comprises a Module?
- D. Transferring Control Between Modules
- E. Configuring Modules

## **J2EE Struts Programming using RAD**

### **Course Outline (cont'd)**

- F. Action Superclasses
- G. Prewritten Actions
- H. Introduction to DispatchAction
- I. Using DispatchAction
- J. DispatchAction Input JSP
- K. DispatchAction Configuration
- L. DispatchAction Coding
- M. Multiple Buttons: Another Way
- N. Multiple Buttons: The Form
- O. Chapter Summary

#### **XIII. Extending Struts**

- A. Extending Struts
- B. Extending Struts
- C. Struts Plugins
- D. Configuring a Plugin
- E. Struts Behind the Scenes
- F. Struts Behind the Scenes, cont'd
- G. RequestProcessor processXXX Methods
- H. Configuring Subclasses in Struts-config
- I. Struts Extension Example
- J. Struts Extension Example, cont'd
- K. Configuring the Request Processor
- L. Chapter Summary

#### **XIV. Beyond Struts**

- A. Beyond Struts
- B. Introduction to Shale
- C. Shale Features
- D. Shale Validation
- E. Intro to Struts2
- F. Struts2 Features
- G. Comparing Struts1 and Struts2
- H. Struts2 HelloWorld Example
- I. Struts2 HelloWorld Example, cont'd
- J. Struts2 HelloWorld Example, cont'd