JEE Web Application Programming with Velocity and Spring

Course Summary

Description

This class covers how to develop JEE Web applications that use Velocity templates and the Spring Framework.

Objectives

At the end of this course, students will be able to:

- Understand the structure of a JEE Web application
- Write servlets that respond to HTML forms
- Write servlets that participate in sessions
- Architect and code JEE Web applications that use the Model-View-Controller (MVC) pattern
- Write applications that use the Velocity templating engine
- Write applications that use the Spring Framework for dependency injection
- Write Web applications that use Spring and Velocity templates

Audience

This course is designed for experienced Java developers that wish to learn how to program JEE Web applications.

Prerequisites

Prior Java programming experience is required.

Duration

Five days
JEE Web Application Programming with Velocity and Spring

Course Summary

I. Introduction to the Course
   A. JEE Web Application Programming with Velocity and Spring
   B. Legal Information
   C. JEE Web Application Programming with Velocity and Spring
   D. Introductions
   E. Course Description
   F. Course Logistics

II. Web Architecture Review
   A. Web Architecture Review
   B. What is HTML?
   C. What is HTTP?
   D. Common HTTP Methods
   E. What is a URL?
   F. HTML Forms
   G. What is CGI?
   H. A Sample Perl CGI Script
   I. What's Wrong with CGI?
   J. CGI Enhancements and Alternatives
   K. Microsoft's ASP
   L. A Sample ASP
   M. What is Java2 Enterprise Edition?
   N. Chapter Summary

III. Introduction to JEE
   A. Introduction to JEE
   B. What is JEE?
   C. JEE Version History
   D. Benefits of JEE
   E. JEE Vendors
   F. JEE Development Tools
   G. JEE Technologies
   H. Deployment Descriptors
   I. JEE Development and Packaging
   J. Introduction to Servlets
   K. Introduction to JSPs
   L. Introduction to EJBs
   M. Introduction to JNDI
   N. Introduction to JDBC
   O. Introduction to JMS
   P. Introduction to JavaMail
   Q. Introduction to JTA
   R. Introduction to Web Services
   S. Chapter Summary

IV. Introduction to Servlets
   A. Introduction to Servlets
   B. What is a Servlet?
   C. Why Use Servlets?
   D. Servlet Containers
   E. The Servlet API
   F. Writing a Servlet
   G. A Sample Servlet
   H. Chapter Summary

V. Installing and Configuring a Servlet Container
   A. Installing and Configuring a Container
   B. Basic Requirements
   C. Additional Support
   D. Basic Installation
   E. Configuring the Container
   F. Logging Console Output
   G. Developing Servlets
   H. Deploying Servlets
   I. Introduction to Web Applications
   J. Chapter Summary

VI. Programming Servlets
   A. Programming Servlets
   B. Servlet Lifecycle
   C. Servlet Class Diagram
   D. The Servlet Interface
   E. The ServletConfig Interface
   F. The GenericServlet Abstract Class
   G. The HTTPServlet Abstract Class
   H. Initialization
   I. Termination
   J. Processing Requests
   K. The HTTPServletRequest Interface
   L. Get versus Post
   M. Accessing Client Arguments
   N. The HTTPServletResponse Class
   O. Setting the Content Type
   P. Obtaining an Output Stream
   Q. Generating Output
   R. Using HTML Forms
   S. Servlet Example: The HTML Form
   T. Servlet Example: The Desired Output
   U. Servlet Example: The Servlet
   V. Accessing the Request Headers
   W. Accessing Headers: Example
   X. User Agent Strings
   Y. Output Buffering
   Z. Using StringBuffers instead of Strings
   AA. Servlet Instances and Multithreading
   BB. Chapter Summary

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VII. Servlet Error Handling
   A. Servlet Error Handling
   B. Handling Errors
   C. Uncaught Exceptions Example
   D. Catching the Exception
   E. Generating HTTP Response Codes
   F. Common HTTP Response Codes
   G. Servlet Exceptions
   H. Chapter Summary

VIII. Web Applications
   A. Web Applications
   B. What is a Web Application?
   C. Web Application Directory Structure
   D. The URL for the Web Application
   E. The Deployment Descriptor
   F. Deployment Descriptor Elements
   G. Mapping a Servlet's URL
   H. Defining Initialization Parameters
   I. Retrieving Initialization Parameters
   J. Packaging the Web App into a WAR
   K. Packaging the WAR into an EAR
   L. Deploying the J2EE Application
   M. The Servlet Context
   N. Context Listeners
   O. Chapter Summary

IX. Sessions
   A. Sessions
   B. HTTP is a Stateless Protocol
   C. What is a Session?
   D. Remembering State
   E. The Servlet Session API
   F. How Does the Session API Work?
   G. Creating or Retrieving a Session
   H. Saving State in a Session
   I. Retrieving State from a Session
   J. Configuring Sessions
   K. Using URL Rewriting
   L. Using Cookies Explicitly
   M. Cookie Example: Setting a Cookie
   N. Cookie Example: Retrieving a Cookie
   O. Chapter Summary

X. Introduction to JavaServer Pages
   A. Introduction to JavaServer Pages
   B. What are JavaServer Pages?
   C. JSPs Are Actually Servlets
   D. Why Use JSPs?
   E. JSP Version History
   F. Model 1 vs Model 2
   G. Intro to the JSP Expression Language
   H. A JSP Consists Of...
   I. Writing Scriptlets
   J. Deploying JSPs
   K. Separating Content From Presentation
   L. What is a JavaBean?
   M. What is a JavaBean Property?
   N. Using a JavaBean from a JSP
   O. Referencing a JavaBean with Actions
   P. JavaBean Scope
   Q. Retrieving Properties
   R. Using Expressions to Read Properties
   S. Intro to the JSP Standard Tag Library
   T. JSTL Core Tags
   U. c:forEach Example
   V. Chapter Summary

XI. Combining Servlets and JSPs
   A. Combining Servlets and JSPs
   B. Servlets versus JSPs
   C. Nomenclature
   D. Combining Servlets and JSPs
   E. What is the MVC Architecture?
   F. MVC and Web Applications
   G. MVC Tradeoffs
   H. Transferring Control
   I. Forwarding Requests
   J. Redirecting Requests
   K. Forwarding vs Redirecting Summary
   L. MVC Example: Student Information System
   M. MVC Example User Interface
   N. The Find Student HTML
   O. The List All Students HTML
   P. The Controller Servlet
   Q. The Display Student JSP
   R. The List Students JSP
   S. Deploying the Web Application
   T. Chapter Summary

XII. Servlet Filters
   A. Servlet Filters
   B. What is a Filter?
   C. Uses of Filters
   D. Filter Chains
   E. Mapping Filters to URLs and Servlets
   F. The Filter API
   G. Filter Interaction Diagram
   H. The doFilter Method
   I. Invoking the Next Filter or Web Resource
   J. Deployment Descriptor for Filters
   K. JEE 6 Filter Annotation
   L. Chapter Summary
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Course Summary (cont’d)

XIII. Logging
A. Logging
B. Debugging Strategies
C. Logging
D. Using System.out.println for Logging
E. Using J2SE 1.4 Logging API
F. J2SE 1.4 Logging Architecture
G. Standard Logging Classes
H. J2SE 1.4 Logging Levels
I. J2SE 1.4 Logging Example
J. J2SE 1.4 Logging Example Output
K. Introduction to Log4J
L. Steps For Using Log4J
M. Sample Log4J Properties File
N. Sample Log4J Program
O. Sample Log4J Program's Output
P. Log4J Logging Levels
Q. Log4J Layouts
R. Log4J Appenders
S. Chapter Summary

XIV. J2EE Web Application Security
A. J2EE Web Application Security
B. What is Security?
C. Authentication and Authorization
D. Programmatic versus Declarative Security
E. Security Roles
F. Security Interaction Diagram
G. Steps for Declarative Security
H. Authentication Techniques
I. HTTP Basic Authentication
J. Form Validation
K. Secure Authentication
L. Restricting Resources by Role
M. Assigning Users to Roles
N. Programmatic Security
O. Chapter Summary

XV. Web Application Performance
A. Web Application Performance
B. Web Application Performance
C. Finding Bottlenecks
D. General Tips, Part 1
E. General Tips, Part 2
F. MVC Architecture Performance Tips
G. JSP Performance Tips
H. Servlet Performance Tips
I. Chapter Summary

XVI. Introduction to Velocity Templates
A. Introduction to Velocity Templates
B. Why Use a Templating System?
C. What Are Velocity Templates?
D. How Velocity Works
E. A Simple Velocity Template
F. A Simple Velocity Standalone Application
G. VTL Fundamentals
H. VTL Comments
I. VTL References
J. VTL Directives
K. The VTL #Set Directive
L. VTL Conditional Directive
M. VTL Looping Directive
N. Using Velocity in Web Applications
O. The VelocityViewServlet
P. An Example Web Application
Q. Chapter Summary

XVII. JDK 5 Programming
A. JDK 5 Programming
B. Enhanced for Loop
C. Generics
D. Generic Collections
E. Defining Generic Types
F. Using Type Wildcards
G. Autoboxing and Unboxing
H. String Formatting
I. Formatted Input
J. StringBuilder Class
K. Variable Argument Lists
L. Defining Related Constants
M. Enumerations
N. Enums Define a Type
O. Metadata
P. Standard Annotations
Q. Using an Annotation
R. Annotation Elements
S. Custom Annotations
T. Annotation Retention Policies
U. Default Element Values
V. Processing Annotations
W. Sample Reflection-Based Annotation Processing
X. Chapter Summary
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Course Summary (cont’d)

XVIII. Introduction to the Spring Framework
A. Introduction to the Spring Framework
B. What is the Spring Framework?
C. History of Spring
D. Spring Fundamentals
E. Spring Modules
F. What is a Spring Bean?
G. Programming To Interfaces
H. Dependent Objects Without Spring
  I. The Spring Container
  J. Introduction to Dependency Injection
  K. Configuring Injection with Annotations
  L. Configuring Injection with XML
  M. Injecting Simple Values
  N. Configuring Spring
  O. Creating the Container
  P. Steps for a Simple Spring Application
  Q. Hello World From Spring
  R. Chapter Summary

XIX. XML Dependency Injection
A. XML Dependency Injection
B. Introduction to Dependency Injection
C. Configuring Dependency Injection
D. Inversion of Control
E. Sample Application for this Chapter
F. Setter Injection
G. Property Conversions
H. Constructor Injection
  I. Constructor Injection Resolution
  J. Constructor Injection Resolution, cont’d
  K. Mixing Injection Types
  L. Setter vs Constructor Injection
  M. Chapter Summary

XX. Spring Beans
A. Spring Beans
B. Configuring Spring Beans
C. XML Bean IDs, Names and Aliases
D. Inheriting an XML Definition
E. XML Abstract Parent Beans
F. Bean Scopes
G. Singleton Scope
H. Prototype Scope
  I. XML Inner Beans
  J. XML Compound Names
  K. Bean Lifecycle
  L. Lifecycle Annotations
  M. Creation Lifecycle
  N. Creation Lifecycle Example
  O. Destruction Lifecycle
  P. Destruction Lifecycle Example
  Q. BeanPostProcessors
  R. Coding A BeanPostProcessor
  S. BeanPostProcessor Example
  T. Factory Methods
  U. Factory Classes
  V. Chapter Summary

XXI. Additional Configuration and Annotations
A. Additional Configuration and Annotations
B. Configuring Spring Beans
C. Spring XML Namespaces
D. Java Collection Framework Review
E. XML: Injecting Collections as Properties
F. Spring XML Collection Configuration
G. XML: Injecting a List
H. XML: Injecting a Set
  I. XML: Injecting a Map
  J. XML: Injecting java.util.Properties
  K. Introduction to XML Autowiring
  L. XML Autowiring By Name
  M. XML Autowiring By Type
  N. Should You Autowire using XML?
  O. Introduction to Annotations
  P. Annotations and Spring
  Q. Enabling Annotations
  R. The @Value Annotation
  S. The @Required Annotation
  T. The @Resource Annotation
  U. The @Component Annotation
  V. Autowiring with Annotations
  W. The @Qualifier Annotation
  X. Other Annotations
  Y. Spring and JSR-330
  Z. Annotations vs XML Configuration
AA. Introduction to Java-Based Configuration
BB. Java-Based Configuration Example
CC. Chapter Summary
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Course Summary (cont’d)

XXII. Introduction to Spring MVC
A. Introduction to Spring MVC
B. Spring and the Web
C. The Spring WebApplicationContext
D. Introduction to Spring MVC
E. What is the MVC Design Pattern?
F. Spring MVC Architecture
G. Spring MVC Controllers
H. Form Processing Flow: Phase 1
I. Form Processing Flow: Phase 2
J. Spring MVC Development Steps
K. Configuring the Web Application
L. A Service Bean
M. A Spring MVC Input Form
N. A Spring MVC Result Page
O. Configuring Controller Annotation Processing
P. What is a ViewResolver?
Q. A Spring MVC Command Controller
R. The Spring Configuration File
S. Chapter Summary

XXIII. Introduction to Spring Web Flow
A. Introduction to Spring Web Flow
B. What is Spring Web Flow?
C. History of Spring Web Flow
D. What Does the Web Flow Project Provide?
E. Spring Web Flow vs Spring Web MVC
F. Spring and Ajax
G. Spring and JSF
H. What is a Flow?
I. Authoring Flows
J. What is a State?
K. Evaluating Expressions
L. What is a View State?
M. Rendering
N. State Transitions
O. What is an Action State?
P. SWF Configuration
Q. Configuration in web.xml
R. Configuring the Business Layer
S. Configuring Spring MVC
T. Configuring Spring Web Flow
U. Configuring a Flow
V. Creating the View
W. Chapter Summary

XXIV. Introduction to Spring AOP
A. Introduction to AOP
B. What is Aspect-Oriented Programming?
C. AOP Terminology
D. Spring Support for AOP
E. Steps for Using Spring AOP
F. Defining a Pointcut
G. Basic Pointcut Syntax
H. Applying Advice
I. Configuring Spring AOP
J. Spring AOP Behind the Scenes
K. Complete Hello, World Example
L. Chapter Summary

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