



Table of Contents

Introduction	xxxi
Chapter 1: Java EE 6: An Overview	1
Evolution of Java	2
Starting with Java	4
Java Programming Language.....	4
Java Runtime Environment	4
Java Virtual Machine	5
Java Platform	5
Exploring Enterprise Architecture Types.....	6
The Single-Tier Architecture	6
The 2-Tier Architecture	6
The 3-Tier Architecture	8
The n-Tier Architecture.....	9
Objectives of Enterprise Applications	11
Exploring the Features of the Java EE Platform	13
Platform Independence	13
Managed Objects.....	13
Reusability	13
Modularity	14
Easier Development.....	14
Simplified EJB.....	14
Enhanced Web Services	14
Support for Web 2.0.....	14
Exploring the New Features of the Java EE 6 Platform.....	14
Exploring the Java EE 6 Platform	15
The Runtime Infrastructure	15
The Java EE 6 APIs.....	15
Exploring the Architecture of Java EE 6	18

Table of Contents

Describing Java EE 6 Containers	19
Container Types	20
Java EE 6 Container Architecture.....	20
Developing Java EE 6 Applications	22
Probable Java EE Application Architectures	23
Application Development and Deployment Roles.....	25
Application Development Process.....	25
Listing the Compatible Products for the Java EE Platform.....	28
Introducing Web Servers.....	29
Introducing Application Servers.....	29
The WebLogic Application Server	29
The WebSphere Application Server	29
The JBoss Application Server	29
The Glassfish Application Server.....	30
Java Database Connectivity	30
Java Servlet.....	31
JavaServer Pages	31
JavaServer Faces	31
JavaMail.....	31
Enterprise JavaBeans	31
Hibernate.....	32
Seam.....	32
Java EE Connector Architecture.....	32
Web Services	32
Struts.....	32
Spring.....	33
JAAS.....	33
AJAX	33
Summary	33
Quick Revise	33
Chapter 2: Web Applications and Java EE 6	35
Exploring the HTTP Protocol	36
Describing HTTP Requests.....	38
Describing the HTTP Responses.....	41
Introducing Web Applications	41
Describing Components of a Web Application.....	42
Describing Structure /Modules of Web Applications	45
Describing Web Containers	46

Exploring Web Architecture Models	47
Describing the Model-1 Architecture	47
Describing the Model-2 Architecture	48
Exploring the MVC Architecture	49
Describing the Model Component.....	50
Describing the View Component.....	50
Describing the Controller Component.....	50
Summary	51
Quick Revise	51
Chapter 3: Working with JDBC 4.0	53
Introducing JDBC.....	54
Components of JDBC.....	54
JDBC Specification.....	55
JDBC Architecture.....	55
Exploring JDBC Drivers	56
Describing the Type-1 Driver.....	56
Describing the Type-2 Driver (Java to Native API)	58
Describing the Type-3 Driver (Java to Network Protocol/ All Java Driver).....	59
Describing the Type-4 Driver (Java to Database Protocol)	60
Exploring the Features of JDBC.....	61
Additional Features of JDBC 3.0	61
New Features in JDBC 4.0.....	62
Describing JDBC APIs	64
The java.sql Package.....	64
The javax.sql Package.....	66
Exploring Major Classes and Interfaces	68
The DriverManager Class	68
The Driver Interface.....	69
The Connection Interface.....	70
The Statement Interface.....	72
Exploring JDBC Processes with the java.sql Package.....	75
Understanding Basic JDBC Steps.....	75
Creating a Simple JDBC Application.....	78
Working with the PreparedStatement Interface	82
Working with the CallableStatement Interface	88
Working with ResultSets.....	95
Working with Batch Updates	106
Describing SQL 99 Data Types.....	110

Table of Contents

Exploring JDBC Processes with the javax.sql Package	127
Using DataSource to Make a Connection	127
Exploring Connection Pooling	128
Using RowSet Objects	131
Working with Transactions.....	144
ACID Properties.....	144
Types of Transactions.....	145
Transaction Management	145
Summary	148
Quick Revise	149
Chapter 4: Working with Servlets 3.0	151
Exploring the Features of Java Servlet.....	152
Servlet - A Request and Response Model	152
Servlet and Environment State.....	153
Security Features.....	155
HTML-Aware Servlets	156
HTTP-Specific Servlets	156
Performance Features.....	157
3-Tier Applications	158
Web Publishing System.....	159
Exploring New Features in Servlet 3.0	159
Exploring the Servlet API.....	161
Describing the javax.servlet Package.....	161
Exploring the javax.servlet.http Package.....	163
Explaining the Servlet Life Cycle	165
The init() Method	166
The service() Method.....	166
The destroy() Method.....	167
Understanding Servlet Configuration.....	167
Creating a Sample Servlet	169
Exploring Directory Structure.....	170
Configuring the Servlet	171
Packaging, Deploying and Running the Web Application	171
Creating a Servlet by using Annotation	173
Working with ServletConfig and ServletContext Objects.....	174
Working with the HttpServletRequest and HttpServletResponse Interfaces.....	175
Using the HttpServletRequest Interface.....	175
Using the HttpServletResponse Interface	185

Exploring Request Delegation and Request Scope	190
Implementing Servlet Collaboration.....	194
Collaboration through the System Properties List.....	194
Collaboration through a Shared Object.....	195
Collaboration through Inheritance	202
Summary	204
Quick Revise	204
Chapter 5: Handling Sessions in Servlets 3.0	207
Describing a Session.....	208
Introducing Session Tracking	208
Exploring the Session Tracking Mechanisms	209
Using Cookies.....	209
Using Hidden Form Fields	213
Implementing URL Rewriting.....	213
Using Secure Socket Layer.....	217
Using the Java Servlet API for Session Tracking.....	217
History of Session Tracking.....	217
Session Creation and Tracking.....	218
Creating Login Application using Session Tracking	228
Exploring the Directory Structure of Login Application	228
Building the Front-End	228
Creating and Managing a Session.....	229
Configuring the Login Application	231
Running the Login Application	232
Summary	233
Quick Revise	234
Chapter 6: Implementing Event Handling and Wrappers in Servlets 3.0.....	235
Introducing Events.....	236
Introducing Event Handling.....	236
Working with the Types of Servlet Events.....	237
Implementing the Servlet Context Level Events.....	237
Implementing the Servlet Session Level Events.....	246
Developing the onlineshop Web Application	254
Creating the JavaBeans for the onlineshop Web Application	254
Creating the CartContextListener Class.....	258
Building the Front-end of the onlineshop Web Application	260
Introducing Wrappers	266

Table of Contents

Exploring the Need for Wrappers	267
Exploring the Types of Wrapper Classes	267
Working with Wrappers	268
Creating the Home HTML Page	269
Creating the WrapperTestServlet.java File	269
Creating the TestServlet.java File	270
Creating the MyRequestWrapper.java File	270
Creating the MyResponseWrapper.java File	271
Creating the web.xml File	271
Packaging, Deploying, and Running the wrapper Web Application	272
Summary	273
Quick Revise	273
Chapter 7: Working with JavaServer Pages (JSP) 2.1	275
Introducing JSP Technology	276
Exploring New Features of JSP 2.1	276
Listing Advantages of JSP over Java Servlet	277
Exploring the Architecture of a JSP Page	277
The JSP Model I Architecture	277
The JSP Model II Architecture	278
Describing the Life Cycle of a JSP Page	278
The Page Translation Stage	278
The Compilation Stage	279
The Loading & Initialization Stage	279
The Request Handling Stage	279
The Destroying Stage	280
Working with JSP Basic Tags and Implicit Objects	280
Exploring Scripting Tags	280
Exploring Implicit Objects	284
Explaining Directive Tags	291
Working with Action Tags in JSP	297
Exploring Action Tags	297
Declaring a Bean in a JSP Page	305
Exploring the JSP Unified EL	310
Understanding the Basic Syntax of using EL	311
Classifying EL Expressions	311
Describing Tag Attribute Types	313
Resolving EL Expressions	313
Describing EL Operators	315

Describing EL Objects	317
Using Functions with EL.....	323
Summary	325
Quick Revise	325
Chapter 8: Implementing JSP Tag Extensions.....	327
Exploring the Elements of Tag Extensions.....	328
The TLD File	328
The taglib Directive	329
The Tag Handler	329
Exploring the Tag Extension API.....	329
The Tag Extension Interfaces.....	330
The Tag Extension Classes.....	334
Working with Classic Tag Handlers.....	344
Exploring the Life Cycle of Classic Tag Handlers	344
Implementing Classic Tags.....	345
Working with Simple Tag Handlers.....	349
Exploring the Life Cycle of Simple Tag Handlers	349
Implementing Simple Tag Handler	349
Working with JSP Fragments.....	352
Creating a JSP Fragment	352
Invoking a JSP Fragment.....	352
Exploring the JspFragment Class.....	353
Working with Tag Files	353
Handling Dynamic Attributes in Tag Files.....	354
Exporting Variables from a Tag File to a JSP Page	354
Using Attributes to Provide Names for Variables	355
Invoking JSP Fragments from Tag Files.....	355
Summary	356
Quick Revise	356
Chapter 9: Implementing JavaServer Pages Standard Tag Library 1.2.....	357
Introducing JSTL	358
Explaining the Features of JSTL.....	358
Exploring the Tag Libraries in JSTL.....	359
Working with the Core Tag Library	359
Exploring the Tags in the Core Tag Library	359
Using the Core Tag Library in the coreTagApp Application.....	363
Working with the XML Tag Library	366

Table of Contents

Exploring the Tags of the XML Tag Library.....	367
Using the XML Tag Library in the XMLTagApp Application.....	373
Working with the Internationalization Tag Library	375
Exploring the Tags of the Internationalization Tag Library	375
Using the Internationalization Tag Library in Web Applications	382
Working with the SQL Tag Library	389
Exploring Tags of the SQL Tag Library	389
Using the SQL Tag Library in the SqlTagApp Application	395
Working with the Functions Tag Library.....	397
Exploring the Functions Available in the Functions Tag Library.....	397
Using the JSTL Functions in the JSTLFunctionApp Application	398
Summary	400
Quick Revise	400
Chapter 10: Implementing Filters.....	401
Exploring the Need of Filters.....	402
Exploring the Working of Filters.....	403
Exploring Filter API.....	403
The Filter Interface.....	403
The FilterConfig Interface.....	404
The FilterChain Interface	405
Configuring a Filter.....	405
Configuring Filters Using Deployment Descriptor	405
Configuring Filters Using Annotations.....	407
Creating a Web Application Using Filters	407
Using Deployment Descriptor to Configure a Filter	407
Exploring the Directory Structure of FilterApp Application	411
Using Annotations to Configure a Filter.....	413
Creating a Servlet to Test the Filter	415
Using Initializing Parameter in Filters.....	417
Creating the MsgFilter Filter	417
Creating a JSP Page to Test the Filter	417
Configuring the Filter.....	418
Testing a Filter.....	418
Manipulating Responses	420
Creating the ServletOutputStreamFilter Class.....	420
Creating the MyGenericResponseWrapper Class.....	421
Creating the Filter	422
Creating the Servlet to Test the Filter	423

Configuring the Filter	423
Testing the FilterPrePost Filter	424
Discussing Issues in Using Threads with Filters	424
Summary	425
Quick Revise	425
Chapter 11: Working with JavaServer Faces 2.0.....	427
Introducing JSF	428
Explaining the Features of JSF	429
Exploring the JSF Architecture	430
Describing JSF Elements.....	432
UI Component.....	432
Renderer.....	433
Validators.....	433
Backing Beans.....	434
Converters.....	435
Events and Listeners.....	435
Message.....	437
Navigation	438
Exploring the JSF Request Processing Life Cycle.....	438
The Restore View Phase.....	439
The Apply Request Values Phase	440
The Process Validations Phase	440
The Update Model Values Phase	440
The Invoke Application Phase	441
The Render Response Phase	441
Exploring JSF Tag Libraries	441
JSF HTML Tags	442
JSF Core Tags.....	459
JSF Standard UI Components	470
Command Components.....	472
Data Component.....	472
Form Component.....	472
Image Component	473
Input Component.....	473
Message and Messages Component.....	473
Output Component	473
Parameter Component	473
Checkbox Component.....	473

Table of Contents

SelectItem and SelectItems Component	473
SelectMany and SelectOne Component	473
ViewRoot Component	474
Working with Backing Beans	474
Using the Backing Bean Method as an Event Handler	476
Using Backing Bean Method as Validator	477
Managing Backing Beans	477
JSF Input Validation	478
Using Validator Method	478
Using Validators	479
JSF Type Conversion	480
Standard JSF Converters	481
Creating Custom Converters	481
Handling Page Navigation in JSF	482
Describing Internationalization Support in JSF	484
Configuring Supported Locales	484
Creating Resource Bundles	484
Accessing Localized Messages from Resource Bundle	485
Configuring JSF Applications	486
Setting web.xml	487
Setting the faces-config.xml File	488
Developing a JSF Application	489
Setting Development Environment	489
Creating JSF Pages	490
Creating the Employee Backing Bean	499
String getEmployees()	502
String addNew()	502
String update()	502
String deleteEmployee()	502
String getDetail()	502
void getEmployee(ActionEvent)	502
Managing Employee Bean	503
Creating the EmployeeDB Class	503
Creating the EmailValidator Class	506
Configuring a JSF Application	507
Enabling JSF Servlet in the web.xml File	507
Navigation Rules Defined in the faces-config.xml File	507
Supporting Internationalization	509

Exploring the Directory Structure of the Application	510
Running the KogentPro Application	511
Displaying All Employees	512
Getting Employee Detail.....	512
Adding New Employee	513
Editing Employee Detail.....	513
Deleting Employee.....	514
Summary	514
Quick Revise	515
Chapter 12: Understanding JavaMail 1.4	517
Introducing JavaMail	518
Exploring the E-Mail Protocols	519
MIME.....	520
Establishing Communication between an E-mail Client and E-mail Server	520
Exploring the JavaMail Architecture.....	521
Exploring the JavaMail API	521
The Session Class	522
The Authenticator Class.....	524
The Message Class	524
The MimeMessage Class.....	524
The Part Interface.....	526
The Multipart Class	528
The ContentType Class	529
The MimeBodyPart Class	529
The PreencodedMimeBodyPart Class.....	529
The MimeUtility Class.....	530
The InternetHeader Class.....	531
The ParameterList Class.....	531
The QuotaAwareStore Interface	531
The Resource Class	532
The Quota Class	532
The SharedFileInputStream Class.....	532
The SharedByteArrayInputStream Class.....	533
The ByteArrayDataSource Class.....	533
The Address Class	533
The Store Class	534
The Folder Class.....	535
The Transport Class.....	541

Table of Contents

Working with JavaMail	542
Sending Mails.....	542
Reading Mails.....	544
Summary	545
Quick Revise	545

Chapter 13: Working with EJB 3.1 547

Understanding EJB 3 Fundamentals.....	548
Why EJB 3?.....	548
EJB 3 – Architecture and Concepts	549
Features of EJB 3.....	552
Classifying EJBs.....	555
Introducing Session Beans	555
Conversational State.....	556
State Management of a Bean	556
The Stateless Session Beans	556
The Stateful Session Beans.....	558
Stateless versus Stateful Session Beans	559
Implementing Session Beans	560
Exploring Business Interface	560
Exploring Bean Class.....	560
Working with a Stateless Session Bean	560
Working with a Stateful Session Bean.....	567
Introducing the MDB.....	571
Characteristics of the MDB.....	571
Structure of the MDB.....	572
Life Cycle of the MDB	572
Implementing the MDB.....	574
Implementing the MessageDrivenBean and MessageListener Interfaces	574
Implementing Business Logic inside the onMessage() Method.....	574
Creating a Sample MDB Application.....	574
Packaging, Deploying, and Running the Application.....	579
Managing Transactions in Java EE Applications	584
Exploring Transaction Properties	585
Exploring Transaction Model.....	586
Explaining Distributed Transactions.....	588
Implementing Transaction Management in EJB 3	589
Explaining Bean-Managed Transactions	590
Explaining Container-Managed Transactions.....	591

Explaining EJB 3 Timer Services.....	593
Different Types of Timers.....	593
Strengths and Limitations of EJB Timer Services.....	594
Timer Service API.....	594
Implementing EJB 3 Timer Service	597
Creating Timer Objects.....	598
Canceling a Timer Object.....	599
Expiring the Timer Object.....	599
Exploring EJB 3 Interceptors.....	599
Specifying Interceptors.....	600
Exploring the Life Cycle of Interceptors	600
Working with the Interceptor Class.....	601
Applying Interceptors through XML	602
Disabling Interceptors	602
Using the Business Method Interceptors	603
Using the Life Cycle Callback Methods.....	603
Specifying Default Interceptor Methods.....	604
Exploring the Life Cycle Callback Methods in an Interceptor Class	605
The @PreDestroy Annotation.....	605
The @PostConstruct Annotation.....	606
The @PostActivate Annotation	606
The @PrePassivate Annotation	606
Exploring the Life Cycle Callback Interceptor Methods in an MDB	606
Exploring the Life Cycle Callback Interceptor Methods in a Session Bean	608
Summary	609
Quick Revise	610
Chapter 14: Implementing Entities and Java Persistence API 2.0	611
Understanding Java Persistence and EntityManager API	612
Introducing Entities	613
Specifying the @ENTITY Annotation.....	619
Specifying the @Table Annotation.....	619
Specifying the @Column Annotation.....	619
Specifying the @Enumerated Annotation.....	620
Specifying the @Lob Annotation.....	621
Specifying the @Temporal Annotation	621
Exploring Entity and Session Beans	621
Describing When To Use Entity Beans.....	621
Describing an Entity Class	622

Table of Contents

Describing the Life Cycle of Entity	622
Entity Listeners and Callbacks	623
Packaging a Persistence Unit.....	624
Obtaining an EntityManager.....	625
Interacting with an EntityManager	626
Understanding Entity Relationship Types.....	628
The One-to-One Relationship.....	628
The One-to-Many Relationship.....	634
The Many-to-One Relationship.....	638
The Many-to-Many Relationship	642
Mapping Collection-Based Relationships	647
Understanding Entity Inheritance.....	648
Single Table Per Class Hierarchy	651
Separate Table Per Subclass.....	653
Single Table Per Concrete Entity Class	654
Understanding JPQL.....	655
JPQL Functions.....	655
JPQL Statements.....	657
The SELECT Clause	658
The FROM Clause.....	659
The WHERE Clause.....	659
The ORDER BY Clause.....	660
Conditional Expressions	660
Query API.....	663
Developing Sample Application	667
Exploring the Directory Structure	667
Creating the Web Module.....	669
Configuring Connection Pool and JDBC Resource.....	676
Summary	679
Quick Revise	679
Chapter 15: Implementing Java Persistence Using Hibernate 3.5	681
Introducing Hibernate	682
Why Hibernate?	682
What is New in Hibernate 3.5?.....	683
Exploring the Architecture of Hibernate.....	684
Noteworthy Interfaces of Hibernate.....	685
The Hibernate Cache Architecture	685
Downloading Hibernate.....	687

Exploring HQL	688
Need of HQL	688
HQL Syntax	688
Understanding Hibernate O/R Mapping	692
Working with Hibernate	699
Setting up the Development Environment	699
Creating Database Table	699
Writing Hibernate Configuration File, JavaBean, and Hibernate Mapping File	699
Implementing O/R Mapping with Hibernate	702
Developing a JavaBean	703
Developing Hibernate Configuration File	704
Developing Hibernate Mapping File	704
Creating the EmployeeData.java File	705
Developing Controller Component	707
Developing View Components	711
Creating the web.xml File	713
Exploring Directory Structure	714
Running the Application	715
Summary	718
Quick Revise	719
Chapter 16: Implementing JBoss Seam	721
Listing the Features of the Seam Framework	722
Working with the Seam Framework	723
Understanding Contexts	723
Working with Seam Components	724
Using Annotations	731
Implementing BPM and Page Flow in Seam	734
Stateless Navigation Model	735
Stateful Navigation Model	735
Using jPDL Pageflows	736
Configuring JBoss Seam	737
Configuring JSF in Seam	738
Configuring EJB components in Seam	739
Creating a Jboss Seam Application	739
Creating an EJB Component	740
Creating Views	743
Creating Resources	748
Packaging and Deploying the Seam Application	753

Table of Contents

Running the Application.....	756
Summary	759
Quick Revise	760
Chapter 17: Java EE Connector Architecture 1.6.....	761
Describing the Key Concepts of the JCA.....	762
Enterprise Information Systems.....	763
Resource Manager	764
Resource Adapter	764
Managed Environment	764
Non-Managed Environment	765
Connection of an Application Client with a Resource Manager.....	765
System Contracts.....	765
Common Client Interface.....	766
Describing the Life Cycle Management of a Resource Adapter.....	767
Bootstrapping a Resource Adapter Instance	769
Understanding a ManagedConnectionFactory JavaBean and Outbound Communication.....	770
Understanding an ActivationSpec JavaBean and Inbound Communication	771
Managing the Life Cycle of a Resource Adapter	771
Exploring Workflow Management	773
Listing the Advantages of Workflow Management	773
Describing the Work Management Model.....	773
Describing the Work Interface.....	774
Describing the ExecutionContext Class	775
Describing the WorkListener Interface	775
Describing the WorkEvent Class	776
Describing the WorkAdapter Class	776
Exploring the Differences between JDBC and JCA.....	777
Exploring the Inbound Communication Model.....	777
Discussing a Scenario using Inbound Communication	778
Exploring Message Inflow from EIS to Resource Adapter	779
Exploring the Message Inflow to Message Endpoints	782
Exploring Activation Specifications (JavaBean).....	783
Exploring Administered Objects.....	783
Understanding EJB Invocation	784
Understanding the CCI API.....	785
The ConnectionFactory Interface	786
The ConnectionSpec Interface	787
The Connection Interface	787

The Interaction Interface	788
The InteractionSpec Interface	788
The LocalTransaction Interface	788
Exploring JCA Exceptions.....	789
The Application Exception	789
The System Exception	789
Packaging and Deploying a Resource Adapter.....	790
Understanding Directory Structure of a Resource Adapter	790
Packaging Considerations	791
Packaging a Resource Adapter	791
Deploying a Resource Adapter	792
Explaining the Deployment Descriptor for a Resource Adapter	792
Explaining the Role of Parties Involved in Deployment of a Resource Adapter	793
Summary	793
Quick Revise	793
Chapter 18: Java EE Design Patterns	795
Describing the Java EE Application Architecture	796
Introducing a Design Pattern.....	797
Discussing the Role of Design Patterns	797
Exploring Types of Patterns.....	797
The Front Controller Pattern	799
The Composite View Pattern.....	802
The Composite Entity Pattern	804
The Intercepting Filter Pattern	806
The Transfer Object Pattern.....	808
The Session Facade Pattern.....	811
The Service Locator Pattern.....	813
The Data Access Object Pattern.....	815
The View Helper Pattern	817
The Dispatcher View Pattern.....	819
The Service To Worker Pattern	821
Summary	823
Quick Revise	823
Chapter 19: Implementing SOA using Java Web Services	825
Overview of SOA	826
Describing the SOA Environment.....	827
The Core Layer.....	828

Table of Contents

The Platform Layer	828
The Quality of Services Layer	828
Overview of JWS	830
Role of WSDL, SOAP, and Java/XML Mapping in SOA	831
Role of WSDL in SOA	831
Role of SOAP in SOA	833
Role of Java/XML Mapping in SOA	834
Exploring the JAX-WS 2.2 Specification	839
The Invocation Sub-Specification Category	840
The Serialization Sub-Specification Category	842
The Deployment Sub-Specification Category	843
Exploring the JAXB 2.2 Specification	844
Mapping Annotations	845
Binding Runtime Framework	845
Implementing Validation	846
Exploring Marshal Event Callbacks	846
Exploring Partial Binding	847
Exploring Binary Data Encoding	847
Exploring JAXB Binding Language	847
Explaining Portability	848
Exploring the WSEE 1.3 Specification	848
Port Component	849
Servlet Endpoints	849
EJB Endpoints	849
Simple Packaging	849
Handler Programming Model	849
Exploring the WS-Metadata 2.2 Specification	849
WSDL Mapping Annotations	850
SOAP Binding Annotations	850
Handler Annotations	850
Service Implementation Bean	851
Start From WSDL and Java	851
Automatic Deployment	851
Describing the SAAJ 1.3 Specification	851
Working with SAAJ and DOM APIs	851
Creating a Simple SOAP Message	852
Accessing the different Message Parts of a SOAP Message	852
Adding Content to the SOAPBody Object	852

Sending a Message.....	853
Retrieving the Content of a Message.....	854
Adding Content to the Header Element.....	854
Creating and Adding Attachments.....	854
Retrieving Attachments.....	855
Describing the JAXR Specification.....	855
JAXR Architecture.....	855
JAXR Client.....	856
JAXR Provider.....	856
Exploring the StAX 1.0 Specification.....	857
StAX APIs.....	857
StAX Factory Classes.....	858
Using the JAX-WS 2.2 Specification.....	859
Invoking Web Services by using JAX-WS Proxies.....	860
Implementing JAX-WS WSDL to Java Mapping.....	860
Marshalling and Unmarshalling Method Calls to SEI.....	862
Invoking a Web Service using a Proxy.....	864
Using the JAXB 2.2 Specification.....	864
Binding between XML Schema and Java Classes.....	865
Customizing JAXB Binding.....	865
Exploring an Example of JAXB 2.2 Java/XML Binding.....	869
Implementing Type Mappings with JAXB 2.2.....	874
Implementing Type Mappings with JAXB 2.2 Annotations.....	878
Using the WSEE and WS-Metadata Specifications.....	882
Deployment using a Servlet Endpoint.....	883
Deployment using an EJB Endpoint.....	883
Deployment without Deployment Descriptors.....	884
Deployment with Deployment Descriptor.....	890
Implementing the SAAJ Specification.....	896
Implementing the JAXR Specification.....	900
Setting up a Connection.....	900
Querying a Registry.....	901
Manipulating Registry Objects.....	903
Implementing the StAX Specification.....	906
Reading XML Streams.....	906
Writing XML Streams.....	907
Reading an XML File using the Cursor API.....	908
Reading an XML File using the Event Iterator API.....	911

Table of Contents

Writing an XML File using the Cursor API	913
Summary	914
Quick Revise	914
Chapter 20: Working with Struts 2.....	917
Introducing Struts 2	918
Explaining MVC 2 Design Pattern for Struts 2.....	918
The Need for Struts 2.....	919
Processing Request in Struts 2.....	919
Exploring Relation between WebWork 2 and Struts 2.....	920
Describing Struts 2 Architecture	921
Exploring Struts 2 Configuration Files.....	922
Explaining Zero Configuration Applications.....	925
Exploring Struts 2 Annotations.....	926
Understanding Actions in Struts 2.....	926
Action Classes	926
POJO as Action.....	935
Implementing Actions in Struts 2	935
Dependency Injection and Inversion of Control	951
The ApplicationAware Interface.....	952
The ParameterAware Interface	952
The ServletRequestAware Interface	953
The ServletResponseAware Interface.....	954
The SessionAware Interface	954
Preprocessing with Interceptors.....	954
What are Interceptors?	955
Interceptors as RequestProcessor.....	955
How to Configure Interceptors?	955
Stacking of Interceptors.....	956
Bundled Interceptors	956
Writing Interceptors	957
OGNL Support in Struts 2.....	959
Syntax of OGNL.....	959
Using OGNL in Struts 2	960
Implementing Struts 2 Tags	961
Generic Tags	961
UI Tags	963
Controlling Results in Struts 2.....	964
What is Result?	964

Types of Results	964
Configuring Results.....	965
Configuring Result Types.....	966
Performing Validation in Struts 2	967
XWork Validation framework.....	967
Bundled Validators.....	967
Registering Validators.....	969
Defining Validation Rules.....	970
Custom Validators.....	970
Short-circuiting Validators	971
Validation Annotation.....	972
ConversionErrorFieldValidator Annotation	972
Validating Stuts2App Application	979
Internationalizing Struts 2 Applications	983
Describing Internationalization and Localization.....	983
Global Resource Bundle.....	985
Implementing Plugins in Struts 2.....	986
Struts 2 Bundled Plugins.....	986
Tiles Plugin	987
Integrating Struts 2 with Hibernate	999
Setting the MySQL Database and Table.....	1000
Configuring Hibernate	1000
Developing Struts Hibernate Plugin	1002
Summary	1003
Quick Revise	1003
Chapter 21: Working with Spring 3.0.....	1005
Introducing Features of the Spring Framework.....	1006
What's New in Spring 3.0.....	1007
Exploring the Spring Framework Architecture.....	1007
Explaining the Spring Core Module	1008
Explaining the Spring AOP Module.....	1008
Explaining the Spring ORM Module.....	1008
Explaining the Spring Web MVC Module.....	1009
Explaining the Spring Web Flow Module	1009
Explaining the Spring DAO Module	1009
Explaining the Spring Application Context Module.....	1009
Exploring Dependency Injection and Inversion of Control.....	1009

Table of Contents

Explaining DI.....	1010
Explaining IoC Container	1010
Exploring AOP with Spring.....	1011
Describing the AOP Concepts.....	1011
Explaining Types of Advices.....	1012
Spring AOP Capabilities and Its Goals	1012
Managing Transactions	1012
Need of Transaction Management Support	1013
Spring Transaction Abstraction	1013
Resource Synchronization with Transactions	1015
Declarative Transaction Management.....	1016
Programmatic Transaction Management.....	1016
Choosing between Programmatic and Declarative Transaction Managements	1017
Application Server-Specific Integration.....	1018
Exploring Spring Form Tag Library	1018
Classifying the Types of Tags.....	1018
Exploring Spring's Web MVC Framework.....	1025
Key Features of Spring Web MVC.....	1025
The DispatcherServlet Class	1026
Controllers	1027
Handler Mappings.....	1029
Views and View Resolvers	1029
Implementing Spring Web MVC Framework	1030
Creating the Controller	1031
Creating the Views.....	1031
Creating the Spring Configuration File.....	1032
Creating the Web Configuration File	1032
Exploring the Directory Structure	1033
Running the Application.....	1034
Testing Spring Applications	1034
The Unit Testing.....	1034
The Integration Testing	1034
Integrating Spring with Hibernate.....	1037
Integrating Struts 2 with Spring	1037
Configuring Spring in a Struts 2 Application.....	1038
Summary	1039
Quick Revise	1039

Chapter 22: Securing Java EE 6 Applications.....	1041
Introducing Security in Java EE 6.....	1042
Authentication.....	1042
Protection Domain.....	1043
Exploring Security Mechanisms.....	1045
Application Layer Security.....	1045
Transport Layer Security.....	1045
Message Layer Security.....	1046
Implementing Security on an Application Server.....	1046
Realm.....	1047
User.....	1047
Group.....	1047
Role.....	1048
Securing Enterprise Beans.....	1048
Using the Programmatic Security Approach.....	1049
Using Security Identity.....	1049
Securing Application Clients.....	1050
Implementing Security in Web Applications.....	1050
Using JAAS.....	1050
Using Authentication Mechanisms.....	1053
Implementing Security.....	1055
Describing Declarative Security.....	1055
Implementing Programmatic Security.....	1067
Summary.....	1077
Quick Revise.....	1078
 Chapter 23: People Management Solutions	 1079
Software Requirements.....	1080
SDLC of the Project.....	1080
Requirement Analysis.....	1080
Software Design.....	1080
Database Design.....	1082
Development.....	1085
Testing.....	1085
Implementation and Maintenance.....	1086
Summary.....	1086

Chapter 23: Section A: Developing the Login Module.....	1087
Designing Login User Interface.....	1088
Creating the people_user_login Servlet.....	1089
Creating the UserLoginDBObj Class.....	1092
Creating the UserLoginDBMethods Class.....	1093
Creating the people_default.jsp File.....	1095
Directory Structure of the Project.....	1098
Login and Navigating to Home Page.....	1099
Changing Password.....	1101
Chapter 23: Section B: Developing the Profile Management Module.....	1103
Implementing Logic with Servlet.....	1104
Creating the people_employee Servlet.....	1104
Creating the EmployeeObj Class.....	1108
Creating the EmployeeDBMethods Class.....	1108
Creating the GenerateId Class.....	1111
Creating Views.....	1112
Creating the employee_insert JSP Page.....	1112
Creating the employee_search JSP Page.....	1116
Creating the employee_edit JSP Page.....	1118
Creating the employee_list JSP Page.....	1121
Creating the employee_profile JSP Page.....	1123
Chapter 23: Section C: Developing the Recruitment Module.....	1127
Registering a New Applicant.....	1128
Creating the people_applicant Servlet.....	1128
Creating the ApplicantDBObj Class.....	1131
Creating the ApplicantDBMethods Class.....	1132
Creating the GenerateId Class.....	1138
Creating an Interface for Applicant Registration.....	1138
Conducting Rounds of Test.....	1149
Creating the applicant_test_dtl Servlet.....	1149
Designing JSP Views.....	1153
Working of the Recruitment Module.....	1164
Chapter 23: Section D: Developing the Attendance Management Module.....	1167
Creating the time_management Servlet.....	1168
Creating the Classes in the com.TimeManagement Package.....	1172
Creating JSP Views.....	1176

Creating the employee_daily_attendance JSP Page	1176
Creating the employee_daily_attendance_summary JSP Page.....	1179
Chapter 23: Section E: Developing the Leave Management Module	1181
Creating the leave_management Servlet.....	1182
Creating the LeaveRequest Class.....	1185
Creating the LeaveMgmtBeanMethods Class	1186
Creating the GenerateId Class.....	1190
Designing JSP Views.....	1190
Creating the leave_request JSP Page	1191
Creating the leave_request_edit JSP Page.....	1195
Creating the leave_request_reject JSP Page.....	1197
Creating the leave_request_list JSP Page.....	1200
Chapter 23: Section F: Developing the Payroll Module.....	1203
Updating Salary Statement	1204
Creating people_payroll Servlet.....	1204
Creating the EmpSal Class.....	1211
Creating the EmployeeAgreement Class	1211
Creating the PayrollBeanMethods Class.....	1211
Designing JSP Views.....	1218
Creating the employee_agreement JSP Page.....	1218
Creating the employee_agreement_edit JSP Page.....	1222
Creating the salary_search.jsp File	1224
Creating the salary_slip JSP Page	1226
Appendix A: AJAX.....	1229
Appendix B: Installing Java EE 6 SDK	1245
Appendix C: Working with NetBeans IDE 6.8	1253
Appendix D: Implementing Internationalization.....	1281
Appendix E: Working with Facelets.....	1293
Appendix F: Working with JMS.....	1303
Glossary	1315
Index	1325
What's on the CD-ROM	1336

Appendices on the CD

Appendix A: RMI-IIOP

Appendix B: Understanding Directory Services and JNDI

Appendix C: XML

Appendix D: Unified Modeling Language (UML)