



Table of Contents

Introduction	xxxi
Chapter 1: Java EE 7: 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	13
Easier Development	14
Simplified EJB	14
Enhanced Web Services	14
Support for Web 2.0	14
Exploring the New Features of the Java EE 7 Platform	14
Exploring the Java EE 7 Platform	15
The Runtime Infrastructure	15
The Java EE 7 APIs	15
Exploring the Architecture of Java EE 7	19

Describing Java EE 7 Containers	19
Container Types	20
Java EE 7 Container Architecture.....	21
Developing Java EE 7 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.....	30
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 7	 35
Exploring the HTTP Protocol	36
Processing HTTP Requests	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 (Native API Driver).....	58
Describing the Type-3 Driver (Java to Network Protocol/ All Java Driver).....	59
Describing the Type-4 Driver (Database Protocol Driver).....	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.....	67
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.....	76
Creating a Simple JDBC Application.....	78
Working with the PreparedStatement Interface	82
Working with the CallableStatement Interface	88
Working with ResultSet	96
Working with Batch Updates	106

Describing SQL99 Data Types.....	110
Exploring JDBC Processes with the javax.sql Package.....	128
Using DataSource to Make a Connection	128
Exploring Connection Pooling	129
Using RowSet Objects	132
Working with Transactions.....	145
ACID Properties.....	145
Types of Transactions.....	146
Transaction Management	146
Summary	149
Quick Revise	149
 Chapter 4 : Working with Servlets 3.1	 151
Exploring the Features of Java Servlet.....	152
Servlet - A Request and Response Model	152
Servlet and Environment State.....	153
Security Features.....	154
HTML-Aware Servlets	155
HTTP-Specific Servlets.....	156
Performance Features.....	157
3-Tier Applications	158
Web Publishing System.....	158
Exploring New Features in Servlet 3.1	159
Exploring the Servlet API.....	162
Describing the javax.servlet Package.....	162
Exploring the javax.servlet.http Package	165
Explaining the Servlet Life Cycle	166
The init() Method	167
The service() Method.....	167
The destroy() Method.....	168
Understanding Servlet Configuration.....	169
Creating a Sample Servlet	170
Exploring Directory Structure	171
Configuring the Servlet.....	172
Packaging, Deploying and Running the Web Application	172
Creating a Servlet by using Annotation	174
Working with ServletConfig and ServletContext Objects.....	175
Working with the HttpServletRequest and HttpServletResponse Interfaces.....	176
Using the HttpServletRequest Interface.....	176

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	201
Summary	204
Quick Revise	204
Chapter 5 : Handling Sessions in Servlets 3.1	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.....	216
Using the Java Servlet API for Session Tracking.....	217
History of Session Tracking.....	217
Session Creation and Tracking.....	217
Creating Login Application using Session Tracking	227
Exploring the Directory Structure of Login Application	227
Building the Front-End	228
Creating and Managing a Session.....	229
Configuring the Login Application	231
Running the Login Application	232
Summary	235
Quick Revise	235
Chapter 6 : Implementing Event Handling and Wrappers in Servlets 3.1	237
Introducing Events.....	238
Introducing Event Handling.....	238
Working with the Types of Servlet Events.....	239
Implementing the Servlet Context Level Events.....	239
Implementing the Servlet Session Level Events.....	247
Developing the onlineshop Web Application	255
Creating the JavaBeans for the onlineshop Web Application	255
Creating the CartContextListener Class.....	259
Building the Front-End of the onlineshop Web Application.....	261

Introducing Wrappers	267
Exploring the Need for Wrappers	267
Exploring the Types of Wrapper Classes	267
Working with Wrappers	269
Creating the Home HTML Page	269
Creating the WrapperTestServlet.java File	270
Creating the TestServlet.java File	270
Creating the MyRequestWrapper.java File	271
Creating the MyResponseWrapper.java File	271
Creating the web.xml File	272
Packaging, Deploying, and Running the wrapper Web Application	272
Summary	273
Quick Revise	273
Chapter 7 : Java Server Pages 2.3 and Expression Language 3.0	275
Introducing JSP Technology	276
Listing Advantages of JSP over Java Servlet	276
Exploring the Architecture of a JSP Page	277
The JSP Model I Architecture	277
The JSP Model II Architecture	277
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	279
Working with JSP Basic Tags and Implicit Objects	280
Exploring Scripting Tags	280
Exploring Implicit Objects	284
Explaining the Types of Directive Tags	290
Working with Action Tags in JSP	295
Exploring Action Tags	296
Declaring a Bean in a JSP Page	304
Exploring EL	309
New Features of EL 3.0	309
Understanding the Basic Syntax of using EL	310
Classifying EL Expressions	311
Describing Tag Attribute Types	312
Resolving EL Expressions	313

Describing EL Operators.....	314
Showing the Use of Implicit EL Scope Objects.....	318
Showing the Use of Implicit EL Objects.....	320
Using Custom Tag Library with EL Functions.....	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.....	333
Working with Classic Tag Handlers.....	342
Exploring the Life Cycle of Classic Tag Handlers.....	343
Implementing Classic Tags.....	343
Working with Simple Tag Handlers.....	347
Exploring the Life Cycle of Simple Tag Handlers.....	347
Implementing Simple Tag Handler.....	347
Working with JSP Fragments.....	350
Creating a JSP Fragment.....	350
Invoking a JSP Fragment.....	350
Exploring the JspFragment Class.....	351
Working with Tag Files.....	351
Handling Dynamic Attributes in Tag Files.....	352
Exporting Variables from a Tag File to a JSP Page.....	352
Using Attributes to Provide Names for Variables.....	352
Invoking JSP Fragments from Tag Files.....	353
Summary.....	353
Quick Revise.....	354
Chapter 9: Implementing JavaServer Pages Standard Tag Library 1.2.....	355
Introducing JSTL.....	356
Explaining the Features of JSTL.....	356
Exploring the Tag Libraries in JSTL.....	357
Working with the Core Tag Library.....	357
Exploring the Tags in the Core Tag Library.....	357

Using the Core Tag Library in the coreTagApp Application.....	361
Working with the XML Tag Library	364
Exploring the Tags of the XML Tag Library	365
Using the XML Tag Library in the XMLTagApp Application.....	371
Working with the Internationalization Tag Library	373
Exploring the Tags of the Internationalization Tag Library	373
Using the Internationalization Tag Library in Web Applications	380
Working with the SQL Tag Library	386
Exploring Tags of the SQL Tag Library	386
Using the SQL Tag Library in the SqlTagApp Application	392
Working with the Functions Tag Library.....	394
Exploring the Functions Available in the Functions Tag Library	394
Using the JSTL Functions in the JSTLFunctionApp Application	396
Summary	397
Quick Revise	397
Chapter 10 : Implementing Filters	399
Exploring the Need of Filters.....	400
Exploring the Working of Filters.....	401
Exploring Filter API.....	401
The Filter Interface	401
The FilterConfig Interface.....	402
The FilterChain Interface	403
Configuring a Filter.....	403
Configuring Filters Using Deployment Descriptor	403
Configuring Filters Using Annotations.....	404
Creating a Web Application Using Filters	405
Using Deployment Descriptor to Configure a Filter	405
Exploring the Directory Structure of FilterApp Application	409
Using Annotations to Configure a Filter.....	411
Creating a Servlet to Test the Filter.....	412
Using Initializing Parameter in Filters.....	414
Creating the MsgFilter Filter	414
Creating a JSP Page to Test the Filter	415
Configuring the Filter.....	415
Let's now learn how to test a filter.....	415
Testing a Filter.....	415
Manipulating Responses	417
Creating the ServletOutputStreamFilter Class.....	417

Creating the MyGenericResponseWrapper Class.....	418
Creating the Filter	419
Creating the Servlet to Test the Filter	419
Configuring the Filter.....	420
Testing the FilterPrePost Filter	420
Discussing Issues in Using Threads with Filters	420
Summary	421
Quick Revise	422
Chapter 11: Working with JavaServer Faces 2.2	423
Introducing JSF	424
Explaining the Features of JSF	425
Exploring the JSF Architecture	427
Describing JSF Elements.....	429
UI Component.....	429
Renderer.....	430
Validators.....	430
Backing Beans.....	431
Converters.....	432
Events and Listeners.....	432
Message	434
Navigation	435
Exploring the JSF Request Processing Life Cycle.....	435
The Restore View Phase.....	436
The Apply Request Values Phase	437
The Process Validations Phase	437
The Update Model Values Phase	437
The Invoke Application Phase	438
The Render Response Phase	438
Exploring JSF Tag Libraries	438
JSF HTML Tags	439
JSF Core Tags.....	456
JSF Standard UI Components	467
Command Components	469
Data Component	469
Form Component.....	470
Image Component	470
Input Component.....	470
Message and Messages Component	470

Output Component	470
Parameter Component	470
Checkbox Component	470
SelectItem and SelectItems Component	470
SelectMany and SelectOne Component	471
ViewRoot Component	471
Working with Backing Beans	471
Using the Backing Bean Method as an Event Handler	473
Using Backing Bean Method as Validator	474
Managing Backing Beans	474
JSF Input Validation	475
Using Validator Method	476
Using Validators	476
JSF Type Conversion	478
Standard JSF Converters	478
Creating Custom Converters	479
Handling Page Navigation in JSF	479
Describing Internationalization Support in JSF	481
Configuring Supported Locales	481
Creating Resource Bundles	481
Accessing Localized Messages from Resource Bundle	482
Configuring JSF Applications	484
Setting web.xml	484
Setting the faces-config.xml File	485
Developing a JSF Application	486
Setting Development Environment	486
Creating JSF Pages	487
Creating the Employee Backing Bean	496
String getEmployees()	499
String addNew()	499
String update()	499
String deleteEmployee()	499
String getDetail()	499
void getEmployee(ActionEvent)	499
Managing Employee Bean	500
Creating the EmployeeDB Class	500
Creating the EmailValidator Class	503
Configuring a JSF Application	504

Enabling JSF Servlet in the web.xml File.....	504
Navigation Rules Defined in the faces-config.xml File	504
Supporting Internationalization.....	506
Exploring the Directory Structure of the Application	507
Running the KogentPro Application	508
Displaying All Employees	509
Getting Employee Detail.....	509
Adding New Employee	510
Editing Employee Detail	510
Deleting Employee.....	511
Summary	511
Quick Revise	511
Chapter 12: Understanding JavaMail 1.5	513
Introducing JavaMail	514
Exploring the E-Mail Protocols	515
MIME.....	516
Establishing Communication between an E-mail Client and E-mail Server	516
Exploring the JavaMail Architecture	517
Exploring the JavaMail API	517
The Session Class	518
The Authenticator Class.....	520
The Message Class	520
The MimeMessage Class.....	520
The Part Interface.....	522
The Multipart Class	524
The ContentType Class	525
The MimeBodyPart Class.....	525
The PreencodedMimeBodyPart Class.....	526
The MimeUtility Class.....	526
The InternetHeader Class.....	527
The ParameterList Class.....	527
The QuotaAwareStore Interface.....	528
The Resource Class	528
The Quota Class	528
The SharedFileInputStream Class.....	528
The SharedByteArrayInputStream Class.....	529
The ByteArrayDataSource Class.....	529
The Address Class	530

The Store Class	530
The Folder Class.....	531
The Transport Class.....	537
Exploring New Features in JavaMail 1.5.....	538
Support for QRESYNC and CONSTORE	538
Support for WITHIN and ID	538
Support for Write Timeouts.....	538
Working with JavaMail	539
Sending Mails.....	539
Reading Mails.....	540
Summary	541
Quick Review	542
Chapter 13: Working with EJB 3.2	543
Understanding EJB 3 Fundamentals.....	544
Why EJB 3?.....	544
EJB 3 – Architecture and Concepts	545
Features of EJB 3.....	548
Classifying EJBs.....	551
Introducing Session Beans	552
Conversational State.....	552
State Management of a Bean.....	552
The Stateless Session Beans	553
The Stateful Session Beans	554
Stateless versus Stateful Session Beans	556
Implementing Session Beans	556
Exploring Business Interface	556
Exploring Bean Class.....	556
Working with a Stateless Session Bean	557
Working with a Stateful Session Bean.....	563
Introducing the MDB.....	568
Characteristics of the MDB.....	568
Structure of the MDB.....	568
Life Cycle of the MDB	568
Implementing the MDB.....	570
Implementing the MessageDrivenBean and MessageListener Interfaces	571
Implementing Business Logic inside the onMessage() Method.....	571
Creating a Sample MDB Application.....	571
Packaging, Deploying, and Running the Application.....	575

Managing Transactions in Java EE Applications	581
Exploring Transaction Properties	581
Exploring Transaction Model.....	583
Explaining Distributed Transactions.....	585
Implementing Transaction Management in EJB 3	586
Explaining Bean-Managed Transactions	587
Explaining Container-Managed Transactions.....	588
Explaining EJB 3 Timer Services.....	590
Different Types of Timers.....	590
Strengths and Limitations of EJB Timer Services.....	591
Timer Service API.....	591
Implementing EJB 3 Timer Service	594
Creating Timer Objects.....	595
Canceling a Timer Object.....	596
Expiring the Timer Object.....	596
Exploring EJB 3 Interceptors.....	596
Specifying Interceptors.....	597
Exploring the Life Cycle of Interceptors	597
Working with the Interceptor Class.....	598
Applying Interceptors through XML	599
Disabling Interceptors	599
Using the Business Method Interceptors	600
Using the Life Cycle Callback Methods.....	600
Specifying Default Interceptor Methods.....	601
Exploring the Life Cycle Callback Methods in an Interceptor Class	602
The @PreDestroy Annotation.....	602
The @PostConstruct Annotation.....	603
The @PostActivate Annotation	603
The @PrePassivate Annotation	603
Exploring the Life Cycle Callback Interceptor Methods in an MDB	603
Exploring the Life Cycle Callback Interceptor Methods in a Session Bean.....	605
Summary	607
Quick Review	607
 Chapter 14 : Implementing Entities and Java Persistence API 2.1	 609
Understanding Java Persistence and EntityManager API	610
Exploring New Features in JPA 2.1.....	611
Support for Stored Procedures.....	612
Introduction of New Annotations	612

Introducing Entities	614
Specifying the @ENTITY Annotation.....	619
Specifying the @Table Annotation.....	619
Specifying the @Column Annotation.....	620
Specifying the @Enumerated Annotation.....	621
Specifying the @Temporal Annotation	621
Exploring Entity and Session Beans	621
Describing When To Use Entity Beans.....	622
Describing an Entity Class	622
Describing the Life Cycle of Entity	623
Entity Listeners and Callbacks	623
Packaging a Persistence Unit.....	624
Obtaining an EntityManager.....	626
Interacting with an EntityManager.....	627
Understanding Entity Relationship Types.....	628
The One-to-One Relationship.....	629
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	650
Separate Table Per Subclass.....	653
Single Table Per Concrete Entity Class	654
Understanding JPQL.....	654
JPQL Functions.....	655
JPQL Statements.....	657
The SELECT Clause	658
The FROM Clause.....	659
The WHERE Clause.....	659
The ORDER BY Clause.....	659
Conditional Expressions	660
Query API.....	662
Developing Sample Application	667
Exploring the Directory Structure	667
Creating the Web Module.....	668
Configuring Connection Pool and JDBC Resource.....	676
Summary	679
Quick Revise	679

Chapter 15: Implementing Java Persistence Using Hibernate 4.3	681
Introducing Hibernate	682
Why Hibernate?	682
What is New in Hibernate 4.3?	683
Exploring the Architecture of Hibernate	683
Noteworthy Interfaces of Hibernate	684
The Hibernate Cache Architecture	685
Downloading Hibernate	687
Exploring HQL	687
Need of HQL	688
HQL Syntax	688
Understanding Hibernate O/R Mapping	691
Working with Hibernate	698
Setting up the Development Environment	698
Creating Database Table	699
Writing Hibernate Configuration File, JavaBean, and Hibernate Mapping File	699
Implementing O/R Mapping with Hibernate	702
Developing a JavaBean	702
Developing Hibernate Configuration File	703
Developing Hibernate Mapping File	704
Creating the EmployeeData.java File	704
Developing Controller Component	707
Developing View Components	710
Creating the web.xml File	712
Exploring Directory Structure	714
Running the Application	714
Summary	716
Quick Revise	717
Chapter 16: Implementing JBoss Seam	719
Listing the Features of the Seam Framework	720
Working with the Seam Framework	721
Understanding Contexts	721
Working with Seam Components	722
Using Annotations	729
Implementing BPM and Page Flow in Seam	732
Stateless Navigation Model	732
Stateful Navigation Model	733

Using jPDL Pageflows.....	734
Configuring JBoss Seam.....	735
Configuring JSF in Seam.....	736
Configuring EJB components in Seam.....	737
Creating a Jboss Seam Application.....	737
Creating an EJB Component.....	737
Creating Views.....	741
Creating Resources.....	746
Packaging and Deploying the Seam Application.....	751
Running the Application.....	753
Summary.....	757
Quick Revise.....	757
Chapter 17: Java EE Connector Architecture 1.7.....	759
Describing the Key Concepts of the JCA.....	760
Enterprise Information Systems.....	761
Resource Manager.....	762
Resource Adapter.....	762
Managed Environment.....	762
Non-Managed Environment.....	763
Connection of an Application Client with a Resource Manager.....	763
System Contracts.....	763
Common Client Interface.....	764
What Is New in JCA 1.7.....	765
Describing the Life Cycle Management of a Resource Adapter.....	766
Bootstrapping a Resource Adapter Instance.....	767
Understanding a ManagedConnectionFactory JavaBean and Outbound Communication.....	769
Understanding an ActivationSpec JavaBean and Inbound Communication.....	769
Managing the Life Cycle of a Resource Adapter.....	770
Exploring Workflow Management.....	771
Listing the Advantages of Workflow Management.....	772
Describing the Work Management Model.....	772
Describing the Work Interface.....	773
Describing the ExecutionContext Class.....	774
Describing the WorkListener Interface.....	774
Describing the WorkEvent Class.....	774
Describing the WorkAdapter Class.....	775
Exploring the Differences between JDBC and JCA.....	775
Exploring the Inbound Communication Model.....	776

Discussing a Scenario using Inbound Communication	777
Exploring Message Inflow from EIS to Resource Adapter	777
Exploring the Message Inflow to Message Endpoints	781
Exploring Activation Specifications (JavaBean)	782
Exploring Administered Objects.....	782
Understanding EJB Invocation	783
Understanding the CCI API.....	785
The ConnectionFactory Interface	786
The ConnectionSpec Interface	786
The Connection Interface	786
The Interaction Interface	787
The InteractionSpec Interface	787
The LocalTransaction Interface	787
Exploring JCA Exceptions.....	788
The Application Exception	788
The System Exception	788
Packaging and Deploying a Resource Adapter.....	789
Understanding Directory Structure of a Resource Adapter	790
Packaging Considerations	790
Packaging a Resource Adapter	791
Deploying a Resource Adapter	791
Explaining the Deployment Descriptor for a Resource Adapter	791
Explaining the Role of Parties Involved in Deployment of a Resource Adapter	792
Summary	792
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	800
The Composite View Pattern.....	802
The Composite Entity Pattern	804
The Intercepting Filter Pattern	807
The Transfer Object Pattern	808
The Session Facade Pattern.....	810
The Service Locator Pattern.....	812
The Data Access Object Pattern.....	814

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
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	847
Exploring Partial Binding	847
Exploring Binary Data Encoding	847
Exploring JAXB Binding Language	847
Explaining Portability	848
Exploring the WSEE 1.3 Specification.....	849
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.....	851

Handler Annotations.....	851
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.....	853
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
Exploring the WebSocket 1.0 Specification.....	859
Describing the JAX-RS 2.0 Specification.....	860
Exploring the JASON-P 1.0 Specification.....	860
Using the JAX-WS 2.2 Specification.....	860
Invoking Web Services by using JAX-WS Proxies.....	861
Implementing JAX-WS WSDL to Java Mapping.....	862
Marshalling and Unmarshalling Method Calls to SEI	863
Invoking a Web Service using a Proxy.....	865
Using the JAXB 2.2 Specification.....	865
Binding between XML Schema and Java Classes	865
Customizing JAXB Binding	866
Exploring an Example of JAXB 2.2 Java/XML Binding.....	870
Implementing Type Mappings with JAXB 2.2	875
Implementing Type Mappings with JAXB 2.2 Annotations.....	879
Using the WSEE and WS-Metadata Specifications	883
Deployment using a Servlet Endpoint	884
Deployment using an EJB Endpoint.....	884

Deployment without Deployment Descriptors.....	886
Deployment with Deployment Descriptor.....	892
Implementing the SAAJ Specification.....	898
Implementing the JAXR Specification.....	902
Setting up a Connection.....	902
Querying a Registry.....	904
Manipulating Registry Objects.....	906
Implementing the StAX Specification.....	909
Reading XML Streams.....	909
Writing XML Streams.....	910
Reading an XML File using the Cursor API.....	911
Reading an XML File using the Event Iterator API.....	914
Writing an XML File using the Cursor API.....	915
Summary.....	917
Quick Review.....	917
Chapter 20: Working with Struts 2.....	921
Introducing Struts 2.....	922
Explaining MVC 2 Design Pattern for Struts 2.....	922
The Need for Struts 2.....	923
Processing Request in Struts 2.....	923
Exploring Relation between WebWork 2 and Struts 2.....	924
Describing Struts 2 Architecture.....	925
Exploring Struts 2 Configuration Files.....	926
Explaining Zero Configuration Applications.....	929
Exploring Struts 2 Annotations.....	929
Understanding Actions in Struts 2.....	930
Action Classes.....	930
POJO as Action.....	938
Implementing Actions in Struts 2.....	938
Dependency Injection and Inversion of Control.....	954
The ApplicationAware Interface.....	954
The ParameterAware Interface.....	955
The ServletRequestAware Interface.....	955
The ServletResponseAware Interface.....	956
The SessionAware Interface.....	956
Preprocessing with Interceptors.....	957
What are Interceptors?.....	957
Interceptors as RequestProcessor.....	957

How to Configure Interceptors?	957
Stacking of Interceptors.....	958
Bundled Interceptors.....	959
Writing Interceptors	959
OGNL Support in Struts 2.....	961
Syntax of OGNL.....	962
Using OGNL in Struts 2	962
Implementing Struts 2 Tags.....	963
Generic Tags	963
UI Tags	965
Controlling Results in Struts 2.....	966
What is Result?	966
Types of Results	966
Configuring Results.....	967
Configuring Result Types.....	968
Performing Validation in Struts 2	969
XWork Validation framework.....	969
Bundled Validators.....	969
Registering Validators.....	971
Defining Validation Rules.....	972
Custom Validators.....	972
Short-Circuiting Validators	973
Validation Annotation.....	974
ConversionErrorFieldValidator Annotation	974
Validating Stuts2App Application	981
Internationalizing Struts 2 Applications	985
Describing Internationalization and Localization.....	985
Global Resource Bundle.....	987
Implementing Plugins in Struts 2.....	988
Struts 2 Bundled Plugins.....	988
Tiles Plugin	989
Integrating Struts 2 with Hibernate	1000
Setting the MySQL Database and Table.....	1001
Configuring Hibernate	1002
Developing Struts Hibernate Plugin	1004
Summary.....	1005
Quick Revise	1005

Chapter 21: Working with Spring 4.0	1007
Features of the Spring Framework.....	1008
What's New in Spring 4.0.....	1009
Exploring the Spring Framework Architecture.....	1011
Explaining the Spring Core Module.....	1012
Explaining the Spring AOP Module.....	1012
Explaining the Spring ORM Module.....	1012
Explaining the Spring Web MVC Module.....	1012
Explaining the Spring Web Flow Module	1013
Explaining the Spring DAO Module.....	1013
Explaining the Spring Application Context Module.....	1013
Exploring Dependency Injection and Inversion of Control.....	1013
Explaining DI.....	1014
Explaining IoC Container	1014
Exploring AOP with Spring.....	1015
Describing the AOP Concepts.....	1015
Explaining Types of Advices.....	1015
Spring AOP Capabilities and Its Goals	1016
Managing Transactions	1016
Need of Transaction Management Support	1016
Spring Transaction Abstraction	1017
Resource Synchronization with Transactions	1019
Declarative Transaction Management.....	1020
Programmatic Transaction Management.....	1020
Choosing between Programmatic and Declarative Transaction Managements.....	1021
Application Server-Specific Integration.....	1021
Exploring Spring Form Tag Library	1022
Classifying the Types of Tags.....	1022
Exploring Spring's Web MVC Framework.....	1029
Key Features of Spring Web MVC.....	1029
The DispatcherServlet Class.....	1030
Controllers	1031
Handler Mappings.....	1032
Views and View Resolvers	1033
Implementing Spring Web MVC Framework	1034
Creating the Controller	1034
Creating the Views.....	1035
Creating the Spring Configuration File.....	1036

Creating the Web Configuration File	1036
Exploring the Directory Structure	1037
Running the Application.....	1037
Testing Spring Applications	1038
The Unit Testing.....	1038
The Integration Testing	1038
Integrating Spring with Hibernate.....	1041
Integrating Struts 2 with Spring	1041
Configuring Spring in a Struts 2 Application.....	1041
Summary	1043
Quick Revise	1043
Chapter 22 : Securing Java EE 7 Applications	1045
Introducing Security in Java EE 7.....	1046
Authentication.....	1046
Protection Domain.....	1047
Exploring Security Mechanisms	1049
Application Layer Security	1049
Transport Layer Security	1049
Message Layer Security.....	1050
Implementing Security on an Application Server.....	1050
Realm.....	1051
User.....	1051
Group	1051
Role.....	1052
Securing Enterprise Beans.....	1052
Using the Programmatic Security Approach	1052
Using Security Identity	1053
Securing Application Clients	1054
Implementing Security in Web Applications	1054
Using JAAS.....	1054
Using Authentication Mechanisms	1057
Implementing Security	1059
Describing Declarative Security	1059
Implementing Programmatic Security	1069
Summary	1079
Quick Revise	1079

Chapter 23 : People Management Solutions	1081
Software Requirements	1082
SDLC of the Project	1082
Requirement Analysis	1082
Software Design	1082
Database Design	1084
Development	1087
Testing	1087
Implementation and Maintenance	1088
Summary	1088
Chapter 23 : Section A : Developing the Login Module	1089
Designing Login User Interface	1090
Creating the people_user_login Servlet	1091
Creating the UserLoginDBObj Class	1094
Creating the UserLoginDBMethods Class	1095
Creating the people_default.jsp File	1097
Directory Structure of the Project	1100
Login and Navigating to Home Page	1101
Changing Password	1102
Chapter 23 : Section B : Developing the Profile Management Module	1105
Implementing Logic with Servlet	1106
Creating the people_employee Servlet	1106
Creating the EmployeeDBObj Class	1110
Creating the EmployeeDBMethods Class	1110
Creating the GenerateId Class	1113
Creating Views	1114
Creating the employee_insert JSP Page	1114
Creating the employee_search JSP Page	1118
Creating the employee_edit JSP Page	1120
Creating the employee_list JSP Page	1123
Creating the employee_profile JSP Page	1124
Chapter 23 : Section C : Developing the Recruitment Module	1129
Registering a New Applicant	1130
Creating the people_applicant Servlet	1130
The next subsection describes the ApplicantDBObj class, which is used as a DTO	1133
Creating the ApplicantDBObj Class	1133

Creating the ApplicantDBMethods Class.....	1134
Creating the GenerateId Class.....	1140
Creating an Interface for Applicant Registration.....	1140
Conducting Rounds of Test	1150
Creating the applicant_test_dtl Servlet	1151
Designing JSP Views	1155
Working of the Recruitment Module	1166
Chapter 23 : Section D : Developing the Attendance Management Module	1169
Creating the time_management Servlet	1170
Creating the Classes in the com.TimeManagement Package	1173
Creating JSP Views.....	1178
Creating the employee_daily_attendance JSP Page	1178
Creating the employee_daily_attendance_summary JSP Page.....	1180
Chapter 23 : Section E : Developing the Leave Management Module	1183
Creating the leave_management Servlet.....	1184
Creating the LeaveRequest Class.....	1188
Creating the LeaveMgmtBeanMethods Class	1189
Creating the GenerateId Class.....	1193
Designing JSP Views.....	1194
Creating the leave_request JSP Page	1194
Creating the leave_request_edit JSP Page.....	1198
Creating the leave_request_reject JSP Page.....	1201
Creating the leave_request_list JSP Page.....	1203
Chapter 23 : Section F : Developing the Payroll Module	1207
Updating Salary Statement	1208
Creating people_payroll Servlet.....	1208
Creating the EmpSal Class.....	1215
Creating the EmployeeAgreement Class	1215
Creating the PayrollBeanMethods Class.....	1215
Designing JSP Views.....	1222
Creating the employee_agreement JSP Page.....	1222
Creating the employee_agreement_edit JSP Page	1226
Creating the salary_search.jsp File	1228
Creating the salary_slip JSP Page	1229

Table of Contents

Glossary	1233
Index	1251
Online Resource Available with the Book	1267

Bonus Chapters Available with the Book

Appendix A : AJAX

Appendix B : Installing Java EE7 SDK

Appendix C : Working with NetBeans IDE 7.4

Appendix D : Introducing Batch Processing

Appendix E : Working with JMS 2.0