Contents

Foreword	хi
Introduction	xv
Chapter 1: J2EE Essentials	1
What Is J2EE?	2
How J2EE Relates to J2SE	2
Why J2EE?	3
Features and Concepts in J2EE	10
Containers	11
Java Servlets	12
JavaServer Pages	14
Enterprise JavaBeans	16
XML Support	18
Web Services	19
Transaction Support	19
Security	20
Sample J2EE Architectures	20
n-Tier Architecture	21
Application Client with EJB	21
JSP Client with EJB	22
Applet Client with JSP and Database	22
Using Web Services for Application Integration	23
Summary	23

Chapter 2: Getting Set	25
Installing the J2EE 1.4 SDK	26
Problems and Solutions	
Testing the J2EE 1.4 SDK Installation	29
Starting the Database Server	
Starting the J2EE Server	
Problems and Solutions	
Compiling and Deploying "Hello J2EE World"	
Problems and Solutions	
Summary	
Chapter 3: JavaServer Pages	45
Introduction to JSP	45
Developing JSP Pages	46
Basic JSP Lifecycle	46
Writing JSP Pages	47
JSP Elements	48
Implicit Objects	69
Scope	73
Translation and Compilation	81
The Servlet API	82
The JSP API	82
A Translated JSP	82
Errors and Exceptions	84
The page Directive	85
The Deployment Descriptor	85
Including and Forwarding from JSP Pages	
include Action	91
forward Action	91
Using include and forward	92
Summary	97
Exercises	98
Chapter 4: Advanced JSP Topics	99
Expression Language	100
Syntax of EL	
Implicit Objects	
Using EL Expressions	
Custom Actions and Tag Libraries	
Custom Actions	
Tag Handlers	
Simple Tag Handlers	
Tag Library Descriptor	

Packaging Tag Libraries	121
JavaServer Pages Standard Tag Library (JSTL)	140
Getting an Implementation	
What's in the JSTL?	140
Core Actions	141
Formatting Actions	142
SQL Actions	143
Other Tag Libraries	148
Summary	149
Exercises	149
Chapter 5: Servlets	151
HTTP and Server Programs	152
Request Methods	152
The Servlet Model and HttpServlets	157
Basic Servlet Design	158
Using the request Object	167
Using the response Object	169
Deployment Descriptors	170
Servlet Lifecycle	174
Event Logging in Servlets	
Servlets Are Multi-Threaded	178
Handling Exceptions	186
Poor Exception Handling	186
Error Pages	187
Session Management	188
Session Management with Cookies	191
Filters	196
Why You Need Filters	196
Implementing a Filter	197
The MVC Architecture	205
Model 1 vs. Model 2	205
MVC	206
Forwarding and Including Requests	207
Summary	219
Exercises	990

Chapter 6: Working with Databases	221
Connecting to Databases	222
Drivers	
Driver Types	
The DriverManager Class	
Loading a Driver	
Connections	
Statements	
Creating and Using Statement Objects	
Resultsets	
Summary	
Exercises	
Chapter 7: Advanced Topics in JDBC	259
Prepared Statements	260
Creating a Prepared Statement	
Using a Prepared Statement	
Callable Statements	
Using Placeholders	269
Data Sources and Connection Pools	
Data Source Overview	271
Using a DataSource Object	
Connection Pool Overview	
Transactions	
Connection Methods for Transaction Control	
Transactions and Stored Procedures	
Introduction to Distributed Transactions	
Locking and Isolation	
Pessimistic Locking	
Optimistic Locking	
Summary	
Exercises	
Chapter 8: EJB Fundamentals	311
Understanding EJBs	312
Why Use EJBs?	
The Three Kinds of EJBs	
Decisions, Decisions	
A Closer Look at Session Beans	
The Anatomy of a Session Bean	
Developing Session Beans	
Stateful vs. Stateless Session Beans	
Summary	
Evercises	349

Chapter 9: EJB Entity Beans	343
A Closer Look at Entity Beans	344
The Anatomy of an Entity Bean	344
Other Features of Entity Beans	347
Developing CMP Entity Beans	349
Developing BMP Entity Beans	
EJB Local Interfaces	
The EJB Query Language	
Summary	
Exercises	398
Chapter 10: More EJB Topics	399
Container-Managed Relationships	399
Creating an EJB-QL Select Method	
Using JDBC with Enterprise JavaBeans	
Summary	
Exercises	436
Chapter 11: Design Patterns and Message-Driven Beans Using Design Patterns in EJB Applications	437 437
Using JSP and Servlets with EJBs	
Developing Message-Driven Beans	
Introduction to the Java Message Service API	464
Introduction to the EJB Timer Service	465
Summary	479
Resources	479
Exercises	480
Chapter 12: Web Services and JAX-RPC	481
Understanding Web Services	482
Why Use Web Services?	
The Web Services Protocol Stack	
Developing Web Services in Java	487
Understanding JAX-RPC	
Summary	508
Resources	509
Exercises	509

Chapter 13: More J2EE Web Services Topics	511
Implementing a Session Bean As a Web Service	512
Implementing a Stateful Web Service	
Can Web Services Be Stateful?	
The JAX-RPC Service Endpoint Model	525
Summary	
Exercises	
Appendix A: Installing Tomcat	543
Getting Tomcat	543
Binary Installation to Windows	
Binary Installation to Linux/Unix	545
Source Installation	
Running Tomcat	546
Appendix B: SQL and EJB-QL	547
SQL	547
SQL Data Types	549
Working with Tables	551
Handling Null Values	553
Joins	562
EJB-QL	
Appendix C: J2EE Glossary	569
Index	575