Contents

Foreword	xiii
About the Author	xvii
About the Technical Reviewer	xix
Acknowledgments	xxi
Introduction	
Chapter 1 All Kinds of Methods for Persisting Objects	
reisisting objects	1
Storing Objects to Simple Data Files	
Using Java Serialization	
Storage Using XML	
Object Databases for Transparent Persistence	
The Value of Relational Databases	
Using an Object-Relational Persistence Layer	
Summary	15
Chamber 2 Understanding Deletional	
Chapter 2 Understanding Relational	
Database Management Systems	17
What Does a Relational Database Do?	17
How Relational Databases Work	
Ensuring Good Data Through Transactions	
Database Design	
Gathering Requirements	
Data Modeling	23
Normalization in Database Design	23
Reviewing Structured Query Language	27
Creating a New Database	
Creating New Tables	
Inserting Data into Tables	
Updating Data with SQL	
Deleting Data with SQL	
Selecting Data from Tables	
Summary	

Relational Database Work 35 What Is JDBC? 36 Different Types of Drivers 37 How to Use JDBC 38 Creating the Database 41 Creating the Tables 47 Using a Statement to Create Tables 48 Using a JDBC Statement to Insert Data 50 Using JDBC to Update Data 51 Obtaining Data and Querying via JDBC 51 Using Basic JDBC Transactions 55 Optimizing Performance with JDBC 56 First Culprit Is Probably the SQL 57 Know Your Driver 58 Use Prepared Statements for Repeated SQL 58 Manage Resources Carefully 59 Watch Out for Premature Optimization 60 Summary 60 Chapter 4 What Is New in JDBC 2 and 3 63 What's New in JDBC 2.1 63 Result Set Running Wild 64
Different Types of Drivers
Using a Statement to Create Tables
Optimizing Performance with JDBC
Chapter 4 What Is New in JDBC 2 and 3
JDBC 2 and 3
Using Batch Updates to Execute Multiple SQL Statements 68
JDBC 2.0 Optional Package
Saving System Resources Through Connection Pooling 73 Distributed Transactions
JDBC 3.0
Using Database Auto-Generated Keys

Chapter 5	Writing a	Persistence	Layer 81
Writing You	r First Data Ad	ccess Object	83
	ject Search Cri		
Search Mo	ethods		84
Search by	Example		86
Search La	nguages		92
The Rest of	the CRUD		92
	New Objects		
Summary			98
Chapter 6	Persisten	ce-Related De	osian
Chapter 0			_
	Patterns		99
The Value o	f Patterns		100
	uilder Pattern		
SQL State	ments As Objects		102
	of the Construction		
The Build	er's Superclass		104
	nn InsertBuilder		
	trategy Patterr		
	nt Databases		108
	acade Pattern t		
	acade That Wraps J		
_	QueryFacade		
	ng the QueryFacade		
<i>30,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</i>			122
Chapter 7	Unit Tosti	ing Persister	100
Chapter /		_	
	Layers		123
Junit. A Ja	va Unit-Testing	a Framework	124
	g JUnit		
	en Development		
	ests with a TestPack		
	ng Data Access Ob	_	
	Unit		
	C Using Mock Ob ts with Mock Ob		
_		•	
Summarv			136

Chapter 8	Enterprise JavaBeans:	
	Container Managed	
	Persistence 2.0	139
Parts of an E	Entity Enterprise JavaBean	140
	naged Persistence Contracts	
	ields	
Primary Key	7S	143
Relationship	os	143
Deploymen	t Descriptor	144
Life Cycle of	f a CMP Entity Bean	147
	jects	
	Objects	
	Objects	
	Reference Implementation	
	Interfaces	
	aces	
	Managed Persistent Entity Beans	
- •	ent Descriptor Example	
	ient	
	nd Running	
Summary		173
Charatar 0	Uniting to the ODMC 2 0	
chapter 9	Writing to the ODMG 3.0	175
Object Model		176
Working with	Objects	178
	tity and Names	178
	ects to and Removing Objects	
	rsistence	
	Persisted Objects	
	Objects	
, -	y Language	
	om Java	
Summary		189

Chapter 10 Persistence with Java Data	
Objects (JDO)	191
• , ,	
What Is a JDO Implementation?	192
Overview of the JDO Architecture	192
How JDO Works	
Source and Byte-Code Enhancing	
JDO Transactions and What Happens After the Rollback	195
Querying with JDOQL	195
Getting All Instances in Extents	196
JDO Class Restrictions and Requirements	196
Different Types of JDO Identity	197
JDO XML Metadata	198
How You Can Use JDO to Persist Your Objects	199
Example Business Objects	199
Performing the JDO Work	
Using the Sun JDO Reference Implementation	
Summary	217
Libraries and Frameworks	219
What Is Open Source?	220
What Is Open Source?	220 221
What Is Open Source?	220 221 221
What Is Open Source? Hibernate for Persistence Setting Up Hibernate Hibernate Mapping Files	220 221 221 223
What Is Open Source?	220 221 221 223 225
What Is Open Source? Hibernate for Persistence Setting Up Hibernate Hibernate Mapping Files Working with Hibernate Hibernate Query Language	220 221 221 223 225
What Is Open Source? Hibernate for Persistence Setting Up Hibernate Hibernate Mapping Files Working with Hibernate Hibernate Query Language Other Hibernate Notes	220 221 223 225 235 236
What Is Open Source? Hibernate for Persistence Setting Up Hibernate Hibernate Mapping Files Working with Hibernate Hibernate Query Language Other Hibernate Notes ObJectRelationalBridge for Persistence	220221223225235236
What Is Open Source? Hibernate for Persistence Setting Up Hibernate Hibernate Mapping Files Working with Hibernate Hibernate Query Language Other Hibernate Notes ObJectRelationalBridge for Persistence Setting Up OJB	220221223225235236237
What Is Open Source? Hibernate for Persistence Setting Up Hibernate Hibernate Mapping Files Working with Hibernate Hibernate Query Language Other Hibernate Notes ObJectRelationalBridge for Persistence Setting Up OJB Building the User Repository	220221223225236236237238
What Is Open Source? Hibernate for Persistence Setting Up Hibernate Hibernate Mapping Files Working with Hibernate Hibernate Query Language Other Hibernate Notes ObJectRelationalBridge for Persistence Setting Up OJB Building the User Repository Working with OJB	220221223225236237238239
What Is Open Source? Hibernate for Persistence Setting Up Hibernate Hibernate Mapping Files Working with Hibernate Hibernate Query Language Other Hibernate Notes ObJectRelationalBridge for Persistence Setting Up OJB Building the User Repository Working with OJB Other OJB Notes	220221223225235236237238239241250
What Is Open Source? Hibernate for Persistence Setting Up Hibernate Hibernate Mapping Files Working with Hibernate Hibernate Query Language Other Hibernate Notes ObJectRelationalBridge for Persistence Setting Up OJB Building the User Repository Working with OJB Other OJB Notes Castor JDO	220221223225235236237238239241250
What Is Open Source? Hibernate for Persistence Setting Up Hibernate Hibernate Mapping Files Working with Hibernate Hibernate Query Language Other Hibernate Notes ObJectRelationalBridge for Persistence Setting Up OJB Building the User Repository Working with OJB Other OJB Notes Castor JDO Setting Up Castor JDO	220221223225235236237238239241250251
What Is Open Source? Hibernate for Persistence Setting Up Hibernate Hibernate Mapping Files Working with Hibernate Hibernate Query Language Other Hibernate Notes ObJectRelationalBridge for Persistence Setting Up OJB Building the User Repository Working with OJB Other OJB Notes Castor JDO Setting Up Castor JDO Configuring Castor JDO	220221223225236237238239241250251251
What Is Open Source? Hibernate for Persistence Setting Up Hibernate Hibernate Mapping Files Working with Hibernate Hibernate Query Language Other Hibernate Notes ObJectRelationalBridge for Persistence Setting Up OJB Building the User Repository Working with OJB Other OJB Notes Castor JDO Setting Up Castor JDO Configuring Castor JDO Working with Castor JDO	220221223225236237238239241251251252
What Is Open Source? Hibernate for Persistence Setting Up Hibernate Hibernate Mapping Files Working with Hibernate Hibernate Query Language Other Hibernate Notes ObJectRelationalBridge for Persistence Setting Up OJB Building the User Repository Working with OJB Other OJB Notes Castor JDO Setting Up Castor JDO Configuring Castor JDO Working with Castor JDO Other Castor JDO Notes	220221223225236237238239241250251251253253
What Is Open Source? Hibernate for Persistence Setting Up Hibernate Hibernate Mapping Files Working with Hibernate Hibernate Query Language Other Hibernate Notes ObJectRelationalBridge for Persistence Setting Up OJB Building the User Repository Working with OJB Other OJB Notes Castor JDO Setting Up Castor JDO Configuring Castor JDO Working with Castor JDO	220221223225236237238239241250251252253265

Chapter 12 Commercial Java Persistence	
Libraries and Frameworks	267
Using TopLink for Java Persistence Obtaining and Setting Up TopLink TopLink Configuration Working with TopLink Other TopLink Notes	268 268 269
Using CocoBase for Java Persistence	288
Setting Up CocoBase	289
Working with CocoAdminOther CocoBase Notes	
Summary	306
Chapter 13 Summary	307
All Kinds of Methods of Persisting Objects Understanding Relational Database Management	307
Systems	308
Using JDBC 1 for Relational Database Work	
What Is New in JDBC 2.1 and 3.0	
Writing a Persistence Layer	
Persistence-Related Design Patterns	
Unit Testing Persistence Layers Enterprise JavaBeans: Container Managed	
Persistence 2.0/2.1	
Writing to ODMG 3.0	315
Persistence with Java Data Objects Open Source Java Persistence Libraries and	316
Frameworks	317
Frameworks	317
Finally	
Indox	210