

Contents

1	Basic Concepts, Protocols and Terminology	1
1.1	Clients, Servers and Peers	1
1.2	Ports and Sockets	2
1.3	The Internet and IP Addresses	3
1.4	Internet Services, URLs and DNS	4
1.5	TCP	5
1.6	UDP.....	7
2	Starting Network Programming in Java.....	9
2.1	The <i>InetAddress</i> Class.....	9
2.2	Using Sockets.....	12
2.2.1	TCP Sockets	12
2.2.2	Datagram (UDP) Sockets.....	20
2.3	Network Programming with GUIs.....	28
3	Multithreading and Multiplexing	47
3.1	Thread Basics	48
3.2	Using Threads in Java	49
3.2.1	Extending the <i>Thread</i> Class	49
3.2.2	Explicitly Implementing the <i>Runnable</i> Interface	54
3.3	Multithreaded Servers	56
3.4	Locks and Deadlock.....	61
3.5	Synchronising Threads.....	63
3.6	Non-blocking Servers	71
3.6.1	Overview	71
3.6.2	Implementation	72
3.6.3	Further Details.....	81
4	File Handling	87
4.1	Serial Access Files	87
4.2	File Methods	93
4.3	Redirection.....	96

4.4	Command Line Parameters.....	96
4.5	Random Access Files	98
4.6	Serialisation [U.S. Spelling Serialization]	105
4.7	File I/O with GUIs	109
4.8	ArrayLists.....	115
4.9	ArrayLists and Serialisation.....	117
4.10	Vectors Versus ArrayLists	124
5	Remote Method Invocation (RMI)	129
5.1	The Basic RMI Process.....	129
5.2	Implementation Details	130
5.3	Compilation and Execution.....	134
5.4	Using RMI Meaningfully.....	136
5.5	RMI Security.....	145
6	CORBA	151
6.1	Background and Basics.....	151
6.2	The Structure of a <i>Java IDL</i> Specification	152
6.3	The <i>Java IDL</i> Process	156
6.4	Using Factory Objects.....	165
6.5	Object Persistence.....	175
6.6	RMI-IIOP.....	176
7	Java Database Connectivity (JDBC)	179
7.1	The Vendor Variation Problem.....	180
7.2	SQL and Versions of JDBC.....	180
7.3	Creating an ODBC Data Source	182
7.4	Simple Database Access	182
7.5	Modifying the Database Contents.....	189
7.6	Java DB/Apache Derby.....	193
7.7	Transactions	195
7.8	Meta Data.....	196
7.9	Using a GUI to Access a Database	200
7.10	Scrollable <i>ResultSet</i> s	203
7.11	Modifying Databases via Java Methods	207
7.12	Using the <i>DataSource</i> Interface.....	212
7.12.1	Overview and Support Software.....	212
7.12.2	Defining a JNDI Resource Reference	214
7.12.3	Mapping the Resource Reference onto a Real Resource.....	215
7.12.4	Obtaining the Data Source Connection	216
7.12.5	Data Access Objects	217
8	Servlets	225
8.1	Servlet Basics.....	226
8.2	Setting Up the Servlet API.....	226
8.3	Creating a Web Application	228

8.4	The Servlet URL and the Invoking Web Page	230
8.5	Servlet Structure.....	231
8.6	Testing a Servlet.....	233
8.7	Passing Data.....	233
8.8	Sessions.....	240
8.9	Cookies	252
8.10	Accessing a Database via a Servlet.....	260
9	JavaServer Pages (JSPs).....	269
9.1	The Rationale Behind JSPs.....	269
9.2	Compilation and Execution.....	270
9.3	JSP Tags	271
9.3.1	Directives	272
9.3.2	Declarations.....	272
9.3.3	Expressions	272
9.3.4	Scriptlets.....	273
9.3.5	Comments	274
9.3.6	Actions.....	274
9.4	Implicit JSP Objects	274
9.5	Collaborating with Servlets.....	276
9.6	JSPs in Action	276
9.7	Error Pages.....	281
9.8	Using JSPs to Access Remote Databases.....	284
10	JavaBeans.....	287
10.1	Creating a JavaBean.....	288
10.2	Exposing a Bean's Properties.....	293
10.3	Making Beans Respond to Events	296
10.4	Using JavaBeans Within an Application	297
10.5	Bound Properties.....	300
10.6	Using JavaBeans in JSPs.....	306
10.6.1	The Basic Procedure	306
10.6.2	Calling a Bean's Methods Directly	308
10.6.3	Using HTML Tags to Manipulate a Bean's Properties	312
11	Multimedia.....	327
11.1	Transferring and Displaying Images Easily	328
11.2	Transferring Media Files.....	332
11.3	Playing Sound Files	338
11.4	The Java Media Framework.....	340
12	Applets.....	347
12.1	<i>Applets</i> and <i>JApplets</i>	348
12.2	Applet Basics and the Development Process	348
12.3	The Internal Operation of Applets	350
12.4	Using Images in Applets	354

12.4.1	Using Class <i>Image</i>	355
12.4.2	Using Class <i>ImageIcon</i>	360
12.5	Scaling Images	362
12.6	Using Sound in Applets	363
Appendix: Structured Query Language (SQL)		369
A.1	DDL Statements	370
A.1.1	Creating a Table	370
A.1.2	Deleting a Table	370
A.1.3	Adding Attributes	371
A.1.4	Removing Attributes	371
A.2	DML Statements	371
A.2.1	SELECT	372
A.2.2	INSERT	373
A.2.3	DELETE.....	373
A.2.4	UPDATE	373
Index		375



<http://www.springer.com/978-1-4471-5254-5>

An Introduction to Network Programming with Java

Java 7 Compatible

Graba, J.

2013, XII, 380 p. 84 illus.,

ISBN: 978-1-4471-5254-5