

Contents

Introduction	xxvii
---------------------	--------------

Part I: Getting Up and Running with PHP

Chapter 1: Introducing PHP	3
-----------------------------------	----------

What Is PHP?	3
Why Use PHP?	5
The Evolution of PHP	7
What's New in PHP 5.3	7
Namespaces	7
The goto Operator	8
Nowdoc Syntax	8
Shorthand Form of the Ternary Operator	8
Advanced Changes	9
Summary	9

Chapter 2: Your First PHP Script	11
---	-----------

Installing PHP	12
Installing on Ubuntu Linux	12
Installing on Windows	15
Installing on Mac OS X	17
Testing Your Installation	19
Setting Your Time Zone	21
Other Ways to Run PHP	22
Running PHP with other Web Servers	23
Compiling PHP Yourself	23
Running PHP Remotely	24
Creating Your First Script	24
Embedding PHP within HTML	25
Enhancing the Script Further	28
Using Comments to Make Code More Readable	29
Summary	30
Exercise	30

Part II: Learning the Language

Chapter 3: PHP Language Basics 33

Using Variables in PHP	33
Naming Variables	34
Creating Variables	34
Understanding Data Types	35
About Loose Typing	36
Testing the Type of a Variable	36
Changing a Variable's Data Type	38
Changing Type by Casting	38
Operators and Expressions	40
Operator Types	40
Understanding Operator Precedence	47
Constants	48
Summary	50
Exercises	50

Chapter 4: Decisions and Loops 51

Making Decisions	52
Simple Decisions with the if Statement	52
Providing an Alternative Choice with the else Statement	54
Testing One Expression Many Times with the switch Statement	55
Compact Coding with the Ternary Operator	56
Doing Repetitive Tasks with Looping	59
Simple Looping with the while Statement	59
Testing at the End: The do . . . while Loop	60
Neater Looping with the for Statement	61
Escaping from Loops with the break Statement	64
Skipping Loop Iterations with the continue Statement	64
Creating Nested Loops	65
Mixing Decisions and Looping with HTML	70
Summary	72
Exercises	72

Chapter 5: Strings 73

Creating and Accessing Strings	74
Including More Complex Expressions within Strings	75
Using Your Own Delimiters	76

Other Ways to Create Strings	77
Finding the Length of a String	77
Accessing Characters within a String	78
Searching Strings	78
Searching Strings with strstr()	79
Locating Text with strpos() and strrpos()	79
Finding the Number of Occurrences with substr_count()	80
Searching for a Set of Characters with strpbrk()	81
Replacing Text within Strings	81
Replacing All Occurrences using str_replace()	81
Replacing a Portion of a String with substr_replace()	82
Translating Characters with strtr()	87
Dealing with Upper- and Lowercase	87
Formatting Strings	89
General-Purpose Formatting with printf() and sprintf()	89
Trimming Strings with trim(), ltrim(), and rtrim()	95
Padding Strings with str_pad()	96
Wrapping Lines of Text with wordwrap()	96
Formatting Numbers with number_format()	98
Summary	99
Exercises	100
Chapter 6: Arrays	101
The Anatomy of an Array	102
Creating Arrays	102
Accessing Array Elements	103
Changing Elements	104
Outputting an Entire Array with print_r()	105
Extracting a Range of Elements with array_slice()	107
Counting Elements in an Array	108
Stepping Through an Array	109
Looping Through Arrays with foreach	113
Using foreach to Loop Through Values	114
Using foreach to Loop Through Keys and Values	114
Altering Array Values with foreach	115
Working with Multidimensional Arrays	116
Creating a Multidimensional Array	117
Accessing Elements of Multidimensional Arrays	118
Looping Through Multidimensional Arrays	119

Contents

Manipulating Arrays	121
Sorting Arrays	121
Adding and Removing Array Elements	128
Merging Arrays Together	134
Converting Between Arrays and Strings	136
Converting an Array to a List of Variables	137
Summary	138
Exercises	139
Chapter 7: Functions	141
What Is a Function?	141
Why Functions Are Useful	142
Calling Functions	142
Working with Variable Functions	144
Writing Your Own Functions	145
Defining Parameters	145
Optional Parameters and Default Values	147
Returning Values from Your Functions	148
Understanding Variable Scope	150
Creating Anonymous Functions	154
Working with References	158
Passing References to Your Own Functions	159
Returning References from Your Own Functions	160
Writing Recursive Functions	160
Summary	163
Exercises	164
Chapter 8: Objects	165
What Is Object-Oriented Programming?	166
Advantages of OOP	166
Understanding Basic OOP Concepts	167
Classes	167
Objects	167
Properties	168
Methods	168
Creating Classes and Objects in PHP	168
Creating and Using Properties	169
Understanding Property Visibility	169
Declaring Properties	170
Accessing Properties	170

Static Properties	172
Class Constants	173
Working with Methods	174
Method Visibility	174
Creating a Method	174
Calling Methods	175
Adding Parameters and Returning Values	175
Accessing Object Properties from Methods	175
Static Methods	179
Using Hints to Check Method Arguments	180
Making Your Classes Self-Contained with Encapsulation	182
Object Overloading with <code>__get()</code>, <code>__set()</code>, and <code>__call()</code>	183
Overloading Property Accesses with <code>__get()</code> and <code>__set()</code>	184
Overloading Method Calls with <code>__call()</code>	187
Other Overloading Methods	191
Using Inheritance to Extend the Power of Objects	192
Overriding Methods in the Parent Class	196
Preserving the Functionality of the Parent Class	198
Blocking Inheritance and Overrides with Final Classes and Methods	199
Using Abstract Classes and Methods	200
Working with Interfaces	204
Constructors and Destructors	209
Setting Up New Objects with Constructors	209
Cleaning Up Objects with Destructors	210
Automatically Loading Class Files	212
Storing Objects as Strings	213
Determining an Object's Class	215
Summary	217
Exercises	218

Part III: Using PHP in Practice

Chapter 9: Handling HTML Forms with PHP	221
How HTML Forms Work	222
Capturing Form Data with PHP	230
Dealing Securely with Form Data	234
Handling Empty Form Fields	234
Dealing with Multi-Value Fields	236
Generating Web Forms with PHP	242
Storing PHP Variables in Forms	249
Creating File Upload Forms	257

Contents

Accessing Information on Uploaded Files	257
Limiting the Size of File Uploads	258
Storing and Using an Uploaded File	259
Redirecting after a Form Submission	264
Summary	266
Exercises	266
Chapter 10: Preserving State With Query Strings, Cookies, and Sessions	267
Saving State with Query Strings	268
Building Query Strings	268
Accessing Data in Query Strings	270
Working with Cookies	274
Cookie Components	274
Setting a Cookie in PHP	276
Accessing Cookies in Your Scripts	277
Removing Cookies	277
Using PHP Sessions to Store Data	282
Creating a Session	282
Reading and Writing Session Data	283
Destroying a Session	289
Passing Session IDs in Query Strings	289
Changing Session Behavior	290
Summary	296
Exercises	296
Chapter 11: Working with Files and Directories	297
Understanding Files and Directories	298
Getting Information on Files	298
Time-Related Properties	299
Retrieving a Filename from a Path	299
Opening and Closing Files	300
Opening a File with fopen()	300
Closing a File with fclose()	302
Reading and Writing to Files	302
Reading and Writing Strings of Characters	303
Testing for the End of a File	306
Reading One Line at a Time	307
Reading CSV Files	308
Reading and Writing Entire Files	309

Random Access to File Data	311
Working with File Permissions	312
Changing Permissions	313
Checking File Permissions	314
Copying, Renaming, and Deleting Files	315
Working with Directories	316
Other Directory Functions	318
Working with Directory Objects	320
Telling a File from a Directory	321
Building a Text Editor	325
The Text Editor Script	325
Testing the Editor	328
Examining the Editor Code	329
Summary	334
Exercise	335
Chapter 12: Introducing Databases and SQL	337
<hr/>	
Deciding How to Store Data	338
Database Architectures	338
Database Models	339
Choosing a Database	340
Understanding Relational Databases	341
Normalization	341
Talking to Databases with SQL	343
Setting Up MySQL	349
Starting the MySQL Server	349
Setting Up the MySQL root Password	350
A Quick Play with MySQL	353
Creating a New Database	353
Creating a Table	354
Adding Data to a Table	356
Reading Data from a Table	356
Updating Data in a Table	357
Deleting Data from a Table	358
Deleting Tables and Databases	358
Connecting to MySQL from PHP	359
Making a Connection	360
Handling Errors	360
Reading Data	361
Summary	365
Exercises	365

Chapter 13: Retrieving Data from MySQL with PHP **367**

Setting Up the Book Club Database	367
The BINARY Attribute and Collations	369
The UNIQUE Constraint	370
The ENUM Data Type	370
The TIMESTAMP Data Type	371
Retrieving Data with SELECT	371
Limiting the Number of Rows Returned	372
Sorting Results	373
Using Pattern Matching for Flexible Queries	374
Summarizing Data	376
Eliminating Duplicate Results	377
Grouping Results	378
Pulling Data from Multiple Tables	379
Using Aliases	381
Other Useful MySQL Operators and Functions	382
Creating a Member Record Viewer	385
Creating the config.php File	386
Creating the common.inc.php File	387
Creating the DataObject Class File	388
Building the Member Class	390
Building the LogEntry Class	394
Creating the view_members.php Script	395
Creating the view_member.php Script	399
Testing the Application	400
Summary	401
Exercises	402

Chapter 14: Manipulating MySQL Data with PHP **403**

Inserting Records	403
Updating Records	406
Deleting Records	407
Building a Member Registration Application	408
Adding More Common Code	408
Enhancing the Member Class	409
Creating the Registration Script	411
Testing the Application	417
Creating a Members' Area	417
Adding an Authentication Method to the Member Class	418
Enhancing the LogEntry Class to Record Page Views	419

Adding More Common Code	420
Writing the Login Page Script	421
Creating a Logout Function	424
Creating the Pages for the Members' Area	424
Testing the Members' Area	426
Creating a Member Manager Application	428
Adding Update and Delete Methods to the Member Class	428
Adding a Deletion Method to the LogEntry Class	430
Tweaking the view_members.php Script	431
Creating the view_member.php Script	431
Testing the Member Manager	437
Summary	438
Exercises	439
Chapter 15: Making Your Job Easier with PEAR	441
<hr/>	
Installing PEAR Packages	442
Testing the PEAR Package Manager on Ubuntu	442
Testing PEAR using Mac OS X and MAMP	443
Installing and Testing PEAR with WampServer on Windows	444
Installing a Package	446
Installing Dependencies	447
Uninstalling Packages	447
Using a PEAR Package	448
Creating HTML Tables with the HTML_Table Package	450
Web Forms the Easy Way with HTML_QuickForm	455
Installing HTML_QuickForm	455
Working with HTML_QuickForm	455
Using Validation Rules	460
Summary	470
Exercises	470
Chapter 16: PHP and the Outside World	471
<hr/>	
Working with Dates and Times	472
Understanding Timestamps	472
Getting the Current Date and Time	472
Creating Your Own Timestamps	473
Extracting Date and Time Values from a Timestamp	475
Formatting Date Strings	478
Checking Date Values	481

Contents

Working with Microseconds	481
DateTime: The Future of PHP Date/Time Handling	487
Working with HTTP	488
Understanding HTTP Requests	489
Exploring HTTP Responses	490
Modifying an HTTP Response	493
Getting Information from the Web Server	494
Sending Email	497
Specifying the Sender Address and Adding Headers	498
Controlling the Return Path Email Address	499
Sending HTML Emails	500
Summary	505
Exercises	506
Chapter 17: Generating Images with PHP	507
<hr/>	
Basics of Computer Graphics	507
Color Theory	508
Coordinate Systems	508
Image Types	509
Creating Images	510
Creating a New Image	510
Allocating Colors	510
Outputting Images	511
Drawing in an Image	512
Manipulating Images	520
Opening an Existing Image	521
Applying a Watermark	523
Creating Thumbnails	528
Using Text in Images	531
Adding Standard Text	531
Using TrueType Fonts	533
Summary	536
Exercises	537
Chapter 18: String Matching with Regular Expressions	539
<hr/>	
What Is a Regular Expression?	540
Pattern Matching in PHP	541
Exploring Regular Expression Syntax	542

Matching Literal Characters	542
Matching Types of Characters using Character Classes	544
Matching Multiple Characters	545
Greedy and Non-Greedy Matching	546
Using Subpatterns to Group Patterns	546
Referring to Previous Subpattern Matches	547
Matching Alternative Patterns	548
Using Anchors to Match at Specified Positions	548
Finding Multiple Matches with preg_match_all()	550
Searching Arrays with preg_grep()	556
Replacing Text	557
Replacing Text with preg_replace()	557
Replacing Text using a Callback Function	560
Altering Matching Behavior with Pattern Modifiers	560
Splitting a String with a Regular Expression	562
Summary	571
Exercises	571

Chapter 19: Working with XML **573**

What Is XML?	574
XML Document Structure	575
Major Parts of an XML Document	576
XML Syntax Rules	577
Using XML Elements and Attributes	578
Valid XML Documents: DTDs and XSDs	578
Reading XML Documents with PHP	582
How XML Parser Works	582
Creating a New Parser	582
Creating Event Handlers	583
Parsing the XML Document	584
Dealing with Parse Errors	584
Writing and Manipulating XML Documents with PHP	589
DOM Basics	590
Creating an XML Document using the DOM	595
Manipulating XML Documents using the DOM	599
Doing XML the Easy Way with SimpleXML	606
Reading an XML Document	608
Creating an XML Document	610
Converting Between SimpleXML and DOM Objects	612
Working with XSL and XSLT	613
Summary	615
Exercises	616

Contents

Chapter 20: Writing High-Quality Code	619
Writing Modular Code	620
Including Files	621
Including a File Only Once	622
Working with Include Paths	623
Dynamic Includes	625
Using Namespaces to Avoid Clashes	625
Using Coding Standards for Consistency	630
Documenting Your Code	631
Writing Good Comments	632
Using phpDocumentor to Generate External Documentation	633
Checking Input and Encoding Output	641
Checking Input	642
Encoding Output	643
Handling Errors	644
Understanding Error Levels	644
Triggering Errors	646
Controlling Where Error Messages Are Sent	647
Logging Your Own Error Messages	647
Letting Your Script Handle Errors	648
Fine-Tuning Error Reporting	651
Using Exception Objects to Handle Errors	652
Separating Application Logic from Presentation Logic	660
Automated Code Testing with PHPUnit	666
Summary	671
Exercises	672
Appendix A: Solutions to Exercises	673
Appendix B: Configuring PHP	719
Appendix C: Alternatives to MySQL	757
Appendix D: Using PHP from the Command Line	765
Index	775