Beginning PHP5

Beginning PHP5

Dave W. Mercer Allan Kent Steven D. Nowicki David Mercer Dan Squier Wankyu Choi

with Heow Eide-Goodman Edward Lecky-Thompson and Clark Morgan



Beginning PHP5

Published by Wiley Publishing, Inc. 10475 Crosspoint Boulevard Indianapolis, IN 46256 www.wiley.com

Copyright © 2004 by Wiley Publishing, Inc., Indianapolis, Indiana

Published simultaneously in Canada

CIP Data available upon request.

eISBN: 0-7645-7723-9

Manufactured in the United States of America

10987654321

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except as permitted under Sections 107 or 108 of the 1976 United States Copyright Act, without either the prior written permission of the Publisher, or authorization through payment of the appropriate per-copy fee to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, (978) 750-8400, fax (978) 646-8600. Requests to the Publisher for permission should be addressed to the Legal Department, Wiley Publishing, Inc., 10475 Crosspoint Blvd., Indianapolis, IN 46256, (317) 572-3447, fax (317) 572-4447, E-Mail: permcoordinator@wiley.com.

LIMIT OF LIABILITY/DISCLAIMER OF WARRANTY: THE PUBLISHER AND THE AUTHOR MAKE NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE ACCURACY OR COMPLETENESS OF THE CONTENTS OF THIS WORK AND SPECIFICALLY DISCLAIM ALL WAR-RANTIES, INCLUDING WITHOUT LIMITATION WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. NO WARRANTY MAY BE CREATED OR EXTENDED BY SALES OR PROMOTIONAL MATERIALS. THE ADVICE AND STRATEGIES CONTAINED HEREIN MAY NOT BE SUITABLE FOR EVERY SITUATION. THIS WORK IS SOLD WITH THE UNDERSTANDING THAT THE PUB-LISHER IS NOT ENGAGED IN RENDERING LEGAL, ACCOUNTING, OR OTHER PROFESSIONAL SERVICES. IF PROFESSIONAL ASSISTANCE IS REQUIRED, THE SERVICES OF A COMPETENT PROFESSIONAL PERSON SHOULD BE SOUGHT. NEITHER THE PUBLISHER NOR THE AUTHOR SHALL BE LIABLE FOR DAMAGES ARISING HEREFROM. THE FACT THAT AN ORGANIZA-TION OR WEBSITE IS REFERRED TO IN THIS WORK AS A CITATION AND/OR A POTENTIAL SOURCE OF FURTHER INFORMATION DOES NOT MEAN THAT THE AUTHOR OR THE PUB-LISHER ENDORSES THE INFORMATION THE ORGANIZATION OR WEBSITE MAY PROVIDE OR RECOMMENDATIONS IT MAY MAKE. FURTHER, READERS SHOULD BE AWARE THAT INTER-NET WEBSITES LISTED IN THIS WORK MAY HAVE CHANGED OR DISAPPEARED BETWEEN WHEN THIS WORK WAS WRITTEN AND WHEN IT IS READ.

For general information on our other products and services or to obtain technical support, please contact our Customer Care Department within the U.S. at (800) 762-2974, outside the U.S. at (317) 572-3993 or fax (317) 572-4002.

Wiley also publishes its books in a variety of electronic formats. Some content that appears in print may not be available in electronic books.

Trademarks: Wiley, the Wiley Publishing logo, Wrox, the Wrox logo, Programmer to Programmer, and related trade dress are trademarks or registered trademarks of John Wiley & Sons, Inc. and/or its affiliates, in the United States and other countries, and may not be used without written permission. All other trademarks are the property of their respective owners. Wiley Publishing, Inc., is not associated with any product or vendor mentioned in this book.

About the Authors

Dave W. Mercer

Dave W. Mercer has 15 years' experience in industrial and process engineering, and systems analysis, and is CTO for a B2B, responsible for the development and deployment of online automated business services. His entire site, hosting server, and the applications he builds for hosted clients are programmed in PHP using Postgres or MySQL as the database.

Allan Kent

Allan Kent is a PHP programmer who runs his own company and is a co-author of *Beginning PHP 4*. Allan has been programming seriously for the past dozen years and, other than the single blemish when he achieved a diploma in Cobol programming, is entirely self-taught.

Steven D. Nowicki

Steven D. Nowicki is Director of Software development at The Content Project, a Santa Monica, California–based consulting firm currently developing a massive enterprise resource planning and contact management system comprising more than 300,000 lines of OO PHP code. He has a decade of experience in large-scale software development and system architecture on all major platforms.

David Mercer

David Mercer is a PHP programmer and contributed to *Beginning PHP 4*. He has maintained a keen interest in all things open source ever since he managed to put together a working Beowulf cluster by nicking old computer parts from colleagues and assembling them under his desk. He has worked on Wrox open source titles about PHP, Perl, and Linux.

Dan Squier

Dan Squier is a longtime contributor to the Wrox community and a PHP programmer.

Wankyu Choi

Wankyu Choi is an accomplished PHP programmer and lead author of *Beginning PHP 4*. He holds a Master's degree in English/Korean interpretation and translation from the Graduate School of Translation & Interpretation.

Heow Eide-Goodman

Heow Eide-Goodman is a member of NYPHP and LispNYC who uses PHP in his day job to do Web sites, services, and back-office transformations among SQL Server, Interbase/Firebird, and MySQL.

Edward Lecky-Thompson

Edward Lecky-Thompson is the founder and director of Ashridge New Media, a professional new media technology consultancy based in Berkhamsted, just north of London, England. Self-described as "utterly obsessed with PHP," Ed has more than six years' experience in commercial software development and enterprise-level systems architecture across myriad platforms, with particularly strong exposure to PHP and Apache on Linux-based platforms.

Clark Morgan

Clark Morgan is an experienced programmer who creates and administers databases with Web sites using PHP and MySQL for Fusion Computing and Media.

This book has been a team effort and represents the efforts of many people. The current team of authors dedicates this book to the previous authors for their great introduction to earlier versions of PHP and to the editors and managers who worked so hard to help us build another great introduction to the new PHP5, especially Debra Williams Cauley, Maryann Steinhart, and David Mercer. We also thank the developers of PHP, the ZEND engine, and all the folks who've contributed the open-source software and code examples that make PHP the ideal scripting language for Web applications.

Credits

Acquisitions Editor

Debra Williams Cauley

Project Editor

Maryann Steinhart

Technical Editors

David Mercer Heow Eide-Goodman

Production Editor

Eric Newman

Editorial Manager

Mary Beth Wakefield

Vice President & Executive Group Publisher

Richard Swadley

Vice President and Executive Publisher

Bob Ipsen

Vice President and Publisher

Joseph B. Wikert

Executive Editorial Director

Mary Bednarek

Introduction	xix
Chapter 1: Getting Up and Running	1
The Roots of PHP	1
Installing, Configuring, and Running PHP	2
System Requirements	3
php.ini, the PHP Configuration File	3
Setting Up a Test Machine	4
Network Connections	4
Where Do You Start?	4
Running PHP5	5
Installing PHP5 with Linux and Apache	6
Choosing Your Installation Method	6
Setting up Apache for PHP	16
Installing PHP5 on Windows 2000/Internet Information Server (IIS) 5	19
Downloading PHP5	20
php.ini and Extensions	22
Testing and Troubleshooting	26
Configuring PHP	28
php.ini	28
PHP Extensions	29
Caching	29
Summary	29
Exercise	30
Chapter 2: Writing Simple Programs	31
Create a Simple PHP Program	31
Explore Some Details	33
How PHP Code Works	33
How Online PHP Programs Run	36
Web Communications: Internet Protocols and HTTP	36
TCP/IP	37
The HTTP Protocol	27

Using Variables in PHP	41
Issues Concerning Creating Variables	41
Defined Constants	45
Operators and Expressions	46
PHP Operators	46
PHP Expressions	47
Operator Types	47
Arrays	58
Summary	62
Exercises	62
Chapter 3: PHP, HTML, and State	63
HTML Primer	63
The HTML Document Type Definition	65
The Form and Input Elements	65
Accessing PHP and HTTP Data	67
Predefined Variables	67
Variables in HTTP Request and Response	69
SuperGlobal Arrays	69
Links	72
Query Strings	73
HTML (Web) Forms	74
HTML Form Elements	74
HTML Form Fields (Controls) and PHP	79
The Concept of State	108
State Maintenance	108
Native Sessions in PHP	116
Summary	120
Exercise	120
Chapter 4: Decisions, Loops, and Arrays	123
Designing PHP Program Logic	123
Problem Statement	123
Writing Pseudo Code	124
Boolean Logic	125
Conditional or Branching Statements	127
An Example of Branching	128
if Statements	129
switch Statements	140

Loops and Arrays	145
Loops	145
Arrays	161
Summary	185
Exercise	185
Chapter 5: Robust and Healthy Code	187
Testing and Debugging	187
Values That Break Your Code	188
Basic Error Types	189
Debugging PHP Script	189
Understanding PHP Error Messages	189
Syntax Errors	190
Logic Errors	193
Runtime Errors	193
Debugging and Handling Errors in PHP5	198
Preventing the Display of Private Information	198
Roll-Your-Own Debugging Tools	198
Form Validation	199
Using the exit Statement	200
String Validation and Regular Expressions	204
Validating Data Entry	213
Using Regexps to Check File Path Parameters	218
Handling Errors Gracefully	220
Configuring PHP for Error Handling	220
Try/Catch—New in PHP5	222
Summary	229
Exercise	230
Chapter 6: Writing High-Quality Code	231
Development Planning	231
Formal Software Development Processes	232
Optimizing Your Code	234
Using Coding Standards	23 4
Writing User-Defined Functions in PHP	236
The Structure of Functions	237
Switching Functions	243
How Values Get Inside Functions	245

247
247
248
251
251
254
257
257
258
259
260
260
261
264
264
269
272
274
278
282
287
287
288 290
292
294
295
300
307
312
312
313
313
313 315
315 315
316
317

Valid XML Documents: DTDs and XML Schemas Web Services PHP and XML PHP4 XML Functions XML Parsers	318 322 323 329 332 334
PHP and XML PHP4 XML Functions	322 323 329 332 334 334
PHP4 XML Functions	323 329 332 334 334
	329 332 334 334
XML Parsers	332 334 334
	334 334
The Document Object Model	334
PHP5 XML Functions	
The SimpleXML Extension	
Changing a Value with simpleXML	338
Summary	340
Exercise	341
Chapter 9: An Introduction to Databases and SQL	343
Storing Data	344
Databases and Databases	344
Database Architectures	345
Choosing a Database	346
Setting Up MySQL	347
Installing on Windows	347
Installing on Linux	348
Configuring MySQL	350
Relational Databases	351
Normalization	352
Talking to Databases with SQL	355
A Quick Play with MySQL	360
Starting the mysql Client Program	360
Selecting a Database to Use	361
Looking at Tables Inside a Database	362
Using SQL to Look at Data	363
Manipulating Data in a Database	364
Using GRANT and REVOKE Commands	365
Connecting to MySQL from PHP	367
PHP MySQL Connectivity	368
Basic Connection Functions	368
Handling Server Errors	371
Creating Databases and Tables from MySQL	375
Creating the Sample Database and Tables with PHP	379
Altering Tables	383
Inserting Data into a Table	385
Summary	388

Chapter 10: Retrieving Data from MySQL Using PHP	391	
Retrieving Data Using PHP	391	
SQL Statements for Retrieving Data	394	
Server Functions	394	
Retrieving Fields	395	
Getting Summaries	400	
More Complex Retrievals	401	
Putting It All Together	404	
The common_db.inc File Contents	405	
The userviewer.php File Contents	407	
Using the User Viewer	414	
Summary	415	
Chapter 11: Using PHP to Manipulate Data in MySQL	417	
Inserting Records Using PHP	417	
Special Characters	418	
htmlspecialchars()	419	
Updating and Deleting Records in Tables	420	
Working with Date and Time Type Fields	422	
Getting Information on Database Tables	426	
ENUM Options and Field Defaults	431	
Creating a User Registration Script	435	
register.php	435	
Choosing Actions to Take	440	
Creating an Access Logger Script	442	
auth_user.php	442	
access_logger.php	444	
Creating a User Manager	449	
userman.php	449	
Choosing an Action to Take	457	
Summary	458	
Exercises	459	
Chapter 12: An Introduction to Object-Oriented Programming	461	
What Is Object-Oriented Programming?	461	
Understanding OOP Concepts	463	
Classes	463	
Objects	464	
Inheritance	477	

	Contents
Interfaces	486
Encapsulation	489
Changes to 00 in PHP5	490
Summary	491
Exercises	491
Chapter 13: Working with UML and Classes	493
The Unified Modeling Language	493
Why Would You Want to Use UML?	494
UML Software	494
Class Diagrams	495
Creating the Contact Manager	496
The Contact Manager UML Diagrams	496
Other Useful UML Diagrams	500
Creating the Entity Class	503
Putting it All Together	509
The PropertyObject Class	509
The Contact Type Classes The DataManager Class	512 516
The Entity, Individual, and Organization Classes	517
Making Use of the System	525
Summary	527
Chapter 14: PEAR	529
·	
What Is PEAR?	529
How Is PEAR Structured?	530
Recapping PEAR Standards	532
Installing PEAR Packages	534
Finding Your Way Around pear.php.net	534
Exploring PEAR Classes and Applications	534
Installing and Using the PEAR Package Manager	535 545
Using PEAR Packages Building an Application Using Two PEAR Components	545 551
Summary	566 566
Chapter 15: PHP5 and E-Mail	567
E-Mail Background	567
Internet Mail Protocols	568