

Join the discussion @ p2p.wrox.com



Wrox Programmer to Programmer™



Microsoft® Access® 2010

Programmer's Reference

Teresa Hennig, Rob Cooper, Geoffrey Griffith, Jerry Dennison



Programmer to Programmer™

Get more out of wrox.com

Interact

Take an active role online by participating in our P2P forums @ p2p.wrox.com

Wrox Online Library

Hundreds of our books are available online through Books24x7.com

Wrox Blox

Download short informational pieces and code to keep you up to date and out of trouble!

Join the Community

Sign up for our free monthly newsletter at newsletter.wrox.com

Browse

Ready for more Wrox? We have books and e-books available on .NET, SQL Server, Java, XML, Visual Basic, C#/ C++, and much more!

Contact Us.

We always like to get feedback from our readers. Have a book idea?

Need community support? Let us know by e-mailing wrox-partnerwithus@wrox.com

MICROSOFT® ACCESS® 2010

PROGRAMMER'S REFERENCE

INTRODUCTION	xxxiii
CHAPTER 1 Introduction to Microsoft Access 2010	1
CHAPTER 2 New Features	13
CHAPTER 3 Upgrading and Converting to Access 2010	33
CHAPTER 4 Macros in Access 2010	63
CHAPTER 5 Using the VBA Editor	119
CHAPTER 6 VBA Basics	141
CHAPTER 7 Using VBA in Access	173
CHAPTER 8 Creating Classes in VBA	227
CHAPTER 9 Extending VBA with APIs	283
CHAPTER 10 Working with the Windows Registry	319
CHAPTER 11 Using DAO to Access Data	355
CHAPTER 12 Using ADO to Access Data	419
CHAPTER 13 Using SQL with VBA	459
CHAPTER 14 Using VBA to Enhance Forms	489
CHAPTER 15 Enhancing Reports with VBA	549
CHAPTER 16 Customizing the Ribbon	581
CHAPTER 17 Customizing the Office Backstage	631
CHAPTER 18 Working with Office 2010	671
CHAPTER 19 Working with SharePoint	707
CHAPTER 20 Working with .NET	757
CHAPTER 21 Building Client-Server Applications with Access	799
CHAPTER 22 The Access 2010 Templates	841
CHAPTER 23 Access Runtime Deployment	861
CHAPTER 24 Database Security	875
CHAPTER 25 Access 2010 Security Features	919

Continues

APPENDIX A	The Access Object Model	945
APPENDIX B	DAO Object Method and Property Descriptions	999
APPENDIX C	ADO Object Model Reference.....	1035
APPENDIX D	64-Bit Access	1095
APPENDIX E	References for Projects.....	1103
APPENDIX F	Reserved Words and Special Characters	1113
APPENDIX G	Naming Conventions.....	1127
APPENDIX H	The Access Source Code Control.....	1137
APPENDIX I	Tips and Tricks	1145
INDEX.....		1191

Microsoft® Access® 2010

PROGRAMMER'S REFERENCE

Teresa Hennig
Rob Cooper
Geoffrey Griffith
Jerry Dennison



WILEY

Wiley Publishing, Inc.

Microsoft® Access® 2010 Programmer's Reference

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

Copyright © 2010 by Teresa Hennig, Rob Cooper, Geoffrey Griffith, Jerry Dennison

Published by Wiley Publishing, Inc., Indianapolis, Indiana

Published simultaneously in Canada

ISBN: 978-0-470-59166-6

Manufactured in the United States of America

10 9 8 7 6 5 4 3 2 1

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 Permissions Department, John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030, (201) 748-6011, fax (201) 748-6008, or online at <http://www.wiley.com/go/permissions>.

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 warranties, 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 publisher 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 organization or Web site 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 publisher endorses the information the organization or Web site may provide or recommendations it may make. Further, readers should be aware that Internet Web sites 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 please contact our Customer Care Department within the United States at (877) 762-2974, outside the United States 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.

Library of Congress Control Number: 2010929738

Trademarks: Wiley, the Wiley logo, Wrox, the Wrox logo, Wrox 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. Microsoft and Access are registered trademarks of Microsoft Corporation in the United States and/or other countries. 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.

*To my family and incredible friends, you help me
to realize that every day is filled with precious
moments — sights, sounds, and emotions to be
cherished. May we all remember to pause and savor
the blessings that we have, especially the time that
we share with those we love.*

— TERESA

*To my family, for all of the love and support you've
shown me over the years.*

— ROB

*To my wife, Jamie, and my son, Ryan, I couldn't
have been blessed with a better family and this would
not have been possible without all of your love and
support!*

— GEOFF

*To my wife Dianne, my son, Jeremy, my daughter,
Amber, and my late parents, Clifford and Jeanette
Dennison. You are my inspiration and my life. Thanks
Dad, for instilling into me the insatiable appetite to
explore and learn, without which I would not be
where I am. To my grandchildren: Brianna, Fisher,
and Huntlee. You are our future.*

— JERRY

CREDITS

EXECUTIVE EDITOR

Robert Elliott

PROJECT EDITOR

Tom Dinse

**CONTRIBUTING AUTHORS AND
TECHNICAL EDITORS**

Ben Clothier

Doug (Dagi) Yudovich

TECHNICAL EDITORS

Dr. Jeff Boyce

Albert D. Kallal

Armen Stein

TIP CONTRIBUTORS

Dane Miller

Garry Robinson

Steve Schapel

Larry Strange

PRODUCTION EDITOR

Kathleen Wisor

COPY EDITORS

Nancy Rapoport

Paula Lowell

EDITORIAL DIRECTOR

Robyn B. Siesky

EDITORIAL MANAGER

Mary Beth Wakefield

MARKETING MANAGER

Ashley Zurcher

PRODUCTION MANAGER

Tim Tate

**VICE PRESIDENT AND EXECUTIVE
GROUP PUBLISHER**

Richard Swadley

**VICE PRESIDENT AND EXECUTIVE
PUBLISHER**

Barry Pruett

ASSOCIATE PUBLISHER

Jim Minatel

PROJECT COORDINATOR, COVER

Lynsey Stanford

PROOFREADER

Nancy Carrasco

INDEXER

Robert Swanson

COVER DESIGNER

Michael E. Trent

COVER IMAGE

© Randolph Jay Braun/istockphoto

ABOUT THE AUTHORS



TERESA HENNIG loves challenges, solving problems, and making things happen. So it is no surprise that she was immediately hooked on Access; by its tools for rapid development and the ability to quickly create intuitive, user-friendly applications. Within a month, she started her own company as an Access developer and business consultant (1997). With a strong background in business and project management, Teresa (and her company, Data Dynamics NW), focuses on using Access to provide cost-effective custom database solutions. In recognition of her expertise and dedication to the Access community, Teresa has been awarded as a Microsoft Access MVP (Most Valuable Professional) every year since 2006. She continues to serve as President of both the Pacific Northwest Access Developers Group (PNWADG) and the Seattle Access Group. Her leadership, expertise, and service to the Access community have also earned her recognition as a National Community Champion from INETA. Being the lead author of several Access books has afforded Teresa the opportunity to work with esteemed colleagues and to invite others to share the experience of becoming published authors. Learn more at www.DataDynamicsNW.com and www.SeattleAccess.org.



ROB COOPER is a Senior Test Lead at Microsoft. He started at Microsoft as a support engineer in Charlotte, North Carolina in 1998 and joined the Access 2003 test team in Redmond in 2001. During the Access 2010 release, he led the team that worked on exciting new features such as the Macro Designer, Navigation Control, Web Browser Control, and the design and migration of objects for Access Services. He also helped test the 64-bit version of VBA in Office 2010 and programmability and security in Access 2010. He is currently working on Microsoft Bing. Rob has spoken at user group meetings and conferences such as the Portland Access User Group conference and Office DevCon in Brisbane, Australia, and has written for the Microsoft Knowledge Base. Aside from writing code in Access and C#, he also enjoys spending time with his family cooking, watching movies, going to the zoo and aquarium, and hanging out in and around Seattle.



GEOFFREY GRIFFITH is a professional software developer from Colorado, where he owns his own software consulting company. He holds a Bachelor of Science degree in Computer Science from the University of Colorado at Boulder, where he studied software engineering. He began his Access life working on various database systems, starting with Access 2.0, developed at GBS, Inc., a software development firm in Boulder, Colorado. An avid Access user, he worked on the Microsoft Access Team for the Access 2007 release. Today, Geoff continues his work with Access, by writing books about Access and building applications that use Access databases.



JERRY DENNISON has over 18 years of professional experience designing and developing MS Access database applications beginning with Access v1.0. He has been awarded the Microsoft Office Access Most Valuable Professional Award for the past four years. Jerry is an active contributor and Administrator at UtterAccess.com, the premier MS Access forum on the Web. He is considered by many of his peers to be one of the foremost experts on the Forms of Data Normalization (a set of guidelines for relational databases developed by Dr. E. F. Codd). Jerry currently lives in Easley, South Carolina with his wife of 21 years and their two dogs, Duke and Duchess.

ABOUT THE CONTRIBUTING AUTHORS AND TECHNICAL EDITORS



BEN CLOTHIER is an Access developer working as an independent contractor through development shops such as Advisicon and J Street Technology. He is also a certified MySQL developer, and has designed and supported Access front-end applications for corporate databases. In recognition of his contributions to the Access community, Ben is recognized as a Microsoft Access MVP (Most Valued Professional). Ben lives in San Antonio, Texas with his wife, Suzanne, and his son, Harry.

Suzanne, only with you could I have the time and energy to become a contributing author — you are the absolute best!



DOUG (DAGI) YUDOVICH is the Director of Business Information Applications for UW Physicians in Seattle. The department's primary responsibilities range from developing enterprise-level Web-based reports and OLAP objects to developing database applications in support of various business needs for managing data. The applications vary in scope, from stop-gap applications, to bolt on tools, to mission critical-level applications that support up to 250 users. All of the database applications use Access for the FE, with some using Jet as the database platform, and some using SQL Server. Doug is also an Administrator on UtterAccess Forums and UtterAccess's Access Wiki. Joining UA in 2004, Doug progressed through the ranks (VIP, Editor, Administrator). UA is Doug's cyber home, where he shares his passion and knowledge of database design and information management with members who seek help, and with fellow developers discussing best practices. Doug is an active member of the Pacific Northwest Access Developer Group (PNWADG) and a presenter in the Seattle Access Group (SAG). Doug participated in two Developers' Kitchen events with the Microsoft Access Dev Team to work on early development versions of Access 2010. In acknowledgment of his contributions to the Access developers' community in UtterAccess and the user groups, and his work with the Access Dev Team, Doug was awarded as a Microsoft Access MVP in 2009 and 2010.

I'd like to thank my wife, Lisa, who patiently picks up my slack as I dive head-first into new adventures. I love you.

ABOUT THE TECHNICAL EDITORS



DR. JEFF BOYCE has been providing process and technology solutions to both public and private sectors for over 30 years. Jeff's approach focuses first on business need, emphasizing processes and practices before evaluating suitable technologies. Jeff has designed and developed over 25 applications. Most recently, his integrated Microsoft Office solutions provide data-based applications employing Access, Word, and SQL Server. The support he has provided in the Microsoft Access newsgroups has resulted in his recognition as a Microsoft Access MVP for the past eight years. When not working at his day job, consulting, or offering support in the newsgroups, Jeff enjoys wallyball, swimming, and recreational landscaping.

Jeff acknowledges and thanks his wife, Sue — her forbearance made his contribution possible.



ALBERT D. KALLAL is the owner of HCS consulting group and has been professionally developing software for more than 20 years. His first major project started while he was studying Computing Science at the University of Alberta. Albert was the original developer of a pilot project called Anat-sim, which was the basis for Omni-sim, the first successful commercial authoring system that allowed educators to create applications without having to write code. Albert's early success was an omen of great things to come. His software is currently used in more than six countries around the world with database platforms ranging from PDAs to server and mainframe systems. In recognition of Albert's contributions to the Access community, he received a Microsoft Most Valuable Professional award. Always seeking to stay on the leading edge, Albert was an early beta tester for the new Access 2010 Web Services that enables Access developers to build browser-neutral Web applications with Access 2010.



ARMEN STEIN is the president of J Street Technology, a Microsoft Gold Certified Partner with a team of database application developers near Seattle, Washington. J Street also offers CartGenie, a complete e-commerce Web storefront and shopping cart. Armen is a Microsoft Access MVP and MCP, has taught college-level database classes, and has also developed and taught one-day training classes on Access and Access/SQL Server development. Armen has spoken at various user groups and conferences, including Microsoft TechEd in the United States and Office DevCon in Australia, and is co-author of *Access 2007 VBA Programmer's Reference* (Wrox). His other interests include activities with his family, travel, backgammon, Mariners baseball, and driving his 1969 Ford Bronco in the sun.

Thanks to my wife, Lori, and to my kids, Lauren and Jonathan. I also would like to thank my great team at J Street Technology, who capably manage projects so that I can spend time on books like this.

ACKNOWLEDGMENTS

AS A TEAM, WE would like to express our respect and appreciation for all of the people who contributed to the editing and production of our book. Every book seems like a new adventure and we are fortunate to have the ongoing guidance from Wiley and Wrox to ensure that they are produced with the best standards. So we send a special thanks to Bob Elliott and Tom Dinse — is this our 5th book together? We'd also like to recognize some of the great behind-the-scenes players, Ashley Zurcher, Helen Russo, Mary Beth Wakefield, and Nancy Rapoport, and many others.

Of course, we wouldn't have anything to write about if it weren't for those incredible people on the Microsoft Access team. Their passion, dedication, and commitment to continuously expand and enhance Access are truly remarkable and inspiring. We see this, not only in the new features, but also in their support of the user community. And speaking of community, the Access community is a large part of what makes Access so special. Whether you are a novice or seasoned developer, if you have a problem, you can easily find assistance, guidance, and even friendship, from a variety of user groups and online forums.

We'll wrap up with a resounding round of appreciation for our five tech editors - and contributing authors. With the incredible new features and dramatic changes in Access, we have relied on their expertise to not only identify potential errors and omissions, but to question our content and writing to help ensure that it is both comprehensive and comprehensible. It is no wonder that they have each been recognized by Microsoft as Access MVPs. It is a pleasure to acknowledge you as an integral part of our team and to the success of this book.

— THE AUTHORS

FIRST AND FOREMOST, I want to thank my wonderful family who taught me to embrace life and to live each day with respect, integrity, and purpose. Thank you for helping me to recognize and celebrate the opportunities that life offers. I can rely on your encouragement and support as I dive into new adventures and projects such as this book.

I also want to thank my colleagues and great friends who continue to fuel my passion for helping others to learn about and use Access. In particular, I want to express my appreciation for the people in my user groups (Michka, Randy, Brandi, et al.) and the amazing people who are Access MVPs and community experts (Larry, Truitt, Arvin, George, our TEs, the list goes on) — friendships that are priceless!

One of my favorite aspects of being an author is the opportunity to involve and recognize contributions from people from around the world. In addition to our remarkable team of authors and editors, we have the benefit of sharing tips from our esteemed colleagues, Dane Miller, Garry Robinson, Steve Schapel, and Larry Strange. I especially want to recognize and thank Ben Clothier for his dedication, humor, and tenacity. Neither of us had any idea of what was to come when Ben became a contributing

author. Even working into the wee hours of the morning, we were still having fun as we completed countless iterations of reviews. That epitomizes a great Access developer — passion, commitment, and collaboration. My thanks to everyone — a project of this magnitude is truly a team effort!

— TERESA

THANKS TO EVERYONE ON the Access team at Microsoft for their outstanding work during this release and in particular to the testers on my team for listening to my various ramblings about Access (and food): Nishant Kumar, Kevin Nickel, Michael Tucker, Sanghmitra Gite, Kevin Bell, and Rasika Chakravarthy. Thanks for all of your hard work on this release!

To Geoff Hollander, Jack Stockton, and everyone who's been a part of the Portland Access User Group conference the past few years. Thanks for the invite and for including me as a part of your family!

Last but not least, continued thanks to my wife, Sandi, and children, Isabel and Gillian, for their understanding while I was working evenings and weekends. To my oldest, Taryn, for coming to visit earlier in the year and indulging me with sushi. (Yup, still better on the left coast.)

— ROB

I'D LIKE TO THANK my wife, Jamie. Without all of your love and support, I would be nothing, and I appreciate everything you do for our family. I would like to thank my son, Ryan, and apologize for the time I missed in your life while I wrote this book. You two are the most important people in the world to me! I would like to thank my friends from GBS, Inc.: Andrei, Vladimir, Tianru, Steph, Mia, Richard, Bob, and Jeff. Without you, I would never have gotten my start on Access and the experience was invaluable to me. I would like to thank so many of my friends from the Access team who taught me so much about Access, and to call out a few specifically: Michael, Rob, Tosh, Tim, Shawn, and Sherri. Thanks for the knowledge and opportunities you gave me; the experience was invaluable. And, of course, I would like to thank all of my other friends, colleagues, and teachers that have meant so much to me over the years. You are all Rock Stars!

— GEOFF

I'D LIKE TO THANK my wife, Dianne, a shining light guiding this lost soul into the sunshine. My son, Jeremy and daughter, Amber, no father could ask for better or brighter children to keep him humbled. I'd like to also acknowledge my online "family" at UtterAccess.com; especially Gord, Ricky, and George. You guys are the best. Most of all, I would like to thank Teresa Hennig for giving me the opportunity to work on this project with such a great team (thanks Rob and Geoff for being so patient with the "new kid").

— JERRY

CONTENTS

INTRODUCTION

xxxiii

CHAPTER 1: INTRODUCTION TO MICROSOFT ACCESS 2010 **1**

A Brief History of Access **2**

When to Use Access **2**

Microsoft Office Access 2010 3

SQL Server 2008 Express Edition 3

SQL Server 2008 4

How Do You Choose? 4

Access Database Basics **5**

Getting Started in Access 2010 5

Access 2010 Database Templates 5

The Access Navigation Pane 6

The Access Ribbon 7

The Access Security Bar 7

Access Database Objects **7**

Creating Tables 7

Creating Queries 9

Creating Forms 10

Creating Reports 10

Creating Macros 11

Creating Modules 11

Summary **12**

CHAPTER 2: NEW FEATURES **13**

New Look **14**

Development Environment **15**

64-Bit 15

Office Backstage 15

Calculated Columns 16

Integration with Office Themes 18

New Macro Designer 19

Expression Builder 20

Web Service Expressions 21

Application Parts 21

Forms	22
Web Browser Control	22
New Navigation Control	23
Subreports in Forms	24
Macros	25
UI Macros	25
Data Macros	25
Integration with SharePoint	26
Working with Data on SharePoint	27
Publish the Database to SharePoint	27
Additional SharePoint Features	27
Browser Interface/Applications	28
Introducing the Web Form Designer	29
Introducing Web Report Designer	29
Feature Restrictions (Features Disabled in Web Applications)	30
What's Gone or Deprecated	30
Calendar Control	30
ISAMs	30
Replication Conflict Resolver	31
Snapshot Format	31
Summary	31
 CHAPTER 3: UPGRADING AND CONVERTING TO ACCESS 2010	 33
 To Convert or To Enable	 34
Common Terminology	34
Key Decision Factors	35
Feature Sets and File Extensions: What's New, What's Replaced, What Happens	36
Other Things to Consider	43
Installing Multiple Versions of Access on One PC	46
Changing File Formats	48
Selecting the Default File Format	48
Overriding the Default File Format	48
ACCDE and MDE Files	49
Steps for Converting or Enabling	49
File Conversion Using Access 2010: A One-Stop Shop	49
Other Considerations When Converting	50
Converting to Access 97 or Earlier Is a Two-Version Process	51
Converting a Secured Database	51
Converting a Password-Protected Database	52
Converting a Database with Password-Protected VBA	53

Converting a Replicated Database	53
Enabling a Database	56
Enabling the Experience: Opening 95 or 97 Files with Access 2010	56
Access 2010: 64-Bit Considerations	57
Porting an Access application to a 64-bit Platform	58
Summary	61
 CHAPTER 4: MACROS IN ACCESS 2010	 63
VBA versus Macros in Access	63
Benefits of Using VBA	64
Benefits of Using Macros	65
Types of Macros	66
Macro Objects	66
Embedded Macros	66
Data Macros	67
Creating Macros in Access 2010	67
New Macro Designer	69
Additional Macro Changes	75
Sharing Macros Using Access 2010	76
Running Macros	76
Debugging Macros	77
Macro Objects and Embedded Macros	78
Error Handling	78
Variables	79
Macro Actions and Arguments	82
Macro Scenarios	87
Data Macros	93
Types of Data Macros	94
Running Data Macros	95
Data Macro Blocks	95
Data Macro Properties	97
Data Macro Actions and Arguments	98
Error Handling	99
Variables	101
Data Macro Scenarios	101
Summary	117
 CHAPTER 5: USING THE VBA EDITOR	 119
Anatomy of the VBA Editor	119
Using the Object Browser	121

Object Browser Components	122
Show Hidden Members	124
Testing and Debugging VBA Code	124
Immediate Window	125
The Debug.Print Statement	127
The Debug.Assert Statement	128
Breakpoints	128
Stepping through Code	130
Call Stack	132
Run to Cursor	134
Locals Window	135
Watch Window	135
Edit and Continue	137
Using Option Statements	137
Summary	139
CHAPTER 6: VBA BASICS	141
The Mindset of a Programmer	142
Anatomy of VBA Procedures	142
VBA Keywords	145
VBA Operators	146
Variables and VBA Syntax	147
Variables	147
Naming Your Variables	149
Variable Scope and Lifetime	151
Overlapping Variables	153
Other VBA Components	156
Option Statements	156
Comments	156
Line Continuation	157
Constants	159
Enums	160
VBA Objects	161
Properties	162
Methods	162
Events	162
Using Code Behind Forms and Reports	163
Using VBA Code to Call Macros	165
Writing Code in Modules	166
Example: User-Defined Function	169
Summary	171

CHAPTER 7: USING VBA IN ACCESS	173
When Events Fire	174
Common Form Events	174
Common Control Events	176
Common Report Events	176
Asynchronous Execution	177
VBA Procedures	179
Function or Sub?	179
Public or Private?	180
Coupling and Cohesion	181
Error Handling	183
Using Variables	183
Evaluating Expressions in VBA	185
If ... Then	185
Checking for Nulls	186
Select Case	188
Using Recordsets	188
Opening Recordsets	188
Looping through Recordsets	189
Adding Records	190
Finding Records	191
Updating Records	191
Using Multiple Recordsets	192
Copying Trees of Parent and Child Records	192
Using Bookmark and RecordsetClone	194
Cleaning Up	195
Using VBA in Forms and Reports	196
All about Me	196
Referring to Controls	197
Referring to Subforms and Subreports	197
Closing Forms	198
Debugging VBA	199
Investigating Variables	200
When Hovering Isn't Enough — Using the Immediate Window	202
Setting Breakpoints	202
Setting Watch Values	202
Stopping Runaway Code	204
Stepping through Your Code	204
Common VBA Techniques	206

Drilling Down with Double-Click	206
Date Handling	207
Handling Rounding Issues	209
String Concatenation Techniques	211
The Difference Between & and +	211
String Concatenation Example	212
VBA Error Handling	213
Why Use Error Handling?	213
Two Kinds of Errors: Unexpected and Expected	214
Basic Error Handling	215
Cleaning Up after an Error	221
More on Absorbing Expected Errors	222
Issues in Error Handling	224
Summary	225
CHAPTER 8: CREATING CLASSES IN VBA	227
Why Use Classes?	228
A Touch of Class	228
Creating a Class Module	230
Adding a Class Module to the Project	230
A Brief Word on Naming the Class	230
Instantiating Class Objects	231
Creating Class Methods	231
Creating Property Procedures	234
Naming and Identifying Objects	241
What Does the Object Do?	242
Naming Techniques	242
Identifying a Class Instance	243
Using Class Events	243
Initialize and Terminate Events	243
Creating Custom Class Events	244
Responding to Events	245
Handling Errors in Classes	248
Forms and Reports as Objects	251
Variable Scope and Lifetime	257
The Me Property	260
Subclassing the Form	260
Creating the Subclassed Form	261
Creating a Parent Property	261
Creating a Clone Method	262

Creating and Using Collection Classes	264
The Collection Object	264
Collection Class Basics	266
The Three Pillars	275
Encapsulation	275
Inheritance	276
Polymorphism	276
Inheriting Interfaces	277
Instancing	280
Summary	281
 CHAPTER 9: EXTENDING VBA WITH APIS	 283
Introducing the Windows API	284
Finding API Functions	284
Why You Need the API	285
Introducing Linking	287
Static Linking	287
Dynamic Linking	287
Declaring APIs	288
The Declare Keyword	288
The PtrSafe Keyword	289
Naming the Procedure	289
Specifying the Lib(rary) and Argument List	290
Understanding C Parameters	293
Signed and Unsigned Integers	293
Numeric Parameters	294
Object Parameters	297
String Parameters	298
Variant Parameters	298
Pointers to Numeric Values	298
Pointers to C Structures	299
Pointers to Arrays	299
Pointers to Functions	300
Pointers in 64-Bit Windows	301
The Any Data Type	304
Err.LastDLLError	304
Distributing Applications That Reference Type Libraries and Custom DLLs	306
Useful API Functions	306
Returning the Path to the Windows Folder	306

Determining Whether the System Processor Is 32-Bit or 64-Bit	307
Determining Whether Windows Is 32-Bit or 64-Bit	308
Determining Whether Office Is 32-Bit or 64-Bit	308
Displaying the Windows Open Dialog Box	309
Finding the Position of a Form	311
Finding the Temp Directory	312
Generating a Unique Temp Filename	312
Finding the Login Name of the Current User	313
Finding the Computer Name	314
Opening or Printing Any File	314
Delaying Code Execution	315
Getting the Path to a Special Folder	315
Locking the Computer	317
Summary	317

CHAPTER 10: WORKING WITH THE WINDOWS REGISTRY **319**

About the Registry	320
What the Registry Does	320
What the Registry Controls	321
Accessing the Registry	321
Registry Organization	322
Registry Organization on 64-Bit Windows	328
Using the Built-In VBA Registry Functions	329
SaveSetting	330
GetSetting	330
GetAllSettings	331
DeleteSetting	332
Typical Uses for the Built-In VBA Registry Functions	332
Using the Windows Registry APIs	335
Getting Started	335
Creating a Registry Key	341
Setting the Value for a Key	342
Getting the Value for a Key	343
Deleting a Registry Value	344
Deleting a Registry Key	345
Testing the Function Wrappers	346
Opening an Existing Registry Key	348
Connecting to the Registry on a Remote Computer	349
Enumerating Registry Keys and Values	350
Summary	353

CHAPTER 11: USING DAO TO ACCESS DATA	355
Data Access Objects	355
Why Use DAO?	356
New Features in DAO	357
Multi-Value Lookup Fields	357
Attachment Fields	358
Append-Only Fields	359
Database Encryption	359
Calculated Fields	359
Referring to DAO Objects	359
The DBEngine Object	361
The Workspaces Collection	361
The Errors Collection	365
The Database Object	366
The Default (Access) Database	366
The CurrentDb Function	367
Opening an External Database	368
DAO Object Properties	370
DAO Property Types	370
Creating, Setting, and Retrieving Properties	370
Creating Schema Objects with DAO	374
Creating Tables and Fields	375
Creating Indexes	378
Creating Relations	380
Creating Multi-Value Lookup Fields	382
Creating Calculated Fields	385
Data Access with DAO	386
Working with QueryDefs	386
Working with Recordsets	389
Filtering and Ordering Recordsets	391
Navigating Recordsets	394
Bookmarks and Recordset Clones	399
Finding Records	402
Working with Recordsets	405
Working with Attachment Fields	409
Append-Only Fields	414
Summary	417

CHAPTER 12: USING ADO TO ACCESS DATA	419
Introduction to ADO in Access	420
Adding ADO References	420
Referring to ADO Objects	420
Connecting to ADO Data Sources	421
Creating an Implicit Connection	421
Creating an ADO Connection Object	422
Creating a Connection String	423
Creating a Data Link Connection	424
Closing a Connection	425
Working with Cursors	426
Using Transactions	427
Data Access with ADO	429
Overview of the ADO Object Model	429
Using the Execute Method	430
Creating Recordsets	434
Navigating Recordsets	437
Working with Data in Recordsets	441
Using ADO Events	448
Declaring WithEvents	448
Implementing ADO Event Methods	449
Implicitly Triggering Events	449
Explicitly Calling Events	450
Testing the State Property	451
Schema Recordsets with ADO	451
ADO Schema Recordsets	451
Specifying Constraint Columns	452
Using ACE Specific Schemas	452
Creating Schema with ADOX	453
Adding References to ADOX	453
The ADOX Object Model	453
Working with Tables	454
Working with Views (Queries)	455
Managing Security with ADOX	457
Summary	457
CHAPTER 13: USING SQL WITH VBA	459
Working with SQL Strings in VBA	460
Building SQL Strings with Quotes	460
Using Single Quotation Marks instead of Double Quotation Marks	461

Concatenating Long SQL Strings	462
Using SQL When Opening Forms and Reports	463
Using SQL to Enhance Forms	464
Sorting on Columns	464
Selections on Index Forms	466
Cascading Combo Boxes	473
Using SQL for Report Selection Criteria	475
Altering the SQL inside Queries	480
The ReplaceOrderByClause and ReplaceWhereClause Functions	481
Summary	488
 CHAPTER 14: USING VBA TO ENHANCE FORMS	 489
VBA Basics	490
Properties	490
Event Properties: Where Does the Code Go?	491
Naming Conventions	493
Creating Forms the 2010 Way	494
Columnar and Tabular Layouts	495
Anchoring	496
The Modal Dialog Box Mode	499
Control Wizards — Creating Command Buttons Using VBA or Macros	499
Command Button Properties	500
Attachment Controls	501
Combo Boxes	505
Using the BeforeUpdate Event	516
Saving E-mail Addresses Using the Textbox AfterUpdate Event	519
Outputting to PDF	522
OpenArgs	523
IsLoaded()	524
On Timer ()	525
Late Binding	527
On Click(): Open a Form Based on a Value on the Current Form	531
Multiple Form Instances	534
Displaying Data in TreeView and ListView Controls	540
Summary	548
 CHAPTER 15: ENHANCING REPORTS WITH VBA	 549
Introduction to Reports	549
How Reports Are Structured	550

New in Access 2007	551
New in Access 2010	551
Creating a Report	554
Working with VBA in Reports	555
Control Naming Issues	555
The Me Object	556
Important Report Events and Properties	556
Opening a Report	556
Section Events	558
Closing a Report	562
Report Properties	562
Section Properties	563
Control Properties	564
Working with Charts	565
Common Report Requests	565
Changing the RecordSource at Runtime	565
Gathering Information from a Form	566
Changing the Printer	567
Dictionary-Style Headings	568
Shading Alternate Rows	570
Conditional Formatting of a Control	572
Creating a Progress Meter Report	573
Layout View	575
Report View	576
Considerations When Designing for Report View	576
Interactivity	577
Summary	579
 CHAPTER 16: CUSTOMIZING THE RIBBON	 581
Ribbon Overview	582
Custom Menu Bars and Toolbars	582
Custom Menu Bars	582
Shortcut Menu Bars	583
Ribbon Customization Using the Options Dialog Box	583
Ribbon Customization	584
Saving a Custom Ribbon	584
Specifying the Custom Ribbon	585
Defining a Ribbon Using XML	586
Writing Callback Routines and Macros	597
More Callback Routines	599
Displaying Images	604

Refreshing Ribbon Content	607
Creating an Integrated Ribbon	609
Building the Report Manager	609
Building the Custom Filter Interface	613
Creating a Ribbon from Scratch	616
Defining the Tabs and Groups	616
Building the Home Tab	619
Building the Settings Tab	625
Building the Administration Tab	626
More Ribbon Tips	628
Setting Focus to a Tab	628
Additional Resources	629
Summary	630
CHAPTER 17: CUSTOMIZING THE OFFICE BACKSTAGE	631
Introducing the Office Backstage	632
Access 2010 Backstage	632
Parts of the Backstage	633
Uses for the Backstage in Custom Applications	633
Writing a Backstage Customization	634
Controls in the Backstage	634
Tab	634
Group	635
TaskGroup, Category, and Task	637
TaskFormGroup	638
Button	640
GroupBox	641
Hyperlink	641
ImageControl	641
LayoutContainer	642
RadioGroup	643
Designing the Layout of Components	643
Single-Column Layout	644
Two-Column Layout	644
Column Widths	644
Creating a Grid	645
Extending the Existing Backstage	649
Adding a Group to an Existing Tab	649
Adding a Category to an Existing TabFormGroup	650
Adding a Task to an Existing TaskGroup	651
Backstage-Specific Callbacks	653

onShow	653
onHide	653
getStyle	654
getHelperText	654
getTitle	654
getTarget	655
Backstage Scenarios	655
Access Runtime Experience	655
Setting the Title of a Tab to the Application Title	656
About Page and Contact Form	656
Warning for a Missing Reference	660
Custom Database Information	662
Creating a Bulleted or Numbered List	664
Welcome Page with Image	665
Other Possible Examples	668
Summary	668
CHAPTER 18: WORKING WITH OFFICE 2010	671
Working with Outlook 2010	672
Setting References to Outlook	672
Creating Outlook Application Objects	672
Working with MailItem objects	674
Outlook Security Features	678
Other Outlook Objects	679
More Information about Outlook	684
Working with Excel 2010	684
Setting References to Excel	684
Creating Excel Application Objects	685
Working with Excel Workbooks	686
Working with Sheets in Excel	689
Working with Data in Excel	691
More Information about Excel	695
Working with Word 2010	695
Setting References to Word	695
Creating Word Application Objects	696
Working with Document Objects	698
Working with Data in Word	701
More Information about Word	705
Summary	705

CHAPTER 19: WORKING WITH SHAREPOINT	707
SharePoint 2010	707
What Is SharePoint?	708
SharePoint 2010 Requirements	708
SharePoint 2010 Versions	708
Access Services on SharePoint Server	709
Access Features Overview	709
SharePoint Features in Access 2010	709
Access Features in SharePoint 2010	710
SharePoint Features in Access	711
Access Web Applications	711
Linked Tables to SharePoint	724
Migrating a Database to SharePoint	731
Publishing a Database to SharePoint	736
Access Features on SharePoint	740
SharePoint 2.0 Shows Access Features	740
Access Web Datasheet	741
Open with Access	742
Importing from SharePoint	748
Access Views on SharePoint	752
Summary	756
CHAPTER 20: WORKING WITH .NET	757
Overview	758
Example Files	758
Visual Studio .NET 2010	758
Getting Visual Studio 2010	759
Installing Visual Studio 2010	760
.NET Terminology	760
Writing Code in Visual Studio 2010	762
Debugging Code in Visual Studio 2010	769
The MSDN Library	770
Using Access Databases in .NET	771
Working with ADO.NET	771
Types of .NET Applications	776
Building Client Applications	776
Building Web Applications	779
Other Methods of Using Access Databases	781

Automating Access with .NET	782
The Access PIA	782
Setting References	782
Creating Code to Automate Access	783
Running the Automated Application	785
Creating COM Add-Ins for Access	785
The Benefits of COM Add-Ins	786
Creating a New COM Add-In Project	786
Setting References to the Access PIA	787
Adding Custom Code to the Add-In	788
Installing the COM Add-In	791
Running the COM Add-In	791
Using .NET Code in Access	791
Creating a Managed Library in .NET	791
Calling a Managed Library from VBA	796
Summary	797

CHAPTER 21: BUILDING CLIENT-SERVER APPLICATIONS WITH ACCESS	799
--	------------

Database Application Evolution	800
Client-Server Applications	800
Using the Sample Files	801
Installing the Sample Database	802
Choosing the Correct File Format	803
The ACCDB/MDB File Format	803
Linking to External Data	804
Creating a DSN via Access	805
DSN Connection Types	807
Using ACE with ODBC Data Sources	807
Increasing ODBC Performance	810
The ADP File Format	813
Using ADPs to Link to Data	814
Query Options on SQL Server	816
ACCDB/MDB versus ADP	817
Recordset Differences	818
Security Differences	818
Local Data Storage	819
Sharing Application Files	819
Controlling the Logon Process	820
Controlling Login for ACCDB/MDB Files	820
Controlling the Login Process for ADPs	823