

Join the discussion @ p2p.wrox.com



Wrox Programmer to Programmer™



Beginning

Perl

Curtis "Ovid" Poe



Programmer to Programmer™

Connect with Wrox.

Participate

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

Wrox.com

Browse the vast selection of Wrox titles, e-books, and blogs and find exactly what you need

User Group Program

Become a member and take advantage of all the benefits

Wrox on **twitter**

Follow @wrox on Twitter and be in the know on the latest news in the world of Wrox

Wrox on **facebook**

Join the Wrox Facebook page at facebook.com/wroxpress and get updates on new books and publications as well as upcoming programmer conferences and user group events



GIFT OF THE ASIA FOUNDATION

NOT FOR RE-SALE

QUÀ TẶNG CỦA QUỸ CHÂU Á
KHÔNG ĐƯỢC BÁN LẠI

Contact Us.

We love feedback! Have a book idea? Need community support?
Let us know by e-mailing wrox-partnerwithus@wrox.com

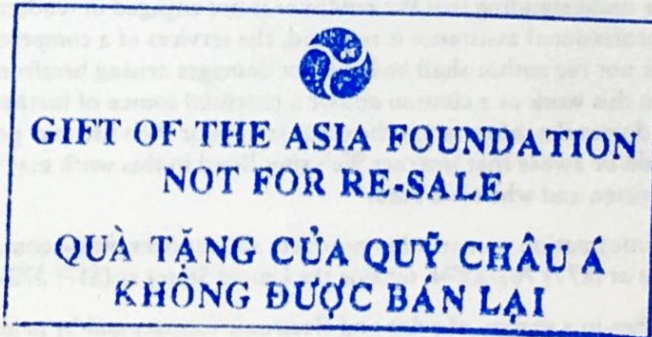
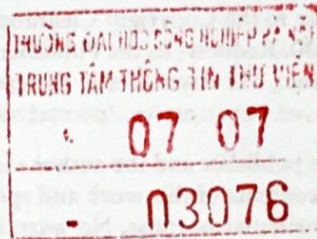
BEGINNING PERL

INTRODUCTION	xxiii
CHAPTER 1 What Is Perl?	1
CHAPTER 2 Understanding the CPAN	25
CHAPTER 3 Variables	41
CHAPTER 4 Working with Data	83
CHAPTER 5 Control Flow	125
CHAPTER 6 References	157
CHAPTER 7 Subroutines	175
CHAPTER 8 Regular Expressions	219
CHAPTER 9 Files and Directories	249
CHAPTER 10 sort, map, and grep	287
CHAPTER 11 Packages and Modules	315
CHAPTER 12 Object Oriented Perl	353
CHAPTER 13 Moose	399
CHAPTER 14 Testing	439
CHAPTER 15 The Interwebs	481
CHAPTER 16 Databases	523
CHAPTER 17 Plays Well with Others	545
CHAPTER 18 Common Tasks	567
CHAPTER 19 The Next Steps	611
APPENDIX Answers to Exercises	655
INDEX	695

BEGINNING

Perl

Curtis "Ovid" Poe



WILEY

John Wiley & Sons, Inc.

Beginning Perl

Published by
John Wiley & Sons, Inc.
10475 Crosspoint Boulevard
Indianapolis, IN 46256
www.wiley.com

Copyright © 2012 by John Wiley & Sons, Inc., Indianapolis, Indiana

Published simultaneously in Canada

ISBN: 978-1-118-01384-7
ISBN: 978-1-118-22187-7 (ebk)
ISBN: 978-1-118-23563-8 (ebk)
ISBN: 978-1-118-26051-7 (ebk)

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 publishes in a variety of print and electronic formats and by print-on-demand. Some material included with standard print versions of this book may not be included in e-books or in print-on-demand. If this book refers to media such as a CD or DVD that is not included in the version you purchased, you may download this material at <http://booksupport.wiley.com>. For more information about Wiley products, visit www.wiley.com.

Library of Congress Control Number: 2012944681

Trademarks: Wiley, the Wiley 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. John Wiley & Sons, Inc., is not associated with any product or vendor mentioned in this book.

This book is dedicated to my wife, Leila, and our daughter, Lilly-Rose.

When I first had the opportunity to write this book, I was going to turn it down because I had a newborn daughter. Leila, however, insisted I write it. She knows how much I love writing and was adamant that she would be supportive while I wrote this book. She has been more than supportive: She has kept me going through a long, painful process. Leila, I love you. And beaucoup. You know what I mean.

Index
Robert Swanson
Cover Designer
Ryan Grant
Cover Image
© 2010

Production Manager
Forensic System
Associate Director of Marketing
Marketing Manager
Business Manager

CREDITS

Acquisitions Editor

Mary James

Project Editor

Maureen Spears

Technical Editor

chromatic

Production Editor

Christine Mugnolo

Copy Editor

San Dee Phillips

Editorial Manager

Mary Beth Wakefield

Freelancer Editorial Manager

Rosemarie Graham

Associate Director of Marketing

David Mayhew

Marketing Manager

Ashley Zurcher

Business Manager

Amy Knies

Production Manager

Tim Tate

**Vice President and Executive Group
Publisher**

Richard Swadley

Vice President and Executive Publisher

Neil Edde

Associate Publisher

Jim Minatel

Project Coordinator, Cover

Katie Crocker

Proofreader

James Saturnio, Word One New York

Indexer

Robert Swanson

Cover Designer

Ryan Sneed

Cover Image

© RTimages / iStockPhoto

ABOUT THE AUTHOR

CURTIS "OVID" POE started programming back in 1982 and has been programming Perl almost exclusively for 13 years. He currently sits on the Board of Directors for the Perl Foundation, speaks at conferences in many countries, but is most proud of being a husband and father.

ABOUT THE TECHNICAL EDITOR

CHROMATIC is a prolific writer and developer. He is most recently the author of *Modern Perl*, from Onyx Neon Press (<http://onyxneon.com/>).

ACKNOWLEDGMENTS

AS WITH MANY BOOKS, this one would not have been possible without many people helping me along the way. In particular, I want to thank Michael Rasmussen, my “secret reviewer” who, despite not being one of the official reviewers, nonetheless diligently reviewed every chapter and came back with many helpful comments that made this a far better book.

I also have to thank chromatic, my technical reviewer, who managed to annoy me time and time again by pointing out subtle issues that I should have caught but didn't. He's a better programmer than I am, damn it.

Mary James and Maureen Spears, my primary contacts at Wiley, Wrox imprint, were a joy to work with and really helped keep my spirits up when this book seemed to drag on far longer than I thought. Their senses of humor and help through the editorial process were invaluable. I also have to thank San Dee, whoever the heck she is. Her name kept popping up through the editorial process and her work catching many issues in this book is much appreciated.

I also need to thank Adrian Howard, Ævar Arnfjörð Bjarmason, Alejandro Lopez, Andy Armstrong, Aristotle, Michael Schwern, Ricardo Signes, Sean T Lewis, and Simon Cozens for foolishly agreeing to review a book of this length.

Finally, I'd like to thank the people working on the Open Feedback Publishing System at O'Reilly and for engendering a review community (<http://ofps.oreilly.com/titles/9781118013847/>) for this book and for all the helpful comments this site generated.

There are far too many to name and I apologize in advance for not mentioning all of you here.

On a personal note, I have to say that many times I've read the comment “and all errors are mine” and I've thought, “But that's what reviewers are for, right?” The reality is far different. When you write a book, the reviewers will catch a huge number of issues, as mine did, but they can't catch all of them. I now realize that in a work of this scope, I have to take responsibility for any flaws. The reviewers are generally not paid for this work and they're not going to sit there, hours every night, months on end, worrying over every paragraph as I did. They caught most issues, but the remaining flaws in this work are mine and mine alone. Mea Culpa.

CONTENTS

INTRODUCTION

xxiii

CHAPTER 1: WHAT IS PERL?

Perl Today

1

Getting Perl

2

Working with Non-Windows Platforms: perlbrew

3

Using Windows

4

The Perl Community

6

IRC

8

PerlMonks

8

Perl Mongers

9

StackOverflow

9

Using perldoc

11

Understanding the Structure of perldoc

11

Getting Started with perldoc

11

Using Tutorials and FAQs

12

Using the perldoc -f function

14

Using a Terminal Window

14

Using the Command Line

15

Creating a Work Directory

16

Creating Hello, World!

18

Writing Your First Program

18

Shebang Lines

21

Summary

22

CHAPTER 2: UNDERSTANDING THE CPAN

CPAN and METACPAN

25

Finding and Evaluating Modules

26

Downloading and Installing

27

CPAN Clients

29

Using the CPAN.pm Client

33

Using the Cpanm Client

33

PPM

35

CPAN::Mini

36

Summary

36

39

	41
CHAPTER 3: VARIABLES	
	42
What Is Programming?	43
A Few Things to Note Before Getting Started	43
strict, warnings, and diagnostics	43
The my Function	44
Sigils	45
Identifiers	46
Scalars	47
Strings	51
Numbers	53
Arrays	54
Breaking Down the Code	55
Accessing Elements	58
Iterating over Arrays	58
Hashes	59
Accessing Elements	60
Iterating Over Hashes	60
Adding Data to Hashes	61
Slices	62
Array Slices	62
Hash Slices	63
Context	63
Scalar Context	64
List Context	67
Scope	67
my Variables	69
Package Variables	72
Strict, Warnings, and Diagnostics	74
strict	74
warnings	75
diagnostics	76
Working Without a Net	78
Perl's Built-in Variables	78
\$_	79
%ENV	79
@ARGV	80
Other Special Variables	81
Summary	83
CHAPTER 4: WORKING WITH DATA	
	84
Using Scalars	85
Working with Strings	85

Using String Operators	94
Scalar::Util	97
Numeric Builtins	98
Bitwise Operators	103
Understanding Booleans	103
Assignment Operators	108
Precedence and Associativity	109
Array and List Functions	111
Built-in Array Functions	111
List::Util	116
Built-in Hash Functions	116
delete()	116
exists()	117
keys()	117
values()	117
each()	117
Scoping Keywords	119
my()	119
local()	119
our()	120
state()	120
Summary	121
CHAPTER 5: CONTROL FLOW	125
Using the if Statement	126
Understanding Basic Conditionals	126
else/elsif/unless	128
The Ternary Operator ?:	131
for/foreach loops	132
Arrays	132
Lists	135
C-Style	136
Using while/until Loops	142
Lists	143
last/next/redo/continue	144
Labels	146
Statement Modifiers	147
Types of Statement Modifiers	147
do while/do until	149
given/when	151
Basic Syntax	151
The Switch Module	153
Summary	154

CHAPTER 6: REFERENCES	157
References 101	158
Array References	158
Hash References	159
Anonymous References	160
Other References	163
Working with References	166
Debugging	166
Copying	169
Slices	172
Summary	173
CHAPTER 7: SUBROUTINES	175
Subroutine Syntax	176
Argument Handling	177
Multiple Arguments	178
Named Arguments	179
Aliasing	181
State Variables (Pre- and Post-5.10)	181
Passing a List, Hash, or Hashref?	184
Returning Data	186
Returning True/False	186
Returning Single and Multiple Values	188
wantarray	189
FAIL!	190
"Wake Up! Time to Die!"	191
carp and croak	192
eval	192
evalGotchas	194
Try::Tiny	195
Subroutine References	196
Existing Subroutines	196
Anonymous Subroutines	197
Closures	197
Prototypes	200
Argument Coercion	200
More Prototype Tricks	202
Mimicking Builtins	204
Forward Declarations	206
Prototype Summary	207