

Perl语言编程 (影印版)

第四版  
下册



*Programming*

# Perl

O'REILLY®

东南大学出版社

*Tom Christiansen,  
brian d foy, Larry Wall,  
Jon Orwant 著*

(第四版/下册)

---

# Perl语言编程 (影印版)

## Programming Perl

*Tom Christiansen, brian d foy & Larry Wall*  
with Jon Orwant 著

O'REILLY®

Beijing • Cambridge • Farnham • Köln • Sebastopol • Tokyo

O'Reilly Media, Inc. 授权东南大学出版社出版

东南大学出版社

· 南 京 ·

## 图书在版编目 (CIP) 数据

Perl 语言编程: 第四版: 英文 / (美) 克里斯蒂安森 (Christiansen, T.) 等著. —影印本. —南京: 东南大学出版社, 2012.6

书名原文: Programming Perl

ISBN 978-7-5641-3412-9

I. ① P… II. ① 克… III. ① Perl 语言—程序设计—英文 IV. ① TP312

中国版本图书馆 CIP 数据核字 (2012) 第 065809 号

江苏省版权局著作权合同登记

图字: 10-2012-6 号

©2012 by O'Reilly Media, Inc.

Reprint of the English Edition, jointly published by O'Reilly Media, Inc. and Southeast University Press, 2012. Authorized reprint of the original English edition, 2012 O'Reilly Media, Inc., the owner of all rights to publish and sell the same.

All rights reserved including the rights of reproduction in whole or in part in any form.

英文原版由 O'Reilly Media, Inc. 出版 2012。

英文影印版由东南大学出版社出版 2012。此影印版的出版和销售得到出版权和销售权的所有者——O'Reilly Media, Inc. 的许可。

版权所有, 未得书面许可, 本书的任何部分和全部不得以任何形式重制。

## Perl 语言编程 第四版 (影印版)

---

出版发行: 东南大学出版社

地 址: 南京四牌楼 2 号 邮编: 210096

出 版 人: 江建中

责任编辑: 张烨

网 址: <http://www.seupress.com>

电子邮件: [press@seupress.com](mailto:press@seupress.com)

印 刷: 扬中市印刷有限公司

开 本: 787 毫米 × 980 毫米 16 开本

印 张: 75

字 数: 1469 千字

版 次: 2012 年 6 月第 1 版

印 次: 2012 年 6 月第 1 次印刷

书 号: ISBN 978-7-5641-3412-9

定 价: 128.00 元 (上下册)

---

本社图书若有印装质量问题, 请直接与营销部联系。电话 (传真): 025-83791830

# 出版说明

随着计算机技术的成熟和广泛应用,人类正在步入一个技术迅猛发展的新时期。计算机技术的发展给人们的工业生产、商业活动和日常生活都带来了巨大的影响。然而,计算机领域的技术更新速度之快也是众所周知的,为了帮助国内技术人员在第一时间了解国外最新的技术,东南大学出版社和美国 O'Reilly Meida, Inc. 达成协议,将陆续引进该公司的代表前沿技术或者在某专项领域享有盛名的著作,以影印版或者简体中文版的形式呈献给读者。其中,影印版书籍力求与国外图书“同步”出版,并且“原汁原味”展现给读者。

我们真诚地希望,所引进的书籍能对国内相关行业的技术人员、科研机构的研究人员 and 高校师生的学习和工作有所帮助,对国内计算机技术的发展有所促进。也衷心期望读者提出宝贵的意见和建议。

最新出版的影印版图书,包括:

- 《Hbase 权威指南》(影印版)
- 《社交应用编程》(影印版)
- 《深入浅出 jQuery》(影印版)
- 《深入浅出 HTML5 编程》(影印版)
- 《创新的神话 第二版》(影印版)
- 《HTML5 应用编程》(影印版)
- 《HTML5 Cookbook》(影印版)
- 《Perl 语言编程 第四版》(影印版)
- 《深入浅出移动互联网》(影印版)
- 《易读代码的艺术》(影印版)
- 《嵌入式系统开发》(影印版)
- 《iOS 5 编程 Cookbook》(影印版)
- 《高性能 MySQL 第三版》(影印版)
- 《iOS 应用安全攻防》(影印版)

---

# Table of Contents

## 上册

|               |       |
|---------------|-------|
| Preface ..... | xxiii |
|---------------|-------|

---

## Part I. Overview

|                                              |          |
|----------------------------------------------|----------|
| <b>1. An Overview of Perl .....</b>          | <b>3</b> |
| Getting Started                              | 3        |
| Natural and Artificial Languages             | 4        |
| Variable Syntax                              | 5        |
| Verbs                                        | 17       |
| An Average Example                           | 18       |
| How to Do It                                 | 20       |
| Filehandles                                  | 21       |
| Operators                                    | 24       |
| Some Binary Arithmetic Operators             | 25       |
| String Operators                             | 25       |
| Assignment Operators                         | 26       |
| Unary Arithmetic Operators                   | 28       |
| Logical Operators                            | 29       |
| Some Numeric and String Comparison Operators | 30       |
| Some File Test Operators                     | 31       |
| Control Structures                           | 31       |
| What Is Truth?                               | 32       |
| The given and when Statements                | 34       |
| Looping Constructs                           | 35       |
| Regular Expressions                          | 39       |
| Quantifiers                                  | 43       |
| Minimal Matching                             | 44       |
| Nailing Things Down                          | 44       |
| Backreferences                               | 45       |

---

|                                           |    |
|-------------------------------------------|----|
| List Processing                           | 47 |
| What You Don't Know Won't Hurt You (Much) | 49 |

---

## Part II. The Gory Details

|                                            |           |
|--------------------------------------------|-----------|
| <b>2. Bits and Pieces .....</b>            | <b>53</b> |
| Atoms                                      | 53        |
| Molecules                                  | 54        |
| Built-in Data Types                        | 56        |
| Variables                                  | 58        |
| Names                                      | 60        |
| Name Lookups                               | 62        |
| Scalar Values                              | 65        |
| Numeric Literals                           | 67        |
| String Literals                            | 67        |
| Pick Your Own Quotes                       | 70        |
| Or Leave Out the Quotes Entirely           | 72        |
| Interpolating Array Values                 | 73        |
| “Here” Documents                           | 73        |
| Version Literals                           | 75        |
| Other Literal Tokens                       | 76        |
| Context                                    | 76        |
| Scalar and List Context                    | 76        |
| Boolean Context                            | 78        |
| Void Context                               | 79        |
| Interpolative Context                      | 79        |
| List Values and Arrays                     | 79        |
| List Assignment                            | 82        |
| Array Length                               | 83        |
| Hashes                                     | 84        |
| Typeglobs and Filehandles                  | 86        |
| Input Operators                            | 87        |
| Command Input (Backtick) Operator          | 87        |
| Line Input (Angle) Operator                | 88        |
| Filename Globbing Operator                 | 91        |
| <b>3. Unary and Binary Operators .....</b> | <b>95</b> |
| Terms and List Operators (Leftward)        | 97        |
| The Arrow Operator                         | 99        |
| Autoincrement and Autodecrement            | 100       |

|                                             |            |
|---------------------------------------------|------------|
| Exponentiation                              | 101        |
| Ideographic Unary Operators                 | 101        |
| Binding Operators                           | 103        |
| Multiplicative Operators                    | 104        |
| Additive Operators                          | 105        |
| Shift Operators                             | 105        |
| Named Unary and File Test Operators         | 106        |
| Relational Operators                        | 111        |
| Equality Operators                          | 111        |
| Smartmatch Operator                         | 112        |
| Smartmatching of Objects                    | 117        |
| Bitwise Operators                           | 118        |
| C-Style Logical (Short-Circuit) Operators   | 119        |
| Range Operators                             | 120        |
| Conditional Operator                        | 123        |
| Assignment Operators                        | 125        |
| Comma Operators                             | 126        |
| List Operators (Rightward)                  | 127        |
| Logical and, or, not, and xor               | 127        |
| C Operators Missing from Perl               | 128        |
| <b>4. Statements and Declarations .....</b> | <b>129</b> |
| Simple Statements                           | 130        |
| Compound Statements                         | 131        |
| if and unless Statements                    | 133        |
| The given Statement                         | 133        |
| The when Statement and Modifier             | 137        |
| Loop Statements                             | 139        |
| while and until Statements                  | 139        |
| Three-Part Loops                            | 140        |
| foreach Loops                               | 142        |
| Loop Control                                | 144        |
| Bare Blocks as Loops                        | 147        |
| Loopy Topicalizers                          | 149        |
| The goto Operator                           | 149        |
| Paleolithic Perl Case Structures            | 150        |
| The Ellipsis Statement                      | 152        |
| Global Declarations                         | 153        |
| Scoped Declarations                         | 155        |
| Scoped Variable Declarations                | 156        |

|                                              |            |
|----------------------------------------------|------------|
| Lexically Scoped Variables: my               | 159        |
| Persistent Lexically Scoped Variables: state | 160        |
| Lexically Scoped Global Declarations: our    | 161        |
| Dynamically Scoped Variables: local          | 162        |
| Pragmas                                      | 164        |
| Controlling Warnings                         | 165        |
| Controlling the Use of Globals               | 165        |
| <b>5. Pattern Matching .....</b>             | <b>167</b> |
| The Regular Expression Bestiary              | 168        |
| Pattern-Matching Operators                   | 171        |
| Pattern Modifiers                            | 175        |
| The m// Operator (Matching)                  | 181        |
| The s/// Operator (Substitution)             | 184        |
| The tr/// Operator (Transliteration)         | 189        |
| Metacharacters and Metasymbols               | 192        |
| Metasymbol Tables                            | 193        |
| Specific Characters                          | 199        |
| Wildcard Metasymbols                         | 200        |
| Character Classes                            | 202        |
| Bracketed Character Classes                  | 202        |
| Classic Perl Character Class Shortcuts       | 204        |
| Character Properties                         | 207        |
| POSIX-Style Character Classes                | 210        |
| Quantifiers                                  | 214        |
| Positions                                    | 217        |
| Beginnings: The \A and ^ Assertions          | 218        |
| Endings: The \z, \Z, and \$ Assertions       | 218        |
| Boundaries: The \b and \B Assertions         | 219        |
| Progressive Matching                         | 219        |
| Where You Left Off: The \G Assertion         | 220        |
| Grouping and Capturing                       | 221        |
| Capturing                                    | 221        |
| Grouping Without Capturing                   | 229        |
| Scoped Pattern Modifiers                     | 230        |
| Alternation                                  | 231        |
| Staying in Control                           | 232        |
| Letting Perl Do the Work                     | 233        |
| Variable Interpolation                       | 234        |
| The Regex Compiler                           | 239        |

|                                                          |            |
|----------------------------------------------------------|------------|
| The Little Engine That /Could(n't)?/                     | 241        |
| Fancy Patterns                                           | 247        |
| Lookaround Assertions                                    | 247        |
| Possessive Groups                                        | 249        |
| Programmatic Patterns                                    | 251        |
| Recursive Patterns                                       | 260        |
| Grammatical Patterns                                     | 262        |
| Defining Your Own Assertions                             | 270        |
| Alternate Engines                                        | 271        |
| <b>6. Unicode .....</b>                                  | <b>275</b> |
| Show, Don't Tell                                         | 280        |
| Getting at Unicode Data                                  | 282        |
| The Encode Module                                        | 285        |
| A Case of Mistaken Identity                              | 287        |
| Graphemes and Normalization                              | 290        |
| Comparing and Sorting Unicode Text                       | 297        |
| Using the <code>UCA</code> with Perl's <code>sort</code> | 303        |
| Locale Sorting                                           | 305        |
| More Goodies                                             | 306        |
| Custom Regex Boundaries                                  | 308        |
| Building Character                                       | 309        |
| References                                               | 313        |
| <b>7. Subroutines .....</b>                              | <b>315</b> |
| Syntax                                                   | 315        |
| Semantics                                                | 317        |
| Tricks with Parameter Lists                              | 318        |
| Error Indications                                        | 320        |
| Scoping Issues                                           | 321        |
| Passing References                                       | 324        |
| Prototypes                                               | 326        |
| Inlining Constant Functions                              | 331        |
| Care with Prototypes                                     | 332        |
| Prototypes of Built-in Functions                         | 333        |
| Subroutine Attributes                                    | 335        |
| The <code>method</code> Attribute                        | 335        |
| The <code>lvalue</code> Attribute                        | 336        |

|                                                              |                |
|--------------------------------------------------------------|----------------|
| <b>8. References .....</b>                                   | <b>339</b>     |
| What Is a Reference?                                         | 339            |
| Creating References                                          | 342            |
| The Backslash Operator                                       | 342            |
| Anonymous Data                                               | 342            |
| Object Constructors                                          | 345            |
| Handle References                                            | 346            |
| Symbol Table References                                      | 347            |
| Implicit Creation of References                              | 348            |
| Using Hard References                                        | 348            |
| Using a Variable As a Variable Name                          | 348            |
| Using a BLOCK As a Variable Name                             | 349            |
| Using the Arrow Operator                                     | 350            |
| Using Object Methods                                         | 352            |
| Pseudohashes                                                 | 352            |
| Other Tricks You Can Do with Hard References                 | 353            |
| Closures                                                     | 355            |
| Symbolic References                                          | 359            |
| Braces, Brackets, and Quoting                                | 360            |
| References Don't Work As Hash Keys                           | 361            |
| Garbage Collection, Circular References, and Weak References | 362            |
| <br><b>9. Data Structures .....</b>                          | <br><b>365</b> |
| Arrays of Arrays                                             | 365            |
| Creating and Accessing a Two-Dimensional Array               | 366            |
| Growing Your Own                                             | 366            |
| Access and Printing                                          | 368            |
| Slices                                                       | 370            |
| Common Mistakes                                              | 371            |
| Hashes of Arrays                                             | 374            |
| Composition of a Hash of Arrays                              | 374            |
| Generation of a Hash of Arrays                               | 374            |
| Access and Printing of a Hash of Arrays                      | 375            |
| Arrays of Hashes                                             | 376            |
| Composition of an Array of Hashes                            | 376            |
| Generation of an Array of Hashes                             | 377            |
| Access and Printing of an Array of Hashes                    | 377            |
| Hashes of Hashes                                             | 378            |
| Composition of a Hash of Hashes                              | 378            |
| Generation of a Hash of Hashes                               | 379            |

|                                                                  |            |
|------------------------------------------------------------------|------------|
| Access and Printing of a Hash of Hashes                          | 380        |
| Hashes of Functions                                              | 381        |
| More Elaborate Records                                           | 382        |
| Composition, Access, and Printing of More Elaborate Records      | 382        |
| Composition, Access, and Printing of Even More Elaborate Records | 383        |
| Generation of a Hash of Complex Records                          | 384        |
| Saving Data Structures                                           | 385        |
| <b>10. Packages .....</b>                                        | <b>387</b> |
| Symbol Tables                                                    | 389        |
| Qualified Names                                                  | 393        |
| The Default Package                                              | 394        |
| Changing the Package                                             | 395        |
| Autoloading                                                      | 397        |
| <b>11. Modules .....</b>                                         | <b>401</b> |
| Loading Modules                                                  | 402        |
| Unloading Modules                                                | 404        |
| Creating Modules                                                 | 405        |
| Naming Modules                                                   | 405        |
| A Sample Module                                                  | 405        |
| Module Privacy and the Exporter                                  | 406        |
| Overriding Built-in Functions                                    | 411        |
| <b>12. Objects .....</b>                                         | <b>415</b> |
| Brief Refresher on Object-Oriented Lingo                         | 415        |
| Perl's Object System                                             | 417        |
| Method Invocation                                                | 418        |
| Method Invocation Using the Arrow Operator                       | 419        |
| Method Invocation Using Indirect Objects                         | 421        |
| Syntactic Snafus with Indirect Objects                           | 421        |
| Package-Quoted Classes                                           | 423        |
| Object Construction                                              | 424        |
| Inheritable Constructors                                         | 425        |
| Initializers                                                     | 427        |
| Class Inheritance                                                | 429        |
| Inheritance Through @ISA                                         | 430        |
| Alternate Method Searching                                       | 432        |
| Accessing Overridden Methods                                     | 433        |
| UNIVERSAL: The Ultimate Ancestor Class                           | 435        |

|                                                             |            |
|-------------------------------------------------------------|------------|
| Method Autoloading                                          | 438        |
| Private Methods                                             | 440        |
| Instance Destructors                                        | 440        |
| Garbage Collection with DESTROY Methods                     | 441        |
| Managing Instance Data                                      | 442        |
| Generating Accessors with Autoloading                       | 444        |
| Generating Accessors with Closures                          | 445        |
| Using Closures for Private Objects                          | 446        |
| New Tricks                                                  | 449        |
| Managing Class Data                                         | 450        |
| The Moose in the Room                                       | 453        |
| Summary                                                     | 455        |
| <b>13. Overloading .....</b>                                | <b>457</b> |
| The overload Pragma                                         | 458        |
| Overload Handlers                                           | 459        |
| Overloadable Operators                                      | 460        |
| The Copy Constructor (=)                                    | 468        |
| When an Overload Handler Is Missing (nomethod and fallback) | 469        |
| Overloading Constants                                       | 470        |
| Public Overload Functions                                   | 472        |
| Inheritance and Overloading                                 | 472        |
| Runtime Overloading                                         | 473        |
| Overloading Diagnostics                                     | 473        |
| <b>14. Tied Variables .....</b>                             | <b>475</b> |
| Tying Scalars                                               | 477        |
| Scalar-Tying Methods                                        | 478        |
| Magical Counter Variables                                   | 483        |
| Cycling Through Values                                      | 483        |
| Magically Banishing \$_                                     | 484        |
| Tying Arrays                                                | 486        |
| Array-Tying Methods                                         | 487        |
| Notational Convenience                                      | 491        |
| Tying Hashes                                                | 492        |
| Hash-Tying Methods                                          | 493        |
| Tying Filehandles                                           | 498        |
| Filehandle-Tying Methods                                    | 499        |
| Creative Filehandles                                        | 506        |
| A Subtle Untying Trap                                       | 510        |
| Tie Modules on CPAN                                         | 512        |

## Part III. Perl as Technology

|                                             |            |
|---------------------------------------------|------------|
| <b>15. Interprocess Communication .....</b> | <b>517</b> |
| Signals                                     | 518        |
| Signalling Process Groups                   | 520        |
| Reaping Zombies                             | 521        |
| Timing Out Slow Operations                  | 522        |
| Blocking Signals                            | 522        |
| Signal Safety                               | 523        |
| Files                                       | 523        |
| File Locking                                | 524        |
| Passing Filehandles                         | 528        |
| Pipes                                       | 531        |
| Anonymous Pipes                             | 531        |
| Talking to Yourself                         | 533        |
| Bidirectional Communication                 | 536        |
| Named Pipes                                 | 538        |
| System V IPC                                | 540        |
| Sockets                                     | 543        |
| Networking Clients                          | 545        |
| Networking Servers                          | 547        |
| Message Passing                             | 550        |
| <b>16. Compiling .....</b>                  | <b>553</b> |
| The Life Cycle of a Perl Program            | 554        |
| Compiling Your Code                         | 556        |
| Executing Your Code                         | 562        |
| Compiler Backends                           | 564        |
| Code Generators                             | 565        |
| The Bytecode Generator                      | 566        |
| The C Code Generators                       | 566        |
| Code Development Tools                      | 567        |
| Avant-Garde Compiler, Retro Interpreter     | 569        |
| <b>17. The Command-Line Interface .....</b> | <b>575</b> |
| Command Processing                          | 575        |
| #! and Quoting on Non-Unix Systems          | 578        |
| Location of Perl                            | 580        |

|                                    |            |
|------------------------------------|------------|
| Switches                           | 580        |
| Environment Variables              | 594        |
| <b>18. The Perl Debugger .....</b> | <b>603</b> |
| Using the Debugger                 | 604        |
| Debugger Commands                  | 606        |
| Stepping and Running               | 607        |
| Breakpoints                        | 607        |
| Tracing                            | 609        |
| Display                            | 609        |
| Locating Code                      | 610        |
| Actions and Command Execution      | 611        |
| Miscellaneous Commands             | 613        |
| Debugger Customization             | 615        |
| Editor Support for Debugging       | 615        |
| Customizing with Init Files        | 616        |
| Debugger Options                   | 616        |
| Unattended Execution               | 619        |
| Debugger Support                   | 620        |
| Writing Your Own Debugger          | 622        |
| Profiling Perl                     | 623        |
| Devel::DProf                       | 623        |
| Devel::NYTProf                     | 627        |
| <b>19. CPAN .....</b>              | <b>629</b> |
| History                            | 629        |
| A Tour of the Repository           | 630        |
| Creating a MiniCPAN                | 632        |
| The CPAN Ecosystem                 | 633        |
| PAUSE                              | 633        |
| Searching CPAN                     | 635        |
| Testing                            | 635        |
| Bug Tracking                       | 635        |
| Installing CPAN Modules            | 636        |
| By Hand                            | 637        |
| CPAN Clients                       | 638        |
| Creating CPAN Distributions        | 640        |
| Starting Your Distribution         | 640        |
| Testing Your Modules               | 642        |

---

## Part IV. Perl as Culture

|                                                       |                |
|-------------------------------------------------------|----------------|
| <b>20. Security .....</b>                             | <b>647</b>     |
| Handling Insecure Data                                | 648            |
| Detecting and Laundering Tainted Data                 | 651            |
| Cleaning Up Your Environment                          | 656            |
| Accessing Commands and Files Under Reduced Privileges | 657            |
| Defeating Taint Checking                              | 660            |
| Handling Timing Glitches                              | 661            |
| Unix Kernel Security Bugs                             | 662            |
| Handling Race Conditions                              | 663            |
| Temporary Files                                       | 665            |
| Handling Insecure Code                                | 668            |
| Changing Root                                         | 669            |
| Safe Compartments                                     | 670            |
| Code Masquerading As Data                             | 675            |
| <br><b>21. Common Practices .....</b>                 | <br><b>679</b> |
| Common Goofs for Novices                              | 679            |
| Universal Blunders                                    | 680            |
| Frequently Ignored Advice                             | 682            |
| C Traps                                               | 683            |
| Shell Traps                                           | 684            |
| Python Traps                                          | 685            |
| Ruby Traps                                            | 687            |
| Java Traps                                            | 689            |
| Efficiency                                            | 691            |
| Time Efficiency                                       | 691            |
| Space Efficiency                                      | 697            |
| Programmer Efficiency                                 | 698            |
| Maintainer Efficiency                                 | 698            |
| Porter Efficiency                                     | 699            |
| User Efficiency                                       | 700            |
| Programming with Style                                | 701            |
| Fluent Perl                                           | 705            |
| Program Generation                                    | 715            |
| Generating Other Languages in Perl                    | 716            |
| Generating Perl in Other Languages                    | 717            |
| Source Filters                                        | 718            |

|                                              |                |
|----------------------------------------------|----------------|
| <b>22. Portable Perl .....</b>               | <b>721</b>     |
| Newlines                                     | 723            |
| Endianness and Number Width                  | 724            |
| Files and Filesystems                        | 725            |
| System Interaction                           | 727            |
| Interprocess Communication (IPC)             | 727            |
| External Subroutines (XS)                    | 728            |
| Standard Modules                             | 728            |
| Dates and Times                              | 729            |
| Internationalization                         | 729            |
| Style                                        | 730            |
| <br><b>23. Plain Old Documentation .....</b> | <br><b>731</b> |
| Pod in a Nutshell                            | 731            |
| Verbatim Paragraphs                          | 733            |
| Command Paragraphs                           | 733            |
| Flowed Text                                  | 737            |
| Pod Translators and Modules                  | 740            |
| Writing Your Own Pod Tools                   | 742            |
| Pod Pitfalls                                 | 747            |
| Documenting Your Perl Programs               | 748            |
| <br><b>24. Perl Culture .....</b>            | <br><b>751</b> |
| History Made Practical                       | 751            |
| Perl Poetry                                  | 754            |
| Virtues of the Perl Programmer               | 756            |
| Events                                       | 757            |
| Getting Help                                 | 758            |

---

## Part V. Reference Material

|                                         |            |
|-----------------------------------------|------------|
| <b>25. Special Names .....</b>          | <b>763</b> |
| Special Names Grouped by Type           | 763        |
| Regular Expression Special Variables    | 763        |
| Per-Filehandle Variables                | 764        |
| Per-Package Special Variables           | 764        |
| Program-Wide Special Variables          | 765        |
| Per-Package Special Filehandles         | 766        |
| Per-Package Special Functions           | 766        |
| Special Variables in Alphabetical Order | 767        |

|                                            |             |
|--------------------------------------------|-------------|
| <b>26. Formats .....</b>                   | <b>793</b>  |
| String Formats                             | 793         |
| Binary Formats                             | 799         |
| pack                                       | 800         |
| unpack                                     | 809         |
| Picture Formats                            | 810         |
| Format Variables                           | 814         |
| Footers                                    | 817         |
| Accessing Formatting Internals             | 817         |
| <b>27. Functions .....</b>                 | <b>819</b>  |
| Perl Functions by Category                 | 822         |
| Perl Functions in Alphabetical Order       | 824         |
| <b>28. The Standard Perl Library .....</b> | <b>991</b>  |
| Library Science                            | 991         |
| A Tour of the Perl Library                 | 993         |
| Roll Call                                  | 995         |
| The Future of the Standard Perl Library    | 997         |
| Wandering the Stacks                       | 998         |
| <b>29. Pragmatic Modules .....</b>         | <b>1001</b> |
| attributes                                 | 1002        |
| autodie                                    | 1003        |
| autouse                                    | 1004        |
| base                                       | 1005        |
| bigint                                     | 1006        |
| bignum                                     | 1006        |
| bigrat                                     | 1007        |
| blib                                       | 1007        |
| bytes                                      | 1007        |
| charnames                                  | 1008        |
| Custom Character Names                     | 1009        |
| Runtime Lookups                            | 1010        |
| constant                                   | 1012        |
| Restrictions on constant                   | 1013        |
| deprecate                                  | 1014        |
| diagnostics                                | 1014        |
| encoding                                   | 1017        |
| feature                                    | 1017        |