## Contents

Preface	vii
Improvements in the Python 3 Edition	
The Hard Way Is Easier	
Reading and Writing	
Attention to Detail	viii
Spotting Differences	viii
Ask, Don't Stare	
Do Not Copy-Paste	xix
Using the Included Videos	xix
A Note on Practice and Persistence	xix
Acknowledgments	
Exercise 0 The Setup	2
macOS	2
macOS: What You Should See	3
Windows	3
Windows: What You Should See	4
Linux	4
Linux: What You Should See	5
Finding Things on the Internet	5
Warnings for Beginners	6
Alternative Text Editors	6
Exercise 1 A Good First Program	8
What You Should See	10
Study Drills	12
Common Student Questions	12
Exercise 2 Comments and Pound Characters	14
What You Should See	14
Study Drills	14
Common Student Questions	15
Exercise 3 Numbers and Math	16
What You Should See	17
Study Drills	17
Common Student Questions	17

	Kercise 4     Variables and Names       What You Should See     .       Study Drills     .       Common Student Questions     .	· ·		· ·			· ·							•••	 		21 21
	tercise 5     More Variables and Print       What You Should See	•••	•	•••			•••				•						24 25
	ercise 6     Strings and Text	 · . · .	• •	 		 	•••						 				27 27 27
:	What You Should See	  •••	 	• •		• • • •							 				28 29 29
:	ercise 8 Printing, Printing What You Should See Study Drills	  •	 	•		 	•		•			• •	 		•		30 31
	ercise 9 Printing, Printing, Printing What You Should See Study Drills	 	 			 	•		•	•	 			•			32 33
	ercise 10 What Was That? What You Should See Escape Sequences	 	 			 		•			 						35 35 36
5	ercise 11 Asking Questions What You Should See Study Drills		 		• •	• •			•		 	•	•			•	38 39

Exercise 12 Prompting People	40
What You Should See	40
Study Drills	40
Common Student Questions	41
Exercise 13 Parameters, Unpacking, Variables	12
Hold Up! Features Have Another Name	
What You Should See	
Study Drills	
Common Student Questions	
Exercise 14 Prompting and Passing	
What You Should See	
Study Drills	
Common Student Questions	47
Exercise 15 Reading Files	48
What You Should See	49
Study Drills	49
Common Student Questions	50
Exercise 16 Reading and Writing Files	52
What You Should See	
Study Drills	
Common Student Questions	
Exercise 17 More Files	
What You Should See	
Study Drills	
Common Student Questions	57
Exercise 18 Names, Variables, Code, Functions	60
What You Should See	51
Study Drills	32
Common Student Questions	52
Exercise 19 Functions and Variables	34
What You Should See	
Study Drills	
Common Student Questions	
Exercise 20 Functions and Files	
What You Should See	39

Study Drills  69    Common Student Questions  69
Exercise 21 Functions Can Return Something     72       What You Should See     73       Study Drills     73       Common Student Questions     74       Exercise 22 What Do You Know So Far?     76       What You Are Learning     76
Exercise 23 Strings, Bytes, and Character Encodings     78       Initial Research     78       Switches, Conventions, and Encodings     80       Disecting the Output     82       Disecting the Code     82       Encodings Deep Dive     84       Breaking It     85
Exercise 24 More Practice     86       What You Should See     87       Study Drills     87       Common Student Questions     87       Exercise 25 Even More Practice     90       What You Should See     91       Study Drills     92       Common Student Questions     93
Exercise 26 Congratulations, Take a Test!     94       Common Student Questions     94       Exercise 27 Memorizing Logic     96       The Truth Terms     96       The Truth Tables     97       Common Student Questions     98
Exercise 28 Boolean Practice
Exercise 29 What If

Study Drills
Exercise 30     Else and If
Exercise 31 Making Decisions
Exercise 32 Loops and Lists     .112       What You Should See     .113       Study Drills     .114       Common Student Questions     .114
Exercise 33 While Loops     .116       What You Should See     .117       Study Drills     .117       Common Student Questions     .118
Exercise 34 Accessing Elements of Lists
Exercise 35 Branches and Functions     .122       What You Should See     .123       Study Drills     .124       Common Student Questions     .124
Exercise 36 Designing and Debugging     .126       Rules for if-statements     .126       Rules for Loops     .126       Tips for Debugging     .127       Homework     .127
Exercise 37 Symbol Review
Operators

Reading Code
Study Drills
Common Student Questions
Exercise 38 Doing Things to Lists     .134       What You Should See     .135       What Lists Can Do     .136       When to Use Lists     .137       Study Drills     .137       Common Student Questions     .138
Exercise 39 Dictionaries, Oh Lovely Dictionaries
A Dictionary Example
What You Should See
What Dictionaries Can Do
Study Drills
Common Student Questions
Exercise 40 Modules, Classes, and Objects
Modules Are Like Dictionaries
Classes Are Like Modules
Objects Are Like Import
Getting Things from Things
A First Class Example
What You Should See
Study Drills
Common Student Questions
Exercise 41 Learning to Speak Object-Oriented
Word Drills
Phrase Drills
Combined Drills
A Reading Test
Practice English to Code
Reading More Code
Common Student Questions
Exercise 42 Is-A, Has-A, Objects, and Classes
How This Looks in Code
About class Name(object)
Study Drills
Common Student Questions

Exercise 43 Basic Object-Oriented Analysis and Design
The Analysis of a Simple Game Engine
Write or Draw About the Problem
Extract Key Concepts and Research Them
Create a Class Hierarchy and Object Map for the Concepts 166
Code the Classes and a Test to Run Them
Repeat and Refine
Top Down versus Bottom Up
The Code for "Gothons from Planet Percal #25"
What You Should See
Study Drills
Common Student Questions
Exercise 44 Inheritance versus Composition
What Is Inheritance?
Implicit Inheritance
Override Explicitly
Alter Before or After
All Three Combined
The Reason for super()
Using super() withinit183
Composition
When to Use Inheritance or Composition
Study Drills
Common Student Questions
Exercise 45 You Make a Game
Evaluating Your Game
Function Style
Class Style
Code Style
Good Comments
Evaluate Your Game
Exercise 46 A Project Skeleton
macOS/Linux Setup
Windows 10 Setup
Creating the Skeleton Project Directory
Final Directory Structure
Testing Your Setup
Using the Skeleton

Required Quiz
Exercise 47 Automated Testing     .200       Writing a Test Case     .200       Testing Guidelines     .202       What You Should See     .202       Study Drills     .203       Common Student Questions     .203
Exercise 48 Advanced User Input     .204       Our Game Lexicon     .204       Breaking Up a Sentence     .205       Lexicon Tuples     .205       Scanning Input     .205       Exceptions and Numbers     .206       A Test First Challenge     .207       Study Drills     .207       Common Student Questions     .209
Exercise 49 Making Sentences.210Match and Peek.210The Sentence Grammar.211A Word on Exceptions.211The Parser Code.211Playing with the Parser.214What You Should Test.215Study Drills.215Common Student Questions.215
Exercise 50 Your First Website
Exercise 51 Getting Input from a Browser

How Forms Work
Creating HTML Forms
Creating a Layout Template
Writing Automated Tests for Forms
Study Drills
Breaking It
Everying 52 The Start of Your Web Come
Exercise 52 The Start of Your Web Game
Refactoring the Exercise 43 Game
Creating an Engine
Your Final Exam
Common Student Questions
Next Steps
How to Learn Any Programming Language
Advice from an Old Programmer
Appendix Command Line Crash Course
Introduction: Shut Up and Shell
How to Use This Appendix
You Will Be Memorizing Things
The Setup
Do This
You Learned This
Do More
Paths, Folders, Directories (pwd)
Do This
You Learned This
Do More
If You Get Lost
Do This
You Learned This
Make a Directory (mkdir)
Do This
You Learned This
Do More
Change Directory (cd)
Do This
You Learned This
Do More

١

List Directory (ls)
Do This
You Learned This
Do More
Remove Directory (rmdir)
Do This
You Learned This
Do More
Moving Around (pushd, popd)
Do This
You Learned This
Do More
Making Empty Files (touch/New-Item)
Do This
You Learned This
Do More
Copy a File (cp)
Do This
You Learned This
Do More
Moving a File (mv)
Do This
You Learned This
Do More
View a File (less/more)
Do This
You Learned This
Do More
Stream a File (cat)
Do This
You Learned This
Do More
Removing a File (rm)
Do This
You Learned This
Do More
Exiting Your Terminal (exit)
Do This

You Learned This						2									•	ł.				.282
Do More																				
Command Line Next Steps						•	•		÷	2	4				•		•			.283
Unix Bash References .		•			•	•	•	•	•	•		•	•	•		•		•		.283
PowerShell References .	•	•	•	•	•		•		٠	¢							÷	ş		. 283
Index				3				•			3		2				÷		•	.284

.