



Learn **PYTHON** the **HARD WAY**

THIRD EDITION

A Very Simple Introduction to
the Terrifyingly Beautiful World of
Computers and Code

Z E D S H A W

LEARN PYTHON THE HARD WAY

Third Edition

Learn Python the Hard Way: A Very Simple Introduction to the Terrifyingly Beautiful World of Computers and Code

Table of Contents

Contents

Preface

- Acknowledgments

- The Hard Way Is Easier

 - Reading and Writing

 - Attention to Detail

 - Spotting Differences

- Do Not Copy-Paste

- Using the Included Videos

 - A Word of Advice for Visual Learners

- A Note on Practice and Persistence

- A Warning for the Smarties

Exercise 0 The Setup

- Mac OSX

 - OSX: What You Should See

- Windows

 - Windows: What You Should See

- Linux

 - Linux: What You Should See

Table of Contents

Warnings for Beginners

Exercise 1 A Good First Program

What You Should See

Study Drills

Common Student Questions

Exercise 2 Comments and Pound Characters

What You Should See

Study Drills

Common Student Questions

Exercise 3 Numbers and Math

What You Should See

Study Drills

Common Student Questions

Exercise 4 Variables and Names

What You Should See

Study Drills

Common Student Questions

Exercise 5 More Variables and Printing

What You Should See

Study Drills

Common Student Questions

Exercise 6 Strings and Text

What You Should See

Study Drills

Common Student Questions

Table of Contents

Exercise 7 More Printing

What You Should See

Study Drills

Common Student Questions

Exercise 8 Printing, Printing

What You Should See

Study Drills

Common Student Questions

Exercise 9 Printing, Printing, Printing

What You Should See

Study Drills

Common Student Questions

Exercise 10 What Was That?

What You Should See

Escape Sequences

Study Drills

Common Student Questions

Exercise 11 Asking Questions

What You Should See

Study Drills

Common Student Questions

Exercise 12 Prompting People

What You Should See

Study Drills

Common Student Questions

Table of Contents

Exercise 13 Parameters, Unpacking, Variables

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

Exercise 15 Reading Files

What You Should See

Study Drills

Common Student Questions

Exercise 16 Reading and Writing Files

What You Should See

Study Drills

Common Student Questions

Exercise 17 More Files

What You Should See

Study Drills

Common Student Questions

Exercise 18 Names, Variables, Code, Functions

What You Should See

Study Drills

Common Student Questions

Table of Contents

Exercise 19 Functions and Variables

What You Should See

Study Drills

Common Student Questions

Exercise 20 Functions and Files

What You Should See

Study Drills

Common Student Questions

Exercise 21 Functions Can Return Something

What You Should See

Study Drills

Common Student Questions

Exercise 22 What Do You Know So Far?

What You Are Learning

Exercise 23 Read Some Code

Exercise 24 More Practice

What You Should See

Study Drills

Common Student Questions

Exercise 25 Even More Practice

What You Should See

Study Drills

Common Student Questions

Exercise 26 Congratulations, Take a Test!

Common Student Questions

Table of Contents

Exercise 27 Memorizing Logic

The Truth Terms

The Truth Tables

Common Student Questions

Exercise 28 Boolean Practice

What You Should See

Study Drills

Common Student Questions

Exercise 29 What If

What You Should See

Study Drills

Common Student Questions

Exercise 30 Else and If

What You Should See

Study Drills

Common Student Questions

Exercise 31 Making Decisions

What You Should See

Study Drills

Common Student Questions

Exercise 32 Loops and Lists

What You Should See

Study Drills

Common Student Questions

Exercise 33 While-Loops

Table of Contents

What You Should See

Study Drills

Common Student Questions

Exercise 34 Accessing Elements of Lists

Study Drills

Exercise 35 Branches and Functions

What You Should See

Study Drills

Common Student Questions

Exercise 36 Designing and Debugging

Rules for If-Statements

Rules for Loops

Tips for Debugging

Homework

Exercise 37 Symbol Review

Keywords

Data Types

String Escape Sequences

String Formats

Operators

Reading Code

Study Drills

Common Student Questions

Exercise 38 Doing Things to Lists

What You Should See

Table of Contents

Study Drills

Common Student Questions

Exercise 39 Dictionaries, Oh Lovely Dictionaries

What You Should See

Study Drills

Common Student Questions

Exercise 40 Modules, Classes, and Objects

Modules Are Like Dictionaries

Classes Are Like Modules

Objects Are Like Mini-Imports

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)

Table of Contents

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

Code the Classes and a Test to Run Them

Repeat and Refine

Top Down vs. Bottom Up

The Code for Gothons from Planet Percal #25

What You Should See

Study Drills

Common Student Questions

Exercise 44 Inheritance vs. Composition

What is Inheritance?

Implicit Inheritance

Override Explicitly

Alter Before or After

All Three Combined

The Reason for super()

Using super() with __init__

Composition

When to Use Inheritance or Composition

Study Drills

Common Student Questions

Exercise 45 You Make a Game

Table of Contents

Evaluating Your Game

Function Style

Class Style

Code Style

Good Comments

Evaluate Your Game

Exercise 46 A Project Skeleton

Installing Python Packages

Creating the Skeleton Project Directory

Final Directory Structure

Testing Your Setup

Using the Skeleton

Required Quiz

Common Student Questions

Exercise 47 Automated Testing

Writing a Test Case

Testing Guidelines

What You Should See

Study Drills

Common Student Questions

Exercise 48 Advanced User Input

Our Game Lexicon

Breaking Up a Sentence

Lexicon Tuples

Scanning Input

Exceptions and Numbers

Table of Contents

What You Should Test

Design Hints

Study Drills

Common Student Questions

Exercise 49 Making Sentences

Match and Peek

The Sentence Grammar

A Word on Exceptions

What You Should Test

Study Drills

Common Student Questions

Exercise 50 Your First Website

Installing lpthw.web

Make a Simple Hello World Project

Whats Going On?

Fixing Errors

Create Basic Templates

Study Drills

Common Student Questions

Exercise 51 Getting Input from a Browser

How the Web Works

How Forms Work

Creating HTML Forms

Creating a Layout Template

Writing Automated Tests for Forms

Table of Contents

Study Drills

Common Student Questions

Exercise 52 The Start of Your Web Game

Refactoring the Exercise 43 Game

Sessions and Tracking Users

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

Exercise 1: The Setup

Do This

You Learned This

Do More

Exercise 2: Paths, Folders, Directories (pwd)

Do This

You Learned This

Do More

Exercise 3: If You Get Lost

Do This

You Learned This

Exercise 4: Make a Directory (mkdir)

Table of Contents

Do This

You Learned This

Do More

Exercise 5: Change Directory (cd)

Do This

You Learned This

Do More

Exercise 6: List Directory (ls)

Do This

You Learned This

Do More

Exercise 7: Remove Directory (rmdir)

Do This

You Learned This

Do More

Exercise 8: Move Around (pushd, popd)

Do This

You Learned This

Do More

Exercise 9: Make Empty Files (Touch, New-Item)

Do This

You Learned This

Do More

Exercise 10: Copy a File (cp)

Do This

You Learned This

Do More

Exercise 11: Move a File (mv)

Table of Contents

Do This

You Learned This

Do More

Exercise 12: View a File (less, MORE)

Do This

You Learned This

Do More

Exercise 13: Stream a File (cat)

Do This

You Learned This

Do More

Exercise 14: Remove a File (rm)

Do This

You Learned This

Do More

Exercise 15: Exit Your Terminal (exit)

Do This

You Learned This

Do More

Command Line Next Steps

Unix Bash References

PowerShell References

Index

Where Are the Companion Content Files?