

THE NATURE OF CODE. Copyright © 2024 by Daniel Shiffman.

This work is licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) license. To view a copy of this license, visit <https://creativecommons.org/licenses/by-nc-sa/4.0/> or send a letter to Creative Commons, PO Box 1866, Mountain View, CA 94042, USA.

Some rights reserved.

When attributing this work, you must credit the author as follows: “Daniel Shiffman, published by No Starch Press® Inc.,” provide a link to the license, and indicate if changes were made. You may not use the material for commercial purposes. For ShareAlike purposes, if you transform or build upon the material, you must distribute your contributions under the same license as the original.

Translations of this work are not covered under this license; all translation rights are reserved by the publisher. For permission to translate this work, please contact rights@nostarch.com.

Moral rights of the author have been asserted.

Printed in China

First printing

28 27 26 25 24 1 2 3 4 5

ISBN-13: 978-1-7185-0370-0 (print)

ISBN-13: 978-1-7185-0371-7 (ebook)



® Published by No Starch Press®, Inc.
245 8th Street, San Francisco, CA 94103
phone: +1.415.863.9900
www.nostarch.com; info@nostarch.com

Publisher: William Pollock

Managing Editor: Jill Franklin

Production Manager: Sabrina Plomitallo-González

Production Editor: Jennifer Kepler

Developmental Editor: Nathan Heidelberg

Illustrator: Zannah Marsh

Cover Design: Tuan Huang

Interior Design: Tuan Huang and Jason Gao

Technical Reviewer: Jasper Palfree

Copyeditor: Sharon Wilkey

Proofreader: Audrey Doyle

Indexer: BIM Creatives, LLC

Library of Congress Control Number: 2023053620

For permissions beyond the scope of this license or customer service inquiries, please contact info@nostarch.com. For information on distribution, bulk sales, or corporate sales: sales@nostarch.com. To report counterfeit copies or piracy: counterfeit@nostarch.com.

No Starch Press and the No Starch Press logo are registered trademarks of No Starch Press, Inc. Other product and company names mentioned herein may be the trademarks of their respective owners. Rather than use a trademark symbol with every occurrence of a trademarked name, we are using the names only in an editorial fashion and to the benefit of the trademark owner, with no intention of infringement of the trademark.

The information in this book is distributed on an “As Is” basis, without warranty. While every precaution has been taken in the preparation of this work, neither the author nor No Starch Press, Inc. shall have any liability to any person or entity with respect to any loss or damage caused or alleged to be caused directly or indirectly by the information contained in it.