Once Upon An Algorithm How Stories Explain Computing

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Weapons of Math Destruction Cathy O'Neil 2016 Longlisted for the National Book Award New York Times Bestseller A former Wall Street quant sounds an alarm on the mathematical models that pervade modern life -- and threaten to rip apart our social fabric We live in the age of the algorithm. Increasingly, the decisions that affect our lives--where we go to school, whether we get a car loan, how much we pay for health insurance--are being made not by humans, but by mathematical models. In theory, this should lead to greater fairness: Everyone is

judged according to the same rules, and bias is eliminated. But as Cathy O'Neil reveals in this urgent and necessary book, the opposite is true. The models being used today are opaque, unregulated, and uncontestable, even when they're wrong. Most troubling, they reinforce discrimination: If a poor student can't get a loan because a lending model deems him too risky (by virtue of his zip code), he's then cut off from the kind of education that could pull him out of poverty, and a vicious spiral ensues. Models are propping up the lucky and punishing the downtrodden, creating a "toxic cocktail for democracy." Welcome to the dark side of Big Data. Tracing the arc of a person's life, O'Neil exposes the black box models that shape our future, both as individuals and as a society. These "weapons of math destruction" score teachers and students, sort r sum s, grant (or deny) loans, evaluate workers, target voters, set parole, and monitor our health. O'Neil calls on modelers to take more responsibility for their algorithms and on policy makers to regulate their use. But in the end, it's up to us to become more savvy about the models that govern our lives. This important book empowers us to ask the tough questions, uncover the truth, and demand change. -- Longlist for National Book Award (Non-Fiction) -- Goodreads, semi-finalist for the 2016 Goodreads Choice Awards (Science and Technology) -- Kirkus, Best Books of 2016 -- New York Times, 100 Notable Books of 2016 (Non-Fiction) --

The Guardian, Best Books
of 2016 -- WBUR's "On
Point," Best Books of
2016: Staff Picks --
Boston Globe, Best Books
of 2016, Non-Fiction
*A Sense of the
Mysterious* Alan Lightman
2006 Presents a
collection of essays
exploring the human
dimensions of science,
furnishing portraits of
seminal scientists
Richard Feynman, Albert
Einstein, Edward Teller,
and Vera Rubin, as well
as reflections on
science and art,
imagination and metaphor
in science, and the
social and spiritual
implications of
technology.
Once Upon an Algorithm
Martin Erwig 2017-08-11
How Hansel and Gretel,
Sherlock Holmes, the
movie Groundhog Day,
Harry Potter, and other
familiar stories
illustrate the concepts
of computing. Picture a
computer scientist,
staring at a screen and
clicking away
frantically on a
keyboard, hacking into a
system, or perhaps
developing an app. Now
delete that picture. In
Once Upon an Algorithm,
Martin Erwig explains
computation as something
that takes place beyond
electronic computers,
and computer science as
the study of systematic
problem solving. Erwig
points out that many
daily activities involve
problem solving. Getting
up in the morning, for
example: You get up,
take a shower, get
dressed, eat breakfast.
This simple daily
routine solves a
recurring problem
through a series of
well-defined steps. In
computer science, such a
routine is called an
algorithm. Erwig
illustrates a series of
concepts in computing
with examples from daily
life and familiar

stories. Hansel and Gretel, for example, execute an algorithm to get home from the forest. The movie Groundhog Day illustrates the problem of unsolvability; Sherlock Holmes manipulates data structures when solving a crime; the magic in Harry Potter's world is understood through types and abstraction; and Indiana Jones demonstrates the complexity of searching. Along the way, Erwig also discusses representations and different ways to organize data; "intractable" problems; language, syntax, and ambiguity; control structures, loops, and the halting problem; different forms of recursion; and rules for finding errors in algorithms. This engaging book explains computation accessibly and shows its relevance to daily life. Something to think about next time we execute the algorithm of getting up in the morning.

The Meaning of Proofs Gabriele Lolli 2022-09-27 Why mathematics is not merely formulaic: an argument that to write a mathematical proof is tantamount to inventing a story. In The Meaning of Proofs, mathematician Gabriele Lolli argues that to write a mathematical proof is tantamount to inventing a story. Lolli offers not instructions for how to write mathematical proofs, but a philosophical and poetic reflection on mathematical proofs as narrative. Mathematics, imprisoned within its symbols and images, Lolli writes, says nothing if its meaning is not narrated in a story. The minute

mathematicians open their mouths to explain something—the meaning of x, how to find y—they are framing a narrative. Every proof is the story of an adventure, writes Lolli, a journey into an unknown land to open a new, connected route; once the road is open, we correct it, expand it. Just as fairy tales offer a narrative structure in which new characters can be inserted into recurring forms of the genre in original ways, in mathematics, each new abstract concept is the protagonist of a different theory supported by the general techniques of mathematical reasoning. In ancient Greece, there was more than an analogy between literature and mathematics, there was direct influence. Euclid's proofs have roots in poetry and rhetoric. Mathematics, Lolli asserts, is not the mere manipulation of formulas.

Building a StoryBrand Donald Miller 2017-10-10 More than half-a-million business leaders have discovered the power of the StoryBrand Framework, created by New York Times best-selling author and marketing expert Donald Miller. And they are making millions. If you use the wrong words to talk about your product, nobody will buy it. Marketers and business owners struggle to effectively connect with their customers, costing them and their companies millions in lost revenue. In a world filled with constant, on-demand distractions, it has become near-impossible for business owners to effectively cut through the noise to reach their customers, something Donald Miller knows first-hand. In

this book, he shares the proven system he has created to help you engage and truly influence customers. The StoryBrand process is a proven solution to the struggle business leaders face when talking about their companies. Without a clear, distinct message, customers will not understand what you can do for them and are unwilling to engage, causing you to lose potential sales, opportunities for customer engagement, and much more. In Building a StoryBrand, Donald Miller teaches marketers and business owners to use the seven universal elements of powerful stories to dramatically improve how they connect with customers and grow their businesses. His proven process has helped thousands of companies engage with their existing customers, giving them the ultimate competitive advantage. Building a StoryBrand does this by teaching you: The seven universal story points all humans respond to; The real reason customers make purchases; How to simplify a brand message so people understand it; and How to create the most effective messaging for websites, brochures, and social media. Whether you are the marketing director of a multibillion-dollar company, the owner of a small business, a politician running for office, or the lead singer of a rock band, Building a StoryBrand will forever transform the way you talk about who you are, what you do, and the unique value you bring to your customers.
Lauren Ipsum Carlos Bueno 2014-12-14 Lauren Ipsum is a whimsical

journey through a land where logic and computer science come to life. Meet Lauren, an adventurer lost in Userland who needs to find her way home by solving a series of puzzles. As she visits places like the Push & Pop Café and makes friends with people like Hugh Rustic and the Wandering Salesman, Lauren learns about computer science without even realizing it—and so do you! Read Lauren Ipsum yourself or with someone littler than you, then flip to the notes at the back of the book to learn more about logic and computer science in the real world. Suggested for ages 10+

Algorithmic Puzzles Anany Levitin 2011-10-14 Algorithmic puzzles are puzzles involving well-defined procedures for solving problems. This book will provide an enjoyable and accessible introduction to algorithmic puzzles that will develop the reader's algorithmic thinking. The first part of this book is a tutorial on algorithm design strategies and analysis techniques. Algorithm design strategies — exhaustive search, backtracking, divide-and-conquer and a few others — are general approaches to designing step-by-step instructions for solving problems. Analysis techniques are methods for investigating such procedures to answer questions about the ultimate result of the procedure or how many steps are executed before the procedure stops. The discussion is an elementary level, with puzzle examples, and requires neither programming nor mathematics beyond a secondary school level.

Thus, the tutorial provides a gentle and entertaining introduction to main ideas in high-level algorithmic problem solving. The second and main part of the book contains 150 puzzles, from centuries-old classics to newcomers often asked during job interviews at computing, engineering, and financial companies. The puzzles are divided into three groups by their difficulty levels. The first fifty puzzles in the Easier Puzzles section require only middle school mathematics. The sixty puzzle of average difficulty and forty harder puzzles require just high school mathematics plus a few topics such as binary numbers and simple recurrences, which are reviewed in the tutorial. All the puzzles are provided with hints, detailed solutions, and brief comments. The comments deal with the puzzle origins and design or analysis techniques used in the solution. The book should be of interest to puzzle lovers, students and teachers of algorithm courses, and persons expecting to be given puzzles during job interviews.

The CS Detective Jeremy Kubica 2016-08-16 Meet Frank Runtime. Disgraced ex-detective. Hard-boiled private eye. Search expert. When a robbery hits police headquarters, it's up to Frank Runtime and his extensive search skills to catch the culprits. In this detective story, you'll learn how to use algorithmic tools to solve the case. Runtime scours smugglers' boats with binary search, tails spies with a search tree, escapes a

prison with depth-first search, and picks locks with priority queues. Joined by know-it-all rookie Officer Notation and inept tag-along Socks, he follows a series of leads in a best-first search that unravels a deep conspiracy. Each chapter introduces a thrilling twist matched with a new algorithmic concept, ending with a technical recap. Perfect for computer science students and amateur sleuths alike, The CS Detective adds an entertaining twist to learning algorithms. Follow Frank's mission and learn: —The algorithms behind best-first and depth-first search, iterative deepening, parallelizing, binary search, and more —Basic computational concepts like strings, arrays, stacks, and queues —How to adapt search algorithms to unusual data structures —The most efficient algorithms to use in a given situation, and when to apply common-sense heuristic methods **Bad Choices** Ali Almossawi 2017-04-04 A relatable, interactive, and funny exploration of algorithms, those essential building blocks of computer science—and of everyday life—from the author of the wildly popular Bad Arguments Algorithms—processes that are made up of unambiguous steps and do something useful—make up the very foundations of computer science. But they also inform our choices in approaching everyday tasks, from managing a pile of clothes fresh out of the dryer to deciding what music to listen to. With Bad Choices, Ali Almossawi presents twelve scenes from

everyday life that help demonstrate and demystify the fundamental algorithms that drive computer science, bringing these seemingly elusive concepts into the understandable realms of the everyday. Readers will discover how: • Matching socks can teach you about search and hash tables • Planning trips to the store can demonstrate the value of stacks • Deciding what music to listen to shows why link analysis is all-important • Crafting a succinct Tweet draws on ideas from compression • Making your way through a grocery list helps explain priority queues and traversing graphs • And more As you better understand algorithms, you'll also discover what makes a method faster and more efficient, helping you become a more nimble,

creative problem-solver, ready to face new challenges. Bad Choices will open the world of algorithms to all readers, making this a perennial go-to for fans of quirky, accessible science books.
Once Upon an Algorithm Martin Erwig 2022-08-09 How Hansel and Gretel, Sherlock Holmes, the movie Groundhog Day, Harry Potter, and other familiar stories illustrate the concepts of computing. Picture a computer scientist, staring at a screen and clicking away frantically on a keyboard, hacking into a system, or perhaps developing an app. Now delete that picture. In Once Upon an Algorithm, Martin Erwig explains computation as something that takes place beyond electronic computers, and computer science as the study of systematic problem solving. Erwig

points out that many daily activities involve problem solving. Getting up in the morning, for example: You get up, take a shower, get dressed, eat breakfast. This simple daily routine solves a recurring problem through a series of well-defined steps. In computer science, such a routine is called an algorithm. Erwig illustrates a series of concepts in computing with examples from daily life and familiar stories. Hansel and Gretel, for example, execute an algorithm to get home from the forest. The movie Groundhog Day illustrates the problem of unsolvability; Sherlock Holmes manipulates data structures when solving a crime; the magic in Harry Potter's world is understood through types and abstraction; and Indiana Jones demonstrates the complexity of searching. Along the way, Erwig also discusses representations and different ways to organize data; "intractable" problems; language, syntax, and ambiguity; control structures, loops, and the halting problem; different forms of recursion; and rules for finding errors in algorithms. This engaging book explains computation accessibly and shows its relevance to daily life. Something to think about next time we execute the algorithm of getting up in the morning.

Grokking Algorithms Aditya Bhargava 2016-05-12 Summary Grokking Algorithms is a fully illustrated, friendly guide that teaches you how to apply common algorithms to the practical problems you

face every day as a programmer. You'll start with sorting and searching and, as you build up your skills in thinking algorithmically, you'll tackle more complex concerns such as data compression and artificial intelligence. Each carefully presented example includes helpful diagrams and fully annotated code samples in Python. Learning about algorithms doesn't have to be boring! Get a sneak peek at the fun, illustrated, and friendly examples you'll find in Grokking Algorithms on Manning Publications' YouTube channel. Continue your journey into the world of algorithms with Algorithms in Motion, a practical, hands-on video course available exclusively at Manning.com (www.manning.com/livevideo/algorithms-□in-

motion). Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology An algorithm is nothing more than a step-by-step procedure for solving a problem. The algorithms you'll use most often as a programmer have already been discovered, tested, and proven. If you want to understand them but refuse to slog through dense multipage proofs, this is the book for you. This fully illustrated and engaging guide makes it easy to learn how to use the most important algorithms effectively in your own programs. About the Book Grokking Algorithms is a friendly take on this core computer science topic. In it, you'll learn how to apply common algorithms to the practical programming

problems you face every day. You'll start with tasks like sorting and searching. As you build up your skills, you'll tackle more complex problems like data compression and artificial intelligence. Each carefully presented example includes helpful diagrams and fully annotated code samples in Python. By the end of this book, you will have mastered widely applicable algorithms as well as how and when to use them. What's Inside Covers search, sort, and graph algorithms Over 400 pictures with detailed walkthroughs Performance trade-offs between algorithms Python-based code samples About the Reader This easy-to-read, picture-heavy introduction is suitable for self-taught programmers, engineers, or anyone who wants to brush up on algorithms.

About the Author Aditya Bhargava is a Software Engineer with a dual background in Computer Science and Fine Arts. He blogs on programming at adit.io. Table of Contents Introduction to algorithms Selection sort Recursion Quicksort Hash tables Breadth-first search Dijkstra's algorithm Greedy algorithms Dynamic programming K-nearest neighbors
The Algorithm Design Manual Steven S Skiena 2009-04-05 This newly expanded and updated second edition of the best-selling classic continues to take the "mystery" out of designing algorithms, and analyzing their efficacy and efficiency. Expanding on the first edition, the book now serves as the primary textbook of choice for algorithm design courses while maintaining its status as the premier

practical reference guide to algorithms for programmers, researchers, and students. The reader-friendly Algorithm Design Manual provides straightforward access to combinatorial algorithms technology, stressing design over analysis. The first part, Techniques, provides accessible instruction on methods for designing and analyzing computer algorithms. The second part, Resources, is intended for browsing and reference, and comprises the catalog of algorithmic resources, implementations and an extensive bibliography. NEW to the second edition: • Doubles the tutorial material and exercises over the first edition • Provides full online support for lecturers, and a completely updated and improved website component with lecture slides, audio and video • Contains a unique catalog identifying the 75 algorithmic problems that arise most often in practice, leading the reader down the right path to solve them • Includes several NEW "war stories" relating experiences from real-world applications • Provides up-to-date links leading to the very best algorithm implementations available in C, C++, and Java

Algorithms to Live By Brian Christian 2016-04-19 A fascinating exploration of how insights from computer algorithms can be applied to our everyday lives, helping to solve common decision-making problems and illuminate the workings of the human mind All our lives are constrained by limited space and time, limits that give rise to

a particular set of problems. What should we do, or leave undone, in a day or a lifetime? How much messiness should we accept? What balance of new activities and familiar favorites is the most fulfilling? These may seem like uniquely human quandaries, but they are not: computers, too, face the same constraints, so computer scientists have been grappling with their version of such issues for decades. And the solutions they've found have much to teach us. In a dazzlingly interdisciplinary work, acclaimed author Brian Christian and cognitive scientist Tom Griffiths show how the algorithms used by computers can also untangle very human questions. They explain how to have better hunches and when to leave things to chance, how to deal with overwhelming choices and how best to connect with others. From finding a spouse to finding a parking spot, from organizing one's inbox to understanding the workings of memory, Algorithms to Live By transforms the wisdom of computer science into strategies for human living.

The Bestseller Code Jodie Archer 2016-09-20 "When a story captures the imagination of millions, that's magic. Can you qualify magic? Archer and Jockers just may have done so."—Sylvia Day, New York Times bestselling author Ask most people about massive success in the world of fiction, and you'll typically hear that it's a game of hazy crystal balls. The sales figures of E. L. James or Dan Brown seem to be freakish—random occurrences in an unknowable market. But

what if there were an algorithm that could reveal a secret DNA of bestsellers, regardless of their genre? What if it knew, just from analyzing the words alone, not just why genre writers like John Grisham and Danielle Steel belong on the lists, but also that authors such as Junot Diaz, Jodi Picoult, and Donna Tartt had telltale signs of success all over their pages? Thanks to Jodie Archer and Matthew Jockers, the algorithm exists, the code has been cracked, and the results bring fresh new insights into how fiction works and why we read. The Bestseller Code offers a new theory for why Fifty Shades of Grey sold so well. It sheds light on the current craze for dark heroines. It reveals which themes tend to sell best. And all with fascinating supporting data taken from a five-year study of twenty thousand novels. Then there is the hunt for "the one"—the paradigmatic example of bestselling writing according to a computer's analysis of thousands of points of data. The result is surprising, a bit ironic, and delightfully unorthodox. This book explains groundbreaking text-mining research in accessible terms and offers a new perspective on the New York Times bestseller list. It's a big-idea book about the relationship between creativity and technology that will be provocative to anyone interested in how analytics have already transformed the worlds of finance, medicine, and sports. But at heart it is a celebration of books for readers and writers—a compelling investigation into how

successful writing works, and a fresh take on our intellectual and emotional response to stories.

The Fear Index Robert Harris 2012-01-31 At the nexus of high finance and sophisticated computer programming, a terrifying future may be unfolding even now. Dr. Alex Hoffmann's name is carefully guarded from the general public, but within the secretive inner circles of the ultrarich he is a legend. He has developed a revolutionary form of artificial intelligence that predicts movements in the financial markets with uncanny accuracy. His hedge fund, based in Geneva, makes billions. But one morning before dawn, a sinister intruder breaches the elaborate security of his lakeside mansion, and so begins a waking nightmare of paranoia and violence as Hoffmann attempts, with increasing desperation, to discover who is trying to destroy him. Fiendishly smart and suspenseful, The Fear Index gives us a searing glimpse into an all-too-recognizable world of greed and panic. It is a novel that forces us to confront the question of what it means to be human—and it is Robert Harris's most spellbinding and audacious novel to date.

The Master Algorithm Pedro Domingos 2015-09-22 A thought-provoking and wide-ranging exploration of machine learning and the race to build computer intelligences as flexible as our own In the world's top research labs and universities, the race is on to invent the ultimate learning algorithm: one capable of discovering any knowledge from data, and doing anything we want,

before we even ask. In The Master Algorithm, Pedro Domingos lifts the veil to give us a peek inside the learning machines that power Google, Amazon, and your smartphone. He assembles a blueprint for the future universal learner--the Master Algorithm--and discusses what it will mean for business, science, and society. If data-ism is today's philosophy, this book is its bible. *Programming Pearls* Jon Bentley 2016-04-21 When programmers list their favorite books, Jon Bentley's collection of programming pearls is commonly included among the classics. Just as natural pearls grow from grains of sand that irritate oysters, programming pearls have grown from real problems that have irritated real programmers. With origins beyond solid engineering, in the realm of insight and creativity, Bentley's pearls offer unique and clever solutions to those nagging problems. Illustrated by programs designed as much for fun as for instruction, the book is filled with lucid and witty descriptions of practical programming techniques and fundamental design principles. It is not at all surprising that Programming Pearls has been so highly valued by programmers at every level of experience. In this revision, the first in 14 years, Bentley has substantially updated his essays to reflect current programming methods and environments. In addition, there are three new essays on testing, debugging, and timing set representations string problems All the original programs have

been rewritten, and an equal amount of new code has been generated. Implementations of all the programs, in C or C++, are now available on the Web. What remains the same in this new edition is Bentley's focus on the hard core of programming problems and his delivery of workable solutions to those problems. Whether you are new to Bentley's classic or are revisiting his work for some fresh insight, the book is sure to make your own list of favorites.

Data Feminism Catherine D'Ignazio 2020-03-31 A new way of thinking about data science and data ethics that is informed by the ideas of intersectional feminism. Today, data science is a form of power. It has been used to expose injustice, improve health outcomes, and topple governments. But it has also been used to discriminate, police, and surveil. This potential for good, on the one hand, and harm, on the other, makes it essential to ask: Data science by whom? Data science for whom? Data science with whose interests in mind? The narratives around big data and data science are overwhelmingly white, male, and techno-heroic. In Data Feminism, Catherine D'Ignazio and Lauren Klein present a new way of thinking about data science and data ethics—one that is informed by intersectional feminist thought. Illustrating data feminism in action, D'Ignazio and Klein show how challenges to the male/female binary can help challenge other hierarchical (and empirically wrong) classification systems. They explain how, for

example, an understanding of emotion can expand our ideas about effective data visualization, and how the concept of invisible labor can expose the significant human efforts required by our automated systems. And they show why the data never, ever "speak for themselves." Data Feminism offers strategies for data scientists seeking to learn how feminism can help them work toward justice, and for feminists who want to focus their efforts on the growing field of data science. But Data Feminism is about much more than gender. It is about power, about who has it and who doesn't, and about how those differentials of power can be challenged and changed.
Cloud Cuckoo Land (Large Print Edition) Anthony Doerr 2021-09-28 From the Pulitzer Prize—winning author of All the Light We Cannot See, perhaps the most bestselling and beloved literary fiction of our time, comes a triumph of imagination and compassion, a soaring novel about children on the cusp of adulthood in a broken world, who find resilience, hope, and story. The heroes of Cloud Cuckoo Land are trying to figure out the world around them: Anna and Omeir, on opposite sides of the formidable city walls during the 1453 siege of Constantinople; teenage idealist Seymour in an attack on a public library in present day Idaho; and Konstance, on an interstellar ship bound for an exoplanet, decades from now. Like Marie-Laure and Werner in All the Light We Cannot See, Anna, Omeir, Seymour, and Konstance are dreamers and

outsiders who find
resourcefulness and hope
in the midst of peril.
An ancient text—the
story of Aethon, who
longs to be turned into
a bird so that he can
fly to a utopian
paradise in the
sky—provides solace and
mystery to these
unforgettable
characters. Doerr has
created a tapestry of
times and places that
reflects our vast
interconnectedness—with
other species, with each
other, with those who
lived before us and
those who will be here
after we're gone.
Dedicated to "the
librarians then, now,
and in the years to
come," Cloud Cuckoo Land
is a hauntingly
beautiful and redemptive
novel about
stewardship—of the book,
of the Earth, of the
human heart.
*Nine Algorithms That
Changed the Future* John
MacCormick 2020-09-15
Nine revolutionary
algorithms that power
our computers and
smartphones Every day,
we use our computers to
perform remarkable
feats. A simple web
search picks out a
handful of relevant
needles from the world's
biggest haystack.
Uploading a photo to
Facebook transmits
millions of pieces of
information over
numerous error-prone
network links, yet
somehow a perfect copy
of the photo arrives
intact. Without even
knowing it, we use
public-key cryptography
to transmit secret
information like credit
card numbers, and we use
digital signatures to
verify the identity of
the websites we visit.
How do our computers
perform these tasks with
such ease? John
MacCormick answers this
question in language

anyone can understand, using vivid examples to explain the fundamental tricks behind nine computer algorithms that power our PCs, tablets, and smartphones.
Ten Arguments for Deleting Your Social Media Accounts Right Now Jaron Lanier 2018-05-29 "You might have trouble imagining life without your social media accounts, but virtual reality pioneer Jaron Lanier insists that we're better off without them. In Ten Arguments for Deleting Your Social Media Accounts Right Now, Lanier, who participates in no social media, offers powerful and personal reasons for all of us to leave these dangerous online platforms"--
What Algorithms Want Ed Finn 2017-03-10 The gap between theoretical ideas and messy reality, as seen in Neal Stephenson, Adam Smith, and Star Trek. We depend on—we believe in—algorithms to help us get a ride, choose which book to buy, execute a mathematical proof. It's as if we think of code as a magic spell, an incantation to reveal what we need to know and even what we want. Humans have always believed that certain invocations—the marriage vow, the shaman's curse—do not merely describe the world but make it. Computation casts a cultural shadow that is shaped by this long tradition of magical thinking. In this book, Ed Finn considers how the algorithm—in practical terms, "a method for solving a problem"—has its roots not only in mathematical logic but also in cybernetics, philosophy, and magical thinking. Finn argues that the algorithm deploys concepts from

the idealized space of computation in a messy reality, with unpredictable and sometimes fascinating results. Drawing on sources that range from Neal Stephenson's Snow Crash to Diderot's Encyclopédie, from Adam Smith to the Star Trek computer, Finn explores the gap between theoretical ideas and pragmatic instructions. He examines the development of intelligent assistants like Siri, the rise of algorithmic aesthetics at Netflix, Ian Bogost's satiric Facebook game Cow Clicker, and the revolutionary economics of Bitcoin. He describes Google's goal of anticipating our questions, Uber's cartoon maps and black box accounting, and what Facebook tells us about programmable value, among other things. If we want to understand the gap between abstraction and messy reality, Finn argues, we need to build a model of "algorithmic reading" and scholarship that attends to process, spearheading a new experimental humanities.

The Joy of Search Daniel M. Russell 2019-10-01 How to be a great online searcher, demonstrated with step-by-step searches for answers to a series of intriguing questions (for example, "Is that plant poisonous?"). We all know how to look up something online by typing words into a search engine. We do this so often that we have made the most famous search engine a verb: we Google it—"Japan population" or "Nobel Peace Prize" or "poison ivy" or whatever we want to know. But knowing how to Google something doesn't make us search experts;

there's much more we can do to access the massive collective knowledge available online. In The Joy of Search, Daniel Russell shows us how to be great online researchers. We don't have to be computer geeks or a scholar searching out obscure facts; we just need to know some basic methods. Russell demonstrates these methods with step-by-step searches for answers to a series of intriguing questions—from "what is the wrong side of a towel?" to "what is the most likely way you will die?" Along the way, readers will discover essential tools for effective online searches—and learn some fascinating facts and interesting stories. Russell explains how to frame search queries so they will yield information and describes the best ways to use such resources as Google Earth, Google Scholar, Wikipedia, and Wikimedia. He shows when to put search terms in double quotes, how to use the operator (*), why metadata is important, and how to triangulate information from multiple sources. By the end of this engaging journey of discovering, readers will have the definitive answer to why the best online searches involve more than typing a few words into Google.
A Human's Guide to Machine Intelligence Kartik Hosanagar 2020-03-10 A Wharton professor and tech entrepreneur examines how algorithms and artificial intelligence are starting to run every aspect of our lives, and how we can shape the way they impact us Through the technology embedded in almost every major tech

platform and every web-enabled device, algorithms and the artificial intelligence that underlies them make a staggering number of everyday decisions for us, from what products we buy, to where we decide to eat, to how we consume our news, to whom we date, and how we find a job. We've even delegated life-and-death decisions to algorithms--decisions once made by doctors, pilots, and judges. In his new book, Kartik Hosanagar surveys the brave new world of algorithmic decision-making and reveals the potentially dangerous biases they can give rise to as they increasingly run our lives. He makes the compelling case that we need to arm ourselves with a better, deeper, more nuanced understanding of the phenomenon of algorithmic thinking.

And he gives us a route in, pointing out that algorithms often think a lot like their creators--that is, like you and me. Hosanagar draws on his experiences designing algorithms professionally--as well as on history, computer science, and psychology--to explore how algorithms work and why they occasionally go rogue, what drives our trust in them, and the many ramifications of algorithmic decision-making. He examines episodes like Microsoft's chatbot Tay, which was designed to converse on social media like a teenage girl, but instead turned sexist and racist; the fatal accidents of self-driving cars; and even our own common, and often frustrating, experiences on services like Netflix and Amazon. A Human's Guide to Machine Intelligence is

an entertaining and provocative look at one of the most important developments of our time and a practical user's guide to this first wave of practical artificial intelligence.
Computer Science Distilled Wladston Ferreira Filho 2017-01-17 A foolproof walkthrough of must-know computer science concepts. A fast guide for those who don't need the academic formality, it goes straight to what differentiates pros from amateurs. First introducing discrete mathematics, then exposing the most common algorithm and data structure design elements, and finally the working principles of computers and programming languages, the book is indicated to all programmers.
Data Structures and Algorithms in Java Michael T. Goodrich 2014-01-28 The design and analysis of efficient data structures has long been recognized as a key component of the Computer Science curriculum. Goodrich, Tomassia and Goldwasser's approach to this classic topic is based on the object-oriented paradigm as the framework of choice for the design of data structures. For each ADT presented in the text, the authors provide an associated Java interface. Concrete data structures realizing the ADTs are provided as Java classes implementing the interfaces. The Java code implementing fundamental data structures in this book is organized in a single Java package, net.datastructures. This package forms a coherent library of data structures and

algorithms in Java specifically designed for educational purposes in a way that is complimentary with the Java Collections Framework.

A Human Algorithm Flynn Coleman 2019-10-01 A groundbreaking narrative on the urgency of ethically designed AI and a guidebook to reimagining life in the era of intelligent technology. The Age of Intelligent Machines is upon us, and we are at a reflection point. The proliferation of fast—moving technologies, including forms of artificial intelligence akin to a new species, will cause us to confront profound questions about ourselves. The era of human intellectual superiority is ending, and we need to plan for this monumental shift. A Human Algorithm: How Artificial Intelligence Is Redefining Who We Are examines the immense impact intelligent technology will have on humanity. These machines, while challenging our personal beliefs and our socioeconomic world order, also have the potential to transform our health and well—being, alleviate poverty and suffering, and reveal the mysteries of intelligence and consciousness. International human rights attorney Flynn Coleman deftly argues that it is critical that we instill values, ethics, and morals into our robots, algorithms, and other forms of AI. Equally important, we need to develop and implement laws, policies, and oversight mechanisms to protect us from tech's insidious threats. To realize AI's transcendent potential, Coleman advocates for

inviting a diverse group of voices to participate in designing our intelligent machines and using our moral imagination to ensure that human rights, empathy, and equity are core principles of emerging technologies. Ultimately, A Human Algorithm is a clarion call for building a more humane future and moving conscientiously into a new frontier of our own design. "[Coleman] argues that the algorithms of machine learning—if they are instilled with human ethics and values—could bring about a new era of enlightenment." —San Francisco Chronicle Algorithmic Thinking Daniel Zingaro 2020-12-15 A hands-on, problem-based introduction to building algorithms and data structures to solve problems with a computer. Algorithmic Thinking will teach you how to solve challenging programming problems and design your own algorithms. Daniel Zingaro, a master teacher, draws his examples from world-class programming competitions like USACO and IOI. You'll learn how to classify problems, choose data structures, and identify appropriate algorithms. You'll also learn how your choice of data structure, whether a hash table, heap, or tree, can affect runtime and speed up your algorithms; and how to adopt powerful strategies like recursion, dynamic programming, and binary search to solve challenging problems. Line-by-line breakdowns of the code will teach you how to use algorithms and data structures like: • The breadth-first search

algorithm to find the optimal way to play a board game or find the best way to translate a book • Dijkstra's algorithm to determine how many mice can exit a maze or the number of fastest routes between two locations • The union-find data structure to answer questions about connections in a social network or determine who are friends or enemies • The heap data structure to determine the amount of money given away in a promotion • The hash-table data structure to determine whether snowflakes are unique or identify compound words in a dictionary NOTE: Each problem in this book is available on a programming-judge website. You'll find the site's URL and problem ID in the description. What's better than a free correctness check? Python and Algorithmic Thinking for the Complete Beginner (2nd Edition) Aristides S Bouras 2019-06-16 Thoroughly revised for the latest version of Python, this book explains basic concepts in a clear and explicit way that takes very seriously one thing for granted-that the reader knows nothing about computer programming. Addressed to anyone who has no prior programming knowledge or experience, but a desire to learn programming with Python, it teaches the first thing that every novice programmer needs to learn, which is Algorithmic Thinking. Algorithmic Thinking involves more than just learning code. It is a problem-solving process that involves learning how to code. This edition contains all the popular features of the previous edition and adds a significant

number of exercises, as well as extensive revisions and updates. Apart from Python's lists, it now also covers dictionaries, while a brand new section provides an effective introduction to the next field that a programmer needs to work with, which is Object Oriented Programming (OOP). This book has a class course structure with questions and exercises at the end of each chapter so you can test what you have learned right away and improve your comprehension. With 250 solved and 450 unsolved exercises, 475 true/false, about 150 multiple choice, and 200 review questions and crosswords (the solutions and the answers to which can be found on the Internet), this book is ideal for novices or average programmers, for self-study high school students first-year college or university students teachers professors anyone who wants to start learning or teaching computer programming using the proper conventions and techniques

Hello World Hannah Fry 2019-03-28 'One of the best books yet written on data and algorithms. . .deserves a place on the bestseller charts.' (The Times) You are accused of a crime. Who would you rather determined your fate - a human or an algorithm? An algorithm is more consistent and less prone to error of judgement. Yet a human can look you in the eye before passing sentence. Welcome to the age of the algorithm, the story of a not-too-distant future where machines rule supreme, making important decisions - in healthcare, transport,

finance, security, what we watch, where we go even who we send to prison. So how much should we rely on them? What kind of future do we want? Hannah Fry takes us on a tour of the good, the bad and the downright ugly of the algorithms that surround us. In Hello World she lifts the lid on their inner workings, demonstrates their power, exposes their limitations, and examines whether they really are an improvement on the humans they are replacing. A BBC RADIO 4- BOOK OF THE WEEK SHORTLISTED FOR THE 2018 BAILLIE GIFFORD PRIZE AND 2018 ROYAL SOCIETY SCIENCE BOOK PRIZE
Algorithm Design Jon Kleinberg 2012-02-28 This is the eBook of the printed book and may not include any media, website access codes, or print supplements that may come packaged with the bound book. Algorithm Design introduces algorithms by looking at the real-world problems that motivate them. The book teaches students a range of design and analysis techniques for problems that arise in computing applications. The text encourages an understanding of the algorithm design process and an appreciation of the role of algorithms in the broader field of computer science. August 6, 2009 Author, Jon Kleinberg, was recently cited in the New York Times for his statistical analysis research in the Internet age.
Effective C Robert C. Seacord 2020-08-11 A detailed introduction to the C programming language for experienced programmers. The world runs on code written in the C programming

language, yet most schools begin the curriculum with Python or Java. Effective C bridges this gap and brings C into the modern era--covering the modern C17 Standard as well as potential C2x features. With the aid of this instant classic, you'll soon be writing professional, portable, and secure C programs to power robust systems and solve real-world problems. Robert C. Seacord introduces C and the C Standard Library while addressing best practices, common errors, and open debates in the C community. Developed together with other C Standards committee experts, Effective C will teach you how to debug, test, and analyze C programs. You'll benefit from Seacord's concise explanations of C language constructs and behaviors, and from his 40 years of coding experience. You'll learn: • How to identify and handle undefined behavior in a C program • The range and representations of integers and floating-point values • How dynamic memory allocation works and how to use nonstandard functions • How to use character encodings and types • How to perform I/O with terminals and filesystems using C Standard streams and POSIX file descriptors • How to understand the C compiler's translation phases and the role of the preprocessor • How to test, debug, and analyze C programs Effective C will teach you how to write professional, secure, and portable C code that will stand the test of time and help strengthen the foundation of the computing world.
The Ethical Algorithm

Michael Kearns
2019-10-04 Over the
course of a generation,
algorithms have gone
from mathematical
abstractions to powerful
mediators of daily life.
Algorithms have made our
lives more efficient,
more entertaining, and,
sometimes, better
informed. At the same
time, complex algorithms
are increasingly
violating the basic
rights of individual
citizens. Allegedly
anonymized datasets
routinely leak our most
sensitive personal
information; statistical
models for everything
from mortgages to
college admissions
reflect racial and
gender bias. Meanwhile,
users manipulate
algorithms to "game"
search engines, spam
filters, online
reviewing services, and
navigation apps.
Understanding and
improving the science
behind the algorithms
that run our lives is
rapidly becoming one of
the most pressing issues
of this century.
Traditional fixes, such
as laws, regulations and
watchdog groups, have
proven woefully
inadequate. Reporting
from the cutting edge of
scientific research, The
Ethical Algorithm offers
a new approach: a set of
principled solutions
based on the emerging
and exciting science of
socially aware algorithm
design. Michael Kearns
and Aaron Roth explain
how we can better embed
human principles into
machine code - without
halting the advance of
data-driven scientific
exploration. Weaving
together innovative
research with stories of
citizens, scientists,
and activists on the
front lines, The Ethical
Algorithm offers a
compelling vision for a
future, one in which we

can better protect humans from the unintended impacts of algorithms while continuing to inspire wondrous advances in technology.
Once Upon a Time . . . A Treasury of Classic Fairy Tale Illustrations Jeff A. Menges 2013-02-19 This collection gathers breathtaking art from early editions of "Sleeping Beauty," "Cinderella," and other classics. 180 elegant images — most in color — include works by Rackham, Dore, Dulac, Nielsen, and others.
Artificial Unintelligence Meredith Broussard 2019-01-29 A guide to understanding the inner workings and outer limits of technology and why we should never assume that computers always get it right. In Artificial Unintelligence, Meredith Broussard argues that our collective enthusiasm for applying computer technology to every aspect of life has resulted in a tremendous amount of poorly designed systems. We are so eager to do everything digitally—hiring, driving, paying bills, even choosing romantic partners—that we have stopped demanding that our technology actually work. Broussard, a software developer and journalist, reminds us that there are fundamental limits to what we can (and should) do with technology. With this book, she offers a guide to understanding the inner workings and outer limits of technology—and issues a warning that we should never assume that computers always get things right. Making a case against technochauvinism—the belief that technology

is always the solution—Broussard argues that it's just not true that social problems would inevitably retreat before a digitally enabled Utopia. To prove her point, she undertakes a series of adventures in computer programming. She goes for an alarming ride in a driverless car, concluding "the cyborg future is not coming any time soon"; uses artificial intelligence to investigate why students can't pass standardized tests; deploys machine learning to predict which passengers survived the Titanic disaster; and attempts to repair the U.S. campaign finance system by building AI software. If we understand the limits of what we can do with technology, Broussard tells us, we can make better choices about what we should do with it to make the world better for everyone. **Once Upon a Sunset** Tif Marcelo 2020-03-03 The author of The Key to Happily Ever After—"a true gem filled with heart, laughs, and a cast of delightful characters" (Nina Bocci, USA TODAY bestselling author)—returns with a heartwarming and charming novel about a woman who travels to the Philippines to reconnect with her long-lost family…and manages to find herself along the way. Diana Gallagher-Cary is at a tipping point. As a Washington, DC, OB/GYN at a prestigious hospital, she uses her career to distract herself from her grief over her granny's death and her breakup from her long-term boyfriend after her free-spirited mother moves in with her. But when she makes a medical

decision that disparages the hospital, she is forced to go on a short sabbatical. Never one to wallow, Diana decides to use the break to put order in her life, when her mother, Margo, stumbles upon a box of letters from her grandfather, Antonio Cruz, to her grandmother from the 1940s. The two women always believed that Antonio died in World War II, but the letters reveal otherwise. When they learn that he lived through the war, and that they have surviving relatives in the Philippines, Diana becomes determined to connect with the family that she never knew existed, though Margo refuses to face her history. But Diana pushes on, and heads on a once-in-a-lifetime trip that challenges her identity, family history, and her idea of romantic love that could change her life forever. Infused with Tif Marcelo's signature "sexy, adorable, and heartfelt" (Kate Meader, USA TODAY bestselling author) voice, Once Upon a Sunset is a moving and lyrical celebration of love, family, and second chances.

Real-World Algorithms Panos Louridas 2017-03-17 An introduction to algorithms for readers with no background in advanced mathematics or computer science, emphasizing examples and real-world problems. Algorithms are what we do in order not to have to do something. Algorithms consist of instructions to carry out tasks—usually dull, repetitive ones. Starting from simple building blocks, computer algorithms enable machines to recognize and produce

speech, translate texts, categorize and summarize documents, describe images, and predict the weather. A task that would take hours can be completed in virtually no time by using a few lines of code in a modern scripting program. This book offers an introduction to algorithms through the real-world problems they solve. The algorithms are presented in pseudocode and can readily be implemented in a computer language. The book presents algorithms simply and accessibly, without overwhelming readers or insulting their intelligence. Readers should be comfortable with mathematical fundamentals and have a basic understanding of how computers work; all other necessary concepts are explained in the text. After presenting background in pseudocode conventions, basic terminology, and data structures, chapters cover compression, cryptography, graphs, searching and sorting, hashing, classification, strings, and chance. Each chapter describes real problems and then presents algorithms to solve them. Examples illustrate the wide range of applications, including shortest paths as a solution to paragraph line breaks, strongest paths in elections systems, hashes for song recognition, voting power Monte Carlo methods, and entropy for machine learning. Real-World Algorithms can be used by students in disciplines from economics to applied sciences. Computer science majors can read it before using a more technical text.

The Complete Guide to Absolutely Everything

(Abridged): Adventures in Math and Science Adam Rutherford 2022-01-25 The complete story of the universe and absolutely everything in it (minus the boring parts). Despite our clever linguistic abilities, humans are spectacularly ill-equipped to comprehend what's happening in the universe. Our senses and intuition routinely mislead us. The Complete Guide to Absolutely Everything (Abridged) tells the story of how we came to suppress our monkey minds and perceive the true nature of reality. Written with wit and humor, this brief book tells the story of science—tales of fumbles and missteps, errors and egos, hard work, accidents, and some really bad decisions—all of which have created the sum total of human knowledge. Geneticist Adam Rutherford and mathematician Hannah Fry guide readers through time and space, through our bodies and brains, showing how emotions shape our view of reality, how our minds tell us lies, and why a mostly bald and curious ape decided to begin poking at the fabric of the universe. Rutherford and Fry shine as science sleuths, wrestling with some truly head-scratching questions: Where did time come from? Do we have free will? Does my dog love me? Hilarious sidebars present memorable scientific oddities: for example, hypnotized snails, human-sized ants, and the average time it takes most animals to evacuate their bladders. (A surprisingly consistent twenty-one seconds, if you must know.) Both rigorous and playful, The Complete Guide to

Absolutely Everything (Abridged) is a celebration of the weirdness of the cosmos, the strangeness of humans, and the joys and follies of scientific discovery.
Computational Fairy Tales Jeremy Kubica 2012 Have you ever thought that computer science should include more dragons and wizards? Computational Fairy Tales introduces principles of computational thinking, illustrating high-level computer science concepts, the motivation behind them, and their application in a non-computer—fairy tale—domain. It's a quest that will take you from learning the basics of programming in a blacksmith's forge to fighting curses with recursion.Fifteen seers delivered the same prophecy, without so much as a single minstrel to lighten the mood: an unknown darkness threatens the kingdom. Suddenly, Princess Ann finds herself sent forth alone to save the kingdom. Leaving behind her home, family, and pet turtle Fido, Princess Ann must face goblin attacks, magical curses, arrogant scholars, an unpleasant oracle, and rude Boolean waiters. Along the way she must build a war chest of computational knowledge to survive the coming challenge.
Once Upon an Algorithm Martin Erwig 2017-08-18 How Hansel and Gretel, Sherlock Holmes, the movie Groundhog Day, Harry Potter, and other familiar stories illustrate the concepts of computing. Picture a computer scientist, staring at a screen and clicking away frantically on a keyboard, hacking into a system, or perhaps

developing an app. Now delete that picture. In Once Upon an Algorithm, Martin Erwig explains computation as something that takes place beyond electronic computers, and computer science as the study of systematic problem solving. Erwig points out that many daily activities involve problem solving. Getting up in the morning, for example: You get up, take a shower, get dressed, eat breakfast. This simple daily routine solves a recurring problem through a series of well-defined steps. In computer science, such a routine is called an algorithm. Erwig illustrates a series of concepts in computing with examples from daily life and familiar stories. Hansel and Gretel, for example, execute an algorithm to get home from the forest. The movie Groundhog Day illustrates the problem of unsolvability; Sherlock Holmes manipulates data structures when solving a crime; the magic in Harry Potter's world is understood through types and abstraction; and Indiana Jones demonstrates the complexity of searching. Along the way, Erwig also discusses representations and different ways to organize data; "intractable" problems; language, syntax, and ambiguity; control structures, loops, and the halting problem; different forms of recursion; and rules for finding errors in algorithms. This engaging book explains computation accessibly and shows its relevance to daily life. Something to think about next time we execute the algorithm of getting up in the

morning.