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How To Design Programs
Second Edition

A first programming course should not be directed towards learning a particular programming language, but rather at learning to program well; the

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programming language should get out of the way and serve this goal. The simple, powerful Racket language (related to Scheme) allows us to concentrate on the fundamental concepts and techniques of computer programming, without being distracted

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by complex syntax. As a result, this book can be used at the high school (and perhaps middle school) level, while providing enough advanced concepts not usually found in a first course to challenge a college student. Those who have already done some

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programming (e.g. in Java, Python, or C++) will enhance their understanding of the fundamentals, un-learn some bad habits, and change the way they think about programming. We take a graphics-early approach: you'll start manipulating and combining graphic

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images from Chapter 1 and writing event-driven GUI programs from Chapter 6, even before seeing arithmetic. We continue using graphics, GUI and game programming throughout to motivate fundamental concepts. At the same time, we

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emphasize data types, testing, and a concrete, step-by-step process of problem-solving. After working through this book, you'll be prepared to learn other programming languages and program well in them. Or, if this is the last programming course you ever

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take, you'll understand many of the issues that affect the programs you use every day. I have been using Picturing Programs with my daughter, and there's no doubt that it's gentler than Htdp. It does exactly what Stephen claims, which is to move gradually

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from copy-and-change exercises to think-on-your-own exercises within each section. I also think it's nice that the "worked exercises" are clearly labeled as such. There's something psychologically appealing about the fact that you first see an example in the

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text of the book, and then a similar example is presented as if it were an exercise but they just happen to be giving away the answer. It is practically shouting out "Here's a model of how you go about solving this class of problems, pay close attention ."" Mark

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Engelberg "1. Matthias & team have done exceptional, highly impressive work with HtDP. The concepts are close to genius. (perhaps yes, genius quality work) They are a MUST for any high school offering serious introductory CS curriculum. 2.

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Without Dr. Blochs book "Picturing Programs," I would not have successfully implemented these concepts (Dr. Scheme, Racket, Design Recipe etc) into an ordinary High School Classroom. Any high school instructor who struggles to find ways to

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bring these great HtDP ideas to the typical high schooler, should immediately investigate the Bloch book. Think of it as coating the castor oil with chocolate." Brett Penza Addressing general readers as well as software practitioners, "Software and

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Mind" discusses the fallacies of the mechanistic ideology and the degradation of minds caused by these fallacies. Mechanism holds that every aspect of the world can be represented as a simple hierarchical structure of entities. But, while useful in fields like

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mathematics and manufacturing, this idea is generally worthless, because most aspects of the world are too complex to be reduced to simple hierarchical structures. Our software-related affairs, in particular, cannot be represented in this fashion. And yet, all

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programming theories and development systems, and all software applications, attempt to reduce real-world problems to neat hierarchical structures of data, operations, and features. Using Karl Popper's famous principles of demarcation between

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science and pseudoscience, the book shows that the mechanistic ideology has turned most of our software-related activities into pseudoscientific pursuits. Using mechanism as warrant, the software elites are promoting invalid, even fraudulent, software notions.

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They force us to depend on generic, inferior systems, instead of allowing us to develop software skills and to create our own systems. Software mechanism emulates the methods of manufacturing, and thereby restricts us to high levels of abstraction and simple,

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isolated structures. The benefits of software, however, can be attained only if we start with low-level elements and learn to create complex, interacting structures. Software, the book argues, is a non-mechanistic phenomenon. So it is akin to language, not to physical

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objects. Like language, it permits us to mirror the world in our minds and to communicate with it. Moreover, we increasingly depend on software in everything we do, in the same way that we depend on language. Thus, being restricted to mechanistic software is like

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thinking and communicating while being restricted to some ready-made sentences supplied by an elite.

Ultimately, by impoverishing software, our elites are achieving what the totalitarian elite described by George Orwell in "Nineteen Eighty-Four"

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achieves by impoverishing language: they are degrading our minds.

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

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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

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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.

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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

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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

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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++,

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and Java

Describes basic programming principles and their step-by-step applications. Numerous examples are included.

Code Complete

Understanding by Design

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The Voltage Effect

From Principles to Practice

An Introduction to Programming and Computing

Racket Programming the Fun Way

With Learning JavaScript Design Patterns, you'll learn how to write

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beautiful, structured, and maintainable JavaScript by applying classical and modern design patterns to the language. If you want to keep your code efficient, more manageable, and up-to-date with the latest best practices, this book is for you.

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Explore many popular design patterns, including Modules, Observers, Facades, and Mediators. Learn how modern architectural patterns—such as MVC, MVP, and MVVM—are useful from the perspective of a modern web application developer. This

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book also walks experienced JavaScript developers through modern module formats, how to namespace code effectively, and other essential topics. Learn the structure of design patterns and how they are written Understand different pattern categories,

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including creational, structural, and behavioral Walk through more than 20 classical and modern design patterns in JavaScript Use several options for writing modular code—including the Module pattern, Asynchronous Module Definition (AMD), and CommonJS

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Discover design patterns implemented in the jQuery library
Learn popular design patterns for writing maintainable jQuery plugins "This book should be in every JavaScript developer's hands. It's the go-to book on JavaScript patterns that will be read and

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referenced many times in the future."—Andrée Hansson, Lead Front-End Developer, presis! Starting Out with Programming Logic and Design, Third Edition, is a language-independent introductory programming book that orients students to

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programming concepts and logic without assuming any previous programming experience. In the successful, accessible style of Tony Gaddis' best-selling texts, useful examples and detail-oriented explanations allow students to become comfortable

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with fundamental concepts and logical thought processes used in programming without the complication of language syntax. Students gain confidence in their program design skills to transition into more comprehensive programming courses. The book is

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ideal for a programming logic course taught as a precursor to a language-specific introductory programming course, or for the first part of an introductory programming course.

**Software -- Software Engineering.
A new edition of a textbook that**

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provides students with a deep, working understanding of the essential concepts of programming languages, completely revised, with significant new material. This book provides students with a deep, working understanding of the essential concepts of programming

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languages. Most of these essentials relate to the semantics, or meaning, of program elements, and the text uses interpreters (short programs that directly analyze an abstract representation of the program text) to express the semantics of many essential

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language elements in a way that is both clear and executable. The approach is both analytical and hands-on. The book provides views of programming languages using widely varying levels of abstraction, maintaining a clear connection between the high-level and low-

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level views. Exercises are a vital part of the text and are scattered throughout; the text explains the key concepts, and the exercises explore alternative designs and other issues. The complete Scheme code for all the interpreters and analyzers in the book can be found

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online through The MIT Press web site. For this new edition, each chapter has been revised and many new exercises have been added. Significant additions have been made to the text, including completely new chapters on modules and continuation-passing

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style. Essentials of Programming Languages can be used for both graduate and undergraduate courses, and for continuing education courses for programmers.

An Introduction to Computer Programming

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Programming Fundamentals How to Design Programs

Realm of Racket The Little Typer

There is a lot of material on Scratch Programming on the Internet, including videos,

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online courses, Scratch projects, and so on, but, most of it is introductory. There is very little that can take students to the next level, where they can apply their Scratch and CS concepts to

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exciting and challenging problems. There is also very little material that shows students how to design complex projects, and introduces them to the process of programming. This book is

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meant to fill these gaps. In short, this book is for students who are already familiar with Scratch: its various commands, its user interface, and how it represents a variety of CS concepts such as, variables,

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conditional statements, looping, and so on. The book does not attempt to teach these concepts, but, it does provide a quick introduction to each concept in the free Supplement to the book. I call

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this an "interactive book" because it is something between a traditional book - which is static and passive - and a fully interactive online course. It does look like a book: it has a series of chapters,

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diagrams, a lot of text, etc. But it also contains links to online Scratch programs, code snippets, references, which the reader is expected to click and explore to fully benefit from the ideas presented. I have

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organized the book as a series of independent Scratch projects - each of which describes how to design and build an interesting and challenging Scratch program. Each project progresses in

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stages - from a simple implementation to increasingly complex versions. You can read these chapters in any order you like, although I have tried to arrange the chapters in an increasing order of

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challenge. Programming is a powerful tool that can be applied to virtually any field of human endeavor. I have tried to maintain a good diversity of applications in this book. You will find the following types of

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projects:-Simple ball games-
Puzzle games-Memory games-
Science simulations-Math
games-Geometric designsLearn
the concepts:As the experts
will tell you, concepts are really
understood and internalized

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when you apply them to solve problems. The purpose of this book is to help you apply Scratch and CS concepts to solve interesting and challenging programming problems. Every chapter lists,

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at the very start, the Scratch and CS concepts that you will apply while building that project. Learn the design process: Besides these technical concepts, you will also learn the "divide and

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conquer" approach of problem-solving. This is a fancy term for the technique of breaking down a bigger problem into many smaller problems and solving them separately one by one. You will also learn the

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"iterative design process" for designing programs. This is another fancy name that describes the idea that something complex can be designed in a repeated idea -> implement -> test cycle, such

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that in each cycle we add a little more complexity. You will also learn a bit of "project management". Project management helps you undertake a project, such as creating a complex program,

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and complete it in a reasonable time, with reasonable effort, and with reasonable quality. It involves things such as planning tasks, tracking their progress, etc. Audience for the book: The book is intended for

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students who are already familiar with Scratch. The level of challenge is tuned for middle- and high-school students, but elementary-school students who have picked up all the concepts in

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an introductory course might also be able to enjoy the projects presented in this book. The book would be a great resource for teachers who teach Scratch programming. They could use

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the projects to teach advanced tricks of programming and to show how complex programs are designed. Finally, the book is for anyone who wants to get the wonderful taste of the entertaining and creative

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aspect of Computer Programming.

The first comprehensive presentation of reduction semantics in one volume, and the first tool set for such forms of semantics. This text is the

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first comprehensive presentation of reduction semantics in one volume; it also introduces the first reliable and easy-to-use tool set for such forms of semantics. Software engineers have long

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known that automatic tool support is critical for rapid prototyping and modeling, and this book is addressed to the working semantics engineer (graduate student or professional language

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designer). The book comes with a prototyping tool suite to develop, explore, test, debug, and publish semantic models of programming languages. With PLT Redex, semanticists can formulate models as

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grammars and reduction models on their computers with the ease of paper and pencil. The text first presents a framework for the formulation of language models, focusing on equational calculi and

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abstract machines, then introduces PLT Redex, a suite of software tools for expressing these models as PLT Redex models. Finally, experts describe a range of models formulated in Redex. PLT

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Redex comes with the PLT Scheme implementation, available free at <http://www.plt-scheme.org/>. Readers can download the software and experiment with Redex as they work their way through the

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book.

Programming Fundamentals - A Modular Structured Approach using C++ is written by Kenneth Leroy Busbee, a faculty member at Houston Community College in Houston,

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Texas. The materials used in this textbook/collection were developed by the author and others as independent modules for publication within the Connexions environment. Programming fundamentals are

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often divided into three college courses: Modular/Structured, Object Oriented and Data Structures. This textbook/collection covers the rest of those three courses. How to Design Programs,

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second edition
An Introduction to Programming and Computing
MIT Press
Learning JavaScript Design Patterns
Scheme and the Art of Programming

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Improving the Design of Existing Code

Elements of Reusable Object-Oriented Software

Software and Mind

Designing Services and Programs for High-Ability

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Learners

Scheme is the fast track to getting started in programming. As a first introduction to programming, it is an ideal vehicle for

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*learning to reason
correctly about
computation.*

*Data is at the center of
many challenges in
system design today.*

Difficult issues need to

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be figured out, such as scalability, consistency, reliability, efficiency, and maintainability. In addition, we have an overwhelming variety of

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tools, including relational databases, NoSQL datastores, stream or batch processors, and message brokers. What are the right choices for your application?

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How do you make sense of all these buzzwords? In this practical and comprehensive guide, author Martin Kleppmann helps you navigate this diverse landscape by

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examining the pros and cons of various technologies for processing and storing data. Software keeps changing, but the fundamental principles

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remain the same. With this book, software engineers and architects will learn how to apply those ideas in practice, and how to make full use of data in modern

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applications. Peer under the hood of the systems you already use, and learn how to use and operate them more effectively Make informed decisions by

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identifying the strengths and weaknesses of different tools
Navigate the trade-offs around consistency, scalability, fault tolerance, and

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complexity Understand the distributed systems research upon which modern databases are built Peek behind the scenes of major online services, and learn from

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*their architectures
Despite using them every
day, most software
engineers know little
about how programming
languages are designed
and implemented. For*

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many, their only experience with that corner of computer science was a terrifying "compilers" class that they suffered through in undergrad and tried to

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*blot from their memory
as soon as they had
scribbled their last NFA
to DFA conversion on the
final exam. That
fearsome reputation
belies a field that is*

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rich with useful techniques and not so difficult as some of its practitioners might have you believe. A better understanding of how programming languages

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are built will make you a stronger software engineer and teach you concepts and data structures you'll use the rest of your coding days. You might even

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have fun. This book teaches you everything you need to know to implement a full-featured, efficient scripting language. You'll learn both high-

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level concepts around parsing and semantics and gritty details like bytecode representation and garbage collection. Your brain will light up with new ideas, and your

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hands will get dirty and calloused. Starting from main(), you will build a language that features rich syntax, dynamic typing, garbage collection, lexical

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scope, first-class functions, closures, classes, and inheritance. All packed into a few thousand lines of clean, fast code that you thoroughly

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understand because you wrote each one yourself. Presents a multifaceted model of understanding, which is based on the premise that people can demonstrate

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understanding in a variety of ways.

Design Patterns

The Big Ideas Behind

Reliable, Scalable, and

Maintainable Systems

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*an Introduction to
Programming and
Computing*

Don't Teach Coding

*A Guidebook for Gifted
Education*

The Seasoned Schemer,

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Intelligent readers who want to build their own embedded computer systems-- installed in everything from cell phones to cars to handheld

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organizers to refrigerators-- will find this book to be the most in-depth, practical, and up-to-date guide on the market. Designing Embedded Hardware carefully steers

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between the practical and philosophical aspects, so developers can both create their own devices and gadgets and customize and extend off-the-shelf systems. There are

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hundreds of books to choose from if you need to learn programming, but only a few are available if you want to learn to create hardware. Designing Embedded Hardware provides

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software and hardware engineers with no prior experience in embedded systems with the necessary conceptual and design building blocks to understand the

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architectures of embedded systems. Written to provide the depth of coverage and real-world examples developers need, Designing Embedded Hardware also provides a

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road-map to the pitfalls and traps to avoid in designing embedded systems. Designing Embedded Hardware covers such essential topics as:
The principles of

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developing computer
hardware Core hardware
designs Assembly language
concepts Parallel I/O
Analog-digital conversion
Timers (internal and
external) UART Serial

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Peripheral Interface Inter-Integrated Circuit Bus Controller Area Network (CAN) Data Converter Interface (DCI) Low-power operation This invaluable and eminently useful book

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gives you the practical tools and skills to develop, build, and program your own application-specific computers.

"A leading economist

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answers one of today's trickiest questions: why do some great ideas make it big while others fail to take off? 'Scale' has become a favored buzzword in the startup world. But

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scale isn't just about accumulating more users or capturing more market share. It's about whether an idea that takes hold in a small group can do the same in a much larger

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one--whether you're growing a small business, rolling out a diversity and inclusion program, or delivering billions of doses of a vaccine. Translating an idea into

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widespread impact, says University of Chicago economist John A. List, depends on one thing only: whether it can achieve 'high voltage': the ability to be replicated

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at scale" --

A completely revised edition, offering new design recipes for interactive programs and support for images as plain values, testing,

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event-driven programming, and even distributed programming. This introduction to programming places computer science at the core of a liberal arts

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education. Unlike other introductory books, it focuses on the program design process, presenting program design guidelines that show the reader how to analyze a problem

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statement, how to formulate concise goals, how to make up examples, how to develop an outline of the solution, how to finish the program, and how to test it. Because

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learning to design programs is about the study of principles and the acquisition of transferable skills, the text does not use an off-the-shelf industrial

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language but presents a tailor-made teaching language. For the same reason, it offers DrRacket, a programming environment for novices that supports playful,

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feedback-oriented learning. The environment grows with readers as they master the material in the book until it supports a full-fledged language for the whole spectrum of

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programming tasks. This second edition has been completely revised. While the book continues to teach a systematic approach to program design, the second edition

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introduces different design recipes for interactive programs with graphical interfaces and batch programs. It also enriches its design recipes for functions with

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numerous new hints. Finally, the teaching languages and their IDE now come with support for images as plain values, testing, event-driven programming, and even

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distributed programming. Widely considered one of the best practical guides to programming, Steve McConnell's original `CODE COMPLETE` has been helping developers write better

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software for more than a decade. Now this classic book has been fully updated and revised with leading-edge practices—and hundreds of new code samples—illustrating the

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art and science of software construction. Capturing the body of knowledge available from research, academia, and everyday commercial practice, McConnell

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synthesizes the most effective techniques and must-know principles into clear, pragmatic guidance. No matter what your experience level, development environment,

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or project size, this book will inform and stimulate your thinking—and help you build the highest quality code. Discover the timeless techniques and strategies that help you:

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Design for minimum complexity and maximum creativity Reap the benefits of collaborative development Apply defensive programming techniques to reduce and

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flush out errors Exploit opportunities to refactor—or evolve—code, and do it safely Use construction practices that are right-weight for your project Debug

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problems quickly and effectively Resolve critical construction issues early and correctly Build quality into the beginning, middle, and end of your project

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Advanced Scratch
Programming
Occupational Outlook
Handbook
A Guide for Students
The Science of Programming
Software Design for

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Flexibility

How to Design Programs,
second edition

Structure and Interpretation of
Computer Programs by Harold
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Build a program from the ground up or improve existing services with the guidelines, practical tips, templates, and action plans in this comprehensive yet practical guide.

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Processing simple forms of data -
Processing arbitrarily large data - More
on processing arbitrarily large data -
Abstracting designs - Generative
recursion - Changing the state of
variables - Changing compound values.
Users can dramatically improve the

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design, performance, and manageability of object-oriented code without altering its interfaces or behavior. "Refactoring" shows users exactly how to spot the best opportunities for refactoring and exactly how to do it, step by step.

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Starting Out with Programming Logic and Design

Designing Your Life

A JavaScript and jQuery Developer's Guide

How to Build a Well-Lived, Joyful Life

The Art of Failure

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The Algorithm Design Manual
An introduction to the Racket functional programming language and DrRacket development environment to explore topics in mathematics (mostly recreational) and computer science. At last, a lively guided tour through all the

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features, functions, and applications of the Racket programming language. You'll learn a variety of coding paradigms, including iterative, object oriented, and logic programming; create interactive graphics, draw diagrams, and solve puzzles as you

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explore Racket through fun computer science topics--from statistical analysis to search algorithms, the Turing machine, and more. Early chapters cover basic Racket concepts like data types, syntax, variables, strings, and formatted output. You'll learn how

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to perform math in Racket's rich numerical environment, and use programming constructs in different problem domains (like coding solutions to the Tower of Hanoi puzzle). Later, you'll play with plotting, grapple with graphics, and visualize data. Then, you'll escape

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the confines of the command line to produce animations, interactive games, and a card trick program that'll dazzle your friends. You'll learn how to:

- Use DrRacket, an interactive development environment (IDE) for writing programs***
- Compute classical math***

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problems, like the Fibonacci sequence • Generate two-dimensional function plots and create drawings using graphics primitives • Import and export data to and from Racket using ports, then visually analyze it • Build simple computing devices

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(pushdown automaton, Turing machine, and so on) that perform tasks • Leverage Racket's built-in libraries to develop a command line algebraic calculator Racket Programming the Fun Way is just like the language itself--an embodiment of everything that

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makes programming interesting and worthwhile, and that makes you a better programmer.

The second edition of the Impact Evaluation in Practice handbook is a comprehensive and accessible introduction to impact evaluation for policy makers and development

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practitioners. First published in 2011, it has been used widely across the development and academic communities. The book incorporates real-world examples to present practical guidelines for designing and implementing impact evaluations. Readers will gain an

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understanding of impact evaluations and the best ways to use them to design evidence-based policies and programs. The updated version covers the newest techniques for evaluating programs and includes state-of-the-art implementation advice, as well as

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an expanded set of examples and case studies that draw on recent development challenges. It also includes new material on research ethics and partnerships to conduct impact evaluation. The handbook is divided into four sections: Part One discusses what to evaluate and

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why; Part Two presents the main impact evaluation methods; Part Three addresses how to manage impact evaluations; Part Four reviews impact evaluation sampling and data collection. Case studies illustrate different applications of impact evaluations. The book links

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to complementary instructional material available online, including an applied case as well as questions and answers. The updated second edition will be a valuable resource for the international development community, universities, and policy

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makers looking to build better evidence around what works in development.

Learning to program isn't just learning the details of a programming language: to become a good programmer you have to become expert at debugging,

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testing, writing clear code and generally unsticking yourself when you get stuck, while to do well in a programming course you have to learn to score highly in coursework and exams. Featuring tips, stories and explanations of key terms, this book teaches these skills explicitly.

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Examples in Python, Java and Haskell are included, helping you to gain transferable programming skills whichever language you are learning. Intended for students in Higher or Further Education studying early programming courses, it will help you succeed in,

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and get the most out of, your course, and support you in developing the software engineering habits that lead to good programs.

#1 NEW YORK TIMES BEST SELLER • At last, a book that shows you how to build—design—a

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life you can thrive in, at any age or stage Designers create worlds and solve problems using design thinking. Look around your office or home—at the tablet or smartphone you may be holding or the chair you are sitting in. Everything in our lives was designed by someone. And

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every design starts with a problem that a designer or team of designers seeks to solve. In this book, Bill Burnett and Dave Evans show us how design thinking can help us create a life that is both meaningful and fulfilling, regardless of who or where we are, what we do or have

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done for a living, or how young or old we are. The same design thinking responsible for amazing technology, products, and spaces can be used to design and build your career and your life, a life of fulfillment and joy, constantly creative and productive, one that

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always holds the possibility of surprise.

Structure and Interpretation of Computer Programs - 2nd Edition
From Strings to Turing Machines
How to Avoid Programming Yourself into a Corner
An Essay on the Pain of Playing

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Video Games

The Little LISPer

Designing Embedded Hardware

Strategies for building large systems that can be easily adapted for new situations with only minor programming

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modifications. Time pressures encourage programmers to write code that works well for a narrow purpose, with no room to grow. But the best systems are evolvable; they can be adapted for new

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situations by adding code, rather than changing the existing code. The authors describe techniques they have found effective--over their combined 100-plus years of programming experience--that

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will help programmers avoid programming themselves into corners. The authors explore ways to enhance flexibility by:

- Organizing systems using combinators to compose mix-and-match parts, ranging from**

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small functions to whole arithmetics, with standardized interfaces • Augmenting data with independent annotation layers, such as units of measurement or provenance • Combining independent pieces

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of partial information using unification or propagation • Separating control structure from problem domain with domain models, rule systems and pattern matching, propagation, and dependency-

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directed backtracking •

Extending the programming language, using dynamically extensible evaluators

Products, technologies, and workplaces change so quickly today that everyone is

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continually learning. Many of us are also teaching, even when it's not in our job descriptions. Whether it's giving a presentation, writing documentation, or creating a website or blog, we need and

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want to share our knowledge with other people. But if you've ever fallen asleep over a boring textbook, or fast-forwarded through a tedious e-learning exercise, you know that creating a great learning

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experience is harder than it seems. In Design For How People Learn, you'll discover how to use the key principles behind learning, memory, and attention to create materials that enable your audience to

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both gain and retain the knowledge and skills you're sharing. Using accessible visual metaphors and concrete methods and examples, Design For How People Learn will teach you how to leverage the

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fundamental concepts of instructional design both to improve your own learning and to engage your audience. The definitive resource for understanding what coding is, designed for educators and

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parents Even though the vast majority of teachers, parents, and students understand the importance of computer science in the 21st century, many struggle to find appropriate educational

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resources. Don't Teach Coding: Until You Read This Book fills a gap in current knowledge by explaining exactly what coding is and addressing why and how to teach the subject. Providing a historically

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grounded, philosophically sensitive description of computer coding, this book helps readers understand the best practices for teaching computer science to their students and their children.

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The authors, experts in teaching computer sciences to students of all ages, offer practical insights on whether coding is a field for everyone, as opposed to a field reserved for specialists. This innovative

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book provides an overview of recent scientific research on how the brain learns coding, and features practical exercises that strengthen coding skills. Clear, straightforward chapters

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discuss a broad range of questions using principles of computer science, such as why we should teach students to code and is coding a science, engineering, technology, mathematics, or language?

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Helping readers understand the principles and issues of coding education, this book: Helps those with no previous background in computer science education understand the questions and debates

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within the field Explores the history of computer science education and its influence on the present Views teaching practices through a computational lens Addresses why many schools fail to teach

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**computer science adequately
Explains contemporary issues
in computer science such as
the language wars and trends
that equate coding with
essential life skills like reading
and writing Don't Teach**

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Coding: Until You Read This Book is a valuable resource for K-12 educators in computer science education and parents wishing to understand the field to help chart their children's education path.

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An introduction to dependent types, demonstrating the most beautiful aspects, one step at a time. A program's type describes its behavior. Dependent types are a first-class part of a language, and

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are much more powerful than other kinds of types; using just one language for types and programs allows program descriptions to be as powerful as the programs they describe. The Little Typer explains

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dependent types, beginning with a very small language that looks very much like Scheme and extending it to cover both programming with dependent types and using dependent types for

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mathematical reasoning. Readers should be familiar with the basics of a Lisp-like programming language, as presented in the first four chapters of The Little Schemer. The first five

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chapters of The Little Typer provide the needed tools to understand dependent types; the remaining chapters use these tools to build a bridge between mathematics and programming. Readers will

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learn that tools they know from programming—pairs, lists, functions, and recursion—can also capture patterns of reasoning. The Little Typer does not attempt to teach either practical

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programming skills or a fully rigorous approach to types. Instead, it demonstrates the most beautiful aspects as simply as possible, one step at a time.

Crafting Interpreters

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**Lessons Learned from
Programming Over Time
Learn to Program, One Game
at a Time!
Universal Design in Higher
Education
How to Write Good Programs**

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Picturing Programs

Racket is a descendant of Lisp, a programming language renowned for its elegance, power, and challenging learning curve. But while Racket

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retains the functional goodness of Lisp, it was designed with beginning programmers in mind.

Realm of Racket is your introduction to the Racket language. In

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Realm of Racket, you'll learn to program by creating increasingly complex games. Your journey begins with the Guess My Number game and coverage of some basic

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Racket etiquette. Next you'll dig into syntax and semantics, lists, structures, and conditionals, and learn to work with recursion and the GUI as you build

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the Robot Snake game. After that it's on to lambda and mutant structs (and an Orc Battle), and fancy loops and the Dice of Doom. Finally, you'll explore

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laziness, AI, distributed games, and the Hungry Henry game. As you progress through the games, chapter checkpoints and challenges help

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reinforce what you've learned. Offbeat comics keep things fun along the way. As you travel through the Racket realm, you'll: -Master the quirks of Racket's

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syntax and semantics
-Learn to write concise and elegant functional programs
-Create a graphical user interface using the 2htdp/image library
-Create a server

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to handle true
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programming. Read it to
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so much fun!

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technological
environments at**

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institutions of higher education; at issues pertaining to curriculum and instruction; and at the full array of student services.

Universal Design in

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Higher Education is a comprehensive guide for researchers and practitioners on creating fully accessible college and university programs. It

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is founded upon, and contributes to, theories of universal design in education that have been gaining increasingly wide attention in recent years. As greater

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numbers of students with disabilities attend postsecondary educational institutions, administrators have expressed increased

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interest in making their programs accessible to all students. This book provides both theoretical and practical guidance for schools as they work to

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turn this admirable goal into a reality. It addresses a comprehensive range of topics on universal design for higher education institutions,

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thus making a crucial contribution to the growing body of literature on special education and universal design. This book will be of unique value to

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university and college administrators, and to special education researchers, practitioners, and activists.

Today, software

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engineers need to know not only how to program effectively but also how to develop proper engineering practices to make their codebase sustainable and healthy.

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This book emphasizes this difference between programming and software engineering. How can software engineers manage a living codebase that evolves and

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responds to changing requirements and demands over the length of its life? Based on their experience at Google, software engineers Titus Winters and Hyrum

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Wright, along with technical writer Tom Manshreck, present a candid and insightful look at how some of the world's leading practitioners construct

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and maintain software.
This book covers
Google's unique
engineering culture,
processes, and tools and
how these aspects
contribute to the

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effectiveness of an engineering organization. You'll explore three fundamental principles that software organizations should

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keep in mind when designing, architecting, writing, and maintaining code: How time affects the sustainability of software and how to make your code resilient over

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time How scale affects the viability of software practices within an engineering organization What trade-offs a typical engineer needs to make when

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evaluating design and development decisions
An exploration of why we play video games despite the fact that we are almost certain to feel unhappy when we fail at

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them. We may think of video games as being "fun," but in *The Art of Failure*, Jesper Juul claims that this is almost entirely mistaken. When we play

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video games, our facial expressions are rarely those of happiness or bliss. Instead, we frown, grimace, and shout in frustration as we lose, or die, or fail

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to advance to the next level. Humans may have a fundamental desire to succeed and feel competent, but game players choose to engage in an activity in which

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they are nearly certain to fail and feel incompetent. So why do we play video games even though they make us unhappy? Juul examines this paradox. In video

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games, as in tragic works of art, literature, theater, and cinema, it seems that we want to experience unpleasantness even if we also dislike it.

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Reader or audience reaction to tragedy is often explained as catharsis, as a purging of negative emotions. But, Juul points out, this doesn't seem to be

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the case for video game players. Games do not purge us of unpleasant emotions; they produce them in the first place. What, then, does failure in video game playing

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do? Juul argues that failure in a game is unique in that when you fail in a game, you (not a character) are in some way inadequate. Yet games also motivate us

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to play more, in order to escape that inadequacy, and the feeling of escaping failure (often by improving skills) is a central enjoyment of

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games. Games, writes Juul, are the art of failure: the singular art form that sets us up for failure and allows us to experience it and experiment with it. The

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Art of Failure is essential reading for anyone interested in video games, whether as entertainment, art, or education.

A Modular Structured

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Approach Using C++

Essentials of

**Programming Languages,
third edition**

**The Mechanistic Myth and
Its Consequences**

Semantics Engineering

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with PLT Redex

**Designing Data-Intensive
Applications**

**Until You Read This Book
*The notion that "thinking
about computing is one of
the most exciting things***

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the human mind can do"
sets both The Little Schemer (formerly known as The Little LISPer) and its new companion volume, The Seasoned Schemer, apart from other books on LISP.

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The authors' enthusiasm for their subject is compelling as they present abstract concepts in a humorous and easy-to-grasp fashion. Together, these books will open new doors

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of thought to anyone who wants to find out what computing is really about. The Little Schemer introduces computing as an extension of arithmetic and algebra; things that

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everyone studies in grade school and high school. It introduces programs as recursive functions and briefly discusses the limits of what computers can do. The authors use

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the programming language Scheme, and interesting foods to illustrate these abstract ideas. The Seasoned Schemer informs the reader about additional dimensions of

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computing: functions as values, change of state, and exceptional cases. The Little LISPer has been a popular introduction to LISP for many years. It had appeared in French and

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Japanese. The Little Schemer and The Seasoned Schemer are worthy successors and will prove equally popular as textbooks for Scheme courses as well as

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