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Comprehensive

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Skiena The treatment focuses on creation of efficient data structures and algorithms and selection or design of data structure best suited to specific problems. This edition uses C++ as the programming language.

Creating robust software requires the use of efficient

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Algorithms, but  
Algorithm Design  
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programmers seldom  
think about them until  
a problem occurs.

Algorithms in a  
Nutshell describes a  
large number of  
existing algorithms for  
solving a variety of  
problems, and helps  
you select and  
implement the right  
algorithm for your  
needs -- with just

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enough math to let you understand and analyze algorithm performance. With its focus on application, rather than theory, this book provides efficient code solutions in several programming languages that you can easily adapt to a specific project. Each major algorithm is

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presented in the style  
of a design pattern  
that includes  
information to help  
you understand why  
and when the  
algorithm is  
appropriate. With this  
book, you will: Solve a  
particular coding  
problem or improve  
on the performance of  
an existing solution  
Quickly locate

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algorithms that relate  
to the problems you  
want to solve, and  
determine why a  
particular algorithm is  
the right one to use  
Get algorithmic  
solutions in C, C++,  
Java, and Ruby with  
implementation tips  
Learn the expected  
performance of an  
algorithm, and the  
conditions it needs to

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perform at its best  
Discover the impact  
that similar design  
decisions have on  
different algorithms  
Learn advanced data  
structures to improve  
the efficiency of  
algorithms With  
Algorithms in a  
Nutshell, you'll learn  
how to improve the  
performance of key  
algorithms essential

Where To  
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Skiena The  
for the success of  
your software  
applications.

This book was first  
published in 2003.  
Combinatorica, an  
extension to the  
popular computer  
algebra system  
Mathematica®, is the  
most comprehensive  
software available for  
teaching and research  
applications of



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discrete mathematics,  
Algorithm Design  
particularly  
combinatorics and  
graph theory. This  
book is the definitive  
reference/user's guide  
to Combinatorica, with  
examples of all 450  
Combinatorica  
functions in action,  
along with the  
associated  
mathematical and  
algorithmic theory.

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The authors cover classical and advanced topics on the most important combinatorial objects: permutations, subsets, partitions, and Young tableaux, as well as all important areas of graph theory: graph construction operations, invariants, embeddings, and

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algorithmic graph theory. In addition to being a research tool, Combinatorica makes discrete mathematics accessible in new and exciting ways to a wide variety of people, by encouraging computational experimentation and visualization. The book contains no

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formal proofs, but enough discussion to understand and appreciate all the algorithms and theorems it contains. This book concentrates on two distinct areas in discrete mathematics. The first section deals with combinatorics, loosely defined as the study of counting. We

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provide functions for generating combinatorial objects such as permutations, partitions, and Young tableaux, as well as for studying various aspects of these structures. The second section considers graph theory, which can be defined equally loosely as the study of binary

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relations. We consider  
a wide variety of  
graphs, provide  
functions to create  
them, and functions to  
show what special  
properties they have,  
Although graphs are  
combinatorial  
structures,  
understanding them  
requires pictures or  
embeddings. Thus we  
provide functions to

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create a variety of graph embeddings, so the same structure can be viewed in several different ways. Algorithmic graph theory is an important interface between mathematics and computer science, and so we study a variety of polynomial and exponential time

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problems.  
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Challenges  
Problems on  
Algorithms  
Adventures of a  
Mathematician  
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An Introduction to  
Machine Learning  
Algorithms  
Covers key recent  
advances in  
combinatorial



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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.

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edition, the book now  
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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

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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

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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

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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++, and Java

Advanced Algorithms

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and Data Structures introduces a collection of algorithms for complex programming challenges in data analysis, machine learning, and graph computing. Summary As a software engineer, you ' ll encounter countless programming challenges that initially seem confusing, difficult, or even impossible.

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Don't despair! Many of these "new" problems already have well-established solutions. Advanced Algorithms and Data Structures teaches you powerful approaches to a wide range of tricky coding challenges that you can adapt and apply to your own applications. Providing a balanced blend of

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classic, advanced, and new algorithms, this practical guide upgrades your programming toolbox with new perspectives and hands-on techniques. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology Can you improve the speed and



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efficiency of your applications without investing in new hardware? Well, yes, you can: Innovations in algorithms and data structures have led to huge advances in application performance. Pick up this book to discover a collection of advanced algorithms that will make you a more

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effective developer.

About the book

Advanced Algorithms  
and Data Structures  
introduces a collection  
of algorithms for  
complex programming  
challenges in data  
analysis, machine  
learning, and graph  
computing. You ' ll  
discover cutting-edge  
approaches to a variety  
of tricky scenarios.

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You 'll even learn to design your own data structures for projects that require a custom solution. What's inside

Build on basic data structures you already know

Profile your algorithms to speed up application

Store and query strings efficiently

Distribute clustering algorithms with MapReduce

Solve

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logistics problems using  
graphs and optimization  
algorithms About the

reader For intermediate  
programmers. About  
the author Marcello La  
Rocca is a research  
scientist and a full-stack  
engineer. His focus is on  
optimization algorithms,  
genetic algorithms,  
machine learning, and  
quantum computing.

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algorithms: Biologically

inspired, fast-converging

optimization

For anyone who has

ever wondered how

computers solve

problems, an engagingly



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written guide for  
nonexperts to the basics  
of computer algorithms.

Have you ever  
wondered how your  
GPS can find the fastest  
way to your destination,  
selecting one route from  
seemingly countless  
possibilities in mere  
seconds? How your  
credit card account  
number is protected  
when you make a

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algorithms. And how do  
these mathematical  
formulations translate  
themselves into your  
GPS, your laptop, or  
your smart phone? This  
book offers an  
engagingly written guide  
to the basics of  
computer algorithms. In  
Algorithms Unlocked,  
Thomas

# Where To Download Steven Skiena The Cormen—coauthor of the leading college textbook on the

subject—provides a  
general explanation,  
with limited  
mathematics, of how  
algorithms enable  
computers to solve  
problems. Readers will  
learn what computer  
algorithms are, how to  
describe them, and how  
to evaluate them. They

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will discover simple ways to search for information in a computer; methods for rearranging information in a computer into a prescribed order ( “ sorting ” ); how to solve basic problems that can be modeled in a computer with a mathematical structure called a “ graph ” (useful for modeling

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road networks,  
dependencies among  
tasks, and financial  
relationships); how to  
solve problems that ask  
questions about strings  
of characters such as  
DNA structures; the  
basic principles behind  
cryptography;  
fundamentals of data  
compression; and even  
that there are some  
problems that no one

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has figured out how to  
solve on a computer in a  
reasonable amount of  
time.

A Beginner's Guide  
Secrets to Landing Your  
Next Job  
Grokking Algorithms  
Data Structures and  
Algorithm Analysis in  
C++, Third Edition  
System Design  
Interview - An Insider's  
Guide

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Designing Data-  
Intensive Applications  
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This book overviews  
the underlying  
chemistry behind the  
most common and  
cutting-edge inorganic  
materials in current  
use, or approaching  
use, in vivo.

Algorithms specify the  
way computers  
process information  
and how they execute

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tasks. Many recent technological innovations and achievements rely on algorithmic ideas – they facilitate new applications in science, medicine, production, logistics, traffic, communication and entertainment. Efficient algorithms not only enable your



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personal computer to execute the newest generation of games with features unimaginable only a few years ago, they are also key to several recent scientific breakthroughs – for example, the sequencing of the human genome would not have been

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possible without the invention of new algorithmic ideas that speed up computations by several orders of magnitude. The greatest improvements in the area of algorithms rely on beautiful ideas for tackling computational tasks more efficiently. The problems solved

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are not restricted to arithmetic tasks in a narrow sense but often relate to exciting questions of nonmathematical flavor, such as: How can I find the exit out of a maze? How can I partition a treasure map so that the treasure can only be found if all parts of the map are recombined?

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How should I plan my trip to minimize cost?

Solving these challenging problems requires logical reasoning, geometric and combinatorial imagination, and, last but not least, creativity – the skills needed for the design and analysis of algorithms. In this book we present

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some of the most beautiful algorithmic ideas in 41 articles written in colloquial, nontechnical language. Most of the articles arose out of an initiative among German-language universities to communicate the fascination of algorithms and computer science to

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high-school students.  
The book can be

understood without

any prior knowledge

of algorithms and

computing, and it will

be an enlightening

and fun read for

students and

interested adults.

This textbook, for

second- or third-year

students of computer

science, presents

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insights, notations,  
Algorithm Design  
and analogies to help  
Manual Solutions  
them describe and  
think about algorithms  
like an expert, without  
grinding through lots  
of formal proof.  
Solutions to many  
problems are  
provided to let  
students check their  
progress, while class-  
tested PowerPoint  
slides are on the web

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for anyone running the course. By looking at both the big picture and easy step-by-step methods for developing algorithms, the author guides students around the common pitfalls. He stresses paradigms such as loop invariants and recursion to unify a huge range of



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algorithms into a few  
meta-algorithms. The  
book fosters a deeper  
understanding of how  
and why each  
algorithm works.

These insights are  
presented in a careful  
and clear way,  
helping students to  
think abstractly and  
preparing them for  
creating their own  
innovative ways to

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solve problems.

" Algorithms and data structures are much more than abstract concepts. Mastering them enables you to write code that runs faster and more efficiently, which is particularly important for today's web and mobile apps. This book takes a practical approach to data

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structures and  
algorithms, with  
techniques and real-  
world scenarios that  
you can use in your  
daily production code.  
Graphics and  
examples make these  
computer science  
concepts  
understandable and  
relevant. You can use  
these techniques with  
any language;

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examples in the book  
are in JavaScript,  
Python, and Ruby.

Use Big O notation,  
the primary tool for  
evaluating algorithms,  
to measure and  
articulate the  
efficiency of your  
code, and modify your  
algorithm to make it  
faster. Find out how  
your choice of arrays,  
linked lists, and hash

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tables can dramatically affect the code you write. Use recursion to solve tricky problems and create algorithms that run exponentially faster than the alternatives. Dig into advanced data structures such as binary trees and graphs to help scale specialized

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applications such as social networks and mapping software. You'll even encounter a single keyword that can give your code a turbo boost. Jay Wengrow brings to this book the key teaching practices he developed as a web development bootcamp founder and educator. Use

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these techniques  
today to make your  
code faster and more  
scalable. "

Programming Pearls  
Algorithms Unplugged  
Implementing  
Discrete Mathematics  
Algorithms in a  
Nutshell  
Guide to Competitive  
Programming  
Real-World  
Algorithms

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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



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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

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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

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analysis research in  
the Internet age.

This textbook  
thoroughly outlines  
combinatorial  
algorithms for  
generation,  
enumeration, and  
search. Topics  
include backtracking  
and heuristic search  
methods applied to

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various  
combinatorial  
Manual Solutions  
structures, such as:

Combinations

Permutations Graphs

Designs Many

classical areas are

covered as well as

new research topics

not included in most

existing texts, such

as: Group algorithms

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Graph isomorphism  
Hill-climbing  
Heuristic search  
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algorithms This  
work serves as an  
exceptional textbook  
for a modern course  
in combinatorial  
algorithms,  
providing a unified  
and focused  
collection of recent

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topics of interest in the area. The authors, synthesizing material that can only be found scattered through many different sources, introduce the most important combinatorial algorithmic techniques - thus

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creating an  
Algorithm Design  
accessible,  
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comprehensive text  
that students of  
mathematics,  
electrical  
engineering, and  
computer science  
can understand  
without needing a  
prior course on  
combinatorics.

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The first edition won the award for Best 1990 Professional and Scholarly Book in Computer Science and Data Processing by the Association of American Publishers. There are books on algorithms that are rigorous but incomplete and



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others that cover  
masses of material  
but lack rigor.

Introduction to  
Algorithms  
combines rigor and  
comprehensiveness.  
The book covers a  
broad range of  
algorithms in depth,  
yet makes their  
design and analysis

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accessible to all levels of readers. Each chapter is relatively self-contained and can be used as a unit of study. The algorithms are described in English and in a pseudocode designed to be readable by anyone

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who has done a little  
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programming. The  
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explanations have  
been kept  
elementary without  
sacrificing depth of  
coverage or  
mathematical rigor.  
The first edition  
became the standard  
reference for  
professionals and a

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widely used text in  
universities  
worldwide. The  
second edition  
features new  
chapters on the role  
of algorithms,  
probabilistic analysis  
and randomized  
algorithms, and  
linear programming,  
as well as extensive

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revisions to virtually every section of the book. In a subtle but important change, loop invariants are introduced early and used throughout the text to prove algorithm correctness. Without changing the mathematical and

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analytic focus, the authors have moved much of the mathematical foundations material from Part I to an appendix and have included additional motivational material at the beginning.

Algorithms and data

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structures are much more than abstract concepts. Mastering them enables you to write code that runs faster and more efficiently, which is particularly important for today's web and mobile apps. Take a practical approach to

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data structures and  
algorithms, with  
techniques and real-  
world scenarios that  
you can use in your  
daily production  
code, with examples  
in JavaScript,  
Python, and Ruby.  
This new and  
revised second  
edition features new



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chapters on  
Algorithm Design  
recursion, dynamic  
Manual Solutions  
programming, and  
using Big O in your  
daily work. Use Big  
O notation to  
measure and  
articulate the  
efficiency of your  
code, and modify  
your algorithm to  
make it faster. Find

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out how your choice  
of arrays, linked  
lists, and hash tables  
can dramatically  
affect the code you  
write. Use recursion  
to solve tricky  
problems and create  
algorithms that run  
exponentially faster  
than the alternatives.  
Dig into advanced

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data structures such  
as binary trees and  
graphs to help scale  
specialized

applications such as  
social networks and  
mapping software.

Youâ€™ll even  
encounter a single  
keyword that can  
give your code a  
turbo boost. Practice

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chapter, along with  
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today to make your  
code faster and more  
scalable.

Algorithms and  
Information  
Retrieval in Java  
Algorithms in C++,

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***Essential***

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***Algorithms and***

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**Data Structures A  
Classic  
Reference The  
latest version of  
Sedgewick, s  
best-selling  
series, reflecting  
an indispensable  
body of  
knowledge  
developed over  
the past several**

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*decades. Broad  
Coverage Full  
treatment of data  
structures and  
algorithms for  
sorting,  
searching, graph  
processing, and  
string  
processing,  
including fifty  
algorithms every*

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**programmer  
should know. See  
The true story  
that inspired the  
2020 film. The  
autobiography of  
mathematician  
Stanislaw Ulam,  
one of the great  
scientific minds  
of the twentieth  
century, tells a**



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***story rich with  
amazingly  
prophetic  
speculations and  
peppered with  
lively anecdotes.  
As a member of  
the Los Alamos  
National  
Laboratory from  
1944 on, Ulam  
helped to***

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***precipitate some  
of the most  
dramatic changes  
of the postwar  
world. He was  
among the first to  
use and advocate  
computers for  
scientific  
research,  
originated ideas  
for the nuclear***

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*propulsion of  
space vehicles,  
and made*

*fundamental  
contributions to  
many of today's  
most challenging  
mathematical  
projects. With his  
wide-ranging  
interests, Ulam  
never*

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*emphasized the  
importance of his  
contributions to  
the research that  
resulted in the  
hydrogen bomb.  
Now Daniel  
Hirsch and  
William Mathews  
reveal the true  
story of Ulam's  
pivotal role in the*

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*making of the*  
*"Super," in their*  
*historical*

*introduction to*  
*this behind-the-*  
*scenes look at*  
*the minds and*  
*ideas that*  
*ushered in the*  
*nuclear age. An*  
*epilogue by*  
*Françoise Ulam*

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*and Jan*  
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*Mycielski sheds  
new light on  
Ulam's character  
and mathematical  
originality.*

*What if William  
Shakespeare  
were asked to  
generate the  
Fibonacci series  
or Jane Austen*

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***had to write a  
factorial  
program? In If  
Hemingway  
Wrote JavaScript,  
author Angus  
Croll imagines  
short JavaScript  
programs as  
written by  
famous  
wordsmiths. The***

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**result is a  
peculiar and  
charming**

**combination of  
prose, poetry,  
and  
programming.**

**The best authors  
are those who  
obsess about  
language—and the  
same goes for**



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***JavaScript  
developers. To  
master either  
craft, you must  
experiment with  
language to  
develop your own  
style, your own  
idioms, and your  
own expressions.  
To that end, If  
Hemingway***

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***Wrote JavaScript  
playfully bridges  
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