

ANNOUNCING THE FIRST VOLUME OF A PLANNED SEVEN-VOLUME SERIES SUMMARIZING ALL PRESENT KNOWLEDGE OF COMPUTER PROGRAMMING TECHNIQUES.

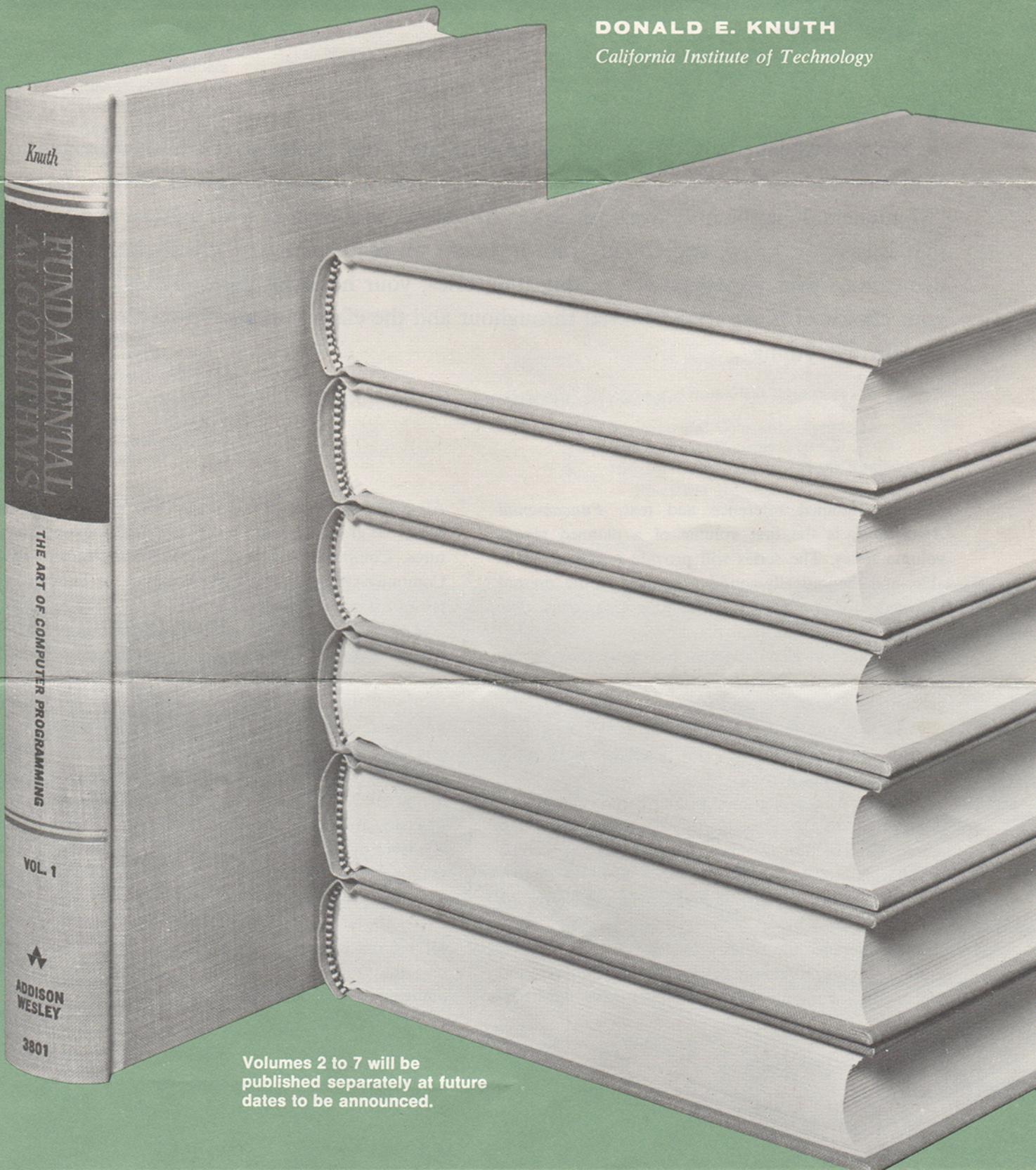
Volume 1

Fundamental Algorithms

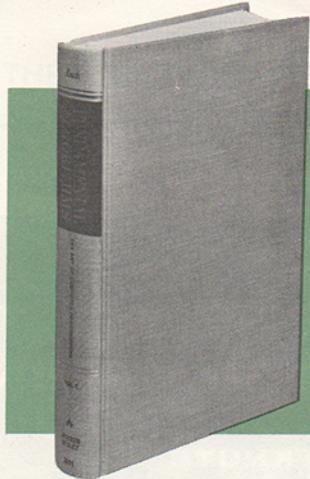
THE ART OF COMPUTER PROGRAMMING

DONALD E. KNUTH

California Institute of Technology



Volumes 2 to 7 will be
published separately at future
dates to be announced.



Volume 1
Fundamental Algorithms

**THE ART OF
COMPUTER PROGRAMMING**

DONALD E. KNUTH
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“I am overwhelmed by the wealth of exciting and fresh material you have managed to pack into the book, especially in view of the fact that it is only the first of seven volumes! “Monumental” is the only word for it . . . Moreover, it is written with a grace and humor that is, as you know, exceedingly rare in books on mathematics. I greatly enjoyed your dedication, your flow-chart for reading the series, your notes on the exercises; above all, your choice of illustrative material throughout and the clarity and brevity with which you explain everything”.

MARTIN GARDNER, *Mathematical Games, Scientific American*

This combined reference and text, *Fundamental Algorithms*, is the first volume of a planned seven-volume series. The series will provide a unified, readable, and theoretically sound summary of the present knowledge of computer programming techniques, plus a study of their historical development.

The point of view adopted by the author differs from many contemporary books about computer programming. The author does not try to teach the reader how to use somebody else's subroutines, but is concerned rather with teaching the reader how to write better subroutines himself.

A reader who is interested primarily in programming rather than in the associated mathematics may stop reading each section as soon as the mathematics become recognizably difficult. On the other hand, a mathematically oriented reader will find a wealth of interesting material.

As a reference the series provides valuable information for system programmers, analyst programmers, and others in the computer and related software industries.

All seven volumes of this series may also be used in senior or graduate courses such as: Information Structures, Computer Science, Combinatorial Mathematics, Computer-Oriented Finite Mathematics, or Fundamentals of Symbolic Machine Language Programming.

Among the areas covered in Volume 1 are the representation of information inside a computer; the structural interrelations between data elements and how to deal with them efficiently; plus applications to simulation, numerical methods, software design, and other factors. Also included is an introduction to fundamental topics in discrete mathematics, of special importance in the study of computer programming techniques.

There are over 850 exercises, graded according to the level of difficulty from extremely simple questions to unsolved research problems. Answers are supplied for over 90% of the exercises. This enhances the value of the book for self-study, classroom use, and for reference. And it helps make it possible to organize the book so that it can be read by both mathematicians and non-mathematicians.

634 pages, 71 figures, (1968), \$19.50

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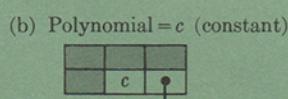
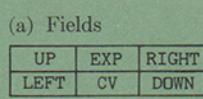
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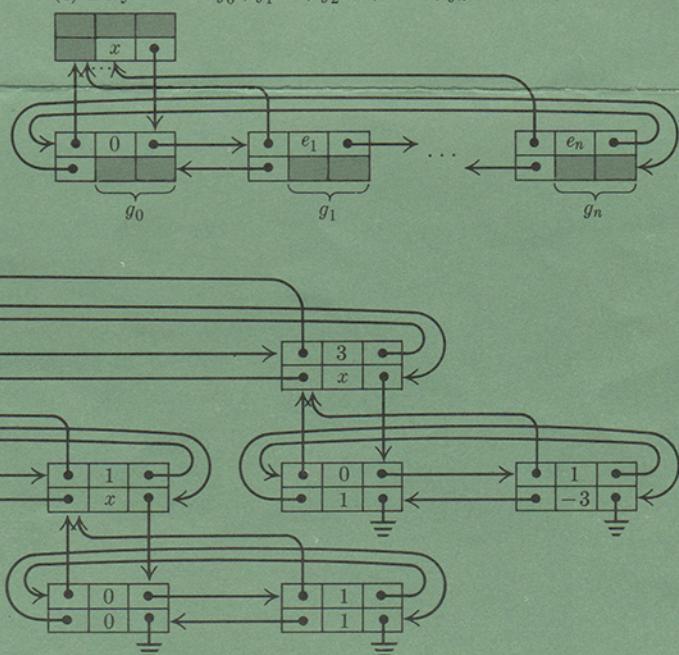
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(c) Polynomial = $g_0 + g_1x^{e_1} + g_2x^{e_2} + \dots + g_nx^{e_n}$



(d) Example: $3+x^2+xyz+z^3-3xz^3$

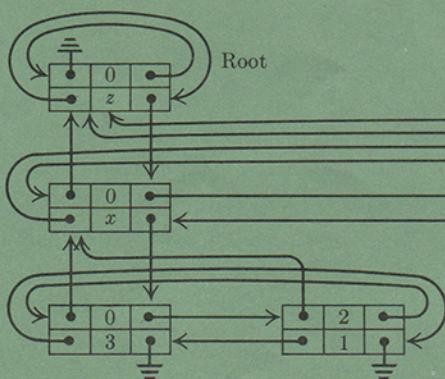


Fig. 28. Representation of polynomials using four-directional links. Shaded areas of nodes indicate information irrelevant in the context considered.

THE COMPLETE SEVEN-VOLUME SET OF

THE ART OF COMPUTER PROGRAMMING

WILL FOLLOW THIS OUTLINE:

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- Chapter 1. Basic Concepts
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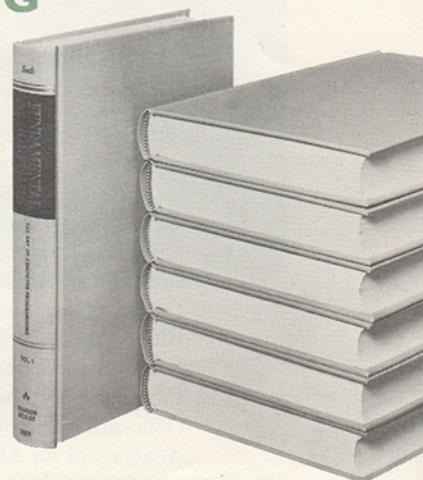
- Chapter 7. Combinatorial Searching
- Chapter 8. Recursion

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- Chapter 9. Lexical Scanning
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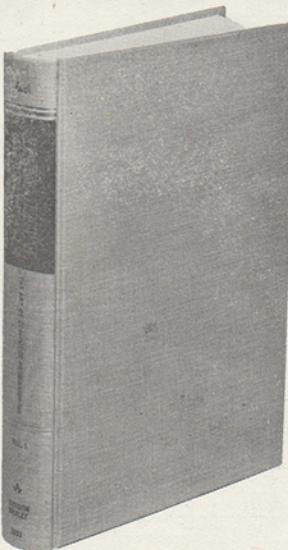
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THE AUTHOR

Donald E. Knuth is Associate Professor of Mathematics at California Institute of Technology, where he received the Ph.D. degree in 1963. A specialist in the fields of computer science and combinatorial mathematics, Dr. Knuth is the author of numerous articles in the technical literature. His professional and honorary memberships include the Association for Computing Machinery, the Mathematical Association of America, the American Mathematical Society, Tau Beta Pi, Pi Delta Epsilon, and Sigma Xi.



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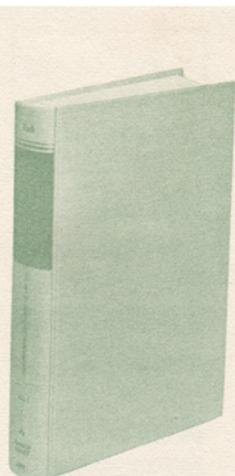
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