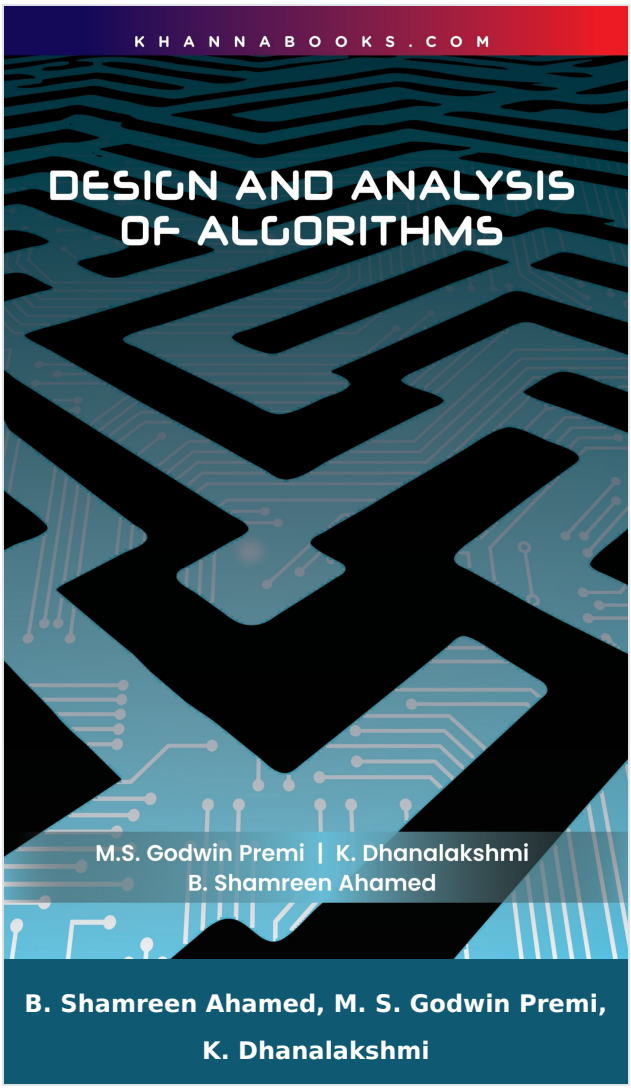


B. Shamreen Ahamed, M. S. Godwin Premi, K. Dhanalakshmi

Design and Analysis of Algorithms

Author :	B. Shamreen Ahamed, M. S. Godwin Premi, K. Dhanalakshmi
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Product Description

This comprehensive textbook, Design and Analysis of Algorithms, is meticulously structured to provide Computer Science Engineering students with an in-depth and systematic understanding of foundational algorithmic principles. The core theme of the book revolves around the effective approach to computational problem-solving, emphasizing the art of designing efficient algorithms and rigorously analyzing their performance.

The book's purpose is to bridge the gap between theoretical knowledge and practical implementation, ensuring that learners can not only grasp complex concepts but also apply them to real-world computational challenges. It systematically covers essential methodologies across five comprehensive units. Starting with the fundamentals of algorithmic problem-solving, it delves into the critical concepts of Time and Space Complexity, Growth of Functions, and Asymptotic Notations (Big-O, Omega, and Theta).

It moves through major design paradigms, including Brute Force, Divide-and-Conquer, Greedy Approach, Dynamic Programming, and Backtracking and Branch and Bound. Detailed discussions on classic problems—like the Travelling Salesman, Knapsack, Huffman Coding, and Optimal Binary Search Trees—demonstrate the strengths and weaknesses of each approach. Written in a clear, simple, and student-friendly manner while maintaining academic rigor, this book is an indispensable resource. It serves as a comprehensive guide for students, educators, and researchers seeking to build a strong analytical mindset and a deep appreciation for the art and science of algorithm design.

Salient Features:

• Fundamental Analysis: Offers a detailed introduction to Time and Space Complexity, Growth Functions, and Asymptotic Notations (Big-O, Omega, Theta), enabling mastery over performance estimation and efficiency.

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• Five Major Techniques: Systematically explores all major algorithm design techniques, including Divide-and-Conquer, Greedy Approach, Dynamic Programming, Backtracking, and Branch and Bound.

• Linear Time Sorting: Features in-depth explanations of advanced sorting algorithms that achieve linear time complexity, such as Counting Sort, Radix Sort, and Bucket Sort.

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