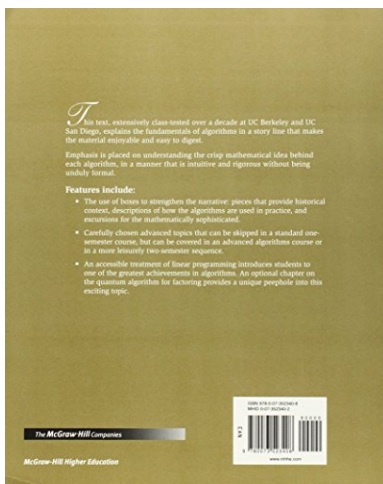


[PDF] Algorithms

Sanjoy Dasgupta, Christos Papadimitriou, Umesh Vazirani - pdf download free book



Books Details:

Title: Algorithms

Author: Sanjoy Dasgupta, Christos Pa

Released:

Language:

Pages: 336

ISBN: 0073523402

ISBN13: 9780073523408

ASIN: 0073523402

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pdf, mobi, epub, azw, kindle

Description:

This text, extensively class-tested over a decade at UC Berkeley and UC San Diego, explains the fundamentals of algorithms in a story line that makes the material enjoyable and easy to digest. Emphasis is placed on understanding the crisp mathematical idea behind each algorithm, in a manner that is intuitive and rigorous without being unduly formal.

Features include: The use of boxes to strengthen the narrative: pieces that provide historical context, descriptions of how the algorithms are used in practice, and excursions for the mathematically sophisticated.

Carefully chosen advanced topics that can be skipped in a standard one-semester

course, but can be covered in an advanced algorithms course or in a more leisurely two-semester sequence.

An accessible treatment of linear programming introduces students to one of the greatest achievements in algorithms. An optional chapter on the quantum algorithm for factoring provides a unique peephole into this exciting topic. In addition to the text, DasGupta also offers a Solutions Manual, which is available on the Online Learning Center.

"*Algorithms* is an outstanding undergraduate text, equally informed by the historical roots and contemporary applications of its subject. Like a captivating novel, it is a joy to read." Tim Roughgarden Stanford University

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Algorithm Analysis: Solving Recurrence Equations. Substitution method. Summations. Forming a Recursive Solution. Parsing Any Context-Free Grammar. Greedy Algorithms. Event Scheduling Problem. = Longest Path solution to critical path scheduling of jobs. Dijkstra's Shortest Path Algorithm. Minimum spanning tree. Maximum Flow in weighted graphs. In mathematics and computer science, an algorithm (listen) is a finite sequence of well-defined, computer-implementable instructions, typically to solve a class of problems or to perform a computation. Algorithms are always unambiguous and are used as specifications for performing calculations, data processing, automated reasoning, and other tasks. This book aims to be an accessible introduction to the design and analysis of efficient algorithms. Throughout the book we will introduce only the most basic techniques and describe the rigorous mathematical methods needed to analyze them. The topics covered include: The divide and conquer technique. The use of randomization in algorithms. The general, but typically inefficient, backtracking technique. Dynamic programming as an efficient optimization for some backtracking algorithms. The following is a list of algorithms along with one-line descriptions for each. Brent's algorithm: finds a cycle in function value iterations using only two iterators. Floyd's cycle-finding algorithm: finds a cycle in function value iterations. Gale-Shapley algorithm: solves the stable marriage problem. Pseudorandom number generators (uniformly distributed—see also List of pseudorandom number generators for other PRNGs with varying degrees of convergence and varying statistical quality)