

<<算法设计手册>>

图书基本信息

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## 前言

Most professional programmers that I've encountered are not well prepared to tackle algorithm design problems. This is a pity, because the techniques of algorithm design form one of the core practical technologies of computer science. Designing correct, efficient, and implementable algorithms for real-world problems requires access to two distinct bodies of knowledge: Techniques - Good algorithm designers understand several fundamental algorithm design techniques, including data structures, dynamic programming, depth-first search, backtracking, and heuristics. Perhaps the single most important design technique is modeling, the art of abstracting a messy real-world application into a clean problem suitable for algorithmic attack. Resources - Good algorithm designers stand on the shoulders of giants. Rather than laboring from scratch to produce a new algorithm for every task, they can figure out what is known about a particular problem. Rather than re-implementing popular algorithms from scratch, they seek existing implementations to serve as a starting point. They are familiar with many classic algorithmic problems, which provide sufficient source material to model most any application. This book is intended as a manual on algorithm design, providing access to combinatorial algorithm technology for both students and computer professionals. It is divided into two parts: Techniques and Resources. The former is a general guide to techniques for the design and analysis of computer algorithms. The Resources section is intended for browsing and reference, and comprises the catalog of algorithmic resources, implementations, and an extensive bibliography.

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### 内容概要

本书是算法设计畅销书的最新版本，是设计实用且高效算法的最全面指导书。

本书揭密了算法的设计与分析，以简单易懂的写作风格，介绍了各种算法技术，着重强调了算法分析，全书包括两大部分，“技术”部分介绍了设计和分析计算机算法的各种方法，“资源”部分给出了大量的参考资源，以及算法实现的各种资源，此外，在作者的个人网址<http://www.CS.sunysb.edu/~algorithm/>还提供了各种教学资源 and 参考材料，这些资源对读者很有参考价值。

本书可以作为算法设计课程的主教材，也是程序人员、研究人员和学生的常备参考书。

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## &lt;&lt;算法设计手册&gt;&gt;

## 书籍目录

I Practical Algorithm Design	1 Introduction to Algorithm Design	1.1 Robot Tour Optimization	1.2
Selecting the Right Jobs	1.3 Reasoning about Correctness	1.4 Modeling the Problem	1.5 About the
War Stories	1.6 War Story: Psychic Modeling	1.7 Exercises	2 Algorithm Analysis
Model of Computation	2.2 The Big Oh Notation	2.3 Growth Rates and Dominance Relations	2.4
Working with the Big Oh	2.5 Reasoning About Efficiency	2.6 Logarithms and Their Applications	
2.7 Properties of Logarithms	2.8 War Story: Mystery of the Pyramids	2.9 Advanced Analysis (*)	
2.10 Exercises	3 Data Structures	3.1 Contiguous vs. Linked Data Structures.	3.2 Stacks and Queues
3.3 Dictionaries	3.4 Binary Search Trees	3.5 Priority Queues	3.6 War Story: Stripping
Triangulations	3.7 Hashing and Strings	3.8 Specialized Data Structures	3.9 War Story: String 'em
Up	3.10 Exercises	4 Sorting and Searching	4.1 Applications of Sorting
4.3 Heapsort: Fast Sorting via Data Structures	4.4 War Story: Give me a Ticket on an Airplane	4.5	
Mergesort: Sorting by Divide-and-Conquer	4.6 Quicksort: Sorting by Randomization	4.7 Distribution	
Sort: Sorting via Bucketing	4.8 War Story: Skiena for the Defense	4.9 Binary Search and Related	
Algorithms	4.10 Divide-and-Conquer	4.11 Exercises	5 Graph Traversal
5.2 Data Structures for Graphs	5.3 War Story: I was a Victim of Moore's Law	5.4 War Story: Getting	
the Graph	5.5 Traversing a Graph	5.6 Breadth-First Search	5.7 Applications of Breadth-First Search
5.8 Depth-First Search	5.9 Applications of Depth-First Search	5.10 Depth-First Search on Directed	
Graphs	5.11 Exercises	6 Weighted Graph Algorithms	6.1 Minimum Spanning Trees
6.2 War		6.3 Shortest Paths	6.4 Wax Story: Dialing for Documents
Story: Nothing but Nets	6.5 Network	6.6 Design Graphs, Not Algorithms	6.7 Exercises.....
Flows and Bipartite Matching			

## 章节摘录

插图 : 3.7.2 Efficient String Matching via Hashing  
Strings are sequences of characters where the order of the characters matters, since ALGORITHM is different than LOGARITHM. Text strings are fundamental to a host of computing applications, from programming language parsing/compilation, to web search engines, to biological sequence analysis. The primary data structure for representing strings is an array of characters. This allows us constant-time access to the  $i$ th character of the string. Some auxiliary information must be maintained to mark the end of the string either a special end-of-string character or (perhaps more usefully) a count of the  $n$  characters in the string. The most fundamental operation on text strings is substring search, namely:  
Problem: Substring Pattern Matching  
Input: A text string  $t$  and a pattern string  $p$ .  
Output: Does  $t$  contain the pattern  $p$  as a substring, and if so where ?

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