

<<算法技术手册>>

图书基本信息

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## &lt;&lt;算法技术手册&gt;&gt;

## 内容概要

创造稳定的软件需要有效的算法，但是程序设计者们很少能在问题出现之前就想到。

《算法技术手册（影印版）》描述了现有的可以解决多种问题的算法，并且能够帮助你根据需求选择并实现正确的算法——只需要一定的数学知识即可理解并分析算法执行。

相对于理论来说，本书更注重实际运用，书中提供了多种程序语言中可用的有效代码解决方案，可轻而易举地适合一个特定的项目。

有了这本书，你可以：  
    解决特定编码问题或改进现有解决方案的执行；  
    迅速确定与需要解决的问题相关的算法，并判定为什么这样的算法是正确的；  
    探索C、C++、Java、Ruby中的算法解决方案，伴有实现诀窍；  
    了解一个算法预期的执行情况最佳的执行条件；  
    发现不同算法中相似设计产生的冲突；  
    学习先进的数据结构以改进算法效率。

有了《算法技术手册》，你可以学习如何改进算法的性能，这是软件应用成功的关键。

## 作者简介

George T. Heineman, Gary Pollice和Stanley Selkow均为 Worcester Polytechnic Institute (伍斯特理工学院) 计算机科学系的教授。

George是《Component-Based Software Engineering: Putting the Pieces Together》(Addison-Wesley) 的合编者, Gary则是《Head First Object-Oriented Analysis and Design》(O'Reilly) 的合著者。

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## 章节摘录

In the sortPointers function of Example 4 - 11, each element in the input is inserted into its associated bucket based upon the provided hash function; this takes linear, or  $O(n)$ , time. The elements in the buckets are not sorted, but because of the careful design of the hash function, we know that all elements in bucket  $b_j$  are smaller than the elements in bucket  $b_{j+1}$ . As the values are extracted from the buckets and written back into the input array, INSERTION SORT is used when a bucket contains more than a single element. For BUCKET SORT to exhibit  $O(n)$  behavior, we must guarantee that the total time to sort each of these buckets is also  $O(n)$ . Let  $n_i$  define  $n_i$  to be the number of elements partitioned in bucket  $b_i$ . We can treat  $n_i$  as a random variable (using statistical theory). NOW consider the expected value. Each element in the input set has probability  $p = 1/n$  of being inserted into a given bucket because each of these elements is uniformly drawn from the range  $[0, 1)$ . Therefore,  $E[n_i] = n * p = n * (1/n) = 1$ . From this equation we can compute the expected value of  $n_i^2$ . This is critical because it is the factor that determines the COST of INSERTION SORT, which runs in a worst case of  $O(n^2)$ . We compute  $E[n_i^2] = (1 - 1/n) + 1 = (2 - 1/n)$ , which shows that  $E[n_i^2]$  is a constant. This means that when we sum up the COSTS of executing INSERTION SORT on all  $n$  buckets, the expected performance COST remains.

### 媒体关注与评论

“作者汲取了大量鲜为人知的文献资料，这本不可或缺的指南巩固了理论与实际操作的完美平衡。通过它来理解算法变得更加轻松容易。”  
——Matthew Russell，高级技术总监，Digital Reasoning System；《Dojo：The Definitive Guide》的作者（OReilly）

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