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<<离散数学和组合数学>>

图书基本信息

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前言

As in the first edition, the purpose of this book is to present an extensive range anddepth of topics in discrete mathematics and also work in a theme on how to do proofs.Proofs are introduced in the first chapter and continue throughout the book. Moststudents taking discrete mathematics are mathematics and computer science majors.Although the necessity of learning to do proofs is obvious for mathematics majors, itis also critical for computer science students to think logically. Essentially, a logicalbug-free computer program is equivalent to a logical proof, Also, it is assumed in thisbook that it is easier to use （or at least not misuse） an application if one understandswhy it works. With few exceptions, the book is self-contained. Concepts are developedmathematically before they are seen in an applied context.Additions and alterations in the second edition:More coverage of proofs, especially in Chapter l. Added computer science applications, such as a greedy algorithm for coloring the nodes of a graph, a recursive algorithm for counting the number of nodes on a binary search tree, or an efficient algorithm for computing ab modn for very largevalues of a, b, and n.An extensive increase in the number of problems in the first seven chapters.More problems are included that involve proofs.Additional material is included on matrices.True-False questions at the end of each chapter.Summary questions at the end of each chapter.Functions and sequences are introduced earlier （in Chapter 2）.Calculus is not required for any of the material in this book. College algebra isadequate for the basic chapters. However, although this book is self-contained, some ofthe remaining chapters require more mathematical maturity than do the basic chapters,so calculus is recommended more for giving maturity, than for any direct uses.This book is intended for either a one- or two-term course in discrete mathematics.The first eight chapters of this book provide a foundation in discrete mathematicsand would be appropriate for a first-level course for freshmen or sophomores. Thesechapters are essentially independent, so that the instructor can pick the material he/shewishes to cover. The remainder of the book contains appropriate material for a secofidcourse in discrete mathematics. These chapters expand concepts introduced earlier andintroduce numerous advanced topics. Topics are explored from different points of viewto show how they may be used in different settings. The range of topics include:Logic-Including truth tables, propositional logic, predicate calculus, circuits, induction, and proofs. Set Theory-Including cardinality of sets, relations, partially ordered sets, congruence relations, graphs, directed graphs, and functions.Algorithms-Including complexity of algorithms, search and sort algorithms, theEuclidean algorithm, Huffman's algorithm, Prim's algorithms, Warshall's algorithm, the Ford-Fulkerson algorithm, the Floyd-Warshall algorithm, and Dijkstra'salgorithms.

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内容概要

用计算机编程解题的核心问题是算法，而组合数学是算法的主要内容。
组合数学对于参加信息学奥林匹克活动的青少年而言，是一门提高思维能力、分析与判断能力．以及自我构造算法的重要课程。
《离散数学和组合数学》力求将分析问题与自己上机编程结合起来，这样做可以化难为易。
书上不但讲了组合数学的原理、概念和分析问题的思路，还讲了如何编程，并给出了参考程序，这对自学《离散数学和组合数学》极为有利。
《离散数学和组合数学》是参加信息学奥林匹克竞赛学生的必读书，同时对于一些理工科的大学生也可用作学习编程解题的参考资料。

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