
Applications of Discrete Mathematics

UPDATED EDITION

Edited by

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JOHN G. MICHAELS AND KENNETH H. ROSEN

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Preface

Goals

The goal of this book is to present a wide variety of interesting applications of discrete mathematics in a flexible and accessible format. The intended audience includes students who are currently studying or have previously studied discrete mathematics from *Discrete Mathematics and Its Applications* by Kenneth H. Rosen, or any of the other texts now available.

The book can be used as a supplement since it provides material on many interesting and important applications not usually covered in an introductory course. This volume can also be used as a text for a second course in discrete mathematics — a short course, a semester-long course, or an independent study course. The range of applications covered makes it appealing for summer courses, including those for in-service secondary teachers who want to develop new skills.

Each chapter can be studied independently since there are no dependencies between chapters. Although the chapters have been written by different authors, a great deal of effort has been devoted to ensure consistency of format, writing styles, accessibility, completeness, and terminology. Devoting an entire chapter to each application permits a thorough treatment not usually possible in an introductory text.

We have covered a broad range of applications in different areas of discrete mathematics, arranged in three sections: discrete structures and computing, combinatorics, and graph theory. Although some applications could fit in two or even three of these sections, each application is placed into the section in which it most strongly fits. The applications come from a wide range of subjects including computer science, the social sciences, the natural sciences, the physical sciences, and mathematics.

Features

Some prominent features of this book are:

Accessibility Each chapter of the book has been written so that it is easily accessible. The basic ideas of each application are carefully and clearly explained, with more sophisticated ideas given in later parts of the chapters.

Prerequisites Prerequisite topics are listed at the beginning of each chapter, and a basic understanding of those topics will suffice for the study of that chapter. The appropriate sections of *Discrete Mathematics and Its Applications* by Kenneth H. Rosen are referenced.

Exercise Sets Each chapter includes a comprehensive exercise set containing routine, intermediate, and challenging exercises. Difficult exercises are marked with a star and very difficult exercises are marked with two stars. Solutions to all exercises are given in a separate section at the end of the book.

Suggested Readings A bibliography of suggested readings appears in each chapter and suggests publications that are useful for surveying related topics as well as proving particular results mentioned in the text.

Algorithms Many of the chapters include a description of algorithms, both in English and in an easily-understood form of Pascal-like pseudocode.

Biographical and Historical Information The historical background of each application is described, and biographical information about mathematicians and computer scientists is also given.

Computer Projects Each chapter concludes with a set of computer projects related to the topics covered in that chapter.

Updated Edition

This Updated Edition is a revision of the original 1991 printing of *Applications of Discrete Mathematics*, and offers several important improvements. Section and chapter references for *Discrete Mathematics and Its Applications* by Kenneth H. Rosen have been completely updated throughout to match the textbook's Sixth Edition, and new textbook references have been added where appropriate. The Suggested Readings sections at the end of each chapter have also been thoroughly revamped to include newer references, updated editions,

reissues of classic works, and online resources. In addition other outdated references and data sets have been replaced, errata in the original printing have been corrected, and discussion in certain sections has been streamlined.

Acknowledgements

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John G. Michaels
Kenneth H. Rosen

For additional online resources to accompany *Discrete Mathematics and Its Applications*, please visit the textbook's MathZone Companion Website at:
<http://www.mhhe.com/rosen/>

Discrete mathematics is the study of objects that are separate from each other – those that can be counted or enumerated for example. The natural numbers like positive 1, 2, 3 and integers like -1, 0, 1 are things that discrete maths studies. It's probably easier to describe what isn't discrete maths. This would be the study of continuous things like the real numbers. Calculus, for example, studies continuous things and isn't part of discrete mathematics. The applications of discrete maths, therefore, includes anything to do with the integers. One interesting application might be the study of Discrete Mathematics and Applications will cover various subjects in the fields such as combinatorial analysis, graph theory, functional systems theory, cryptology, coding, probabilistic problems of discrete mathematics, algorithms and their complexity, combinatorial and computational problems of number theory and of algebra. Issues contain, in addition to original articles and reviews in the above-mentioned subject areas, reviews of books published in and outside the former USSR and information notes. The journal is appearing bimonthly and simultaneously with the Russian edition as a cover-to Log In. Discrete math Discrete Mathematics and Its Applications. Discrete Mathematics and Its Applications, 7th Edition Discrete Mathematics and Its Applications, 7th Edition. 7th Edition | ISBN: 9780073383095 / 0073383090. 3,462.Â Shed the societal and cultural narratives holding you back and let step-by-step Discrete Mathematics and Its Applications textbook solutions reorient your old paradigms. NOW is the time to make today the first day of the rest of your life. Unlock your Discrete Mathematics and Its Applications PDF (Profound Dynamic Fulfillment) today. YOU are the protagonist of your own life. Let Slader cultivate you that you are meant to be!