

Second Edition

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DISCRETE MATHEMATICS FOR COMPUTER SCIENTISTS & MATHEMATICIANS



Joe L. Mott • Abraham Kandel
Theodore P. Baker

Discrete Mathematics For Computer Scientists

Martin Aigner



Discrete Mathematics For Computer Scientists:

Discrete Mathematics for Computer Science Jon Pierre Fortney, 2020-12-23 Discrete Mathematics for Computer Science An Example Based Introduction is intended for a first or second year discrete mathematics course for computer science majors It covers many important mathematical topics essential for future computer science majors such as algorithms number representations logic set theory Boolean algebra functions combinatorics algorithmic complexity graphs and trees Features Designed to be especially useful for courses at the community college level Ideal as a first or second year textbook for computer science majors or as a general introduction to discrete mathematics Written to be accessible to those with a limited mathematics background and to aid with the transition to abstract thinking Filled with over 200 worked examples boxed for easy reference and over 200 practice problems with answers Contains approximately 40 simple algorithms to aid students in becoming proficient with algorithm control structures and pseudocode Includes an appendix on basic circuit design which provides a real world motivational example for computer science majors by drawing on multiple topics covered in the book to design a circuit that adds two eight digit binary numbers Jon Pierre Fortney graduated from the University of Pennsylvania in 1996 with a BA in Mathematics and Actuarial Science and a BSE in Chemical Engineering Prior to returning to graduate school he worked as both an environmental engineer and as an actuarial analyst He graduated from Arizona State University in 2008 with a PhD in Mathematics specializing in Geometric Mechanics Since 2012 he has worked at Zayed University in Dubai This is his second mathematics textbook

Discrete Mathematics for Computer Science Gary Haggard, John Schlipf, Sue Whitesides, 2006 Master the fundamentals of discrete mathematics with DISCRETE MATHEMATICS FOR COMPUTER SCIENCE with Student Solutions Manual CD ROM An increasing number of computer scientists from diverse areas are using discrete mathematical structures to explain concepts and problems and this mathematics text shows you how to express precise ideas in clear mathematical language Through a wealth of exercises and examples you will learn how mastering discrete mathematics will help you develop important reasoning skills that will continue to be useful throughout your career

Discrete Mathematics For Computer Scientists Stein Clifford, 2010-09

Fundamentals of Discrete Math for Computer Science Tom Jenkyns, Ben Stephenson, 2012-08-28 This textbook provides an engaging and motivational introduction to traditional topics in discrete mathematics in a manner specifically designed to appeal to computer science students The text empowers students to think critically to be effective problem solvers to integrate theory and practice and to recognize the importance of abstraction Clearly structured and interactive in nature the book presents detailed walkthroughs of several algorithms stimulating a conversation with the reader through informal commentary and provocative questions Features no university level background in mathematics required ideally structured for classroom use and self study with modular chapters following ACM curriculum recommendations describes mathematical processes in an algorithmic manner contains examples and exercises throughout the text and highlights the most important

concepts in each section selects examples that demonstrate a practical use for the concept in question

Discrete Mathematics for Computer Scientists J. K. Truss, 1994

Discrete Mathematics For Computer Scientist Ali Selamat, Md Hafiz Selamat, 2012 This book serves as an introduction to computer sciences students in the undergraduate levels It will be used as the foundation to understand the discrete mathematic in developing the logic of computer programs Since there are also similar undergraduate computer science programmes in other local and overseas institutions this book is expected to find wider local and international readership Topics covered in this book include set theory and relations functions sequence and string propositional logic predicate logic matrices graph theory and trees As the book serves as an introductory level to computer science students it is expected that once the students are already familiar with the presented contents it will enable them to understand the advanced topics in computer science such as advanced theory of computer science and computational complexity theories The chapters in this book have been organized for the students to learn and understand the main concepts of discrete mathematics for developing computer applications during the period of their studies In information technology IT and computer science fields most of information is represented in digital electronics based on the basic knowledge of discrete mathematics Therefore discrete mathematics is one of the relevant courses to support students for better learning and understanding the nature of computer science and IT It is expected that by using the materials presented in this book students should be able to write statements using mathematical language develop mathematical arguments using logic apply the concept of integers and its role in modeling and solving problems in IT and apply the concept of graph and tree for modeling and solving problems related to real situations

Discrete Mathematics with Computer Science Applications Romualdas Skvarcius, William B. Robinson, 1986

Discrete Mathematics for Computer Science David Liben-Nowell, 2017

Discrete Mathematics for Computer Scientists Clifford Stein, 2010

Lectures On Discrete Mathematics For Computer Science Bakhadyr M Khoussainov, Nodira Khoussainova, 2012-03-21 This textbook presents fundamental topics in discrete mathematics introduced from the perspectives of a pure mathematician and an applied computer scientist The synergy between the two complementary perspectives is seen throughout the book key concepts are motivated and explained through real world examples and yet are still formalized with mathematical rigor The book is an excellent introduction to discrete mathematics for computer science software engineering and mathematics students The first author is a leading mathematician in the area of logic computability and theoretical computer science with more than 25 years of teaching and research experience The second author is a computer science PhD student at the University of Washington specializing in database systems The father and daughter team merges two different views to create a unified book for students interested in learning discrete mathematics the connections between discrete mathematics and computer science and the mathematical foundations of computer science Readers will learn how to formally define abstract concepts reason about objects such as programs graphs and numbers

investigate properties of algorithms and prove their correctness The textbook studies several well known algorithmic problems including the path problem for graphs and finding the greatest common divisor inductive definitions proofs of correctness of algorithms via loop invariants and induction the basics of formal methods such as propositional logic finite state machines counting probability as well as the foundations of databases such as relational calculus

Discrete Mathematics for Computer Scientists Joe L. Mott, Theodore P. Baker, Abraham Kandel, 1983

Essential Discrete Mathematics for Computer Science Todd Feil, Joan Krone, 2003 This book introduces readers to the mathematics of computer science and prepares them for the math they will encounter in other college courses It includes applications that are specific to computer science helps learners to develop reasoning skills and provides the fundamental mathematics necessary for computer scientists Chapter topics include sets functions and relations Boolean algebra natural numbers and induction number theory recursion solving recurrences counting matrices and graphs For computer scientists and the enhancement of programming skills

Discrete Mathematics for Computer Science Kenneth Bogart, Clifford Stein, Robert L. Drysdale, 2005-09-08 Discrete Mathematics for Computer Science is the perfect text to combine the fields of mathematics and computer science Written by leading academics in the field of computer science readers will gain the skills needed to write and understand the concept of proof This text teaches all the math with the exception of linear algebra that is needed to succeed in computer science The book explores the topics of basic combinatorics number and graph theory logic and proof techniques and many more Appropriate for large or small class sizes or self study for the motivated professional reader Assumes familiarity with data structures Early treatment of number theory and combinatorics allow readers to explore RSA encryption early and also to encourage them to use their knowledge of hashing and trees from CS2 before those topics are covered in this course

Logic and Discrete Mathematics Winfried Karl Grassmann, Jean-Paul Tremblay, 1996 For one two semester sophomore level courses in Discrete Mathematics This text covers all the traditional topics of discrete mathematics logic sets relations functions and graphs and reflects recent trends in computer science

Discrete Mathematics Martin Aigner, The advent of fast computers and the search for efficient algorithms revolutionized combinatorics and brought about the field of discrete mathematics This book is an introduction to the main ideas and results of discrete mathematics and with its emphasis on algorithms it should be interesting to mathematicians and computer scientists alike The book is organized into three parts enumeration graphs and algorithms and algebraic systems There are 600 exercises with hints and solutions to about half of them The only prerequisites for understanding everything in the book are linear algebra and calculus at the undergraduate level Praise for the German edition This book is a well written introduction to discrete mathematics and is highly recommended to every student of mathematics and computer science as well as to teachers of these topics Konrad Engel for MathSciNet Martin Aigner is a professor of mathematics at the Free University of Berlin He received his PhD at the University of Vienna and has held a number of positions in the USA and Germany before moving to Berlin He is the author of

several books on discrete mathematics graph theory and the theory of search The Monthly article Turan's graph theorem earned him a 1995 Lester R Ford Prize of the MAA for expository writing and his book *Proofs from the BOOK* with Gunter M Ziegler has been an international success with translations into 12 languages

Relations and Graphs Gunther Schmidt, Thomas Ströhlein, 2012-12-06 Relational methods can be found at various places in computer science notably in database theory relational semantics of concurrency relational type theory analysis of rewriting systems and modern programming language design In addition they appear in algorithms analysis and in the bulk of discrete mathematics taught to computer scientists This book is devoted to the background of these methods It explains how to use relational and graph theoretic methods systematically in computer science A powerful formal framework of relational algebra is developed with respect to applications to a diverse range of problem areas Results are first motivated by practical examples often visualized by both Boolean 0 1 matrices and graphs and then derived algebraically

Discrete Math for Computer Science Students Stahl Zolt, 2016-08-28 Discrete Mathematics for Computer Science Students emphasizes mathematical definitions and proofs as well as applicable methods Topics include formal logic notation proof methods induction well ordering sets relations elementary graph theory integer congruences asymptotic notation and growth of functions permutations and combinations counting principles discrete probability Further selected topics may also be covered such as recursive definition and structural induction state machines and invariants recurrences generating functions

Essential Discrete Mathematics for Computer Science Harry Lewis, 2013

Mathematics of Discrete Structures for Computer Science Gordon J. Pace, 2012-07-09 Mathematics plays a key role in computer science some researchers would consider computers as nothing but the physical embodiment of mathematical systems And whether you are designing a digital circuit a computer program or a new programming language you need mathematics to be able to reason about the design its correctness robustness and dependability This book covers the foundational mathematics necessary for courses in computer science The common approach to presenting mathematical concepts and operators is to define them in terms of properties they satisfy and then based on these definitions develop ways of computing the result of applying the operators and prove them correct This book is mainly written for computer science students so here the author takes a different approach he starts by defining ways of calculating the results of applying the operators and then proves that they satisfy various properties After justifying his underlying approach the author offers detailed chapters covering propositional logic predicate calculus sets relations discrete structures structured types numbers and reasoning about programs The book contains chapter and section summaries detailed proofs and many end of section exercises key to the learning process The book is suitable for undergraduate and graduate students and although the treatment focuses on areas with frequent applications in computer science the book is also suitable for students of mathematics and engineering

Discrete Mathematics for Computer Science, Access Pack Print Component David Liben-Nowell, 2017-08-14

The Enigmatic Realm of **Discrete Mathematics For Computer Scientists**: Unleashing the Language is Inner Magic

In a fast-paced digital era where connections and knowledge intertwine, the enigmatic realm of language reveals its inherent magic. Its capacity to stir emotions, ignite contemplation, and catalyze profound transformations is nothing in short supply of extraordinary. Within the captivating pages of **Discrete Mathematics For Computer Scientists** a literary masterpiece penned with a renowned author, readers attempt a transformative journey, unlocking the secrets and untapped potential embedded within each word. In this evaluation, we shall explore the book's core themes, assess its distinct writing style, and delve into its lasting impact on the hearts and minds of those who partake in its reading experience.

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