Undergraduate Topics in Computer Science
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Discrete Mathematics and Graph Theory

A Concise Study Companion and Guide

The study of discrete mathematics is one of the first courses on curricula in various educational disciplines such as Computer Science, Mathematics and Engineering.

Graphs are key data structures used to represent networks, chemical structures, games etc. and are increasingly used more in various applications such as bioinformatics and the Internet. Graph theory has gone through an unprecedented growth in the last few decades both in terms of theory and implementations; hence it deserves a thorough treatment which is not adequately found in any other contemporary books on discrete mathematics, whereas about 40% of this textbook is devoted to graph theory.

Employing an algorithmic approach, this clearly structured textbook/reference presents a comprehensive review of the fundamental principles of discrete mathematics with emphasis on graph theory. It aims to be a study companion and a guide for discrete mathematics and graph theory.

Topics and features:

- Provides a detailed and concise review of the main concepts of discrete mathematics
- Presents a focus on graph theory concepts
- Surveys main algorithmic methods
- Employs algorithmic solutions to many discrete math and graph theory problems
- Includes chapter summaries, end-of-chapter review questions, numerous examples, and exercises

This unique textbook can serve as a comprehensive manual of discrete mathematics and graph theory for Computer Science or non-CS majors. In addition, its easy-to-read chapters, filled with examples, make it a highly useful reference and study aid for professionals and researchers who have not taken any discrete math course previously.

Dr. K. Erciyes is a professor of Computer Engineering at Üsküdar University, İstanbul. His other publications include the Springer titles *Distributed Graph Algorithms for Computer Networks, Distributed and Sequential Algorithms for Bioinformatics, Guide to Graph Algorithms* and *Distributed Real-Time Systems.*

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Part I Fundamentals of Discrete Mathematics