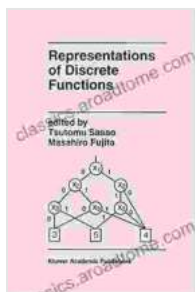# Representations of Discrete Functions: The Ultimate Guide by Tsutomu Sasao

Discrete functions are essential building blocks in various fields, including computer science, mathematics, and engineering. Understanding their representations is crucial for efficient analysis, synthesis, and optimization. "Representations of Discrete Functions" by Tsutomu Sasao provides an unparalleled exploration into this fascinating subject.

Representations of Discrete Functions by Tsutomu Sasao

★★★★★ 5 out of 5

Language	: English
File size	: 4387 KB
Text-to-Speech	: Enabled
Print length	: 348 pages

Disjunctive Decompositions

A central concept in discrete function representation is disjunctive decomposition. Sasao presents a comprehensive treatment of this topic, explaining methods for generating disjunctive normal forms (DNFs) and prime implicants. He discusses the relationship between DNFs and the underlying Boolean function, enabling readers to recognize patterns and simplify expressions.

Spectral Representations

Spectral representations offer an alternative perspective on discrete functions through their Fourier transform. Sasao delves into the details of spectral analysis, demonstrating how to compute spectra for various types of Boolean functions. This approach provides insights into the frequency components and correlation properties of functions, leading to efficient implementations and optimizations.

Algebraic Representations

The book also explores algebraic representations of discrete functions using concepts from group theory and algebra. Sasao introduces the concept of switching algebra, which allows for the representation of logical functions as elements of an algebraic structure. This approach facilitates the study of properties such as self-duality, self-complementarity, and transitivity.

Injectivity and Surjectivity

Sasao dedicates a chapter to the investigation of injectivity and surjectivity in discrete functions. He provides detailed proofs and examples illustrating the relationships between these properties and the structural characteristics of functions. This knowledge is fundamental for applications such as coding theory and cryptography.

Applications

The book concludes with a section on applications, showcasing the practical relevance of discrete function representations. Sasao discusses examples in switching circuits, error detection and correction codes, and error-correcting codes for computer memory. Readers gain valuable

insights into how these representations are used to solve real-world problems.

"Representations of Discrete Functions" by Tsutomu Sasao is an exceptional resource for researchers, engineers, and students working with discrete functions. Its comprehensive coverage, clear explanations, and practical examples make it an indispensable guide for understanding and utilizing these essential mathematical building blocks. Whether you seek to enhance your theoretical knowledge or find practical solutions, this book delivers invaluable insights and empowers you to unlock the full potential of discrete functions.
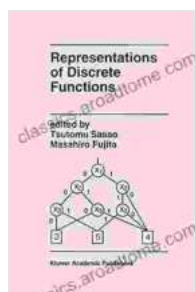
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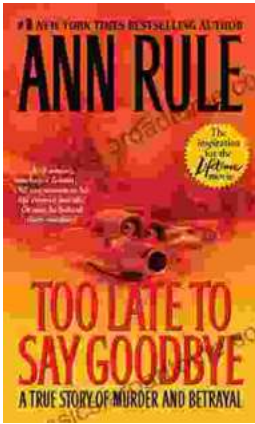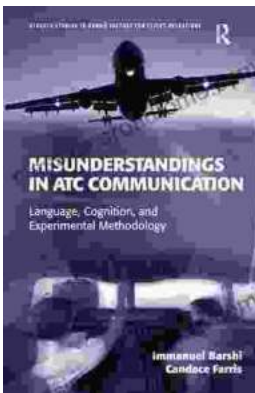|	
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