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   Soggetti   Computer science
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   Lingua di pubblicazione   Inglese

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   Nota di contenuto   Introduction -- Part I: Mathematics for Computer Science -- Propositional Logic -- Sets -- Boolean Algebras and Circuits -- Predicate Logic -- Proof Strategies -- Functions -- Relations -- Inductive and Recursive Definitions -- Proofs by Induction -- Games and Strategies -- Part II: Modelling Computing Systems -- Modelling Processes -- Distinguishing Between Processes -- Logical Properties of Processes -- Concurrent Processes -- Temporal Properties.

   Sommario/riassunto   We have all experienced delays and frustrations as a result of the notorious 'computer glitch.' However, the more dependent we become on computational systems in our daily lives, the more we must ensure that they are safe, reliable and user-friendly. This engaging textbook presents the fundamental mathematics and modelling techniques for computing systems in a novel and light-hearted way, which can be easily followed by students at the very beginning of their university education. Key concepts are taught through a large collection of challenging yet fun mathematical games and logical puzzles that

require no prior knowledge about computers. The text begins with intuition and examples as a basis from which precise concepts are then developed; demonstrating how, by working within the confines of a precise structured method, the occurrence of errors in the system can be drastically reduced. Topics and features: Introduces important concepts from discrete mathematics as the basis of computational thinking, presented in a stimulating and motivating style Demonstrates how game theory provides a paradigm for an intuitive understanding of the nature of computation Contains more than 400 exercises throughout the text, with detailed solutions to half of these presented at the end of the book, together with numerous theorems, definitions and examples Describes an approach to the modelling of computing systems based on state transition systems, exploring the languages and techniques for expressing and reasoning about systems specifications and concurrent implementations This clearly written and classroom-tested textbook/reference is essential reading for first-year undergraduate modules on discrete mathematics and systems modelling.