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Nota di contenuto	1 Introduction -- 1.1 Formal Methods -- 1.2 The History of B -- 1.3 The Relationship of B to Other Formal Methods -- 1.4 Summary -- 2 The Foundations of B AMN -- 2.1 Mathematical Notation -- 2.2 Defining Operations -- 2.3 Abstract Machines -- 2.4 Machine Composition Mechanisms -- 2.5 Refinement -- 2.6 Implementation -- 2.7 Summary -- 2.8 Exercises 1 -- 3 Analysis and Specification -- 3.1 Requirements Analysis -- 3.2 Specification Development -- 3.3 Animation -- 3.4 Proof of Internal Consistency Obligations -- 3.5 Ship Loading Case Study — Specification -- 3.6 Renaming -- 3.7 Aggregation -- 3.8 Summary -- 3.9 Exercises 2 -- 4 Design and Implementation -- 4.1 The Layered Development Paradigm -- 4.2 Refinement Examples -- 4.3 Proofs of Refinement -- 4.4 Decomposing Implementations -- 4.5 Ship Loading Case Study — Implementation -- 4.6 Summary -- 4.7 Exercises 3 -- 5 Case Studies -- 5.1 Personnel System Development -- 5.2 Mine Pump Control -- 5.3 Vending Machine -- 6 Conclusions -- A Exercise Solutions -- A.1 Exercises 1 -- A.2 Exercises 2 -- A.3 Exercises 3 -- B Properties of Weakest Preconditions -- B.1 Termination and Feasibility -- B.2 Set-theoretic

Semantics -- B.3 Refinement -- B.4 Well-formedness Obligations -- B. 5 Normal Forms -- B.6 Rules for ? -- B.7 Definition of := -- C Proof Techniques.

Sommario/riassunto

B is one of the few formal methods which has robust, commercially-available tool support for the entire development lifecycle from specification through to code generation. This volume provides a comprehensive introduction to the B Abstract Machine Notation, and to how it can be used to support formal specification and development of high integrity systems. A strong emphasis is placed on the use of B in the context of existing software development methods, including object-oriented analysis and design. The text includes a large number of worked examples, graduated exercises in B AMN specification and development (all of which have been class-tested), two extended case studies of the development process, and an appendix of proof techniques suitable for B. Based on material which has been used to teach B at postgraduate and undergraduate level, this volume will provide invaluable reading a wide range of people, including students, project technical managers and workers, and researchers with an interest in methods integration and B semantics.