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Nota di contenuto	1 Transactions on the Logical Database -- 2 Operations on the Physical Database -- 3 Logging and Buffering -- 4 Transaction Rollback and Restart Recovery -- 5 Transactional Isolation -- 6 Lock-Based Concurrency Control -- 7 B-Tree Traversals -- 8 B-Tree Structure Modifications -- 9 Advanced Locking Protocols -- 10 Bulk Operations on B-Trees -- 11 Online Index Construction and Maintenance -- 12 Concurrency Control by Versioning -- 13 Distributed Transactions -- 14 Transactions in Page-Server Systems -- 15 Processing of Write-Intensive Transactions.
Sommario/riassunto	Transactions are a concept related to the logical database as seen from the perspective of database application programmers: a transaction is a sequence of database actions that is to be executed as an atomic unit of work. The processing of transactions on databases is a well-established area with many of its foundations having already been laid in the late 1970s and early 1980s. The unique feature of this textbook

is that it bridges the gap between the theory of transactions on the logical database and the implementation of the related actions on the underlying physical database. The authors relate the logical database, which is composed of a dynamically changing set of data items with unique keys, and the underlying physical database with a set of fixed-size data and index pages on disk. Their treatment of transaction processing builds on the “do-redo-undo” recovery paradigm, and all methods and algorithms presented are carefully designed to be compatible with this paradigm as well as with write-ahead logging, steal-and-no-force buffering, and fine-grained concurrency control. Chapters 1 to 6 address the basics needed to fully appreciate transaction processing on a centralized database system within the context of our transaction model, covering topics like ACID properties, database integrity, buffering, rollbacks, isolation, and the interplay of logical locks and physical latches. Chapters 7 and 8 present advanced features including deadlock-free algorithms for reading, inserting and deleting tuples, while the remaining chapters cover additional advanced topics extending on the preceding foundational chapters, including multi-granular locking, bulk actions, versioning, distributed updates, and write-intensive transactions. This book is primarily intended as a text for advanced undergraduate or graduate courses on database management in general or transaction processing in particular.