

Advanced Database Management System and Data Warehousing

1. Understand the states of a transaction in a database system and the importance of maintaining ACID properties.
2. Analyze the different consistency models and storage models used in database systems.
3. Evaluate the concept of cascading rollback and the implications of recoverable schedules in transaction management.
4. Implement various concurrency control protocols such as Two-phase locking protocol, Timestamp based protocol, and optimistic techniques to ensure data consistency.
5. Develop the skills to test for serializability and handle deadlocks in a database system.
6. Examine failure classification and recovery techniques such as log-based recovery and shadow paging.
7. Demonstrate an understanding of query processing and optimization, including steps in query processing, estimation of cost, and join strategies.
8. Evaluate the principles of distributed database systems, levels of distribution transparency, and data fragmentation techniques.
9. Design data warehousing systems using concepts such as OLTP, Data Warehouse Architecture, and various schema models (Star, Snowflake, Fact Constellation).
10. Implement Data Marts and analyze their advantages, drawbacks, and components.
11. Develop skills in data warehouse design, including different views of designs and the processes involved in design.
12. Understand On-line Analytical Processing (OLAP) concepts, Multidimensional Data Models, and OLAP operations for efficient data analysis.

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