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## Acces PDF SQL Performance Explained

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\* A completely revised edition of a book that is highly-regarded in the community (as evidenced by Amazon reviews and other customer feedback). \* The only comprehensive, practical guide to performance optimization techniques for SQL Server applications. \* Essential reading for any DBA or developer responsible for the performance of an existing SQL Server system, or the design of a new one.

How can you realize MySQL's full power? With High Performance MySQL, you'll learn advanced techniques for everything from setting service-level objectives to designing schemas, indexes, and queries to tuning your server, operating system, and hardware to achieve your platform's full potential. This guide also teaches database administrators safe and practical ways to scale applications through replication, load balancing, high availability, and failover. Updated to reflect recent advances in cloud- and self-hosted MySQL, InnoDB performance, and new features and tools, this revised edition helps you design a relational data platform that will scale with your business. You'll learn best practices for database security along with hard-earned lessons in both performance and database stability. Dive into MySQL's architecture, including key facts about its storage engines Learn how server configuration works with your hardware and deployment choices Make query performance part of your software delivery process Examine enhancements to MySQL's replication and high availability Compare different MySQL offerings in managed cloud environments Explore MySQL's full stack optimization from application-side configuration to server tuning Turn traditional database management tasks into automated processes Improve the performance of relational databases with indexes de-

signed for today's hardware Over the last few years, hardware and software have advanced beyond all recognition, so it's hardly surprising that relational database performance now receives much less attention. Unfortunately, the reality is that the improved hardware hasn't kept pace with the ever-increasing quantity of data processed today. Although disk packing densities have increased enormously, making storage costs extremely low and sequential read very fast, random reads are still painfully slow. Many of the old design recommendations are therefore no longer valid—the optimal point of indexing has come a long way. Consequently many of the old problems haven't actually gone away—they have simply changed their appearance. This book provides an easy but effective approach to the design of indexes and tables. Using lots of examples and case studies, the authors describe how the DB2, Oracle, and SQL Server optimizers determine how to access data, and how CPU and response times for the resulting access paths can be quickly estimated. This enables comparisons to be made of the various designs, and helps you choose available choices for the most appropriate design. This book is intended for anyone who wants to understand the issues of SQL performance or how to design tables and indexes effectively. With this title, readers with many years of experience of relational systems will be able to better grasp the implications that have been brought into play by the introduction of new hardware.

What others in the trenches say about The Pragmatic Programmer... "The cool thing about this book is that it's great for keeping the programming process fresh. The book helps you to continue to grow and clearly comes from people who have been there." —Kent Beck, author of Extreme Programming Explained: Embrace Change "I found this book to be a great mix of solid advice and wonderful analogies!" —Martin Fowler, author of Refactoring and

UML Distilled "I would buy a copy, read it twice, then tell all my colleagues to run out and grab a copy. This is a book I would never loan because I would worry about it being lost." —Kevin Ruland, Management Science, MSG-Logistics "The wisdom and practical experience of the authors is obvious. The topics presented are relevant and useful.... By far its greatest strength for me has been the outstanding analogies—tracer bullets, broken windows, and the fabulous helicopter-based explanation of the need for orthogonality, especially in a crisis situation. I have little doubt that this book will eventually become an excellent source of useful information for journeymen programmers and expert mentors alike." —John Lakos, author of Large-Scale C++ Software Design "This is the sort of book I will buy a dozen copies of when it comes out so I can give it to my clients." —Eric Vought, Software Engineer "Most modern books on software development fail to cover the basics of what makes a great software developer, instead spending their time on syntax or technology where in reality the greatest leverage possible for any software team is in having talented developers who really know their craft well. An excellent book." —Pete McBreen, Independent Consultant "Since reading this book, I have implemented many of the practical suggestions and tips it contains. Across the board, they have saved my company time and money while helping me get my job done quicker! This should be a desktop reference for everyone who works with code for a living." —Jared Richardson, Senior Software Developer, iRenaissance, Inc. "I would like to see this issued to every new employee at my company...." —Chris Cleeland, Senior Software Engineer, Object Computing, Inc. "If I'm putting together a project, it's the authors of this book that I want. . . . And failing that I'd settle for people who've read their book." —Ward Cunningham Straight from the programming trenches, The Pragmatic Programmer cuts

through the increasing specialization and technicalities of modern software development to examine the core process—taking a requirement and producing working, maintainable code that delights its users. It covers topics ranging from personal responsibility and career development to architectural techniques for keeping your code flexible and easy to adapt and reuse. Read this book, and you'll learn how to Fight software rot; Avoid the trap of duplicating knowledge; Write flexible, dynamic, and adaptable code; Avoid programming by coincidence; Bullet-proof your code with contracts, assertions, and exceptions; Capture real requirements; Test ruthlessly and effectively; Delight your users; Build teams of pragmatic programmers; and Make your developments more precise with automation. Written as a series of self-contained sections and filled with entertaining anecdotes, thoughtful examples, and interesting analogies, *The Pragmatic Programmer* illustrates the best practices and major pitfalls of many different aspects of software development. Whether you're a new coder, an experienced programmer, or a manager responsible for software projects, use these lessons daily, and you'll quickly see improvements in personal productivity, accuracy, and job satisfaction. You'll learn skills and develop habits and attitudes that form the foundation for long-term success in your career. You'll become a Pragmatic Programmer.

Targeted at Oracle professionals who need fast and accurate working examples of complex issues, Oracle In-focus books target specific areas of Oracle technology in a concise manner. Plenty of working code is provided without a lot of theory, allowing database managers to solve their problems quickly without reviewing data that they already know. All code scripts are available for instant download from a companion web site.

Apache Spark is amazing when everything clicks. But if you haven't seen the performance improvements you expected, or still don't feel confident enough to use Spark in production, this practical book is for you. Authors Holden Karau and Rachel Warren demonstrate performance optimizations to help your Spark queries run faster and handle larger data sizes, while using fewer resources. Ideal for software engineers, data engineers, developers, and system administrators working with large-scale data applications, this book describes techniques that can reduce data infrastructure costs and developer hours. Not only will you gain a more comprehensive understanding of Spark, you'll also learn

how to make it sing. With this book, you'll explore: How Spark SQL's new interfaces improve performance over SQL's RDD data structure The choice between data joins in Core Spark and Spark SQL Techniques for getting the most out of standard RDD transformations How to work around performance issues in Spark's key/value pair paradigm Writing high-performance Spark code without Scala or the JVM How to test for functionality and performance when applying suggested improvements Using Spark MLlib and Spark ML machine learning libraries Spark's Streaming components and external community packages

Get the most out of the rich development capabilities of SQL Server 2016 to build efficient database applications for your organization About This Book Utilize the new enhancements in Transact-SQL and security features in SQL Server 2016 to build efficient database applications Work with temporal tables to get information about data stored in the table at any point in time A detailed guide to SQL Server 2016, introducing you to multiple new features and enhancements to improve your overall development experience Who This Book Is For This book is for database developers and solution architects who plan to use the new SQL Server 2016 features for developing efficient database applications. It is also ideal for experienced SQL Server developers who want to switch to SQL Server 2016 for its rich development capabilities. Some understanding of the basic database concepts and Transact-SQL language is assumed. What You Will Learn Explore the new development features introduced in SQL Server 2016 Identify opportunities for In-Memory OLTP technology, significantly enhanced in SQL Server 2016 Use columnstore indexes to get significant storage and performance improvements Extend database design solutions using temporal tables Exchange JSON data between applications and SQL Server in a more efficient way Migrate historical data transparently and securely to Microsoft Azure by using Stretch Database Use the new security features to encrypt or to have more granular control over access to rows in a table Simplify performance troubleshooting with Query Store Discover the potential of R's integration with SQL Server In Detail Microsoft SQL Server 2016 is considered the biggest leap in the data platform history of the Microsoft, in the ongoing era of Big Data and data science. Compared to its predecessors, SQL Server 2016 offers developers a unique opportunity to leverage the advanced features and build applications that are robust, scalable, and easy to administer.

This book introduces you to new features of SQL Server 2016 which will open a completely new set of possibilities for you as a developer. It prepares you for the more advanced topics by starting with a quick introduction to SQL Server 2016's new features and a recapitulation of the possibilities you may have already explored with previous versions of SQL Server. The next part introduces you to small delights in the Transact-SQL language and then switches to a completely new technology inside SQL Server - JSON support. We also take a look at the Stretch database, security enhancements, and temporal tables. The last chapters concentrate on implementing advanced topics, including Query Store, columnstore indexes, and In-Memory OLTP. You will finally be introduced to R and how to use the R language with Transact-SQL for data exploration and analysis. By the end of this book, you will have the required information to design efficient, high-performance database applications without any hassle. Style and approach This book is a detailed guide to mastering the development features offered by SQL Server 2016, with a unique learn-as-you-do approach. All the concepts are explained in a very easy-to-understand manner and are supplemented with examples to ensure that you—the developer—are able to take that next step in building more powerful, robust applications for your organization with ease.

Troubleshoot query performance issues, identify anti-patterns in code, and write efficient T-SQL queries Key Features Discover T-SQL functionalities and services that help you interact with relational databases Understand the roles, tasks and responsibilities of a T-SQL developer Explore solutions for carrying out database querying tasks, database administration, and troubleshooting Book Description Transact-SQL (T-SQL) is Microsoft's proprietary extension to the SQL language that is used with Microsoft SQL Server and Azure SQL Database. This book will be a useful guide to learning the art of writing efficient T-SQL code in modern SQL Server versions, as well as the Azure SQL Database. The book will get you started with query processing fundamentals to help you write powerful, performant T-SQL queries. You will then focus on query execution plans and learn how to leverage them for troubleshooting. In the later chapters, you will learn how to identify various T-SQL patterns and anti-patterns. This will help you analyze execution plans to gain insights into current performance, and determine whether or not a query is scalable. You will also learn to build diag-

nostic queries using dynamic management views (DMVs) and dynamic management functions (DMFs) to address various challenges in T-SQL execution. Next, you will study how to leverage the built-in tools of SQL Server to shorten the time taken to address query performance and scalability issues. In the concluding chapters, the book will guide you through implementing various features, such as Extended Events, Query Store, and Query Tuning Assistant using hands-on examples. By the end of this book, you will have the skills to determine query performance bottlenecks, avoid pitfalls, and discover the anti-patterns in use. Foreword by Conor Cunningham, Partner Architect - SQL Server and Azure SQL - Microsoft What you will learn Use Query Store to understand and easily change query performance Recognize and eliminate bottlenecks that lead to slow performance Deploy quick fixes and long-term solutions to improve query performance Implement best practices to minimize performance risk using T-SQL Achieve optimal performance by ensuring careful query and index design Use the latest performance optimization features in SQL Server 2017 and SQL Server 2019 Protect query performance during upgrades to newer versions of SQL Server Who this book is for This book is for database administrators, database developers, data analysts, data scientists, and T-SQL practitioners who want to get started with writing T-SQL code and troubleshooting query performance issues, through the help of practical examples. Previous knowledge of T-SQL querying is not required to get started on this book.

Apply powerful window functions in T-SQL—and increase the performance and speed of your queries Optimize your queries—and obtain simple and elegant solutions to a variety of problems—using window functions in Transact-SQL. Led by T-SQL expert Itzik Ben-Gan, you'll learn how to apply calculations against sets of rows in a flexible, clear, and efficient manner. Ideal whether you're a database administrator or developer, this practical guide demonstrates ways to use more than a dozen T-SQL querying solutions to address common business tasks. Discover how to: Go beyond traditional query approaches to express set calculations more efficiently Delve into ordered set functions such as rank, distribution, and offset Implement hypothetical set and inverse distribution functions in standard SQL Use strategies for improving sequencing, paging, filtering, and pivoting Increase query speed using partitioning, ordering, and coverage indexing Apply new opti-

mization iterators such as Window Spool Handle common issues such as running totals, intervals, medians, and gaps

The authors have revised and updated this bestseller to include both the Oracle8i and new Oracle9i Internet-savvy database products.

Updated for the latest database management systems -- including MySQL 6.0, Oracle 11g, and Microsoft's SQL Server 2008 -- this introductory guide will get you up and running with SQL quickly. Whether you need to write database applications, perform administrative tasks, or generate reports, Learning SQL, Second Edition, will help you easily master all the SQL fundamentals. Each chapter presents a self-contained lesson on a key SQL concept or technique, with numerous illustrations and annotated examples. Exercises at the end of each chapter let you practice the skills you learn. With this book, you will: Move quickly through SQL basics and learn several advanced features Use SQL data statements to generate, manipulate, and retrieve data Create database objects, such as tables, indexes, and constraints, using SQL schema statements Learn how data sets interact with queries, and understand the importance of subqueries Convert and manipulate data with SQL's built-in functions, and use conditional logic in data statements Knowledge of SQL is a must for interacting with data. With Learning SQL, you'll quickly learn how to put the power and flexibility of this language to work.

Build a core level of competency in SQL so you can recognize the parts of queries and write simple SQL statements. SQL knowledge is essential for anyone involved in programming, data science, and data management. This book covers features of SQL that are standardized and common across most database vendors. You will gain a base of knowledge that will prepare you to go deeper into the specifics of any database product you might encounter. Examples in the book are worked in PostgreSQL and SQLite, but the bulk of the examples are platform agnostic and will work on any database platform supporting SQL. Early in the book you learn about table design, the importance of keys as row identifiers, and essential query operations. You then move into more advanced topics such as grouping and summarizing, creating calculated fields, joining data from multiple tables when it makes business sense to do so, and more. Throughout the book, you are exposed to a set-based approach to the language and are provided a good grounding in subtle but important topics such as the

effects of null value on query results. With the explosion of data science, SQL has regained its prominence as a top skill to have for technologists and decision makers worldwide. SQL Primer will guide you from the very basics of SQL through to the mainstream features you need to have a solid, working knowledge of this important, data-oriented language. What You'll Learn Create and populate your own database tables Read SQL queries and understand what they are doing Execute queries that get correct results Bring together related rows from multiple tables Group and sort data in support of reporting applications Get a grip on nulls, normalization, and other key concepts Employ subqueries, unions, and other advanced features Who This Book Is For Anyone new to SQL who is looking for step-by-step guidance toward understanding and writing SQL queries. The book is aimed at those who encounter SQL statements often in their work, and provides a sound baseline useful across all SQL database systems. Programmers, database managers, data scientists, and business analysts all can benefit from the baseline of SQL knowledge provided in this book.

A poorly performing database application not only costs users time, but also has an impact on other applications running on the same computer or the same network. SQL Tuning provides an essential next step for SQL developers and database administrators who want to extend their SQL tuning expertise and get the most from their database applications. There are two basic issues to focus on when tuning SQL: how to find and interpret the execution plan of an SQL statement and how to change SQL to get a specific alternate execution plan. SQL Tuning provides answers to these questions and addresses a third issue that's even more important: how to find the optimal execution plan for the query to use. Author Dan Tow outlines a timesaving method he's developed for finding the optimum execution plan--rapidly and systematically--regardless of the complexity of the SQL or the database platform being used. You'll learn how to understand and control SQL execution plans and how to diagram SQL queries to deduce the best execution plan for a query. Key chapters in the book include exercises to reinforce the concepts you've learned. SQL Tuning concludes by addressing special concerns and unique solutions to "unsolvable problems." Whether you are a programmer who develops SQL-based applications or a database administrator or other who troubleshoots poorly tuned applications, SQL Tuning will arm you with a reliable and deterministic method for tuning your SQL

queries to gain optimal performance.

Design and configure SQL Server instances and databases in support of high-throughput applications that are mission-critical and provide consistent response times in the face of variations in user numbers and query volumes. Learn to configure SQL Server and design your databases to support a given instance and workload. You'll learn advanced configuration options, in-memory technologies, storage and disk configuration, and more, all toward enabling your desired application performance and throughput. Configuration doesn't stop with implementation. Workloads change over time, and other impediments can arise to thwart desired performance. High Performance SQL Server covers monitoring and troubleshooting to aid in detecting and fixing production performance problems and minimizing application outages. You'll learn a variety of tools, ranging from the traditional wait analysis methodology to the new query store, and you'll learn how improving performance is really an iterative process. High Performance SQL Server is based on SQL Server 2016, although most of its content can be applied to prior versions of the product. This book is an excellent complement to performance tuning books focusing on SQL queries, and provides the other half of what you need to know by focusing on configuring the instances on which mission-critical queries are executed. Covers SQL Server instance-configuration for optimal performance Helps in implementing SQL Server in-memory technologies Provides guidance toward monitoring and ongoing diagnostics What You Will Learn Understand SQL Server's database engine and how it processes queries Configure instances in support of high-throughput applications Provide consistent response times to varying user numbers and query volumes Design databases for high-throughput applications with focus on performance Record performance baselines and monitor SQL Server instances against them Troubleshoot and fix performance problems Who This Book Is For SQL Server database administrators, developers, and data architects. The book is also of use to system administrators who are managing and are responsible for the physical servers on which SQL Server instances are run.

Queries not running fast enough? Wondering about the in-memory database features in 2014? Tired of phone calls from frustrated users? Grant Fritchey's book SQL Server Query Performance Tuning is the answer to your SQL Server query performance problems. The book is revised to cover the very latest in perfor-

mance optimization features and techniques, especially including the newly-added, in-memory database features formerly known under the code name Project Hekaton. This book provides the tools you need to approach your queries with performance in mind. SQL Server Query Performance Tuning leads you through understanding the causes of poor performance, how to identify them, and how to fix them. You'll learn to be proactive in establishing performance baselines using tools like Performance Monitor and Extended Events. You'll learn to recognize bottlenecks and defuse them before the phone rings. You'll learn some quick solutions too, but emphasis is on designing for performance and getting it right, and upon heading off trouble before it occurs. Delight your users. Silence that ringing phone. Put the principles and lessons from SQL Server Query Performance Tuning into practice today. Covers the in-memory features from Project Hekaton Helps establish performance baselines and monitor against them Guides in troubleshooting and eliminating of bottlenecks that frustrate users

Execution plans show you what's going on behind the scenes in SQL Server. They can provide you with a wealth of information on how your queries are being executed by SQL Server, including: Which indexes are being used, and where no indexes are being used at all. How the data is being retrieved, and joined, from the tables defined in your query. How aggregations in GROUP BY queries are put together. The anticipated load and the estimated cost that all these operations place upon the system. Grant Fritchey's book is the only in-depth look at how to improve your SQL query performance through careful design of execution plans. Sample chapters of the ebook have garnered stunning reviews, such as: "All I can say is WOW. This has to be the best reference I have ever seen on Execution Plans in SQL Server. My hats off to Grant Fritchey" Jonathan Kehayias.

The Essential Guide to SQL Statement Optimization Written by Oracle ACE Director and MySQL expert Ronald Bradford, Effective MySQL: Optimizing SQL Statements is filled with detailed explanations and practical examples that can be applied immediately to improve database and application performances. Featuring a step-by-step approach to SQL optimization, this Oracle Press book helps you to analyze and tune problematic SQL statements. Identify the essential analysis commands for gathering and diagnosing issues Learn how different index theories are applied and repre-

sented in MySQL Plan and execute informed SQL optimizations Create MySQL indexes to improve query performance Master the MySQL query execution plan Identify key configuration variables that impact SQL execution and performance Apply the SQL optimization lifecycle to capture, identify, confirm, analyze, and optimize SQL statements and verify the results Improve index utilization with covering indexes and partial indexes Learn hidden performance tips for improving index efficiency and simplifying SQL statements

Bert Scalzo and Dan Hotka have written the definitive, up-to-date guide to Version 12.x, Dell's powerful new release of Toad for Oracle. Packed with step-by-step recipes, detailed screen shots, and hands-on exercises, Toad for Oracle Unleashed shows both developers and DBAs how to maximize their productivity. Drawing on their unsurpassed experience running Toad in production Oracle environments, Scalzo and Hotka thoroughly cover every area of Toad's functionality. You'll find practical insights into each of Toad's most useful tools, from App Designer to Doc Generator, ER Diagrammer to Code Road Map. The authors offer proven solutions you can apply immediately to solve a wide variety of problems, from maintaining code integrity to automating performance and scalability testing. Learn how to... Install and launch Toad, connect to a database, and explore Toad's new features Customize Toad to optimize productivity in your environment Use the Editor Window to execute SQL and PL/SQL, and view, save, or convert data Browse your schema, and create and edit objects Quickly generate useful reports with FastReport and Report Manager Clarify your database's tables and data with the powerful Entity Relationship Diagrammer (ERD) and HTML documentation generator Work more efficiently with PL/SQL using code templates, snippets, and shortcuts Automate actions and applications with Automation Designer Perform key DBA tasks including database health checks, tablespace management, database and schema comparisons, and object rebuilding Identify and optimize poorlyperforming SQL and applications ON THE WEB: Download all examples and source code presented in this book from [informit.com/title/9780134131856](http://informit.com/title/9780134131856) as it becomes available.

This book provides a comprehensive overview on best practices for troubleshooting and performance tuning in SQL Server. It reviews how to identify performance issues, how to troubleshoot the system in a holistic fashion, and how to properly prioritize tuning

efforts in order to induce the best system performance possible. The book also discusses interdependencies between database components, while spotlighting ways to avoid the bottlenecks that can be triggered by those dependencies. The troubleshooting and performance tuning techniques presented in the book are compatible with any version of SQL Server. They cover both on-premise and Cloud-based SQL Server installations, including Microsoft Azure SQL Databases and Amazon SQL Server RDS. Reflecting the approaches used by many high-end SQL Server consultants, *SQL Server Advanced Troubleshooting and Performance Tuning* is a valuable resource that will help readers master troubleshooting and performance tuning skills and get the best performance out of SQL Server.

A very practical guide to making databases run faster and better. A poorly performing database application can cost each user time, and have an impact on other applications running on the same computer or the same network. This book will help DBAs and programmers improve the performance of their databases.

Written by a Senior Database Administrator who has worked with the Oracle RDBMS for thirty years, this is a book which teaches the skill of SQL Tuning for the Oracle Database. Not a list of one-off tricks or tips, nor a glossing over of topics; this book offers an in-depth process covering discovery, analysis, and problem resolution. Learn the science behind SQL Tuning. Learn and apply the FILTERED ROWS PERCENTAGE Cardinality based method of tuning Determine a query's Driving Table and Join Order Construct Query Diagrams, Data Models, and Join Trees Build and use Count / Filter / and Reconstruction Queries Identify Waste in a Query Execution Plan Zero in on Cardinality Divergence using Estimated vs. Actuals Use the ACCESS / FILTER / COVERAGE strategy to build indexes for Problem Queries Exploit THE 2% RULE in analyzing Access method and Join method Classify queries as Precision Style or Warehouse Style Understand Hash Join mechanics and make Hash Joins go faster Make HINTS work as Detection Tools rather than clubs Avoid early Database Design flaws Manage Statistics and deal with common Statistics problems (NDV, Uniform Distribution, Independence, Dynamic Sampling) (Staleness, Skew, Dependence, Defaulting, Out-Of-Bounds, Transiency, Bloat) Perfect your Question Based Analysis Technique and more Included are: a special chapter for EXADATA, a LAB which demonstrates the cardinality based process of SQL Tuning, and twenty three magical SQL

scripts that make the process of SQL Tuning easy to do. Learn the skill of SQL Tuning as taught by an expert who does it for a living, and become the go-to specialist in your company. Chapter 1: DRIVING TABLE and JOIN ORDER Chapter 2: Ways to Use a Query Execution Plan Chapter 3: The Best Indexes for a Query Chapter 4: JOINS Chapter 5: HINTS Chapter 6: BASICS Chapter 7: ROW COUNTS and RUN TIMES Chapter 8: EXADATA LAB: Reverse Engineering the QEP Appendix: Know Your Scripts Scripts for analyzing queries and plans Scripts for examining an active database Scripts for looking at metadata showplan showplanshort showplan-constraints showplancountqueries showplandatamodel showplandrivingtable showplanfilterqueries showplanfrpspreadsheetcode showplanindexes showplannumrows showplanquerydiagram showplantables showplantablesunique loadplanfromcache loadplanfromhist showtopcpu showowner showindexes showconstraints showcolstats showhistograms showallscanrates showallworkareas It's all about the Cardinalities

Expert Indexing in Oracle Database 11g is about the one database structure at the heart of almost all performance concerns: the index. Database system performance is one of the top concerns in information technology today. Administrators struggle to keep up with the explosion of access and activity driven by the proliferation of computing into everything from phones to tablets to PCs in our increasingly connected world. At the heart of any good-performing database lies a sound indexing strategy that makes appropriate use of indexing, and especially of the vendor-specific indexing features on offer. Few databases fully exploit the wealth of data access mechanisms provided by Oracle. Expert Indexing in Oracle Database 11g helps by bringing together information indexing and how to use it into one, convenient and blissfully short volume that you can read quickly and have at your fingertips for reference. Learn the different types of indices available and when each is best applied. Recognize when queries aren't using indices as you intend. Manage your indexing for maximum performance. Let Expert Indexing in Oracle Database 11g be your guide to deep mastery of the most fundamental performance optimization structure in Oracle Database. Explains how indices work, how they help, and how they hinder Demystifies the various index choices Describes the database administration chores associated with indices

Arguably the most capable of all the open source databases, Post-

greSQL is an object-relational database management system first developed in 1977 by the University of California at Berkeley. In spite of its long history, this robust database suffers from a lack of easy-to-use documentation. Practical PostgreSQL fills that void with a fast-paced guide to installation, configuration, and usage. This comprehensive new volume shows you how to compile PostgreSQL from source, create a database, and configure PostgreSQL to accept client-server connections. It also covers the many advanced features, such as transactions, versioning, replication, and referential integrity that enable developers and DBAs to use PostgreSQL for serious business applications. The thorough introduction to PostgreSQL's PL/pgSQL programming language explains how you can use this very useful but under-documented feature to develop stored procedures and triggers. The book includes a complete command reference, and database administrators will appreciate the chapters on user management, database maintenance, and backup & recovery. With Practical PostgreSQL, you will discover quickly why this open source database is such a great open source alternative to proprietary products from Oracle, IBM, and Microsoft.

How can you bring out MySQL's full power? With High Performance MySQL, you'll learn advanced techniques for everything from designing schemas, indexes, and queries to tuning your MySQL server, operating system, and hardware to their fullest potential. This guide also teaches you safe and practical ways to scale applications through replication, load balancing, high availability, and failover. Updated to reflect recent advances in MySQL and InnoDB performance, features, and tools, this third edition not only offers specific examples of how MySQL works, it also teaches you why this system works a.

Practical SQL is an approachable and fast-paced guide to SQL (Structured Query Language), the standard programming language for defining, organizing, and exploring data in relational databases. The book focuses on using SQL to find the story your data tells, with the popular open-source database PostgreSQL and the pgAdmin interface as its primary tools. You'll first cover the fundamentals of databases and the SQL language, then build skills by analyzing data from the U.S. Census and other federal and state government agencies. With exercises and real-world examples in each chapter, this book will teach even those who have never programmed before all the tools necessary to build power-

ful databases and access information quickly and efficiently. You'll learn how to:

- Create databases and related tables using your own data
- Define the right data types for your information
- Aggregate, sort, and filter data to find patterns
- Use basic math and advanced statistical functions
- Identify errors in data and clean them up
- Import and export data using delimited text files
- Write queries for geographic information systems (GIS)
- Create advanced queries and automate tasks

Learning SQL doesn't have to be dry and complicated. Practical SQL delivers clear examples with an easy-to-follow approach to teach you the tools you need to build and manage your own databases. This book uses PostgreSQL, but the SQL syntax is applicable to many database applications, including Microsoft SQL Server and MySQL.

Identify, analyze, and improve poorly performing queries that damage user experience and lead to lost revenue for your business. This book will help you make query tuning an integral part of your daily routine through a multi-step process that includes monitoring of execution times, identifying candidate queries for optimization, analyzing their current performance, and improving them to deliver results faster and with less overhead. Author Jesper Krogh systematically discusses each of these steps along with the data sources and the tools used to perform them.

MySQL 8 Query Performance Tuning aims to help you improve query performance using a wide range of strategies. You will know how to analyze queries using both the traditional EXPLAIN command as well as the new EXPLAIN ANALYZE tool. You also will see how to use the Visual Explain feature to provide a visually-oriented view of an execution plan. Coverage of indexes includes indexing strategies and index statistics, and you will learn how histograms can be used to provide input on skewed data distributions that the optimizer can use to improve query performance. You will learn about locks, and how to investigate locking issues. And you will come away with an understanding of how the MySQL optimizer works, including the new hash join algorithm, and how to change the optimizer's behavior when needed to deliver faster execution times. You will gain the tools and skills needed to delight application users and to squeeze the most value from corporate computing resources.

What You Will Learn

- Monitor query performance to identify poor performers
- Choose queries to optimize that will provide the greatest gain
- Analyze queries using tools such as EXPLAIN ANALYZE and Visual Explain
- Improve slow queries through a wide

range of strategies

- Properly deploy indexes and histograms to aid in creating fast execution plans
- Understand and analyze locks to resolve contention and increase throughput

Who This Book Is For

Database administrators and SQL developers who are familiar with MySQL and need to participate in query tuning. While some experience with MySQL is required, no prior knowledge of query performance tuning is needed.

How can you bring out MySQL's full power? With High Performance MySQL, you'll learn advanced techniques for everything from designing schemas, indexes, and queries to tuning your MySQL server, operating system, and hardware to their fullest potential. This guide also teaches you safe and practical ways to scale applications through replication, load balancing, high availability, and failover. Updated to reflect recent advances in MySQL and InnoDB performance, features, and tools, this third edition not only offers specific examples of how MySQL works, it also teaches you why this system works as it does, with illustrative stories and case studies that demonstrate MySQL's principles in action. With this book, you'll learn how to think in MySQL. Learn the effects of new features in MySQL 5.5, including stored procedures, partitioned databases, triggers, and views

Implement improvements in replication, high availability, and clustering

Achieve high performance when running MySQL in the cloud

Optimize advanced querying features, such as full-text searches

Take advantage of modern multi-core CPUs and solid-state disks

Explore backup and recovery strategies—including new tools for hot online backups

Jump-start your career as a data scientist—learn to develop datasets for exploration, analysis, and machine learning

SQL for Data Scientists: A Beginner's Guide for Building Datasets for Analysis is a resource that's dedicated to the Structured Query Language (SQL) and dataset design skills that data scientists use most. Aspiring data scientists will learn how to how to construct datasets for exploration, analysis, and machine learning. You can also discover how to approach query design and develop SQL code to extract data insights while avoiding common pitfalls. You may be one of many people who are entering the field of Data Science from a range of professions and educational backgrounds, such as business analytics, social science, physics, economics, and computer science. Like many of them, you may have conducted analyses using spreadsheets as data sources, but never retrieved and

engineered datasets from a relational database using SQL, which is a programming language designed for managing databases and extracting data. This guide for data scientists differs from other instructional guides on the subject. It doesn't cover SQL broadly. Instead, you'll learn the subset of SQL skills that data analysts and data scientists use frequently. You'll also gain practical advice and direction on "how to think about constructing your dataset."

Gain an understanding of relational database structure, query design, and SQL syntax

Develop queries to construct datasets for use in applications like interactive reports and machine learning algorithms

Review strategies and approaches so you can design analytical datasets

Practice your techniques with the provided database and SQL code

In this book, author Renee Teate shares knowledge gained during a 15-year career working with data, in roles ranging from database developer to data analyst to data scientist. She guides you through SQL code and dataset design concepts from an industry practitioner's perspective, moving your data scientist career forward!

When you use Hibernate in your projects, you quickly recognize that you need to do more than just add @Entity annotations to your domain model classes. Real-world applications often require advanced mappings, complex queries, custom data types and caching. Hibernate can do all of that. You just have to know which annotations and APIs you need to use.

Hibernate Tips - More than 70 solutions to common Hibernate problems shows you how to efficiently implement your persistence layer with Hibernate's basic and advanced features. Each Hibernate Tip consists of one or more code samples and an easy to follow step-by-step explanation. You can also download an example project with executable test cases for each Hibernate Tip. Throughout this book, you will get more than 70 ready-to-use solutions that show you how to:

- Define standard mappings for basic attributes and entity associations.
- Implement your own attribute mappings and support custom data types.
- Use Hibernate's Java 8 support and other proprietary features.
- Read data from the database with JPQL, Criteria API, and native SQL queries.
- Call stored procedures and database functions.

This book is for developers who are already working with Hibernate and who are looking for solutions for their current development tasks. It's not a book for beginners who are looking for extensive descriptions of Hibernate's general concepts. The tips are designed as self-contained recipes which pro-

vide a specific solution and can be accessed when needed. Most of them contain links to related tips which you can follow if you want to dive deeper into a topic or need a slightly different solution. There is no need to read the tips in a specific order. Feel free to read the book from cover to cover or to just pick the tips that help you in your current project.

Build smarter and efficient database application systems for your organization with SQL Server 2017 Key Features Build database applications by using the development features of SQL Server 2017 Work with temporal tables to get information stored in a table at any time Use adaptive querying to enhance the performance of your queries Book Description Microsoft SQL Server 2017 is the next big step in the data platform history of Microsoft as it brings in the power of R and Python for machine learning and containerization-based deployment on Windows and Linux. Compared to its predecessor, SQL Server 2017 has evolved into Machine Learning with R services for statistical analysis and Python packages for analytical processing. This book prepares you for more advanced topics by starting with a quick introduction to SQL Server 2017's new features and a recapitulation of the possibilities you may have already explored with previous versions of SQL Server. The next part introduces you to enhancements in the Transact-SQL language and new database engine capabilities and then switches to a completely new technology inside SQL Server: JSON support. We also take a look at the Stretch database, security enhancements, and temporal tables. Furthermore, the book focuses on implementing advanced topics, including Query Store, columnstore indexes, and In-Memory OLTP. Towards the end of the book, you'll be introduced to R and how to use the R language with Transact-SQL for data exploration and analysis. You'll also learn to integrate Python code in SQL Server and graph database implementations along with deployment options on Linux and SQL Server in containers for development and testing. By the end of this book, you will have the required information to design efficient, high-performance database applications without any hassle. What you will learn Explore the new development features introduced in SQL Server 2017 Identify opportunities for In-Memory OLTP technology Use columnstore indexes to get storage and performance improvements Exchange JSON data between applications and SQL Server Use the new security features to encrypt or mask the data Control the access to the data on the row levels

Discover the potential of R and Python integration Model complex relationships with the graph databases in SQL Server 2017 Who this book is for Database developers and solution architects looking to design efficient database applications using SQL Server 2017 will find this book very useful. In addition, this book will be valuable to advanced analysis practitioners and business intelligence developers. Database consultants dealing with performance tuning will get a lot of useful information from this book as well. Some basic understanding of database concepts and T-SQL is required to get the best out of this book.

A guide to SQL covers such topics as retrieving records, metadata queries, working with strings, data arithmetic, date manipulation, reporting and warehousing, and hierarchical queries.

Take a deep dive into perhaps the single most important facet of good performance: indexes, and how to best use them. Recent updates to SQL Server have made it possible to create indexes in situations that in the past would have prevented their use. Other improvements covered in this book include new dynamic management views, the ability to pause and resume index maintenance, and the ability to more easily recover from failures during index creation and maintenance operations. This new edition also brings new content around the indexing of columnstore and in-memory tables, showing how these new types of tables and the queries that execute against them can also benefit from good indexing practices. The book begins with explanations of the types of indexes and how they are stored in databases. Moving deeper into the topic, and further into the book, you will look at the statistics that are accumulated both by indexes and on indexes. You will better understand what indexes are doing in the database and what can be done to mitigate and improve their effect on performance. You will get a look at the Index Advisor now available in Azure SQL Database, and learn how to review and maintain the health of your indexes. The final chapters present a guided tour through a number of scenarios showing approaches you can take to investigate, mitigate, and improve the performance of your database. What You Will Learn Properly index row store, columnstore, and in-memory tables Review statistics to understand indexing choices made by the optimizer Apply indexing strategies such as covering indexes, included columns, and index intersections Recognize and remove unnecessary indexes Design effective indexes for full-text, spatial, and XML data types Manage the big picture: Encompass all

indexes in a database, and all database instances on a server Who This Book Is For Database administrators and developers who are ready to lift the performance of their database environment by thoughtfully building indexes to speed up queries that matter the most and make a difference to the business

T-SQL insiders help you tackle your toughest queries and query-tuning problems Squeeze maximum performance and efficiency from every T-SQL query you write or tune. Four leading experts take an in-depth look at T-SQL's internal architecture and offer advanced practical techniques for optimizing response time and resource usage. Emphasizing a correct understanding of the language and its foundations, the authors present unique solutions they have spent years developing and refining. All code and techniques are fully updated to reflect new T-SQL enhancements in Microsoft SQL Server 2014 and SQL Server 2012. Write faster, more efficient T-SQL code: Move from procedural programming to the language of sets and logic Master an efficient top-down tuning methodology Assess algorithmic complexity to predict performance Compare data aggregation techniques, including new grouping sets Efficiently perform data-analysis calculations Make the most of T-SQL's optimized bulk import tools Avoid date/time pitfalls that lead to buggy, poorly performing code Create optimized BI statistical queries without additional software Use programmable objects to accelerate queries Unlock major performance improvements with In-Memory OLTP Master useful and elegant approaches to manipulating graphs About This Book For experienced T-SQL practitioners Includes coverage updated from Inside Microsoft SQL Server 2008 T-SQL Querying and Inside Microsoft SQL Server 2008 T-SQL Programming Valuable to developers, DBAs, BI professionals, and data scientists Covers many MCSE 70-464 and MCSA/MCSE 70-461 exam topics

When your database application isn't running fast enough, troubleshooting is usually your first move. Finding the slow part of an application is often easy, but discovering a solution can prove much more difficult. Troubleshooting Oracle Performance helps by providing a systematic approach to addressing the underlying causes of poor database application performance. Written for developers by an application developer who has learned by doing, this book shows you how to plan for performance as you would for any other application requirement.

SQL is full of difficulties and traps for the unwary. You can avoid

them if you understand relational theory, but only if you know how to put the theory into practice. In this insightful book, author C.J. Date explains relational theory in depth, and demonstrates through numerous examples and exercises how you can apply it directly to your use of SQL. This second edition includes new material on recursive queries, “missing information” without nulls, new update operators, and topics such as aggregate operators, grouping and ungrouping, and view updating. If you have a modest-to-advanced background in SQL, you’ll learn how to deal with a host of common SQL dilemmas. Why is proper column naming so important? Nulls in your database are causing you to get wrong answers. Why? What can you do about it? Is it possible to write an SQL query to find employees who have never been in the same department for more than six months at a time? SQL supports “quantified comparisons,” but they’re better avoided. Why? How do you avoid them? Constraints are crucially important, but most SQL products don’t support them properly. What can you do to resolve this situation? Database theory and practice have evolved since the relational model was developed more than 40 years ago. SQL and Relational Theory draws on decades of research to present the most up-to-date treatment of SQL available. C.J. Date has a stature that is unique within the database industry. A prolific writer well known for the bestselling textbook *An Introduction to Database Systems* (Addison-Wesley), he has an exceptionally clear style when writing about complex principles and theory.

This is the second edition of the popular practitioner's guide to SQL, the industry-standard database query language. Like most computer languages, SQL can be overwhelming when you first see it, but for years readers have relied on this book to clear the confusion and explain how SQL works and how to use it effectively. Packed with tips, tricks, and good information, *SQL Clearly Explained, Second Edition* teaches database users and programmers everything they need to know to get their job done including · formulating SQL queries, · understanding how queries are processed by the DBMS, · maximizing performance, · using SQL to enter, modify, or delete data, · creating and maintaining database structural elements, and · embedding SQL in applications. Features · Updated and expanded to include changes in the SQL standard

(SQL:1999) as well as recently implemented aspects of SQL-92. · Includes CD with examples from the book as well as MySQL, a popular open-source DBMS, on which the examples are based. · Web enhanced with extra features available online at [www.mkp.com](http://www.mkp.com). \* Second edition of classic SQL handbook \* Updated to cover changes in the SQL language standard (SQL:1999) \* Includes CD with MySQL software

If a query is performing poorly, and you can't understand why, then that query's execution plan will tell you not only what data set is coming back, but also what SQL Server did, and in what order, to get that data. It will reveal how the data was retrieved, and from which tables and indexes, what types of joins were used, at what point filtering, sorting and aggregation occurred, and a whole lot more. These details will often highlight the likely source of any problem. I wrote this book with the singular goal of teaching you how to read SQL Server Execution plans It will explain, among many other things, the following: How to capture execution plans using manual and automatic methods A documented method for reading and interpreting execution plans How common SQL Server objects, such as indexes, views, stored procedures, and so on, appear in execution plans How to control execution plans with hints and plan guides, and why this is a double-edged sword How the Query Store works with, and collects data on, execution plans With this knowledge, you'll have everything you need to read the execution plan, for any query of your own, regardless of complexity, and understand what it does and what is causing the bad performance. It is still your job to work out how best to fix it, but your new understanding of execution plans will give a much better chance of success!

For all the buzz about trendy IT techniques, data processing is still at the core of our systems, especially now that enterprises all over the world are confronted with exploding volumes of data. Database performance has become a major headache, and most IT departments believe that developers should provide simple SQL code to solve immediate problems and let DBAs tune any bad SQL later. In *The Art of SQL*, author and SQL expert Stephane Faroult argues that this safe approach only leads to disaster. His insightful book, named after *Art of War* by Sun Tzu, contends that

writing quick inefficient code is sweeping the dirt under the rug. SQL code may run for 5 to 10 years, surviving several major releases of the database management system and on several generations of hardware. The code must be fast and sound from the start, and that requires a firm understanding of SQL and relational theory. *The Art of SQL* offers best practices that teach experienced SQL users to focus on strategy rather than specifics. Faroult's approach takes a page from Sun Tzu's classic treatise by viewing database design as a military campaign. You need knowledge, skills, and talent. Talent can't be taught, but every strategist from Sun Tzu to modern-day generals believed that it can be nurtured through the experience of others. They passed on their experience acquired in the field through basic principles that served as guiding stars amid the sound and fury of battle. This is what Faroult does with SQL. Like a successful battle plan, good architectural choices are based on contingencies. What if the volume of this or that table increases unexpectedly? What if, following a merger, the number of users doubles? What if you want to keep several years of data online? Faroult's way of looking at SQL performance may be unconventional and unique, but he's deadly serious about writing good SQL and using SQL well. *The Art of SQL* is not a cookbook, listing problems and giving recipes. The aim is to get you-and your manager-to raise good questions.

This remarkably comprehensive new book assembles concepts and results in relational databases theory previously scattered through journals, books, conference proceedings, and technical memoranda in one convenient source, and introduces pertinent new material not found elsewhere. The book is intended for a second course in databases, but is an excellent reference for researchers in the field. The material covered includes relational algebra, functional dependencies, multivalued and join dependencies, normal forms, tableaux and the chase computation, representation theory, domain and tuple relational calculus, query modification, database semantics and null values, acyclic database schemes, template dependencies, and computed relations. The final chapter is a brief survey of query languages in existing relational systems. Each chapter contains numerous examples and exercises, along with bibliographic remarks. - Back cover.