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# Oracle SQL Performance Tuning And Optimization: It's All About The Cardinalities

Plan Table Output (EXPLAIN)				
ID	Operation	Name	Bytes	
0	SELECT STATEMENT		1	0
1	NESTED LOOP		1	0
2	TABLE ACCESS	EMP	19000	1
3	TABLE ACCESS	EMP	19000	1
4	TABLE ACCESS	EMP	19000	1
5	TABLE ACCESS	EMP	19000	1
6	TABLE ACCESS	EMP	19000	1
7	TABLE ACCESS	EMP	19000	1
8	TABLE ACCESS	EMP	19000	1
9	TABLE ACCESS	EMP	19000	1
10	TABLE ACCESS	EMP	19000	1
11	TABLE ACCESS	EMP	19000	1
12	TABLE ACCESS	EMP	19000	1
13	TABLE ACCESS	EMP	19000	1
14	TABLE ACCESS	EMP	19000	1
15	TABLE ACCESS	EMP	19000	1
16	TABLE ACCESS	EMP	19000	1
17	TABLE ACCESS	EMP	19000	1
18	TABLE ACCESS	EMP	19000	1
19	TABLE ACCESS	EMP	19000	1
20	TABLE ACCESS	EMP	19000	1
21	TABLE ACCESS	EMP	19000	1

Oracle SQL  
Performance Tuning  
and Optimization  
It's all about the Cardinalities

ID	TABLE NAME	EMP_ROWS	ROWCOUNT	Cardinality	Cardinality	PRF
0	EMP	6243030	6243030	240137	219414	0.5
1	EMP	6243030	6243030	240137	219414	0.5
2	EMP	6243030	6243030	240137	219414	0.5
3	EMP	6243030	6243030	240137	219414	0.5
4	EMP	6243030	6243030	240137	219414	0.5
5	EMP	6243030	6243030	240137	219414	0.5
6	EMP	6243030	6243030	240137	219414	0.5
7	EMP	6243030	6243030	240137	219414	0.5
8	EMP	6243030	6243030	240137	219414	0.5
9	EMP	6243030	6243030	240137	219414	0.5
10	EMP	6243030	6243030	240137	219414	0.5
11	EMP	6243030	6243030	240137	219414	0.5
12	EMP	6243030	6243030	240137	219414	0.5
13	EMP	6243030	6243030	240137	219414	0.5
14	EMP	6243030	6243030	240137	219414	0.5
15	EMP	6243030	6243030	240137	219414	0.5
16	EMP	6243030	6243030	240137	219414	0.5
17	EMP	6243030	6243030	240137	219414	0.5
18	EMP	6243030	6243030	240137	219414	0.5
19	EMP	6243030	6243030	240137	219414	0.5
20	EMP	6243030	6243030	240137	219414	0.5
21	EMP	6243030	6243030	240137	219414	0.5



## Synopsis

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  
showplans  
showplanshort  
showplanconstraintss  
showplancountqueries  
showplandatamodels  
showplandrivingtables  
showplanfilterqueries  
showplanfrpspreadsheetcodes  
showplanindexess  
showplannumrowss  
showplanquerydiagram  
showplantableness  
showplantablesunique  
loadplanfromcacheloadplanfromhist  
showtopcpushowowners  
showindexess  
showconstraintss  
showcolstatss  
showhistogramss  
showallscan rates  
showallworkareas

It's all about the Cardinalities

## Book Information

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## Customer Reviews

This is a great book on SQL tuning for Oracle. I have several years of experience yet I still have lot to learn, esp in SQL tuning. There are several books in the market which are a rehash of the manuals or just skim over this topic or too hard to follow. This book takes the basic topics related to SQL tuning and presents them in a logical and coherent manner. I learned a lot about reading the sql statements and the plans, tuning the SQLs, look for hot spots and apply a standard approach to tuning. The book lays the foundation to understand SQL, takes you through a series of journeys into the SQL world which is helpful to understand SQL tuning. Each chapter deals with specific topic. The first chapter provides a good set of basic building blocks on how to tune queries. Great ideas with the FRP method approach. After reading the first chapter I tuned a query with several underlying tables by selecting a 'driving table'. The second chapter explains cardinalities and why cardinalities are important and how the plans could go for a toss if cardinalities are off. I have read about the cardinalities in several other places on the internet, but the chapter explains the whole thing from the basics. A must read for any tuner. Chapter 3 elaborates how to choose indexes and deals with ACCESS, FILTER and post table filtering predicates. The fourth chapter is on joins. This is the best chapter of the book in my view. The chapter deals with the most commonly used join methods such as nested loops, sort merge, etc and goes on to explain in detail the mechanisms involved under the hood. It also talks about when each case would be a best fit and its limitations and the most common problems each join method faces.

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Pros Volume 1: The SQL Queries 2012 Hands-On Tutorial for Beginners (SQL Exam Prep Series 70-461 Volume 1 Of 5) (SQL Queries 2012 Joes 2 Pros) Quick Start Guide to Oracle Fusion Development: Oracle JDeveloper and Oracle ADF (Oracle Press) Microsoft SQL Server 2014 Query Tuning & Optimization Hybrid Particle Swarm Algorithm for Multiobjective Optimization: Integrating Particle Swarm Optimization with Genetic Algorithms for Multiobjective Optimization SAP Performance Optimization Guide: Analyzing and Tuning SAP Systems, SAP Basis, SAP Administration Java EE 7 Performance Tuning and Optimization Microsoft SQL Server 2012 Performance Tuning Cookbook SQL for Beginners: Learn the Structured Query Language for the Most Popular Databases including Microsoft SQL Server, MySQL, MariaDB, PostgreSQL, and Oracle Oracle Shell Scripting: Linux and UNIX Programming for Oracle (Oracle In-Focus series) (Volume 26) Oracle Database 11g PL/SQL Programming Workbook (Oracle Press) Oracle Database Administration for Microsoft SQL Server DBAs (Oracle Press) OCA Oracle Database 11g SQL Fundamentals I Exam Guide: Exam 1Z0-051 (Oracle Press) Study Guide for 1Z0-051: Oracle Database 11g: SQL Fundamentals I: Oracle Certification Prep Study Guide for 1Z0-144: Oracle Database 11g: Program with PL/SQL: Oracle Certification Prep Study Guide for 1Z0-071: Oracle Database 12c SQL: Oracle Certification Prep Study Guide for 1Z0-146: Oracle Database 11g: Advanced PL/SQL (Oracle Certification Prep) Study Guide for 1Z0-061: Oracle Database 12c: SQL Fundamentals (Oracle Certification Prep)

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