**Oracle SQL PL/SQL Performance Tuning Training Course**

**Table of Contents:**

1. **Basics of Oracle Internals**
2. Oracle Architecture (Most Important One in tuning Queries).
3. Data files, control files, redo log files, init.ora, sp file, pwd file. Etc…
4. DB blocks, extents, segments, tablespaces…
5. **Introduction to query Tuning.**
6. Basic Steps to be followed before tuning.
7. Identifying the bottlenecks
8. Short term Fix and Long Term Fixes
9. Best practices to be followed while creating objects and writing queries.
10. Do I need to use SQL or PLSQL for specific requirement?
11. **Internal processing of SQL statements**
12. Statement Processing
13. Soft Parsing
14. Hard Parsing
15. SQL Semantic Analysis
16. Generating the execution plan
17. Using optimizer plan stability
18. Using the v$sql view
19. Using the v$sql\_plan view
20. Exercise – Query the library cache
21. **Gathering Statistics.**
22. Purpose of statistics
23. When to gather and its impact
24. Types of statistics (table, column, system)
25. Histogram statistics
26. Dynamic sampling
27. using dbms\_stats
28. using analyze statements
29. Exporting/importing statistics
30. Statistics management
31. **Internals of Query Optimizer**
32. Different modes of SQL optimization
33. Rule-based optimization
34. Cost-based optimization
35. All rows optimization
36. First\_rows optimization
37. Components of the Optimizer
38. Bind variables.
39. **Optimizer Access Paths and table joins**
40. Basics of file I/O
41. Sequential reads vs. scattered reads
42. Table Full Scan, Rowid Scan, Index Scan
43. Nested Loop Joins
44. Sort Merge Joins
45. Outer Joins
46. Hash Joins
47. Cartesian Joins
48. Internal structure of Indexes storage
49. Index Range Scan
50. Index Fast scan /Index Fast Full scan
51. Index (Max/Min) scan
52. Index Skip Scan
53. Histogram
54. Drawback of Bitmap Index (In OLTP Applications)
55. Nested Loop /Hash Join/Sort-Merge Join/ Hash Outer Join
56. Sequential Read/ Scattered Read
57. Dead Lock Solution for Wait Event Problems etc
58. **Execution Plan**
59. What is execution plan?
60. How to generate plan.
61. PLAN\_TABLE Table
62. Reading Execution Plan
63. Parallel Execution Plan
64. Modes of Tracing
65. How To Read Smartly TKPROF
66. Raw trace files
67. Autotrace and Explain plan
68. Reading AWR Reports
69. Table join order evaluation
70. Using the ordered hint
71. Re-writing SQL queries
72. **Optimizer Hints**
73. when to use Hints
74. Impact of Hints on Execution Plan
75. Scope of hints (session-level, statement level)
76. Types of Hints
77. Forcing index usage
78. Using hints in subqueries
79. **Index Optimization and Table compression**
80. Types of Indexes
81. When to use which type of index
82. B-Tree indexes
83. Bitmap Indexes
84. Function-based Indexes
85. Clustered indexes
86. Index-only tables
87. Table Partitioning methodology for performance
88. **DML Tuning**
89. Optimizing Oracle SQL insert performance
90. High Impact insert Tuning Techniques
91. Block size and insert performance
92. Oracle Delete & Update Tuning
93. With clause
94. **Tuning Subqueries**
95. Tuning Subqueries
96. Types of SQL Subqueries
97. Subqueries in the where Clause
98. In vs. exists Subqueries
99. Joins
100. Correlated Subquery
101. Tuning Scalar Subqueries
102. Scalar Subquery Performance
103. Internals of Temporary Tables
104. Subquery Hint Tuning
105. Subquery Tuning with Index Hints
106. Materialized Views and its impact in performance
107. Query rewriting using MViews
108. With Clause
109. **PLSQL Tuning**
110. Do’s and Don’ts while writing PLSQL code.
111. Using Bind variables.
112. Improving Performance using Pipelined Functions
113. Bulk collect
114. FORALL
115. Creating Packages/ Procedures/ Functions/ Triggers
116. Exception Handling
117. Drawback of Triggers
118. Autonomous Transaction etc
119. Optimizer Compiler
120. Data Caching Techniques (Package , Deterministic Function, Result Cache…etc)
121. Hierarchical Profile
122. NOCOPY Hint

**Salient Features.**

1. Course will be covered in real time point of view.
2. Day wise notes.
3. Day wise workouts and interview questions on the topics covered.