Course duration

- 3 days

Course Benefits

- Learn to gain a deeper knowledge and understanding of the Actian Matrix Architecture and SQL and how to write it.

Course Outline

1. What is Columnar?
    1. What is Parallel Processing?
    2. The Basics of a Single Computer
    3. Data in Memory is fast as Lightning
    4. Parallel Processing Of Data
    5. A Table has Columns and Rows
    6. Rows are placed inside a Data Block
    7. Moving Data Blocks is Like Checking in Luggage
    8. Facts That Are Disturbing
    9. Why Columnar?
    10. Row Based Blocks vs. Columnar Based Blocks
    11. As Row-Based Tables Get Bigger, the Blocks Split
    12. Data Blocks Are Processed One at a Time per Unit
    13. Columnar Tables Store Each Column in Separate Blocks
    14. Visualize the Data - Rows vs. Columns
    15. The Architecture of Actian Matrix
    16. Matrix has Linear Scalability
    17. Distribution Styles
    18. Distribution Key Where the Data is Unique
    19. Another Way to Create a Table
    20. Distribution Key Where the Data is Non-Unique
    21. Even Distribution Key
    22. Matching Distribution Keys for Co-Location of Joins
    23. Big Table / Small Table Joins
    24. Fact and Dimension Table Distribution Key Designs
    25. Improving Performance by Defining a Sort Key
    26. Sort Keys Help Group By, Order by and Window Functions
    27. Each Block Comes With Metadata
    28. How Data Might Look On a Slice
    29. The ANALYZE Command Collects Statistics
    30. Matrix Automatically ANALYZES Some Create Statements

11. Use IS NULL or IS NOT NULL when dealing with NULLs
12. Using Greater Than or Equal To (>=)
13. AND in the WHERE Clause
14. Troubleshooting AND
15. OR in the WHERE Clause
16. Troubleshooting Or
17. Troubleshooting Character Data
18. Using Different Columns in an AND Statement
19. What is the Order of Precedence?
20. Using Parentheses to change the Order of Precedence
21. Using an IN List in place of OR
22. The IN List is an Excellent Technique
23. IN List vs. OR brings the same Results
24. Using a NOT IN List
25. A Technique for Handling Nulls with a NOT IN List
26. Another Technique for Handling Nulls with a NOT IN List
27. BETWEEN is Inclusive
28. NOT BETWEEN is Also Inclusive
29. LIKE command Underscore is Wildcard for one Character
30. LIKE Command Works Differently on Char Vs Varchar
31. The Ilike Command Is NOT Case Sensitive
32. Troubleshooting LIKE Command on Character Data
33. Introducing the TRIM Command
34. Numbers are Right Justified and Character Data is Left
35. An Example of Data with Left and Right Justification
36. A Visual of CHARACTER Data vs. VARCHAR Data
37. Use the TRIM command to remove spaces on CHAR Data
38. Like and Your Escape Character of Choice
39. Like and the Default Escape Character
40. Similar To Operators
41. Similar To Example with Lower Case Letters
42. Similar To Example with Lower and Upper Case Letters
43. Similar To Example with Multiple Occurrences
44. Multiple Occurrences Must Be Consecutive

9. Distinct Vs Group By AND TOP
    1. The Distinct Command
    2. Distinct vs. GROUP BY
    3. TOP Command
    4. TOP Command is brilliant when ORDER BY is used!
    5. What is the Difference between TOP and LIMIT?
10. Aggregation
    1. The 3 Rules of Aggregation
    2. There are Five Aggregates
    3. Troubleshooting Aggregates
    4. GROUP BY when Aggregates and Normal Columns Mix
    5. GROUP BY delivers one row per Group
    6. GROUP BY Dept_No or GROUP BY 1 the same thing

11. EXTRACT from DATES and TIME
12. EXTRACT with DATE and TIME Literals
13. EXTRACT of the Month on Aggregate Queries
14. The Datediff command
15. The Datediff Function on Column Data
16. The Date_Part Function Using a Date
17. The Date_Part Function Using a Time
18. Date_Part Abbreviations
19. The to_char command
20. Conversion Functions
21. Conversion Function Templates
22. Conversion Function Templates Continued
23. Formatting a Date
24. A Summary of Math Operations on Dates
25. Using a Math Operation to find your Age in Years
26. Date Related Functions
27. A Side Title example with Reserved Words as an Alias
28. Implied Extract of Day, Month and Year
29. DATE_PART Function
30. DATE_PART Function using an ALIAS
31. DATE_TRUNC Function
32. DATE_TRUNC Function using TIME
33. MONTHS_BETWEEN Function
34. MONTHS_BETWEEN Function in Action
35. ANSI TIME
36. ANSI TIMESTAMP
37. Matrix TIMESTAMP Function
38. Matrix TO_TIMESTAMP Function
39. Matrix NOW () Function
40. Matrix TIMEOFDAY Function
41. Matrix AGE Function
42. Time Zones
43. Setting Time Zones
44. Using Time Zones
45. Intervals for Date, Time and Timestamp
46. Using Intervals
47. Troubleshooting the Basics of a Simple Interval
48. Interval Arithmetic Results
49. A Date Interval Example
50. A Time Interval Example
51. A DATE Interval Example
52. A Complex Time Interval Example using CAST
53. A Complex Time Interval Example using CAST
54. The OVERLAPS Command
55. An OVERLAPS Example that Returns No Rows
56. The OVERLAPS Command using TIME
57. The OVERLAPS Command using a NULL Value

13. OLAP Functions
    1. CSUM
    2. CSUM - The Sort Explained
    3. CSUM - Rows Unbounded Preceding Explained
    4. CSUM - Making Sense of the Data
    5. CSUM - Making Even More Sense of the Data
    6. CSUM - The Major and Minor Sort Key(s)
    7. Reset with a PARTITION BY Statement
    8. PARTITION BY only Resets a Single OLAP not ALL of them
    9. ANSI Moving Window is Current Row and Preceding n Rows
    10. How ANSI Moving SUM Handles the Sort
    11. Moving SUM every 3-rows Vs a Continuous Average
    12. Partition by Resets an ANSI OLAP
    13. Moving Average
    14. The Moving Window is Current Row and Preceding
    15. How Moving Average Handles the Sort
    16. Moving Average every 3-rows Vs a Continuous Average
    17. Partition by Resets an ANSI OLAP
    18. RANK Defaults to Ascending Order
    19. Getting RANK to Sort in DESC Order
    20. RANK () OVER and PARTITION BY
    21. RANK () OVER and LIMIT
    22. PERCENT_RANK () OVER
    23. PERCENT_RANK () OVER with 14 rows in Calculation
    24. PERCENT_RANK () OVER with 21 rows in Calculation
    25. COUNT OVER for a Sequential Number
    26. The MAX OVER Command
    27. MAX OVER with PARTITION BY Reset
    28. The MIN OVER Command
    29. The Row_Number Command
    30. Standard Deviation Functions Using STDDEV / OVER
    31. Standard Deviation Functions and STDDEV / OVER Syntax
    32. STDDEV / OVER Example
    33. VARIANCE / OVER Syntax
    34. Variance Functions Using VARIANCE / OVER
    35. Using VARIANCE with PARTITION BY Example
    36. Using FIRST_VALUE and LAST_VALUE
    37. Using FIRST_VALUE
    38. Using LAST_VALUE
    39. Using LAG and LEAD
    40. Using LEAD
    41. Using LEAD With and Offset of 2
    42. Using LAG
    43. Using LAG with an Offset of 2
14. Temporary Tables
    1. CREATING A Derived Table
    2. The Three Components of a Derived Table

17. The 9 Tabs of the Super Join Builder - Sorting Tab 3
18. The 9 Tabs of the Super Join Builder - Joins Tab 4
19. The 9 Tabs of the Super Join Builder - Where Tab 5
20. Using the WHERE Tab For Additional WHERE or AND
21. The 9 Tabs of the Super Join Builder - SQL Tab 6
22. The 9 Tabs of the Super Join Builder - Answer Set Tab 7
23. The 9 Tabs of the Super Join Builder - Analytics Tab 9
24. Analytics Tab
25. Analytics Tab - OLAP Example
26. Analytics Tab - OLAP Example of SQL Generated
27. Analytics Tab - Grouping Sets Example
28. Analytics Tab - Grouping Sets Answer Set
29. Nexus Data Movement
30. Moving a Single Table to a Different System
31. The Single Table Data Movement Screen
32. Moving an Entire Database to a Different System
33. The Database Mover Screen
34. The Database Mover Options Tab
35. Converting DDL Table Structures
36. Converting DDL Table Structures
37. Converting DDL Table Structures
38. Hound Dog Compression
39. Hound Dog Compression on Teradata

Class Materials

Each student will receive a comprehensive set of materials, including course notes and all the class examples.