



Amazon Redshift SQL Class Outline

Basic SQL Functions

Finding the Current Schema on the Leader Node

Getting Things Setup in Your Search Path

Five Details You Need To Know About The Search_Path

Introduction

SELECT * (All Columns) in a Table

SELECT Specific Columns in a Table

Commas in the Front or Back?

Place your Commas in front for better Debugging Capabilities

Sort the Data with the ORDER BY Keyword

ORDER BY Defaults to Ascending

Use the Name or the Number in your ORDER BY Statement

Two Examples of ORDER BY using Different Techniques

Changing the ORDER BY to Descending Order

NULL Values sort First in Ascending Mode (Default)

NULL Values sort Last in Descending Mode (DESC)

Major Sort vs. Minor Sorts

Multiple Sort Keys using Names vs. Numbers

Sorts are Alphabetical, NOT Logical

Using A CASE Statement to Sort Logically

How to ALIAS a Column Name

A Missing Comma can by Mistake become an Alias

Comments using Double Dashes are Single Line Comments

Comments for Multi-Lines

Comments for Multi-Lines As Double Dashes Per Line

A Great Technique for Comments to Look for SQL Errors

The WHERE Clause

Using Limit to bring back a Sample

Using Limit With an Order By Statement

The WHERE Clause limits Returning Rows

Using a Column ALIAS throughout the SQL

Double Quoted Aliases are for Reserved Words and Spaces

Character Data needs Single Quotes in the WHERE Clause

Character Data needs Single Quotes, but Numbers Don't

NULL means UNKNOWN DATA so Equal (=) won't Work

Use IS NULL or IS NOT NULL when dealing with NULLs

NULL is UNKNOWN DATA so NOT Equal won't Work

Use IS NULL or IS NOT NULL when dealing with NULLs

Using Greater Than Or Equal To (>=)

AND in the WHERE Clause

Troubleshooting AND

OR in the WHERE Clause

Troubleshooting Or

Troubleshooting Character Data

Using Different Columns in an AND Statement

Quiz – How many rows will return?

Answer to Quiz – How many rows will return?

What is the Order of Precedence?

Using Parentheses to change the Order of Precedence

Using an IN List in place of OR

The IN List is an Excellent Technique

IN List vs. OR brings the same Results

Using a NOT IN List

Null Values in a NOT IN List Bring Back No Rows

Another Technique for Handling Nulls with a NOT IN List

BETWEEN is Inclusive

NOT BETWEEN is Also Inclusive

LIKE uses Wildcards Percent '%' and Underscore '_'

LIKE command Underscore is Wildcard for one Character

LIKE Command Works Differently on Char Vs Varchar

The Ilike Command Is NOT Case Sensitive

Troubleshooting LIKE Command on Character Data

Introducing the TRIM Command

Quiz – What Data is Left Justified and What is Right?

Numbers are Right Justified and Character Data is Left

Answer – What Data is Left Justified and What is Right?

An Example of Data with Left and Right Justification

A Visual of CHARACTER Data vs. VARCHAR Data

Use the TRIM command to remove spaces on CHAR Data

Like and Your Escape Character of Choice

Like and the Default Escape Character

Similar To Operators

Similar To Operators

Similar To Example With Lower Case Letters

Similar To Example With Lower and Upper Case Letters

Similar To Example With Multiple Occurrences

Multiple Occurrences Must Be Consecutive

Distinct Vs Group By AND TOP

The Distinct Command

Distinct vs. GROUP BY

Quiz – How many rows come back from the Distinct?

Answer – How many rows come back from the Distinct?

TOP Command

TOP Command is brilliant when ORDER BY is Used!

What is the Difference Between TOP and LIMIT?

Aggregation

Quiz – You calculate the Answer Set in your own Mind

Answer – You calculate the Answer Set in your own Mind

The Rules of Aggregation

There are Five Aggregates

Quiz – How many rows come back?

Answer – How many rows come back?

Troubleshooting Aggregates

GROUP BY when Aggregates and Normal Columns Mix

GROUP BY Delivers one row per Group

GROUP BY Dept_No or GROUP BY the same thing

Limiting Rows and Improving Performance with WHERE

WHERE Clause in Aggregation limits unneeded Calculations

Keyword HAVING tests Aggregates after they are Totaled

Keyword HAVING is like an Extra WHERE Clause for Totals

Join Functions

A Two-Table Join Using Traditional Syntax

A two-table join using Non-ANSI Syntax with Table Alias

You Can Fully Qualify All Columns

A two-table join using ANSI Syntax

Both Queries have the same Results and Performance

Quiz – Can You Finish the Join Syntax?

Answer to Quiz – Can You Finish the Join Syntax?

Quiz – Can You Find the Error?

Answer to Quiz – Can You Find the Error?

Super Quiz – Can You Find the Difficult Error?

Answer to Super Quiz – Can You Find the Difficult Error?

Quiz – Which rows from both tables Won't Return?

Answer to Quiz – Which rows from both tables Won't Return?

LEFT OUTER JOIN

LEFT OUTER JOIN Results

Left Outer Joins Compatible with Oracle

RIGHT OUTER JOIN

RIGHT OUTER JOIN Example and Results

Right Outer Joins Compatible with Oracle

FULL OUTER JOIN

FULL OUTER JOIN Results

Which Tables are the Left and Which are the Right?

Answer - Which Tables are the Left and Which are the Right?

INNER JOIN with Additional AND Clause

ANSI INNER JOIN with Additional AND Clause

ANSI INNER JOIN with Additional WHERE Clause

OUTER JOIN with Additional WHERE Clause

OUTER JOIN with Additional AND Clause

OUTER JOIN with Additional AND Clause Results

Quiz – Why is this Considered an INNER JOIN?

The DREADED Product Join

The DREADED Product Join Results

The Horrifying Cartesian Product Join

The ANSI Cartesian Join will ERROR

Quiz – Do these Joins Return the Same Answer Set?

Answer – Do these Joins Return the Same Answer Set?

The CROSS JOIN

The CROSS JOIN Answer Set

The Self Join

The Self Join with ANSI Syntax

Quiz – Will both queries bring back the same Answer Set?

Answer – Will both queries bring back the same Answer Set?

Quiz – Will both queries bring back the same Answer Set?

Answer – Will both queries bring back the same Answer Set?

How would you Join these two tables?

An Associative Table is a Bridge that Joins Two Tables

Quiz – Can you Write the 5-Table Join?

Answer to Quiz – Can you Write the 5-Table Join?

Quiz – Can you Write the 5-Table Join to ANSI Syntax?

Answer – Can you Write the 5-Table Join to ANSI Syntax?

Quiz – Can you Place the ON Clauses at the End?

Answer – Can you Place the ON Clauses at the End?

The 5-Table Join – Logical Insurance Model

Quiz - Write a Five Table Join Using ANSI Syntax

Answer - Write a Five Table Join Using ANSI Syntax

Quiz - Write a Five Table Join Using Non-ANSI Syntax

Answer - Write a Five Table Join Using Non-ANSI Syntax

Quiz –Re-Write this putting the ON clauses at the END

Answer –Re-Write this putting the ON clauses at the END

Date Functions

Current_Date

TIMEOFDAY()

SYSDATE Returns a Timestamp With Microseconds

GETDATE Returns a Timestamp Without Microseconds

Add or Subtract Days from a date

The ADD_MONTHS Command Returns a Timestamp

The ADD_MONTHS Command With Trunc Removes Time

ADD_MONTHS Command to Add -Year or -Years

Dateadd Function And Add_Months Function are Different

The EXTRACT Command

EXTRACT from DATES and TIME

EXTRACT with DATE and TIME Literals

EXTRACT of the Month on Aggregate Queries

The Datediff command

The Datediff Function on Column Data

The Date_Part Function Using a Date

The Date_Part Function Using a Time

Date_Part Abbreviations

The to_char command

Conversion Functions

Conversion Function Templates

Conversion Function Templates Continued

Formatting A Date

A Summary of Math Operations on Dates

Using a Math Operation to find your Age in Years

Date Related Functions

A Side Title example with Reserved Words as an Alias

Implied Extract of Day, Month and Year

DATE_PART Function
DATE_PART Function using an ALIAS
DATE_TRUNC Function
DATE_TRUNC Function using TIME
MONTHS_BETWEEN Function
MONTHS_BETWEEN Function in Action
ANSI TIME
ANSI TIMESTAMP
Redshift TIMESTAMP Function
Redshift TO_TIMESTAMP Function
Redshift NOW() Function
Redshift TIMEOFDAY Function
Redshift AGE Function
Time Zones
Setting Time Zones
Using Time Zones
Intervals for Date, Time and Timestamp
Using Intervals
Troubleshooting The Basics of a Simple Interval
Interval Arithmetic Results
A Date Interval Example
A Time Interval Example
A DATE Interval Example
A Complex Time Interval Example using CAST
A Complex Time Interval Example using CAST
The OVERLAPS Command
An OVERLAPS Example that Returns No Rows
The OVERLAPS Command using TIME
The OVERLAPS Command using a NULL Value

Window Functions

Cumulative Sum (CSUM)

CSUM – The Sort Explained

CSUM – Rows Unbounded Preceding Explained

CSUM – Making Sense of the Data

CSUM – Making Even More Sense of the Data

CSUM – The Major and Minor Sort Key(s)

Reset with a PARTITION BY Statement

PARTITION BY only Resets a Single OLAP not ALL of them

ANSI Moving Window is Current Row and Preceding n Rows

How ANSI Moving SUM Handles the Sort

Quiz – How is that Total Calculated?

Answer to Quiz – How is that Total Calculated?

Moving SUM every -rows Vs a Continuous Average

Partition By Resets an ANSI OLAP

Moving Average

The Moving Window is Current Row and Preceding

How Moving Average Handles the Sort

Quiz – How is that Total Calculated?

Answer to Quiz – How is that Total Calculated?

Quiz – How is that 4th Row Calculated?

Answer to Quiz – How is that 4th Row Calculated?

Moving Average every -rows Vs a Continuous Average

Partition By Resets an ANSI OLAP

RANK Defaults to Ascending Order

Getting RANK to Sort in DESC Order

RANK() OVER and PARTITION BY

RANK() OVER And LIMIT

PERCENT RANK() OVER

PERCENT_RANK() OVER with rows in Calculation

PERCENT_RANK() OVER with rows in Calculation

Quiz – What Causes the Product_ID to Reset?

Answer to Quiz – What Cause the Product_ID to Reset?

COUNT OVER for a Sequential Number

Quiz – What caused the COUNT OVER to Reset?

Answer to Quiz – What caused the COUNT OVER to Reset?

The MAX OVER Command

MAX OVER with PARTITION BY Reset

The MIN OVER Command

Quiz – Fill in the Blank

Answer – Fill in the Blank

The Row_Number Command

Quiz – How did the Row_Number Reset?

Quiz – How did the Row_Number Reset?

Standard Deviation Functions Using STDDEV / OVER

Standard Deviation Functions and STDDEV / OVER Syntax

STDDEV / OVER Example

VARIANCE / OVER Syntax

Variance Functions Using VARIANCE / OVER

Using VARIANCE with PARTITION BY Example

Using FIRST_VALUE and LAST_VALUE

Using FIRST_VALUE

FIRST_VALUE

FIRST_VALUE After Sorting by the Highest Value

FIRST_VALUE with Partitioning

FIRST_VALUE Combined with Row_Number

FIRST_ FIRST_VALUE And Row_Number with Different Sort

Using LAG and LEAD

Using LEAD

Using LEAD with a PARTITION Statement

Using LEAD With an Offset of

Using LEAD With an Offset of and a PARTITION

Using LAG

Using LAG with a PARTITION Statement

Using LAG With an Offset of

Using LAG With an Offset of and a PARTITION

CUME_DIST

CUME_DIST With a Partition

RANK and DENSE RANK

LISTAGG Function

LISTAGG Basic Example

Another Example of LISTAGG

LISTAGG With a Pipe-Separated List

LISTAGG With a Comma-Separated List in Groups

MEDIAN Function

MEDIAN Example

MEDIAN with Partitioning and a WHERE Clause

MEDIAN with Partitioning

NTILE Function

How Ntile Works

Ntile

Ntile Continued

Ntile Percentile

Another Ntile Example

Using Tertiles (Partitions of Four)

NTILE

NTILE Using a Value of
NTILE With a Partition
NTH_VALUE Function and Syntax
NTH_VALUE Arguments
NTH_VALUE
NTH_VALUE With Partition
NTH_VALUE With Partition
PERCENTILE_CONT Function Description and Syntax
Final Result Information About PERCENTILE_CONT
PERCENTILE_CONT Function Arguments
PERCENTILE_CONT Example
PERCENTILE_CONT Example with Percentage Change
PERCENTILE_CONT With PARTITION Example
PERCENTILE_CONT With PARTITION and (.)
PERCENTILE_DISC Function Description and Syntax
PERCENTILE_DISC Function Arguments
PERCENTILE_DISC Example
PERCENTILE_DISC Example with Percentage Change
PERCENTILE_DISC With PARTITION Example
PERCENTILE_DISC With PARTITION and (.)
RATIO_TO_REPORT Function
RATIO_TO_REPORT Example
RATIO_TO_REPORT Example with Partitioning

Chapter 14 - Temporary Tables

CREATING A Derived Table
The Three Components of a Derived Table
Naming the Derived Table
Aliasing the Column Names in The Derived Table

Visualize This Derived Table

Most Derived Tables Are Used To Join To Other Tables

Multiple Ways to Alias the Columns in a Derived Table

Our Join Example With A Different Column Aliasing Style

Column Aliasing Can Default For Normal Columns

CREATING A Derived Table using the WITH Command

A Join Using the WITH Syntax

WITH

A WITH Clause That Produces Two Tables

Finding the First Occurrence of a Row using WITH

Finding the First Occurrence of a Row using a Derived Table

Finding the Last Occurrence Using a WITH Derived Table

Finding the Last Occurrence Using a Derived Table

The Same Derived Query shown Three Different Ways

Quiz - Answer the Questions

Answer to Quiz - Answer the Questions

Clever Tricks on Aliasing Columns in a Derived Table

A Derived Table lives only for the lifetime of a single query

An Example of Two Derived Tables in a Single Query

Create Table Syntax

Basic Temporary Table Examples

More Advanced Temporary Table Examples

Advanced Temporary Table Examples

Performing a Deep Copy

Deep Copy Using the Original DDL

Deep Copy Using A CTAS

Deep Copy Using A Create Table LIKE

Deep Copy By Creating a Temp Table and Truncating Original

Chapter 15 - Sub-query Functions

An IN List is much like a Subquery

An IN List Never has Duplicates – Just like a Subquery

An IN List Ignores Duplicates

The Subquery

The Three Steps of How a Basic Subquery Works

These are Equivalent Queries

The Final Answer Set from the Subquery

Quiz- Answer the Difficult Question

Answer to Quiz- Answer the Difficult Question

Should you use a Subquery of a Join?

Quiz- Write the Subquery

Answer to Quiz- Write the Subquery

Quiz- Write the More Difficult Subquery

Answer to Quiz- Write the More Difficult Subquery

Quiz – Write the Extreme Subquery

Answer To Quiz – Write the Extreme Subquery

Quiz- Write the Subquery with an Aggregate

Answer to Quiz- Write the Subquery with an Aggregate

Quiz- Write the Correlated Subquery

Answer to Quiz- Write the Correlated Subquery

The Basics of a Correlated Subquery

The Top Query always runs first in a Correlated Subquery

Correlated Subquery Example vs. a Join with a Derived Table

Quiz- A Second Chance To Write a Correlated Subquery

Answer - A Second Chance to Write a Correlated Subquery

Quiz- A Third Chance To Write a Correlated Subquery

Answer - A Third Chance to Write a Correlated Subquery

Quiz- Last Chance To Write a Correlated Subquery

Answer – Last Chance to Write a Correlated Subquery

Quiz – Write the Extreme Correlated Subquery

Answer To Quiz – Write the Extreme Correlated Subquery

Quiz- Write the NOT Subquery

Answer to Quiz- Write the NOT Subquery

Quiz- Write the Subquery using a WHERE Clause

Answer - Write the Subquery using a WHERE Clause

Quiz- Write the Subquery with Two Parameters

Answer to Quiz- Write the Subquery with Two Parameters

How the Double Parameter Subquery Works

More on how the Double Parameter Subquery Works

Quiz – Write the Triple Subquery

Answer to Quiz – Write the Triple Subquery

Quiz – How many rows return on a NOT IN with a NULL?

Answer – How many rows return on a NOT IN with a NULL?

How to handle a NOT IN with Potential NULL Values

Using a Correlated Exists

How a Correlated Exists matches up

The Correlated NOT Exists

Quiz – How many rows come back from this NOT Exists?

Answer – How many rows come back from this NOT Exists?

Substrings and Positioning Functions

The TRIM Command trims both Leading and Trailing Spaces

A Visual of the TRIM Command Using Concatenation

Trim and Trailing is Case Sensitive

How to TRIM Trailing Letters

The SUBSTRING Command

How SUBSTRING Works with NO ENDING POSITION

Using SUBSTRING to move Backwards

How SUBSTRING Works with a Starting Position of -

How SUBSTRING Works with an Ending Position of

The POSITION Command finds a Letters Position

Quiz – Find that SUBSTRING Starting Position

Answer to Quiz – Find that SUBSTRING Starting Position

Using the SUBSTRING to Find the Second Word On

Quiz – Why Did only one Row Return

Answer to Quiz – Why Did only one Row Return

Concatenation

Concatenation and SUBSTRING

Four Concatenations Together

Troubleshooting Concatenation

Declaring a Cursor

Interrogating the Data

Quiz – What would the Answer be?

Answer to Quiz – What would the Answer be?

The NULLIFZERO Command

Quiz – Fill in the Blank Values in the Answer Set

Answer to Quiz – Fill in the Blank Values in the Answer Set

Quiz – Fill in the Answers for the NULLIF Command

Quiz – Fill in the Answers for the NULLIF Command

The ZEROIFNULL Command

Answer to the ZEROIFNULL Question

The COALESCE Command

The COALESCE Answer Set

The Coalesce Quiz

Answer – The Coalesce Quiz

The Basics of CAST (Convert And STore)

Some Great CAST (Convert And STore) Examples

Some Great CAST (Convert And STore) Examples

Some Great CAST (Convert And STore) Examples

The Basics of the CASE Statements

The Basics of the CASE Statement

Valued Case Vs. A Searched Case

Quiz - Valued Case Statement

Answer - Valued Case Statement

Quiz - Searched Case Statement

Answer - Searched Case Statement

Quiz - When NO ELSE is present in CASE Statement

Answer - When NO ELSE is present in CASE Statement

When an ELSE is present in CASE Statement

Answer - When an ELSE is present in CASE Statement

When an Alias is NOT used in a CASE Statement

Answer - When an Alias is NOT used in a CASE Statement

Combining Searched Case and Valued Case

Nested Case

Put a CASE in the ORDER BY

View Functions

Creating a Simple View to Restrict Sensitive Columns

Creating a Simple View to Restrict Sensitive Columns

Creating a Simple View to Restrict Rows

Creating a View to Join Tables Together

You Select From a View

Basic Rules for Views

An ORDER BY Example Inside of a View

An ORDER BY Inside of a View That is Queried Differently

Creating a View With Ordered Analytics

Creating a View With The TOP Command

Creating a View With The LIMIT Command

Altering A Table

Altering A Table After a View has been Created

A View that Errors After An ALTER

Troubleshooting a View

Updating Data in a Table through a View

Set Operators Functions

Rules of Set Operators

INTERSECT Explained Logically

INTERSECT Explained Logically

UNION Explained Logically

UNION Explained Logically

UNION ALL Explained Logically

UNION Explained Logically

EXCEPT Explained Logically

EXCEPT Explained Logically

Minus Explained Logically

Minus Explained Logically

Testing Your Knowledge

Answer - Testing Your Knowledge

Testing Your Knowledge

Answer - Testing Your Knowledge

An Equal amount of Columns in both SELECT List

Columns in the SELECT list should be from the same Domain

The Top Query handles all Aliases

The Bottom Query does the ORDER BY (a Number)
Great Trick: Place your Set Operator in a Derived Table
UNION vs. UNION ALL
A Great Example of how EXCEPT works

Statistical Aggregate Functions

The Stats Table

STDDEV

Casting STDDEV_SAMP and SQRT (VAR_SAMP)

The STDDEV_POP Function

A STDDEV_POP Example

The STDDEV_SAMP Function

A STDDEV_SAMP Example

The VAR_POP Function

A VAR_POP Example

The VAR_SAMP Function

A VAR_SAMP Example

