

Netezza

Course Outline

Basic SQL Functions

Introduction

SELECT * (All Columns) in a Table

Fully Qualifying a Database, Schema and Table

SELECT Specific Columns in a Table

Commas in the Front or Back?

Using Good Form

Using the Best Form for Writing SQL

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

Using Limit to bring back a Sample

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

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

OR must utilize the Column Name Each Time 4

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

A Technique for Handling Nulls with a NOT IN List

A Better Technique for Handling Nulls with a NOT IN List

BETWEEN is Inclusive 7

BETWEEN Works for Character Data

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

LIKE command Underscore is Wildcard for one Character

LIKE Command Works Differently on Char Vs Varchar

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

TRIM Eliminates Leading and Trailing Spaces

Escape Character in the LIKE Command changes Wildcards

Escape Characters Turn off Wildcards in the LIKE Command

Quiz – Turn off that Wildcard

ANSWER – To Find that Wildcard

Distinct Vs Group By

The Distinct Command

Distinct vs. GROUP BY

Rules of Thumb for DISTINCT Vs GROUP BY

Quiz – How many rows come back from the Distinct?

Answer – How many rows come back from the Distinct?

Review

Testing Your Knowledge 1

Testing Your Knowledge 2

Testing Your Knowledge 3

Testing Your Knowledge 4

Testing Your Knowledge 5

Testing Your Knowledge 6

Testing Your Knowledge 7

Aggregation Function

Quiz – You calculate the Answer Set in your own Mind

Answer – You calculate the Answer Set in your own Mind

The 3 Rules of Aggregation

There are Five Aggregates

Quiz – 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 1 the same thing

Aggregates and Derived Data

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

Getting the Average Values per Column

Average Values Per Column For all Columns in a Table

Three types of Advanced Grouping

GROUP BY Grouping Sets

GROUP BY Rollup

GROUP BY Rollup Result Set

GROUP BY Cube

GROUP BY CUBE Result Set

GROUP BY CUBE Result Set

Testing Your Knowledge

Testing Your Knowledge

Testing Your Knowledge

Testing Your Knowledge

Testing Your Knowledge

Final Answer to Test Your Knowledge on Aggregates

Join Functions

A two-table join using Non-ANSI Syntax

A two-table join using Non-ANSI Syntax with Table Alias 5

Aliases and Fully Qualifying Columns

A two-table join using Non-ANSI Syntax 7

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?

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 Example and Results

RIGHT OUTER JOIN

RIGHT OUTER JOIN Example and Results

FULL OUTER JOIN FULL OUTER JOIN Example and 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 Example

Quiz – Why is this considered an INNER JOIN?

The DREADED Product Join

The DREADED Product Join

The Horrifying Cartesian Product Join 2

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?

How would you join these two tables? You can't....Yet!

An Associative Table is a Bridge that Joins Two Table

Quiz – Can you write the 3-Table Join?

Answer to Quiz – Can you write the 3-Table Join?

Answer – Can you write the 3-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

The Nexus Query Chameleon Writes the SQL for Users.

Date Functions

Date, Time, and Timestamp Keywords

Add or Subtract Days from a date

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

Find What Day of the week you were Born

The ADD_MONTHS Command

Using the ADD_MONTHS Command to Add 1-Year

Using the ADD_MONTHS Command to Add 5-Years

Date Related Functions

The EXTRACT Command

EXTRACT from DATES and TIME

EXTRACT with DATE and TIME Literals

EXTRACT of the Month on Aggregate Queries

A Side Title example with Reserved Words as an Alias 1

Implied Extract of Day, Month, and Year 2

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

Netezza TIMESTAMP Function

Netezza TO_TIMESTAMP Function

Netezza NOW() Function

Netezza TIMEOFDAY Function

Netezza 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

OLAP Functions

How ANSI Moving SUM Handles the Sort

Quiz – How is that Total Calculated?

Answer to Quiz – How is that Total Calculated?

Moving SUM every 3-rows Vs a Continuous Average

Partition By Resets an ANSI OLAP

The ANSI Moving Window is Current Row and Preceding

How ANSI 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 3-rows Vs a Continuous Average

Partition By Resets an ANSI OLAP

Moving Difference using ANSI Syntax

Moving Difference using ANSI Syntax with Partition By

RANK using ANSI Syntax Defaults to Ascending Order

Getting RANK using ANSI Syntax to Sort in DESC Order

RANK() OVER and PARTITION BY

RANK() OVER And LIMIT

PERCENT_RANK() OVER

PERCENT_RANK() OVER with 14 rows in Calculation

PERCENT_RANK() OVER with 21 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

Troubleshooting COUNT OVER

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

Troubleshooting MAX OVER

The MIN OVER Command

Troubleshooting MIN OVER

Quiz – Fill in the Blank

Answer to Quiz – 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 Functions Using VARIANCE / OVER

VARIANCE / OVER Syntax

Using VARIANCE with PARTITION BY Example

Using FIRST_VALUE and LAST_VALUE

Using FIRST_VALUE

Using LAST_VALUE

Using LAG and LEAD

Using LEAD

Using LEAD With and Offset of 2 294

Using LAG

Using LAG With an Offset of 2

Temporary Tables

There are Three Types of Temporary Tables

CREATING A Derived Table

Naming the Derived Table

Aliasing the Column Names in The Derived Table

Multiple Ways to Alias the Columns in a Derived Table

CREATING A Derived Table using the WITH Command

Naming the Derived Table Columns using WITH

The Same Derived Query shown Three Different Ways

Most Derived Tables Are Used To Join To Other Tables

Our Join Example With A Different Column Aliasing Style

Column Aliasing Can Default For Normal Columns

Our Join Example With The WITH Syntax

Quiz - Answer the Questions

Answer to Quiz - Answer the Questions

Clever Tricks on Aliasing Columns in a Derived Table

An Example of Two Derived Tables in a Single Query

Syntax For Creating A Temporary Table

Creating and Populating a Temporary Table

A Temporary Table in Action

A Temporary Table Can Be Used Again and Again

Alternative CREATE TEMPORARY TABLE Option

A CTAS Temp Table to Improve Zone Map Selectivity

Creating a Temp Table as a Cluster Based Table (CBT)

What Are External Tables?

External Tables Data Loading Formats

External Table Log Files

External Table Syntax

Exporting Data Off of Netezza into an External Table

Importing Data Into Netezza Using an External Table

What is the Problem Here?

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

How a Basic Subquery Works

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 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

The Bottom Query runs Last in a Correlated Subquery

Quiz- Who is coming back in the Final Answer Set?

Answer- Who is coming back in the Final Answer Set?

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

Correlated Subquery that Finds Duplicates

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

IN is equivalent to =ANY Using a Correlated Exists

How a Correlated Exists matches up

The Correlated NOT Exists

The Correlated NOT Exists Answer Set

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 LOWER Function

The UPPER Function

CHARACTER_LENGTH

OCTET_LENGTH

TRIM for Troubleshooting the CHARACTERS Command

The TRIM Command trims both Leading and Trailing Spaces

Trim and Trailing is Case Sensitive

Trim and Trailing works if Case right

Trim Combined with the CHARACTERS Command

How to TRIM only the Trailing Spaces

How to TRIM Trailing Letters

How to TRIM Trailing Letters and use CHARACTER_Length

LTRIM Function

RTRIM Function

BTRIM Function

The SUBSTRING Command

How SUBSTRING Works with NO ENDING POSITION

Using SUBSTRING to move Backwards

How SUBSTRING Works with a Starting Position of -1

How SUBSTRING Works with an Ending Position of 0

An Example using SUBSTRING, TRIM, and CHAR Together

SUBSTRING and SUBSTR are equal, but use different syntax

The POSITION Command finds a Letters Position

STRPOS Function

The POSITION And STRPOS Do The Same Thing

SUBSTRING and POSITION Used Together In An UPDATE

The POSITION Command is brilliant with SUBSTRING

Quiz – Name that SUBSTRING Starting and For Length

Answer to Quiz – Name that Starting and For Length

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

Miscellaneous Character Functions - ASCII

Miscellaneous Character Functions - CHR

Miscellaneous Character Functions - INITCAP

Miscellaneous Character Functions - REPEAT

Miscellaneous Character Functions - TRANSLATE

Character Padding Functions - LPAD Function

Character Padding Functions - RPAD Function

Interrogating the Data

NVL Syntax

NVL Example

NVL Is Often Used With Calculations

Comparisons of NVL

A Real-World NVL Example

NVL2

NVL2 Example

NVL2 Syntax

A Real-World NVL2 Example

DECODE Syntax

DECODE Example

A Real-World DECODE Example

Quiz – Fill in the Answers for the NULLIF Command

Quiz – Fill in the Answers for the NULLIF Command

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

Round Function

Round Function Continued

The Basics of the CASE Statements

The Basics of the CASE Statement shown Visually

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

When NO ELSE is present in CASE Statement

When an Alias is NOT used in a CASE Statement

When an Alias is NOT used in a CASE Statement

Combining Searched Case and Valued Case

A Trick for getting a Horizontal Case

Nested Case

Put a CASE in the ORDER BY

View Functions

Creating a Simple View

Basic Rules for Views

Views sometimes CREATED for Formatting or Row Security

Another Way to Alias Columns in a View CREATE

Resolving Aliasing Problems in a View CREATE

Resolving Aliasing Problems in a View CREATE

Resolving Aliasing Problems in a View CREATE

CREATING Views for Complex SQL such as Joins

WHY certain columns need Aliasing in a View

Using a WHERE Clause When Selecting From a View

Altering A Table

Altering A Table After a View has been Created

A View that Errors After An ALTER

Troubleshooting a View

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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

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

Using UNION ALL and Literals

A Great Example of how EXCEPT works

USING Multiple SET Operators in a Single Request

Changing the Order of Precedence with Parentheses

Using UNION to be same as GROUP BY GROUPING SETS

Using UNION to be same as GROUP BY ROLLUP

Using UNION to be the same as GROUP BY Cube

Using UNION to be same as GROUP BY Cube

Data Manipulations

Netezza Transactions

BEGIN Command

COMMIT Command

What Happens on a Transaction Error?

Can I See My Uncommitted Changes?

Until the Commit Others Can't See Your Changes?

ROLLBACK Command

ROLLBACK Command in ACTION INSERT Command

INSERT With Keyword Null

A Different Syntax for the INSERT Statements

These Three Statements are the Same

A Third Way of Doing an INSERT

Netezza Has Implemented the Default Values Clause

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INSERT/SELECT Examples

Another Syntax for the INSERT/SELECT

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An UPDATE In Action

An UPDATE With Multiple WHERE and AND Clauses

An UPDATE With Multiple WHERE and AND Clauses

UPDATE Using A Subquery

UPDATE Using A Subquery

UPDATE Using A Subquery

UPDATE Using A Join

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Two DELETE Examples

DELETE Through a Subquery or Join

DELETE Through a Subquery And A Join Examples

Multi-Statement Example

How to Undo A Delete

A Delete Example Query How to Undo a Delete

How to Undo a Delete In Action

Tables, DDL, and Data Types

CREATE TABLE Syntax

Viewing the DDL

Netezza Tables - Distribution Key or Random Distribution

Table CREATE Examples with 4 different Distribution Keys

The Worst Mistake You Can Make For A Distribution Key

Good things to know about Table and Object Names

Netezza Data Types

Netezza Data Types in More Detail

Netezza Data Type Extensions

Reserved Names Within A Table

How To Query and See Non-Active Rows

Column Attributes

Constraints

Constraints

Column Level Constraint Example

Defining Constraints at the Table Level

Utilizing Default Values for a Table

CTAS (Create Table AS)

CTAS Facts

Using the CTAS (Create Table AS) Table For Co-Location

Altering a CTAS Table to Rename It

FPGA Card and Zone Maps – The Netezza Secret Weapon

How A CTAS with ORDER BY Improves Queries

A CTAS Major Sort Benefits over the Minor Sort

Altering A Table

Altering a Table Examples

Drop Table, Truncate, and Delete Compared

Creating and Dropping a Netezza Database

How to Determine the Database you are in?

Netezza Users

Altering a Netezza User

Reserved Words to find out about a User

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The Stats Table

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

Using GROUP BY

A Great Query Example

Stored Procedure Functions

Netezza Stored Procedures

Creating and Executing a Stored Procedure

Creating a Stored Procedure

Netezza Provides Multiple Ways to Run the Stored Procedure

You Can Have Multiple BEGIN and END statements

How to Declare and Set a Variable

Declaring a Variable With A Value

Input Parameters

Input Parameters Using Character Data

Calling a Procedure With Multiple Input Parameters

CREATE OR REPLACE Procedure

IF THEN ELSE IF Techniques

An Easier Way for IF THEN ELSE is ELSIF or ELSEIF

Using Loops in Stored Procedures

Using Loops with Different EXIT strategies

Looping With The WHILE Statement

Stored Procedure Workshop

Using FOR to Loop