Azure SQL Class Outline

The Basics of Azure SQL

- Introduction
- Naming of Objects
- Setting Your Default Database
- 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?
- 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

Double Quoted Aliases are for Reserved Words and Spaces

Using a Column ALIAS in a WHERE Clause

Using a Column ALIAS in an ORDER BY Clause

In What Order Does SQL Server Process A Query?

Character Data needs Single Quotes in the WHERE Clause

Character Data needs Single Quotes, but Numbers Don't

Declaring a Variable

Comparisons against a Null Value

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?

LIKE command Underscore is Wildcard for one Character

LIKE command using a Range of Values

LIKE command using a NOT Range of Values

LIKE Command Works Differently on Char Vs Varchar

Troubleshooting LIKE Command on Character Data

Introducing the RTRIM 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

RTRIM command Removes Trailing spaces on CHAR Data

Using Like with an AND Clause to Find Multiple Letters

Using Like with an OR Clause to Find Either Letters

Declaring a Variable and using it with the LIKE Command

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, 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!

TOP Command with Ties

TOP Command Using a Variable

Aggregation

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?

Answer – How many rows come back?

Troubleshooting Aggregates

GROUP BY when Aggregates and Normal Columns Mix

GROUP BY delivers one row per Group

Count_Big

Limiting Rows and Improving Performance with WHERE

WHERE Clause in Aggregation limits unneeded Calculations

Keyword HAVING tests Aggregates after they are totaled

Group by Grouping Sets

Group by Rollup

Answer Set for Group by Rollup Query

Creating a Cube

Answer Set for Cube Query

An Easy Example of Creating a Cube

Quiz - GROUP BY GROUPING SETS Challenge

Answer To Quiz - GROUP BY GROUPING SETS Challenge

Getting the Average Values per Column

Average Values per Column for all Columns in a Table

Join Functions

The Azure SQL Data Warehouse Join Quiz

The Azure SQL Data Warehouse Join Quiz Answer

Redistribution

Big Table Small Table Join Strategy

Duplication of the Smaller Table across All-Distributions

If the Join Condition is the Distribution Key no Movement

Matching Rows That Are On The Same Node Naturally

What if the Join Condition Columns are Not Primary Indexes

Strategy 1 of 4 – The Merge Join

Quiz – Redistribute the Employees by their Dept_No

Quiz –Dept_No landed on Distribution with Matches

Quiz – Redistribute the Orders to the Proper Distribution

Answer to Redistribute the Employees by their Dept_No Quiz

Strategy 2 of 4 – The Hash Join

Strategy 4 of 4 – The Product Join

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

RIGHT OUTER JOIN

RIGHT OUTER JOIN Example and Results

FULL OUTER JOIN

FULL OUTER JOIN Results

Which Tables are the Left and which Tables are 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?

Evaluation Order for Outer Queries

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 3-Table Join?

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

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

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

Date Function

Current_Timestamp

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

The Same Derived Query shown Three Different Ways

MULTIPLE Derived Tables using the WITH Command

Column Alias Can Default For Normal Columns

Most Derived Tables Are Used To Join To Other Tables

A Join Example Showing Different Column Alias Styles

The Three Components of a Derived Table

Visualize This Derived Table

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

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

An Example of Two Derived Tables in a Single Query

RECURSIVE Derived Table Hierarchy

RECURSIVE Derived Table Query

RECURSIVE Derived Table Definition

WITH RECURSIVE Derived Table Seeding

WITH RECURSIVE Derived Table Looping

Quiz- Answer the Difficult Question

Answer to Quiz- Answer the Difficult Question

Should you use a Subquery or 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

Using a Derived Table and Row_Number

Ordered Analytics OVER

RANK and DENSE RANK

RANK Defaults to Ascending Order

Getting RANK to Sort in DESC Order

RANK OVER and PARTITION BY

Cumulative Sum

The ANSI CSUM – Getting a Sequential Number

Troubleshooting the ANSI OLAP on a GROUP BY

Reset with a PARTITION BY Statement

PARTITION BY only Resets a Single OLAP not ALL of them

Sorting in DESC Order

Moving Average

Casting a Moving Average

Partition by Resets an ANSI OLAP

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

MAX OVER Without Rows Unbounded Preceding

The MIN OVER Command

Quiz – Fill in the Blank

Answer – Fill in the Blank

How Ntile Works

Ntile

Ntile Continued

Ntile Percentile

Another Ntile Example

Using Quartiles (Partitions of Four)

NTILE Buckets

NTILE Using a Value of 10

NTILE with a Partition

Using LAG and LEAD

Using LEAD

Using LEAD With and Offset of 2

LEAD

LEAD With Partitioning

Using LAG

Using LAG with an Offset of 2

LAG

LAG with Partitioning

SUM (SUM (n))

Working with Strings

- The ASCII Function
- The CHAR Function
- The UNICODE Function
- The NCHAR Function
- The LEN Function
- The DATALENGTH Function
- Concatenation
- The RTRIM and LTRIM Command trims Spaces
- The SUBSTRING Command
- Using SUBSTRING to move Backwards
- How SUBSTRING Works with a Starting Position of -1
- How SUBSTRING Works with an Ending Position of 0
- Concatenation and SUBSTRING
- SUBSTRING and Different Aliasing
- The LEFT and RIGHT Functions
- Four Concatenations Together
- The DATALENGTH Function and RTRIM
- A Visual of the TRIM Command Using Concatenation
- CHARINDEX Function Finds a Letter(s) Position in a String
- The CHARINDEX Command is brilliant with SUBSTRING
- The CHARINDEX Command Using a Literal

Some Great CAST (Convert and Store) Examples

A Rounding Example

Quiz - CAST Examples

Answer to Quiz - CAST Examples

Quiz - The Basics of the CASE Statements

Answer to Quiz - The Basics of the CASE Statements

Using an ELSE in the Case Statement

Using an ELSE as a Safety Net

Rules For a Valued Case Statement

Rules for a Searched 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

Quiz -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

A Trick for getting a Horizontal Case

Nested Case

View Functions

Data Manipulation Language (DML)

A DELETE Example Deleting only Some of the Rows

Subquery and Join DELETE Command Syntax

Example of Subquery DELETE Command

MERGE INTO

MERGE INTO

Set Operators Functions

Rules of Set Operators

INTERSECT Explained Logically

INTERSECT Explained Logically

UNION Explained Logically

UNION Explained Logically

UNION ALL Explained Logically

UNION ALL Explained Logically

EXCEPT Explained Logically

EXCEPT Explained Logically

Another EXCEPT Example

EXCEPT Explained Logically in Reverse Order

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

sys.columns

sys.data_spaces

sys.database_files

sys.database_principals

sys.database_role_members

sys.databases

sys.filegroups

sys.identity_columns

sys.objects

sys.partition_range_values

sys.schemas

sys.server_role_members

sys.sql_logins