SQL Server Objects and Concepts Comparison Report

1. Trigger vs Stored Procedure

Trigger

special type of procedure that automatically executes in response to certain events such as INSERT, UPDATE, or DELETE on a table or view. Triggers execute automatically when the triggering event occurs and cannot accept parameters directly. They are primarily used to enforce business rules, auditing, and cascading actions automatically.

Stored Procedure

is a precompiled collection of SQL statements that can be executed explicitly by a user or an application. Stored procedures execute manually using the EXEC command or can be called by another procedure. They can accept input and output parameters and are commonly used to perform repetitive tasks, encapsulate logic, or return results.

2. Stored Procedure vs Function

Stored Procedure

May return multiple values using output parameters and may or may not return a value.

It cannot be used directly in a SELECT statement and can modify database objects and data freely, they can also include transactions.

Functions

Always return a value (scalar, table, or table variable) and can be used directly in SELECT, WHERE, or JOIN statements. Functions should not modify database objects or have side effects, except for table-valued functions, and have limited transaction handling capabilities.

3. DROP vs DELETE

DROP Statement

Removes a database object such as a table or procedure completely from the database and cannot be rolled back once executed unless inside a transaction. Triggers are not activated when using DROP.

DELETE

Removes rows from a table while keeping the table structure intact and can be rolled back if executed within a transaction. DELETE statements can activate triggers.

4. SELECT vs SELECT INTO

SELECT Statement

Retrieves data from one or more tables without creating a new table.

SELECT INTO

Retrieves data and simultaneously creates a new table with the retrieved data.and automatically creates the new table in the database based on the selected columns.

5. DDL, DML, DCL, and DQL

Data Definition Language (DDL)

Is used to define or modify database structures and includes statements like

- CREATE
- ALTER
- DROP

Data Manipulation Language (DML)

Manipulates data in existing tables and includes

- INSERT
- UPDATE
- DELETE

Data Control Language (DCL)

controls access and permissions with statements like

- GRANT
- REVOKE

Data Query Language (DQL)

Is used to query data from tables and primarily includes the **SELECT** statement.

6. Table-Valued Function vs Multi-Statement Function

Table-Valued Function

Returns a table using a single SELECT statement and is optimized like a view, providing faster performance.

Multi-Statement Function

Returns a table using multiple statements, where a table variable is declared and populated before being returned, they have more overhead and are slower compared to inline functions.

7. VARCHAR(50) vs VARCHAR(MAX)

VARCHAR(50)

Can store up to 50 characters and is used for fixed-length text or small strings, with data stored in-row.

VARCHAR(MAX)

Can store up to 2^31-1 characters (approximately 2 GB) and is used for large text storage such as logs, documents, or JSON. Very large VARCHAR(MAX) data may be stored out-of-row.

8. SQL Authentication vs Windows Authentication

SQL Authentication

Uses a username and password defined in SQL Server, with the password managed by SQL Server itself.

Windows Authentication

Relies on the user's Windows credentials, providing enhanced security and support for single sign-on.

9. Inline Function vs View

Inline function

Returns a table based on a single SELECT statement and can accept parameters, making it flexible to use in joins and queries.

View

Is a virtual table based on a SELECT query that cannot accept parameters and is primarily used to simplify query reuse, acting as a saved SELECT statement.

10. IDENTITY vs UNIQUE Constraint

IDENTITY property

Automatically generates sequential numeric values for a column, cannot contain null values, and is often used for auto-increment primary keys.

UNIQUE constraint

ensures all values in a column are unique, may allow nulls depending on the column definition, and can be applied to any column to enforce uniqueness.