trigger and stored procedure

| **Sr. No.** | **Key** | **Triggers** | **Stored procedures** |
| --- | --- | --- | --- |
| 1 | Basic | trigger is a stored procedure that runs automatically when various events happen (eg update, insert, delete) | Stored procedures are a pieces of the code in written in PL/SQL to do some specific task |
| 2 | Running Methodology | It can execute automatically based on the events | It can be invoked explicitly by the user |
| 3 | Parameter | It can not take input as parameter | It can take input as a parameter |
| 4 | Transaction statements | we can't use transaction statements inside a trigger | We can use transaction statements like begin transaction, commit transaction, and rollback inside a stored procedure |
| 5 | Return | Triggers can not return values | Stored procedures can return values |

stored procedure and functions

Stored Procedures

Stored Procedures are pre-compiled objects which are compiled for the first time and its compiled format is saved, which executes (compiled code) whenever it is called.

Functions

A function is compiled and executed every time whenever it is called. A function must return a value and cannot modify the data received as parameters.

## Basic Differences between Stored Procedure and Function in SQL Server

1. The function must return a value but in Stored Procedure it is optional. Even a procedure can return zero or n values.
2. Functions can have only input parameters for it whereas Procedures can have input or output parameters.
3. Functions can be called from Procedure whereas Procedures cannot be called from a Function.

drop and delete statement

[DELETE](https://www.geeksforgeeks.org/sql-delete-statement/) is a Data Manipulation Language (DML) command and used when you want to remove some or all the tuples from a relation. If WHERE clause is used along with the DELETE command it removes only those tuples which satisfy the WHERE clause condition but if WHERE clause is missing from the DELETE statement then by default all the tuples present in relation are removed.

[DROP](https://www.geeksforgeeks.org/sql-drop-truncate/) is a Data Definition Language (DDL) command which removes the named elements of the schema like relations, domains or constraints and you can also remove an entire schema using DROP command.

select and select into statement

The SQL SELECT statement is used to retrieve records from one or more tables in your SQL database. The records retrieved are known as a result set.

The  SELECT INTO  statement is a query that allows you to create a  new  table and populate it with the result set of a  SELECT statement.

To add data to an existing table, see the [INSERT INTO](https://guide.freecodecamp.org/sql/sql-select-into-statement/guides/src/pages/sql/sql-insert-into-select-statement/index.md) statement instead.

SELECT INTO  can be used when you are combining data from several tables or views into a new table.1 The original table is not affected.

DDL,DML,DCL and DQL

DDL (Data Definition Language):

[DDL](https://www.geeksforgeeks.org/features-of-structured-query-language-sql/) or Data Definition Language actually consists of the SQL commands that can be used to define the database schema. It simply deals with descriptions of the database schema and is used to create and modify the structure of database objects in the database. DDL is a set of SQL commands used to create, modify, and delete database structures but not data. These commands are normally not used by a general user, who should be accessing the database via an application.

List of DDL commands:

[CREATE](https://www.geeksforgeeks.org/sql-create/): This command is used to create the database or its objects (like table, index, function, views, store procedure, and triggers).

[DROP](https://www.geeksforgeeks.org/sql-drop-truncate/): This command is used to delete objects from the database.

[ALTER](https://www.geeksforgeeks.org/sql-alter-add-drop-modify/): This is used to alter the structure of the database.

[TRUNCATE](https://www.geeksforgeeks.org/sql-drop-truncate/): This is used to remove all records from a table, including all spaces allocated for the records are removed.

[COMMENT](https://www.geeksforgeeks.org/sql-comments/): This is used to add comments to the data dictionary.

[RENAME](https://www.geeksforgeeks.org/sql-alter-rename/): This is used to rename an object existing in the database.

DQL (Data Query Language):

DQL statements are used for performing queries on the data within schema objects. The purpose of the DQL Command is to get some schema relation based on the query passed to it. We can define DQL as follows it is a component of SQL statement that allows getting data from the database and imposing order upon it. It includes the SELECT statement. This command allows getting the data out of the database to perform operations with it. When a SELECT is fired against a table or tables the result is compiled into a further temporary table, which is displayed or perhaps received by the program i.e. a front-end.

List of DQL:

[SELECT](https://www.geeksforgeeks.org/sql-select-clause/): It is used to retrieve data from the database.

DML(Data Manipulation Language):

The SQL commands that deals with the manipulation of data present in the database belong to DML or Data Manipulation Language and this includes most of the SQL statements. It is the component of the SQL statement that controls access to data and to the database. Basically, DCL statements are grouped with DML statements.

List of DML commands:

[INSERT](https://www.geeksforgeeks.org/sql-insert-statement/) : It is used to insert data into a table.

[UPDATE](https://www.geeksforgeeks.org/sql-update-statement/): It is used to update existing data within a table.

[DELETE](https://www.geeksforgeeks.org/sql-delete-statement/) : It is used to delete records from a database table.

[LOCK:](https://www.geeksforgeeks.org/sql-lock-table/) Table control concurrency.

CALL: Call a PL/SQL or JAVA subprogram.

EXPLAIN PLAN: It describes the access path to data.

DCL (Data Control Language):

DCL includes commands such as GRANT and REVOKE which mainly deal with the rights, permissions, and other controls of the database system.

List of  DCL commands:

[GRANT:](https://www.geeksforgeeks.org/mysql-grant-revoke-privileges/)This command gives users access privileges to the database.

[REVOKE:](https://www.geeksforgeeks.org/difference-between-grant-and-revoke/) This command withdraws the user’s access privileges given by using the GRANT command.

TCL (Transaction Control Language):

Transactions group a set of tasks into a single execution unit. Each transaction begins with a specific task and ends when all the tasks in the group successfully complete. If any of the tasks fail, the transaction fails. Therefore, a transaction has only two results: success or failure. You can explore more about transactions [here](https://www.geeksforgeeks.org/sql-transactions/). Hence, the following TCL commands are used to control the execution of a transaction:

BEGIN: Opens a Transaction.

[COMMIT](https://www.geeksforgeeks.org/sql-transactions/): Commits a Transaction.

[ROLLBACK](https://www.geeksforgeeks.org/sql-transactions/): Rollbacks a transaction in case of any error occurs.

[SAVEPOINT](https://www.geeksforgeeks.org/sql-transactions/): Sets a save point within a transaction.

[SET TRANSACTION:](https://www.geeksforgeeks.org/sql-transactions/) Specifies characteristics for the transaction.

Table valued and multi statemcent function

Table valued function

The Multi-Statement Table Valued Function in SQL Server is the same as the Inline Table-Valued Function means it is also going to returns a table as an output but with the following differences.

1. The Multi-Statement Table-Valued Function body can contain more than one statement. In Inline Table-Valued Function, it contains only a single Select statement prepared by the return statement.
2. In Multi-Statement Table-Valued Function, the structure of the table returned from the function is defined by us. But, in Inline Table-Valued Function, the structure of the table is defined by the Select statement that is going to return from the function body.

Varchar(50) and varchar(max)

|  |  |  |
| --- | --- | --- |
|  | Varchar[(n)] | Varchar(Max) |
| Storage Capacity | It can store maximum 8000 Non-Unicode characters (i.e. maximum storage capacity is 8000 bytes of storage). Optional Parameter n value can be from 1 to 8000. | It can store maximum of 2 147 483 647 Non-Unicode characters (i.e. maximum storage capacity is: 2GB). |
| How data is stored Physically? | It uses the normal data pages to store the data i.e. it stores the value ‘in a row’. | Sql server will try to store the value ‘in a row’ but if it could not then it will store the value ‘out of row’. i.e. It uses the normal data pages until the content actually fills 8k of data.When overflow happens, data is stored as old TEXT Data Type and a pointer is replacing the old content. |
| Which one to use? | If we know that data to be stored in the column or variable is less than or equal to 8000 characters, then we can use this data type.For example First Name, Last Name etc, columns value can’t cross the max 8000 characters limit, in such scenario’s it is better to use this data type. | If we know that the data to be stored in the column or variable can cross a 8KB Data page, then we can use this data type. |

SQL and windows Authentication

## Windows Authentication

Windows authentication mode enables local Windows authentication with SQL Server, where you can login with your local Windows credentials.

For example, the following uses a Windows credential to connect to SQL Server where user in MYDBSERVER\user is the local user account on Windows and MYDBSERVER is the name of the database server. Click OK to login with this credentials and connect to the MYDBSERVER database server.

## Windows authentication

login can be created in SQL Server for an entire Windows group which simplifies managing account administration.

Windows authentication uses Kerberos security protocol, provides password policy enforcement, and supports password expiration.

Let's see how to create a new login that uses local Window's user account to connect with the SQL Server.

Inline function and view

Graphical user interface, text, application

Description automatically generated

Idenitity and unique Constraint

The UNIQUE constraint ensures that all values in a column are different.

 An identity column is a numeric column in a table that is automatically populated with an integer value each time a row is inserted. Identity columns are often defined as integer columns, but they can also be declared as a bigint, smallint, tinyint, or numeric or decimal as long as the scale is 0