What is SQL Server

SQL Server is a relational database management system, or RDBMS, developed and marketed by Microsoft. Similar to other RDBMS software, SQL Server is built on top of [SQL](#), a standard programming language for interacting with relational databases. SQL Server is tied to Transact-SQL, or T-SQL, the Microsoft's implementation of SQL that adds a set of proprietary programming constructs.

1-Database Engine

SQL Server is the Database Engine. The Database Engine consists of a relational engine that processes queries and a storage engine that manages database files, pages, pages, index, etc. The database objects such as stored procedures, views, and triggers are also created and executed by the Database Engine.

Relational Engine
The Relational Engine contains the components that determine the best way to execute a query. The relational engine is also known as the query processor.
The relational engine requests data from the storage engine based on the input query and processed the results.
Some tasks of the relational engine include querying processing, memory management, thread and task management, buffer management, and distributed query processing.

Storage Engine
The storage engine is in charge of storage and retrieval of data from the storage systems such as disks and SAN.

connect to the SQL Server using SQL Server Management Studio

Windows Authentication:

1.It is the default authentication mode of SQL Server.
2.In Windows authentication, we will work on user admin.
3.With Windows authentication mode there is no need to enter the user credentials i.e. user Id and password because User Id and Password are generated by the Operating System by default,

SQL Server Authentication:

1.In SQL Server authentication we will work on the current user.
2.When we will work with SQL Server authentication we should enter user Id and Password (This user Id and password are created by the user at the time of SQL Server software installation).
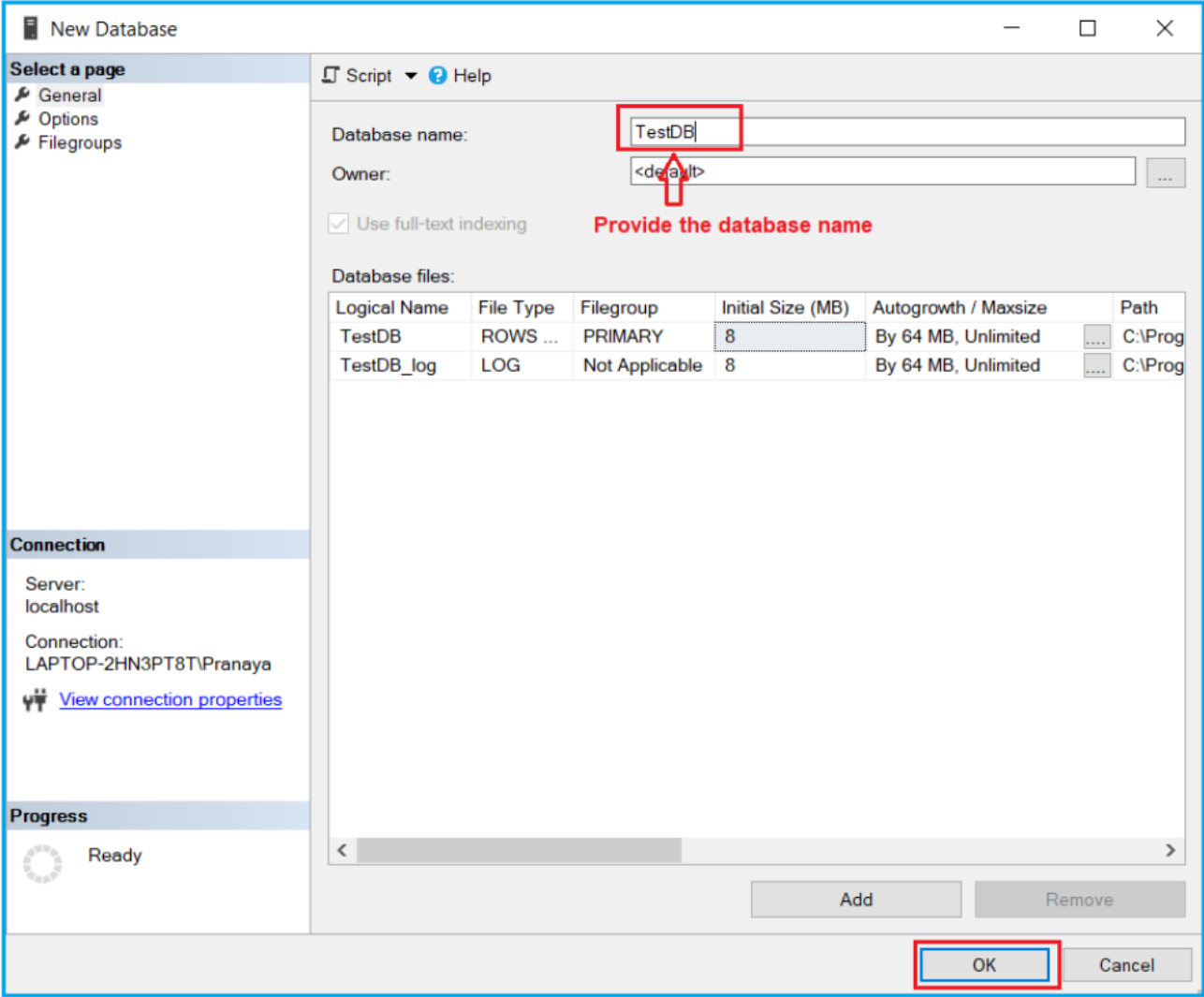
Creating SQL Server Database Graphically:
1.Right Click on the Databases folder in the Object Explorer
2.Select New Database
3.In the New Database dialog box, enter the Database name and click the OK button as shown in the below image.

How to create SQL Server Database using Query?
The syntax for creating a database in SQL Server: **Create database <Database Name>**
Example: **Create database TestDB**

Select the above query and Click on either Execute option or F5 key for execution. Whether we create a database graphically using the designer window or using a query, the following 2 files get generated.
.MDF file: Master Data File (Contains actual data). This file will store all Tables data and will be saved with an extension of .mdf (master data file)

.LDF file: Transaction Log file (Used to recover the database). This file will store transaction Query information (insert, update, delete. Create, etc) and saved with an extension of .ldf (log data file)

Note: The above two files are used for transferring the required database from one system to another system or from one location to another location. The Root Location of .mdf and .ldf files: **C:\Program Files\Microsoft SQL Server\MSSQL10.SQLEXPRESS\MSSQL\DATA**

How to Rename a database in SQL Server?

Once you create a database, then you can modify the name of the database using the Alter command as shown below.

Alter database DatabaseName Modify Name = NewDatabaseName

Alternatively, you can also use the following system-defined stored procedure to change the name.
Execute sp_renameDB 'OldDatabaseName','NewDatabaseName'

How to Delete or Drop a database in SQL Server?

in order to delete or drop a database in SQL Server, you need to use the following DROP command.

Drop Database DatabaseThatYouWantToDrop

Whenever you drop a database in SQL Server, internally it deletes the **LDF** and **MDF** files. You cannot drop a database if it is currently in use and at that time you will get an error stating – **Cannot drop database "DatabaseName" because it is currently in use**. So, if other users are connected to your database, then first you need to put the database in **single-user mode** and then drop the database. In order to put the database in single-user mode, you need to use the following command.

Alter Database DatabaseName Set SINGLE_USER With Rollback Immediate

With Rollback Immediate option, it will rollback all incomplete transactions and closes the connection to the database.

SQL Sub Languages:

SQL contains the following sublanguages

1.DDL (5 commands- create, alter, sp_rename, drop, truncate)

2.DML (3 commands- Insert, Update, Delete).

3.DQL/ DRL (1 command- select).

4.TCL (3 commands- commit, rollback, savepoint)

5.DCL (2 commands- Grant, Revoke).

Data Definition Language (DDL):

1.Data Definition Language (DDL) is used to define database objects such as tables, synonyms, views, procedures, functions, triggers, etc. that means DDL statements are used to alter/modify a database or table structure and schema

2.DDL commands are working on the structure of a table, not on the data of a table.

3.This language contains five commands. Those are (CREATE, ALTER, SP_RENAME, TRUNCATE, DROP)

Create Command in SQL Server:

The **CREATE** command is used to create a new database object in a database such as tables, views, functions, etc. In SQL Server, all database objects (tables, views, etc) are saved with an extension of "**dbo.<object name>**". The syntax to create a database is shown below.

```
CREATE TABLE student
(
studid INT,
sname VARCHAR(max),
salary DECIMAL(6, 2)
)
```

Rules for creating a table in SQL Server:
While creating a database in SQL Server, you need to follow the below rules.
1. The table name should be unique under a database.
2. The column name should be unique within the table definition.
3. A Table name should not start with numeric and special characters except the (-) underscore symbol.
4. Don't provide space in the table name. If you want to provide space in a table name then you can use the underscore symbol.
5. A table name should contain a minimum of 1 character and a maximum of 128 characters.
6. A table should contain a minimum of 1 column and a maximum of 1024 columns.

Alter Command in SQL Server:
This command is used to change or modify the structure of a table. In SQL Server, using the ALTER command we can perform the following operations on an existing table.
1. Increase/decrease the width of a column.
2. Change the data type of a column.
3. Change the NOT NULL to NULL or NULL to NOT NULL.
4. Used to add a new column to an existing table.
5. Used to drop an existing column.
6. We can add a new constraint.
7. It can drop an existing constraint on a table.
8. Disable or re-enable check constraint of a table.
9. Changing a column name in the table.