**TMA 01 : MS Access : Table, Form and Query.**

Introduction:

**MS Access Table:**

A relational database like Access usually has several related tables. In a well-designed database, each table stores data about a particular subject, such as employees or products. A table has records (rows) and fields (columns). Fields have different types of data, such as text, numbers, dates, and hyperlinks.

**MS Access Form:**

A form in Access is a database object that you can use to create a user interface for a database application. A "bound" form is one that is directly connected to a data source such as a table or query, and can be used to enter, edit, or display data from that data source.

**MS Access Query:**

A query can either be a request for data results from your database or for action on the data, or for both. A query can give you an answer to a simple question, perform calculations, combine data from different tables, add, change, or delete data from a database.

Types of MS Access Table, Form and Query:

**MS Access Table:**

Relationships between Tables. There are three types of table relationships you can have in Access (One-to-Many, Many-to-Many, and One-to-one), however, the One-to-Many is the most useful for the beginner

**MS Access Form:**

Detail form: A blank Access form that displays information about one record at a time.

Split form: Simultaneously displays the data in the Form view and Datasheet view.

**MS Access Query:**

There are five types of queries in Access. They are:

• Select queries • Action queries • Parameter queries • Crosstab queries • SQL queries.

Creating of MS Access Table, Form and Query:  
  
**MS Access Table:**

1. Click File > Open, and click the database if it is listed under Recent. If not, select one of the browse options to locate the database.
2. In the Open dialog box, select the database that you want to open, and then click Open.
3. On the Create tab, in the Tables group, click Table.

**MS Access Form:**

To create a form from a table or query in your database, in the Navigation Pane, click the table or query that contains the data for your form, and on the Create tab, click Form. Access creates a form and displays it in Layout view.

**MS Access Query:**

1. Activate the Create tab.
2. Click the Query Design button in the Other group. The Show Table dialog box appears.
3. Activate the Tables tab if you want to base your query on tables, activate the Queries tab if you want base your query on queries or activate the Both tab if you want to base your query on both tables and queries.
4. Click to choose the table or query on which you want to base your query.
5. Click Add. The table appears in the window.
   1. Click to choose the next table or query on which you want to base your query.
   2. Continue clicking tables or queries until you have all the tables and queries you plan to use.
6. Click Close. Access changes to Query Design view.

Uses of MS Access Table, Form and Query:  
**MS Access Table:**

MS Access is used to store large amounts of data in an organized and efficient manner. It allows you to create tables, forms, queries, and reports to manage your data.

**MS Access Form:**

Forms are used to collect the required information in a logical, meaningful fashion for communication and pass to another entity. When you picture what a form is, you can conjure many different types of documents

**MS Access Query:**

Using a query makes it easier to view, add, delete, or change data in your Access database. Some other reasons for using queries: Find specific quickly data by filtering on specific criteria (conditions) Calculate or summarize data.

Conclusion:

Users can create tables, queries, forms and reports, and connect them together with [macros](https://en.wikipedia.org/wiki/Macro_(computer_science)). Advanced users can use [VBA](https://en.wikipedia.org/wiki/Visual_Basic_for_Applications) to write rich solutions with advanced [data manipulation](https://en.wikipedia.org/wiki/Data_manipulation) and user control. Access also has report creation features that can work with any data source that Access can access.

The original concept of Access was for end users to be able to access data from any source. Other features include: the import and export of data to many formats including [Excel](https://en.wikipedia.org/wiki/Microsoft_Excel), [Outlook](https://en.wikipedia.org/wiki/Microsoft_Outlook), [ASCII](https://en.wikipedia.org/wiki/ASCII), [dBase](https://en.wikipedia.org/wiki/DBase), [Paradox](https://en.wikipedia.org/wiki/Paradox_(database)), [FoxPro](https://en.wikipedia.org/wiki/FoxPro_2), [SQL Server](https://en.wikipedia.org/wiki/Microsoft_SQL_Server) and [Oracle](https://en.wikipedia.org/wiki/Oracle_Database). It also has the ability to link to data in its existing location and use it for viewing, querying, editing, and reporting. This allows the existing data to change while ensuring that Access uses the latest data. It can perform [heterogeneous](https://en.wikipedia.org/wiki/Heterogeneity) [joins](https://en.wikipedia.org/wiki/Join_(SQL)) between data sets stored across different platforms. Access is often used by people downloading data from [enterprise level databases](https://en.wikipedia.org/wiki/Enterprise_software) for manipulation, analysis, and reporting locally.

**TMA 02 : Basic SQL Commands.**

Introduction:

Structured query language (SQL) is a programming language for storing and processing information in a relational database. A relational database stores information in tabular form, with rows and columns representing different data attributes and the various relationships between the data values. You can use SQL statements to store, update, remove, search, and retrieve information from the database. You can also use SQL to maintain and optimize database performance.

### **History of SQL**

SQL was invented in the 1970s based on the relational data model. It was initially known as the structured English query language (SEQUEL). The term was later shortened to SQL. Oracle, formerly known as Relational Software, became the first vendor to offer a commercial SQL relational database management system.

## **How does SQL work?**

Structured query language (SQL) implementation involves a server machine that processes the database queries and returns the results. The SQL process goes through several software components, including the following.

### **Parser**

The parser starts by tokenizing, or replacing, some of the words in the SQL statement with special symbols. It then checks the statement for the following:

**Correctness**

The parser verifies that the SQL statement conforms to SQL semantics, or rules, that ensure the correctness of the query statement. For example, the parser checks if the SQL command ends with a semi-colon. If the semi-colon is missing, the parser returns an error.

#### **Authorization**

The parser also validates that the user running the query has the necessary authorization to manipulate the respective data. For example, only admin users might have the right to delete data.

### **Relational engine**

The relational engine, or query processor, creates a plan for retrieving, writing, or updating the corresponding data in the most effective manner. For example, it checks for similar queries, reuses previous data manipulation methods, or creates a new one. It writes the plan in an intermediate-level representation of the SQL statement called byte code. Relational databases use byte code to efficiently perform database searches and modifications.

### **Storage engine**

The storage engine, or database engine, is the software component that processes the byte code and runs the intended SQL statement. It reads and stores the data in the database files on physical disk storage. Upon completion, the storage engine returns the result to the requesting application.

## **SQL commands**

Structured query language (SQL) commands are specific keywords or SQL statements that developers use to manipulate the data stored in a relational database. You can categorize SQL commands as follows.

Data definition language

Data definition language (DDL) refers to SQL commands that design the database structure. Database engineers use DDL to create and modify database objects based on the business requirements. For example, the database engineer uses the CREATE command to create database objects such as tables, views, and indexes.

Data query language

Data query language (DQL) consists of instructions for retrieving data stored in relational databases. Software applications use the SELECT command to filter and return specific results from a SQL table.

Data manipulation language

Data manipulation language (DML) statements write new information or modify existing records in a relational database. For example, an application uses the INSERT command to store a new record in the database.

Data control language

Database administrators use data control language (DCL) to manage or authorize database access for other users. For example, they can use the GRANT command to permit certain applications to manipulate one or more tables.

Transaction control language

The relational engine uses transaction control language (TCL) to automatically make database changes. For example, the database uses the ROLLBACK command to undo an erroneous transaction.

* SELECT - extracts data from a database
* UPDATE - updates data in a database
* DELETE - deletes data from a database
* INSERT INTO - inserts new data into a database
* CREATE DATABASE - creates a new database
* ALTER DATABASE - modifies a database
* CREATE TABLE - creates a new table
* ALTER TABLE - modifies a table
* DROP TABLE - deletes a table
* CREATE INDEX - creates an index (search key)
* DROP INDEX - deletes an index

Conclusion:

Structured query language (SQL) is a popular query language that is frequently used in all types of applications. Data analysts and developers learn and use SQL because it integrates well with different programming languages. For example, they can embed SQL queries with the Java programming language to build high-performing data processing applications with major SQL database systems such as Oracle or MS SQL Server. SQL is also fairly easy to learn as it uses common English keywords in its statements.