Lab #01
Introduction to Database and Microsoft SQL Server

Structured Query Language is a database computer language designed for managing data in relational database management systems(RDBMS), and originally based upon Relational Algebra. Its scope includes data query and update, schema creation and modification, and data access control. SQL was one of the first languages for Edgar F. Codd's relational model in his influential 1970 paper, "A Relational Model of Data for Large Shared Data Banks"[3] and became the most widely used language for relational databases.

- IBM developed SQL in mid of 1970's.
- Oracle incorporated in the year 1979.
- SQL used by IBM/DB2 and DS Database Systems.
- SQL adopted as standard language for RDBS by ASNI in 1989.

SQL language is sub-divided into several language elements, including: CLAUSES, which are in some cases optional, constituent components of statements and queries. EXPRESSIONS, which can produce either scalar values or tables consisting of columns and rows of data. PREDICATES which specify conditions that can be evaluated to SQL three-valued logic (3VL) Boolean truth values and which are used to limit the effects of statements and queries, or to change program flow. QUERIES which retrieve data based on specific criteria. STATEMENTS which may have a persistent effect on schemas and data, or which may control transactions, program flow, connections, sessions, or diagnostics. SQL statements also include the SEMICOLON (";") statement terminator. Though not required on every platform, it is defined as a standard part of the SQL grammar.

There are five types of SQL statements.

- Data definition language (DDL)
- Data manipulation language (DML)
- Data retrieval language (DRL)
- Transactional control language (TCL)
- Data control language (DCL)

• **DATA DEFINITION LANGUAGE (DDL):** The Data Definition Language (DDL) is used to create and destroy databases and database objects. These commands will primarily be used by database administrators during the setup and removal phases of a database project. Let's take a look at the structure and usage of four basic DDL commands:

CREATE: This is used to create a new relation and the corresponding ALTER: This is used to add some extra fields into existing relation.

DROP TABLE: This is used to delete the structure of a relation. It permanently deletes the records in the table. RENAME: It is used to modify the name of the existing database object. TRUNCATE: This command will remove the data permanently. But structure will not be removed.

Difference between Truncate & Delete:-

- By using truncate command data will be removed permanently & will not get back where as by using delete command data will be removed temporally & get back by using roll back command.
- By using delete command data will be removed based on the condition whereas by using truncate command there is no condition.
- Truncate is a DDL command & delete is a DML command.

- **DATA MANIPULATION LANGUAGE (DML):** The Data Manipulation Language (DML) is used to retrieve, insert and modify database information. These commands will be used by all database users during the routine operation of the database. Let's take a brief look at the basic DML commands:

INSERT INTO: This is used to add records into a relation. These are three type of INSERT INTO queries which are as UPDATE: This is used to update the content of a record in a relation. DELETE-FROM: This is used to delete all the records of a relation but it will retain the structure of that relation.

- **DATA RETRIEVAL LANGUAGE (DRL):** Retrieves data from one or more tables. SELECT FROM: To display all fields for all records. SELECT - FROM -WHERE: This query is used to display a selected set of fields for a selected set of records of a relation. SELECT - FROM -GROUP BY: This query is used to group to all the records in a relation together for each and every value of a specific key(s) and then display them for a selected set of fields the relation. SELECT - FROM - ORDER BY: This query is used to display a selected set of fields from a relation in an ordered manner base on some field. JOIN using SELECT - FROM - ORDER BY: This query is used to display a set of fields from two relations by matching a common field in them in an ordered manner based on some fields.

JOIN using SELECT - FROM - GROUP BY: This query is used to display a set of fields from two relations by matching a common field in

them and also group the corresponding records for each and every value of a specified key(s) while displaying. UNION: This query is used to display the combined rows of two different queries, which are having the same structure, without

duplicate rows. INTERSET: This query is used to display the common rows of two different queries, which are having the same structure, and to display a selected set of fields out of them. MINUS: This query is used to display all the rows in relation_1, which are not having in the relation_2.

- **TRANSACTIONAL CONTROL LANGUAGE (TCL):** A transaction is a logical unit of work. All changes made to the database can be referred to as a transaction. Transaction changes can be mode permanent to the database only if they are committed a transaction begins with an executable SQL statement & ends explicitly with either role back or commit statement

COMMIT: This command is used to end a transaction only with the help of the commit command transaction changes can be made permanent to the database. SAVE POINT: Save points are like marks to divide a very lengthy transaction to smaller once. They are used to identify a point in a transaction to which we can latter role back. Thus, save point is used in conjunction with roll back. ROLE BACK: A role back command is used to undo the current transactions. We can roll back the entire transaction so that all changes made by SQL statements are undo (or) role back a transaction to a save point so that the SQL statements after the save point are roll back.

- **DATA CONTROL LANGUAGE (DCL):** DCL provides uses with privilege commands the owner of database objects (tables), has the soul authority ollas them. The owner (data base administrators) can allow other data base uses to access the objects as per their requirement

GRANT: The GRANT command allows granting various privileges to other users and allowing them to perform operations with in their privileges REVOKE: To with draw the privileges that has been GRANTED to a uses, we use the REVOKE command.

TASK:

Visit the below link for the Installation of Microsoft SQL Server 2008.