**DataBase**

1. It is use to store the data and maintain the data.
2. Using Database you can generated reposted easily just by using query.
3. The data stored inside database will be available for a longer period of time.
4. There are different type of databases present
   1. **Relational Database**
      1. In this database the records will be store in the structure format that is in the form of rows and columns (table format).
      2. The data can be store in a distributed was into multiple table. And those table will be related with each other by a primary and foreign key.
      3. The data store into the database is also known as structure Data.
      4. Example: **MySql**, Oracle, SQL Server, Postgrace etc.
   2. Document Database
      1. Is use to store the data in the form of document (.JSON)
      2. In this type of database there is not table structure present and cannot store data into a distributes way using primary and foreign key.
      3. Example:

MongoDB, Cassandra etc.

* 1. Graph Database
     1. The data will be store in the form of tables/rows and columns. But is represented as a graph.
     2. Example:

Neo4J

Download Database and Installation

MySql:

<https://dev.mysql.com/downloads/installer/>



Install MySql:

<https://www.youtube.com/watch?v=OM4aZJW_Ojs>

**Important**

Note down the port number (3306), username (root) and password during the Setup.

SQL (Structure Query Language)

1. It is use to execute the queries inside database.
2. The SQL is use to interact with the database.
3. The SQL is distributed into 5 categories
   1. **DDL (Data Definition Language)**
      1. It is use to create, modify or delete the structure of the table and the different database object such as table, index, triggers, function etc.
      2. SQL Operation like **CREATE, ALTER, DROP** can be use on the Objects
   2. DML (Data Manipulation language)
      1. Using this you can insert, update or remove the data from the table. It is use to perform the data specific operation.
      2. SQL operations like **INSERT, UPDATE, DELETE** can be perform in this type.
   3. DQL (Data Query Language)
      1. Using this you can retrieve the records from the database. There can multiple options to retrieve the data such as clauses, Join etc.
      2. SQL Operation like **SELECT** can use perform in this type.
   4. TCL (Transaction Control Language)
      1. It is use to manage the transactions. Transactions are the set of queries which executes in a group and it will either complete the execution and finalized into database by commit or revert the changes if any one query fails.
      2. SQL Operations like **COMMIT, ROLLBACK and SAVEPOINT**
   5. DCL (Data Control Language)
      1. Using this you can decide which user use which functionality of the database.
      2. Here the Permissions will be granted or reverted for the database user.
      3. SQL Operations like **GRANT and REVOKE** are performed.

**Data Type**

1. String/Textual/binary data type
2. Numeric data type
3. Date and Time data type

<https://www.w3schools.com/mysql/mysql_datatypes.asp#:~:text=In%20MySQL%20there%20are%20three,numeric%2C%20and%20date%20and%20time>.



**DDL**:-

**Create Database**

1. Database is a working area where you can create a tables and records inside table.
2. Mostly for every project there will be a separate database.
3. Syntax:

CREATE <object-name> < name>;

CREATE DATABASE <db-name>;

1. Example:

CREATE DATABASE fsd23sept;

**To Enter into Database**

Syntax: USE <db-name>;

Example: USE fsd23sept;

**Create Table**

1. While creating table you have to provide the column name and its data types.
2. Syntax:

CREATE TABLE <table-name> (column-name DataType, \_ , \_ );

Example:

CREATE TABLE student (

id int,

name varchar(20),

email varchar(50),

age double

);

**Alter Table**

1. Using this you can make a modification into table structure.
2. Can perform ADD, MODIFY, DROP, RENAME operations.
3. ADD Operation
   1. Using this you can create new column into table.
   2. Syntax:

ALTER TABLE <table-name> **ADD COLUMN** <column-name> <DataType>

Example:

ALTER TABLE student ADD COLUMN dob date;

1. MODIFY Operation
   1. You can make a changes inside column data type or the size of the column etc.
   2. Syntax:

ALTER TABLE <table-name> **MODIFY COLUMN** <column-name> <datatype>

Example:

ALTER TABLE student MODIFY COLUMN city varchar(20);

1. RENAME Operation
   1. To rename a column name
   2. Syntax:

ALTER TABLE <table-name> **RENAME COLUMN** <old-column-name> TO <new-column-name>

Example:

ALTER TABLE student RENAME COLUMN city TO location;

1. DROP Operation
   1. To delete the column from the table
   2. Syntax:

ALTER TABLE <table-name> **DROP COLUMN** <column-name>

Example:

ALTER TABLE student DROP COLUMN location;

**Drop database object**

1. It is use to drop the database, table or any database object.
2. Syntax:

DROP <Object> <name>;

Example

DROP TABLE student;

**DML Queries**

1. DML queries are use to perform operation on the records from the table.
2. You can manipulate the data/records present inside table.
3. **INSERT into table:**

Syntax:

INSERT INTO <Table-name>(column, \_ , \_ ) VALUES(val, \_ , \_);

Example:

INSERT INTO student(id,name,email,age) VALUES(1, 'Abc', 'abc@gmail.com',22.1);

INSERT INTO student VALUES(2, 'Pqr', 'pqr@gmail.com',20.4);

INSERT INTO student VALUES(3, 'Lmn', 'lmn@gmail.com',21.6),(4, 'Xyz', 'xyz@gmail.com',16.2),(5, 'Stu', 'stu@gmail.com',11.6);

1. **UPDATE into table**
   1. Using UPDATE query you can update the all records from the table or you can update a specific records.
   2. To Update the specific records from the table you needs to apply clauses and conditions on the record.

Syntax:

UPDATE <table-name> SET column-name=value, column-name=value;

UPDATE <table-name> SET column-name=value, column-name=value

WHERE condition;

Example:

UPDATE student SET age=age+1;

UPDATE student SET email='xyz@yahoo.com', age='20.8' WHERE id=4;

1. **DELETE from table**
   1. You can delete the specific records from the table.
   2. DELETE will be used with a clause to delete a specific row.
   3. Syntax:

DELETE FROM <table-name> WHERE condition;

Example

DELETE FROM student WHERE id=2;

**DQL**

1. Use to get the data from the table.
2. Using SELECT operation you can perform the retrieval operation.
3. To Select the all rows and all column you can use following syntax

SELECT \* FROM <table-name>

**Clauses**

1. Clauses are used to target a specific record from the table.
2. Clauses can be used to perform SELECT, UPDATE, DELETE operation.
3. There are multiple clauses available, following are the mostly used clauses
   1. WHEHRE Clause
      1. In this clause you have to provide a condition so that specific rows will be targeted.
      2. Example:

UPDATE student SET email='xyz@yahoo.com', age='20.8' WHERE id=4;

DELETE FROM student WHERE id=2;

SELECT \* FROM student **WHERE** age>20;

* 1. AND/OR
     1. Using this clause, you can combine two or more conditions to target the records.
     2. It is same as && and || in java. In SQL you cannot use a symbol.
     3. Example:

SELECT \* FROM student WHERE age>20 **AND** id<4;

SELECT \* FROM student WHERE age>20 **OR** id<4;

* 1. IN
     1. Using this clause, you can select the records based on the set of values.
     2. There will be OR condition applies between the set of values.
     3. Example:

SELECT \* FROM student WHERE age **IN** (22.6, 20.8, 12.6);

* 1. BETWEEN
  2. ORDER DY
  3. LIMIT
  4. LIKE
  5. GROUP
  6. Having