24/05/25

SQL: Structured Query language is a standard database that is used to create, maintain, destroy, update and retrieve data from relational databases. (MySQL, PostGreSQL)

Day-1

Database: A database is a systematic collection of data which are used to store, retrieve and manipulate data efficiently.

Key features:

① Organized Data Storage
② Efficient Access
③ security and Scalability
④ Data Integrity
⑤ Data Analytics

Components

① Data: core component representing actual information stored include numbers, text, images, ... etc.
② Schema: it is the blueprint (or) structure of database. it defines how data is organized and includes details like tables, columns, data types.
③ DBMS: software layer that enables interaction with DB.
→ Manages storages, retrieval and manipulation of data.
④ Queries
⑤ users.

Types of Databases:

① Relational DB: contents are arranged as a collection of tables with rows and columns. Ex: MySQL, PostGresQL, ...
② Object Oriented Databases: uses object-based data model approach for storing data in DB System.
Ex: objectDB.

③ Distributed DB: Made up of two (or) more files that spread across multiple locations.

Ex: Google Spanner, Apache Cassandra

④ Centralized DB: Stores Data in a centralized system.

⑤ NO SQL DB: handle unstructured and semi-structured data.

Ex: Mongo DB, Dynamo DB.

⑥ DBMS: DBMS is a software that interacts with Databases to manage data in an organized manner.

⑦ SQL DataTypes: Ensures data is stored efficiently and accurately.

→ Define the type of value a column can hold such as numbers, text (or) Dates.

⑧ Different Datatypes in SQL:

① Numeric DataType: INT, BIGINT, DECIMAL, FLOAT

② CHaracter and String Datatype: Char, Varchar, Text

③ Date and Time: DATE, TIME, DATETIME

④ Binary: Binary, Image

⑤ Boolean: BOOLEAN

⑨ Operators in SQL:

① Arithematic: +, -, /, *, %

② Comparison: =, >, <, >=, <=, <>

③ LOGICAL: AND, OR, NOT

④ Bitwise: &, |, ^, ~, <<, >>

⑩ SQL Commands: fundamental building blocks for communicating with a DBMS. used to interact with DB: with some Operations.

① DDL (Data Defined Language)

→ CREATE, DROP, ALTER, TRUNCATE, RENAME

② DQL (Data Query Language)

→ SELECT

③ DML (Data Manipulation Language)

→ INSERT, UPDATE, DELETE, LOCK, CALL

④ DCL (Data Control Language)

→ GRANT, REVOKE

⊛ SQL CREATE Database

Syntax: CREATE DATABASE database_name

Example: CREATE DATABASE CAFE;

⊛ To verify: SHOW DATABASES; → you will get list of DB's.

⊛ Deleting a Database:

Syntax: DROP DATABASE db_name;

Example: DROP DATABASE CAFE;

⊛ if the DB exists → CREATE DATABASE IF NOT EXISTS CAFE;

⊛ RENAME A DATABASE:

Syntax: ALTER DATABASE CAFE RENAME TO UPCAFE;

↳ ALTER DATABASE curr_db RENAME TO New_db;

⊛ SQL CREATE TABLE:

A Table's structure including Column names, datatypes and constraints like NOT NULL, PRIMARY KEY are created.

SYNTAX: CREATE TABLE Table_name

(

Column1 datatype(size),

Column2 Datatype(size),

⋮

ColumnN Datatype(size)

);

Example: CREATE TABLE CUSTOMER (
Name VARCHAR(50),
Phone int(10),
City varchar(50),
);

Example: CUSTOMER

Name	Phone	City

Inserting Data Into the Tables :-

Example: INSERT INTO CUSTOMER (Name, Phone, City)
VALUES ('Preethi', 4804557638, 'Nandyal'),
('Krishna', 6025846990, 'Vizag');

output: Customer

Name	Phone	City
Preethi	4804557638	Nandyal
Krishna	6025846990	Vizag

CREATING TABLE FROM ANOTHER TABLE:

Query: CREATE TABLE New_Customer AS
SELECT Name, City
FROM Customer;

Output:

Name	City
Preethi	Nandyal
Krishna	Vizag

* SQL DROP Table : permanently deletes the table from the Database.

Syntax: DROP TABLE table_name;

Example: DROP TABLE Customers;

→ if you want to Drop the table if only it exists:

DROP TABLE IF EXISTS Customers;

→ if you want to Drop Temporary Tables in DB:

DROP TEMPORARY TABLE temp_table;

* DELETE STATEMENT:

Syntax: DELETE FROM Table_name
WHERE some_condition;

Example: DELETE FROM new_cafe1
WHERE Name = 'krishnaj';

* DELETING ALL RECORDS FROM TABLE:

Ex: DELETE * FROM CAFE;

* ALTER COMMAND: Allows us to modify the structure of an existing table. → Rename a table.
→ change column name
→ Adding (or) deleting Columns
→ Modify DT of a column

Syntax:

① Renaming

ALTER TABLE table_name
RENAME TO new_table name;

② Renaming columns:

ALTER TABLE Table_name
RENAME COLUMN old_name TO new_columnname;

③ Adding New column;

ALTER TABLE table_name
ADD column_name datatype;

④ Modifying column Datatype:

ALTER TABLE table_name
MODIFY COLUMN column_name new_datatype;

⑤ SQL TRUNCATE COMMAND:

→ Removes all the rows from the data but has the skeleton of the table.

Syntax: TRUNCATE TABLE table_name;

⑥ → Difference between DROP command and Truncate

① Drop:

→ completely removes a table (or) DB from the DB.
→ can't be rolled back
→ Removes all constraints
→ slower compared to TRUNCATE

② TRUNCATE:

→ Removes all rows and data but has the skeleton of the table.
→ faster operation.