PRACTICAL-1 **DATE:_____**

AIM: Introduction to SQL. Data Definition in SQL (CREATE, ALTER and DROP), Data Types.

INPUT:-

i). Introduction to SQL :-

- SQL (Structured Query Language) is a standard language used to communicate with and manipulate databases. It allows users to create, retrieve, update and delete data within a database. It is essential for managing data in relational database management systems (RDBMS) such as MySQL, PostgreSQL, Oracle and SQL Server.

ii). Data Definition in SQL (DDL) :-

- Data Definition Language (DDL) is a subset of SQL that is used to define and manage databases objects, such as tables, indexes and schemas. The primary DDL commands include :

i). CREATE
ii). ALTER
iii). DROP
iv). INSERT
v). TRUNCATE

i). CREATE :-

- The 'CREATE' command is used to create new database objects such as tables, indexes and views.

Syntax :-

```
CREATE TABLE table_name (
    column1 datatype constraints
    column2 datatype constraints
);
```

Example :-

```
CREATE TABLE Employees (
    EmployeeID INT PRIMARY KEY,
    FirstName VARCHAR(50),
    LastName VARCHAR(50),
    BirthDate DATE,
    HireDate DATE,
    Salary DECIMAL(10,2)
);
```

ii). ALTER :-

- The 'ALTER' command is used to modify the structure of an existing database object

Syntax :-

```
# Adding a column
ALTER TABLE table_name
ADD column_name datatype constraints;
# Modifying a column
ALTER TABLE table_name
MODIFY column_name new_datatype
                    new_constraints;
# Dropping a column
ALTER TABLE table_name
DROP COLUMN column_name;
```

Example :-

```
# Adding a column
ALTER TABLE Employees
ADD Email VARCHAR(100);
# Modifying a column
ALTER TABLE Employees
MODIFY Salary DECIMAL(12,2);
# Dropping a column
ALTER TABLE Employees
DROP COLUMN Email;
```

iii). DROP :-

- The 'DROP' command is used to delete existing database objects.

Syntax :-

```
# Dropping a Table
DROP TABLE table_name ;
# Dropping a column
ALTER TABLE table_name
DROP COLUMN column_name ;
```

Example :-

```
# Dropping a Table
DROP TABLE Employees ;
# Dropping a column
ALTER TABLE Employees
DROP COLUMN EMAIL ;
```

iv). INSERT :-

- The 'INSERT' command is used to add new rows of data into a table.

Syntax :-

```
INSERT INTO table_name VALUES
    (value1, value2, ..., valueN) ;
```

Example :-

```
INSERT INTO Employees VALUES (1,
    'John', 'Doe', '1985-01-01', '2020-05-15
    50000) ;
```

v). TRUNCATE :-

- The 'TRUNCATE' command is used to remove all rows from a table without logging the individual row deletions. It is faster than the 'DELETE' command because it does not generate individual row delete transactions. However, 'TRUNCATE' is a DDL command and cannot be rolled back it executed.

Syntax :- `TRUNCATE TABLE table_name ;`

Example :- `TRUNCATE TABLE Employees ;`

iii). Data Types in SQL :-

- Data types define the kind of data that can be stored in a column. Some common SQL data types include :

i). Numeric Data Types :-

- 'INT' → Integer values
- 'Float' → Floating-point numbers
- 'DECIMAL (p,s)' → Fixed-point numbers with precision 'p' and scale 's'.

ii). Character String Data Types :-

- 'CHAR(n)' → Fixed-length character strings.
- 'VARCHAR(n)' → Variable-length character strings.

iii). Date and Time Data Types :-

- 'DATE' → Date values
- 'TIME' → Time values
- 'DATETIME' → Date and Time values

iv). Boolean Data Types :-

- 'BOOLEAN' → True/False values

v). Binary Data Types :-

- 'BLOB' → Binary Large Objects for storing binary data.

vii. Other Data Types :-

- 'ENUM' → Enumeration of predefined values.
- 'SET' → A set of predefined values.

Example :-

```
CREATE TABLE Products (
        ProductID INT PRIMARY KEY,
        ProductName VARCHAR(100),
        Price DECIMAL(10,2),
        ReleaseDate DATE
);
```

SQL Queries Example :-

i). Create a Table :-

```
CREATE TABLE Books (
    BookID INT PRIMARY KEY,
    Title VARCHAR(100),
    Author VARCHAR(100),
    PublishedYear INT,
    Genre VARCHAR(50)
);
```

ii). Insert Data :-

```
INSERT INTO Books(BookID, Title, Author, PublishedYear, Genre)
VALUES
(1, 'To Kill a Mockingbird', 'Harper Lee', 1960, 'Fiction'),
(2, '1984', 'George Orwell', 1949, 'Dystopian'),
(3, 'Moby Dick', 'Herman Melville', 1851, 'Adventure');
```

iii). Fetch Data :-

```
SELECT * FROM Books;
```

Output :-

BookID	Title	Author	Published Year
1	To Kill a Mockingbird	Harper Lee	1960
2	1984	George Orwell	1949
3	Moby Dick	Herman Melville	1851

Genre
Fiction
Dystopian
Adventure

iv). ALTER (DELETE) COLUMN :-

```
ALTER TABLE Books
DROP COLUMN Author;
```

v). Fetch Data :-

```
SELECT * FROM Books;
```

Output :-

BookID	Title	Published Year	Genre
1	To Kill a Mocking Bird	1960	Fiction
2	1984	1949	Dystopian
3	Moby Dick	1851	Adventure

vii. DROP the table :-

```
DROP TABLE Books ;
```

Output :-

BookID	Title	Published Year	Genre