INTRODUCTION TO SQL

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What is Data ?

Data is any sort of information which is stored in computer memory.This information may be in the form of text documents, images, audio clips, software programs, or other types of data.

What is DBMS ?

A Database Management System (DBMS) is software designed to store, retrieve, define, and manage data in a database.

SQL RDBMS CONCEPTS

- **TABLE**

  - ROW
  - COLUMN
  - CELL
  - NULL

EMPNO	ENAME	Job	SALARY	Commission	DEPTNO
1	JAMES	Clerk	10000	1000	3
2	Justin	Business Developer	20000	2000	3
3	Nick	Analyst	25000	1000	6
4	Stuart	SALESMAN	8000	1000	4
5	Ricky	Marketing Head	50000	1000	1
7	Smith	Senior Clerk	10000	1000	3
8	Adam	Executive	10000	1000	2
9	Kevin	SALESMAN	10000	1000	4
10	Alan	MANAGER	10000	1000	5

Structured Query Language

SQL is Structured Query Language, which is a computer language for **storing**, **manipulating** and **retrieving** data stored in relational database.

SQL is the standard language for Relation Database System. All relational database management systems like “MySQL, MS Access, Oracle, Sybase, Informix, postgres and SQL Server” use SQL as standard database language.

SQL RDBMS CONCEPTS

- **Data Types**

- CHAR - a fixed length string that can contain numbers, letters, and special characters.
- VARCHAR - a variable length string that can contain numbers, letters, and special characters.
- INT - integer value
- FLOAT - a floating point number
- DATE - specify date format YYYY-MM-DD
- BLOB - Binary Large Objects

SQL RDBMS CONCEPTS

SQL Constraints: (applied on columns)

- NOT NULL Constraint
- UNIQUE Key
- PRIMARY Key
- FOREIGN Key
- CHECK Constraint
- Default Constraint

Data Integrity:(applied on Rows)

Referential Integrity :- Rows cannot be deleted which are used by other records

SQL COMMANDS

- **DDL** - Data Definition Language
- **DML** - Data Manipulation Language
- **DCL** - Data Control Language
- **DQL** - Data Query Language

SQL COMMANDS

DDL - Data Definition Language

- A data definition language (DDL) is a computer language used to create and modify the structure of database objects in a database.

- ❑ **Create**
- ❑ **Alter**
- ❑ **Drop**
- ❑ **Truncate**

DDL

Create Table :-

```
Create table “ table_name "
(

"column1" "data type",
"column2" "data type",
"column3" "data type",
…
"columnN" "data type“

 );
```

Drop Table :-

```
DROP TABLE table_name ;
```

Truncate Table :-

```
TRUNCATE TABLE table_name ;
```

DDL

Alter Table :-

```
ALTER TABLE table_name
ADD column_name datatype;
```

```
ALTER TABLE table_name
DROP COLUMN column_name;
```

```
ALTER TABLE table_name
MODIFY COLUMN column_name datatype;
```

SQL COMMANDS

DML - Data Manipulation Language

- The SQL commands that deals with the manipulation of data present in the database.

  - **INSERT**
  - **UPDATE**
  - **DELETE**

DML

INSERT :-

```
INSERT INTO table_name (column1, column2, column3, ...)
VALUES (value1, value2, value3, ...);
```

```
INSERT INTO table_name
VALUES (value1, value2, value3, ...) ;
```

UPDATE :-

```
UPDATE table_name
SET column1 = value1, column2 = value2, ...
WHERE condition ;
```

DELETE :-

```
DELETE FROM table_name WHERE condition ;
```

SQL COMMANDS

DCL - Data Control Language

- DCL includes commands such as GRANT and REVOKE which mainly deal with the rights, permissions and other controls of the database system.

  - **GRANT**
  - **REVOKE**

SQL COMMANDS

DQL - Data Query Language

Data Query Language (DQL) or Data Retrieval Language (DRL). Data Query Language has commands that retrieve the data from the query.

- **Select**

```
SELECT column1, column2, ...
FROM table_name ;
```

ARITHMETIC OPERATION

- OPERATOR DESCRIPTION
- = EQUAL
- <> NOT EQUAL
- > GREATER THAN
- < LESS THAN
- >= GREATER THAN OR EQUAL TO
- <= LESS THAN OR EQUAL TO
- BETWEEN AN INCLUSIVE RANGE
- LIKE SEARCH FOR A PATTERN

Operator

AND Operator :-

```
SELECT column1, column2, columnN FROM table_name WHERE [condition1] AND [condition2]...AND [conditionN] ;
```

OR Operator :-

```
SELECT column1, column2, columnN FROM table_name WHERE [condition1] OR [condition2]...OR [conditionN]
```

BETWEEN :-

```
SELECT column_name(s)
FROM table_name
WHERE column_name BETWEEN value1 AND value2;
```

Operator

IN Operator :-

SELECT *column_name(s)*
FROM *table_name*
WHERE *column_name* IN (*value1*, *value2*, ...) ;

NOT IN Operator :-

SELECT *column_name(s)*
FROM *table_name*
WHERE *column_name* NOT IN (*value1*, *value2*, ...) ;

SELECT DISTINCT :-

SELECT DISTINCT column1, column2, ...
FROM table_name;

SQL: DQL: SELECT

ORDER BY

```
SELECT column1, column2, ...
FROM table_name
ORDER BY column1, column2,
... ASC|DESC ;
```

GROUP BY

```
SELECT column_name(s)
FROM table_name
WHERE condition
GROUP BY column_name(s)
ORDER BY column_name(s) ;
```

AGGREGATE FUNCTION

COUNT

```
SELECT COUNT(column_name)
FROM table_name
WHERE condition ;
```

MIN

```
SELECT MIN(column_name)
FROM table_name
WHERE condition ;
```

MAX

```
SELECT MAX(column_name)
FROM table_name
WHERE condition ;
```

AVG

```
SELECT AVG(column_name)
FROM table_name
WHERE condition;
```

AGGREGATE FUNCTION

SUM

```
SELECT SUM(column_name)
FROM table_name
WHERE condition;
```

HAVING CLAUSE

```
SELECT column_name(s)
FROM table_name
WHERE condition
GROUP BY column_name(s)
HAVING condition
ORDER BY column_name(s) ;
```

QUESTIONS?