SQL

- SQL is a standard language for accessing and manipulating databases.
- Structured query language (SQL)
- SQL can Create, update, insert, delete, retrieve, etc from a database.

RDBMS

- Relational Database Management System (RDBMS)
- RDBMS is the basics of SQL and modern DB such as MS SQL server, IBM DB2, oracle, MySQL.
- Data in RDBMS is stored in database objects called tables.
  Table is a collection of related data entries and it consists of columns and rows.

Some of the most important SQL commands

Select - extracts data from a database

update - updates data

Delete - deletes data

Insert into - insert new data

Create database - create a new database

Alter database - Modifies a database

Create table - create a new table

Alter table - Modifies a table

Drop table - deletes

create index - creates an index (Search key)

Drop index - deletes an index

Select statement

- used to select data from a database.
- data returned is stored in a result table, called the result - set.

Create table

- used to create a new table in a database
- Create table table_name (....);

Count

- retrieves the number of rows matching the query
- Select count (Id)

Distinct

- used to . remove duplicate values from a result set.
- Select distinct columnname from tablename

Limit

- Used for restricting the number of rows retrieved from DB.
- Select * from tablename limit 10

Insert

- a Data Manipulation language (DML) used to read and modify data
- Insert into tablename
  <([column name] ...)>
  Values ([value] ..)

Update

- modify the existing records in a table.
- Update [tablename] set [columnname = value] where condition

Delete

- delete the existing records in a table
- Delete from table_name where condition;

2) Aggregate function

- calculates on a set of values and return a single value.

Input : collection of values

Output : single value

Examples : sum(), min(), max(), avg(), etc

Scalar

- Performs operations on every input value.

Examples : Round(), Length(), ucase, Lcase

Date, time functions

Most databases contain special datatypes for dates and times.

Date : YYYYMMDD

Time : HHMMSS

Timestamp : YYYYXXDDHHMMSSZZZZZZ (XX: Month; ZZZZZZ: micro seconds)

Examples :
year(), month(), day(), dayofmonth(), Dayofweek(), dayofyear(), week(), hour(), minute(), second()

Sub-queries and nested selects

Sub query :
A query inside another query

```
Select column1 from table
where column2 = (select max(column2) from table)
```

- Cannot evaluate aggregate functions like Avg() in the where clause

Substitute the table name with a sub-query

Called derived tables or table expressions

```
Select * from (select empid, F_name, L_name,
               from employees) as Emp4all;
```

Queries to access multiple table

Ways to access multiple tables in same query:

1) Sub queries
2) Implicit join
3) Join operators (Inner, outer, etc)

Access database using python