**Day 6: 23 February 2025**

**Database :**

Programs : program is use to perform a specific task.

Input -🡪 initialization, taking value through keyboard using console or browser etc

Process 🡪 apply some logic

Output -> we display that data on console or browser.

If we want to store the data permanently we can use two approach

1. File base system
2. Database system

File base system

Using any language like java, python, node js, C or C++ we can store the data in file system.

Limitation of file base system

1. In file base system data can data redundancy(in file system we can store duplicate records)
2. Data inconsistency :
   1. Extension of the file.
   2. Format of the data inside a file

cid,cname,age

1,steven,25

1. Doing CRUD Operation : Create or insert, read, update and delete more complex.
2. Security : we can apply read or read/write mode security.

Data : raw fact.

Information : processed data or meaningful data.

Database : Storing the data in proper format using table. (Note : if database is SQL Database)

DBMS : Database Management system : it is a software which help to store the data in table format with help of row and columns.

Limitation of DBMS

1. It doesn’t allow to make relationship between two or more table. Means we need to store all information in single table.
2. We can store duplicate records.
3. Data integrity (means we can store invalidate data).

RDBMS : Relational database management system.

Trainer --🡪Table

PK 🡪 Primary key

PK

TID TName Course

1 Steven Python

2 Lex Node JS

Student -🡪Table

PK FK (Foreign key)

Sid SName age TID

100 Leena 23 1

101 Meeta 24 1

102 Keeta 25 2

105 Veena 26 null

RDBMS :

MySQL, Oracle, Db2, Sql Server, Postgres. These all are type of RDBMS databases.

MySQL is one of the type of RDBMS database. It is an open source database part of Oracle.

To interact with any RDMBS database we need to use SQL language

Structured Query Language. This language help use to interact with database to store, retrieve update and delete the data.

This language mainly divided into 5 sub types.

1. DDL (Data Definition language) : it is use to work with structure of a table.
   1. Create, drop, rename, truncate, alter etc.
2. DML (Data Manipulation language): we deal with data.
   1. Insert, delete, and update etc.
3. DRL (Data retrieval language) or DQL (Data Query language).
   1. The query start with select
4. TCL (Transaction control language)
   1. Commit, rollback and save point etc.
5. DCL (Data control language)
   1. Grant providing the permission and revoke remove the permission

Below link allow you to download mysql database in local machine with your OS like window, mac, ubuntu etc

<https://dev.mysql.com/downloads/mysql/8.0.html>

In VM (Virtual Lab)

Open the terminal

**sudo mysql -u root -p**

Password : **Simplilearn**

Local machine non window User

**sudo mysql -u root**

**mysql :**

we can connect mysql database server using 2 ways

1. Command prompt
2. Using GUI base : mysql workbench etc.

Once you connected the database.

show databases; this command is use to display all databases present in our account.

use databasename; this command is use to switch inside an existing database.

show tables; display all tables present in current database.

We will create new database.

create database databasename

create database mytestdb; it is use to create new database.

use mytestdb; now we are inside a new database.

show tables;

table -🡪Employee

Attribute or columns for employee table

Employee\_id, First\_name, last\_name,salary,age,job\_title, doj

Varchar(10) -🡪 it is use to more alpha numerical value with max size.

Int -🡪 number without decimal

Float 🡪with decimal

Date -🡪 it is use to store data information by default format in mysql yyyy-mm-dd

Syntax to create the table

Create table employee(

employee\_id int primary key,

first\_name varchar(30),

last\_name varchar(30),

salary float,

age int,

dob date);

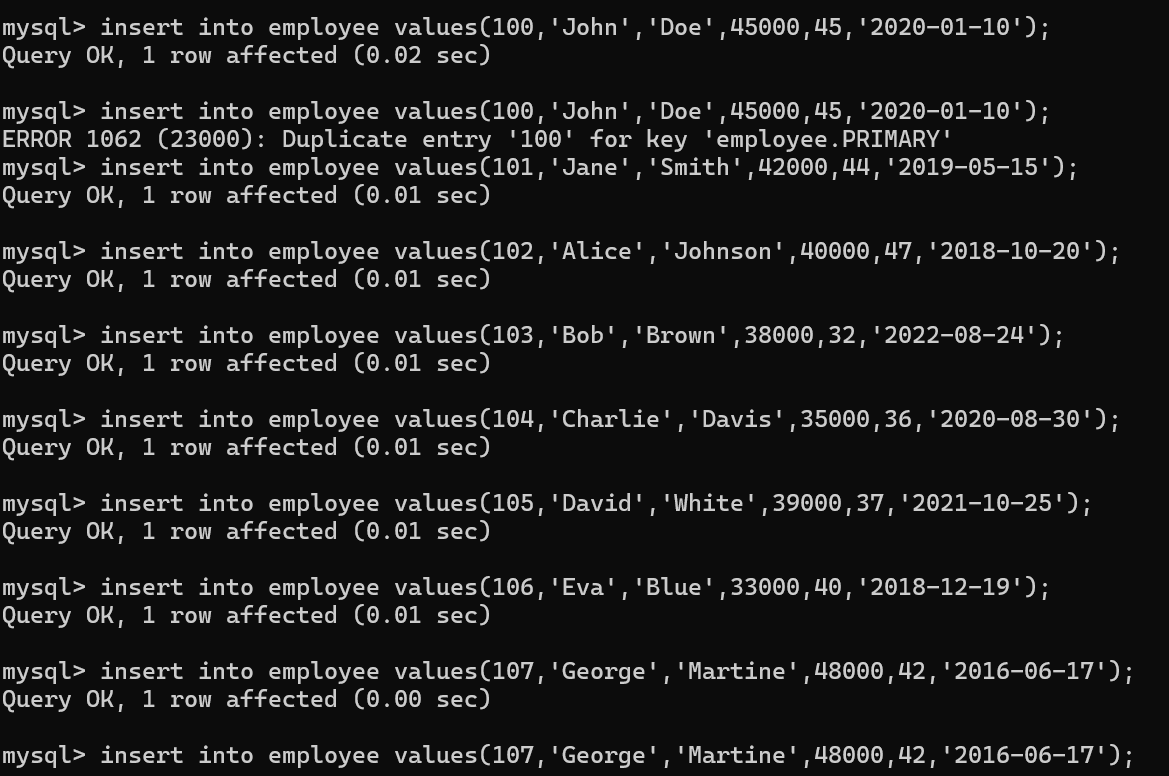
desc tablename; it describe table structure

desc employee;

Insert query

insert into tableName values(v1,v2,v3…v3);

number of columns as well as order of column must be match with above syntax



Select \* from tableName;

\*means all column from a table.

Select \* from employee;

Retrieve few or particular column from a table.

Select columnname, columnname from tableName;

Select first\_name,salary from employee;

select first\_name,last\_name,age from employee;

column alias: it is use to view meaning full name for column while retrieve.

select first\_name as employee\_name, dob as Date\_Of\_Joining from employee;

filter the records using where clause

1. Relational operator

Select \* from tableName where columnName RO value;

>,>=,<,<=,=,!=

**select \* from employee where salary > 40000;**

**select \* from employee where salary >= 40000;**

**select \* from employee where age>40;**

**select \* from employee where employee\_id=103;**

**select \* from employee where employee\_id!=103;**

**select \* from employee where first\_name = 'John';**

**select \* from employee where dob ='2020-08-30';**

**select \* from employee where dob > '2020-12-31'**

1. Between operator : it is use apply the range conditions.

select \* from tableName where columnName minValue and maxValue

**select \* from employee where employee\_id between 102 and 106;**

**select \* from employee where salary between 35000 and 40000;**

**select \* from employee where dob between '2020-01-01' and '2022-12-31';**

1. In operator : it is use to apply condition with more than one values and those value can be random values.

Select \* from tableName where columName in (v1,v2,v3);

**select \* from employee where salary in(45000,35000,30000,40000);**

**select \* from employee where first\_name in('john','jane','Steven','Eva');**

1. **Like operator:** like operator generally we use with string as well as date value. It is use apply some specified pattern. In like operator we use % and \_

**% :** zero or 1 or many character

\_ : means 1 character

select \* from employee where first\_name ='John';

select \* from employee where first\_name like 'John';

select \* from employee where first\_name like 'j%'; start with j character

select \* from employee where first\_name like '%e'; end with e character

select \* from employee where first\_name like '%o%'; contains o character

select \* from employee where last\_name like '\_o%'; 1st character can be anything

and 2nd character must be o character after that it may zero or 1 or many character present.

1. **Is null :** if column cell contains null or empty value.

select first\_name from employee where salary is null;

select first\_name from employee where last\_name is null;

**Missing few columns values ie inserting null value.**

insert into employee values(108,'steven',null,55000,38,'2020-08-14');

insert into employee(employee\_id,first\_name,last\_name,age,dob) values(109,'helen','clark',42,'2022-12-18');

**logical operator**

1. And : it is use to check with more than one condition if both the condition true then we will get the records.
2. Or : in one of the condition true then we will get the records.
3. Not : it is use to apply negation like reverse if true it return false and vice-versa.

select \* from employee where first\_name like 'J%' and salary >= 45000;

select \* from employee where first\_name like 'J%' or salary >= 45000;

select \* from employee where first\_name not like '%e%';

select \* from employee where salary not between 35000 and 40000;

select \* from employee where employee\_id not in(100,103,102,105);

select \* from employee where salary is not null;