

## **Python Database Communication (PDBC)**

Every application or project required store or save data permanently (OR)

Every application required to persist data.

The data can be saved in permanently using two systems.

1. File System
2. Database System

### **Limitations of file system**

1. Files are not secured because files are managed by operating system
2. Files cannot hold large amount data
3. Files does not provide any query language

Database is a collection of data

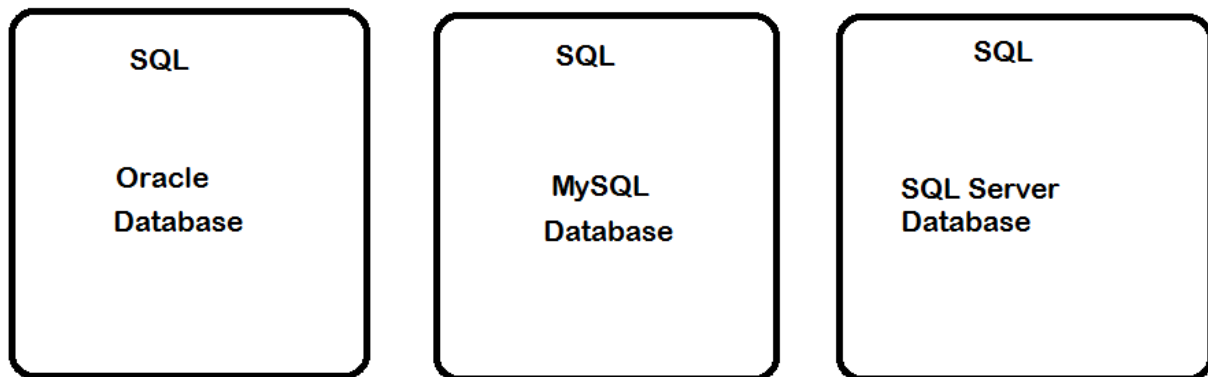
Database can hold large amount data

Data stored inside database is secured

Database provides a query language SQL

### **Database softwares/Applications**

1. Oracle
2. MySQL
3. DB2
4. SQL Server
5. MongoDB
6. Sybase
7. postgresSQL



Every database understand one language called **SQL**

SQL stands for Structured Query Language. It is a standard which used to communicate with database.

## How to install mysql database software?

<https://dev.mysql.com/downloads/installer/>


**General Availability (GA) Releases**Archives*i*

### MySQL Installer 8.0.28

Select Operating System: Looking for previous GA versions?

Microsoft Windows

<b>Windows (x86, 32-bit), MSI Installer</b> (mysql-installer-web-community-8.0.28.0.msi)	8.0.28	2.3M	<b>Download</b>
MD5: 514567a7503999d271a20b86057f15d0 <a href="#">Signature</a>			
<b>Windows (x86, 32-bit), MSI Installer</b> (mysql-installer-community-8.0.28.0.msi)	8.0.28	435.7M	<b>Download</b>
MD5: ef223cbd7873a057d5aa0abcfa596201 <a href="#">Signature</a>			

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## Overview of SQL

SQL commands are divided into different categories

1. DDL (Data Definition Language)
2. DML (Data Manipulation Language)
3. DRL/DQL (Data Retrieval Language/Data Query Language)
4. TCL (Transaction Control Language)
5. DCL (Data Control Language)

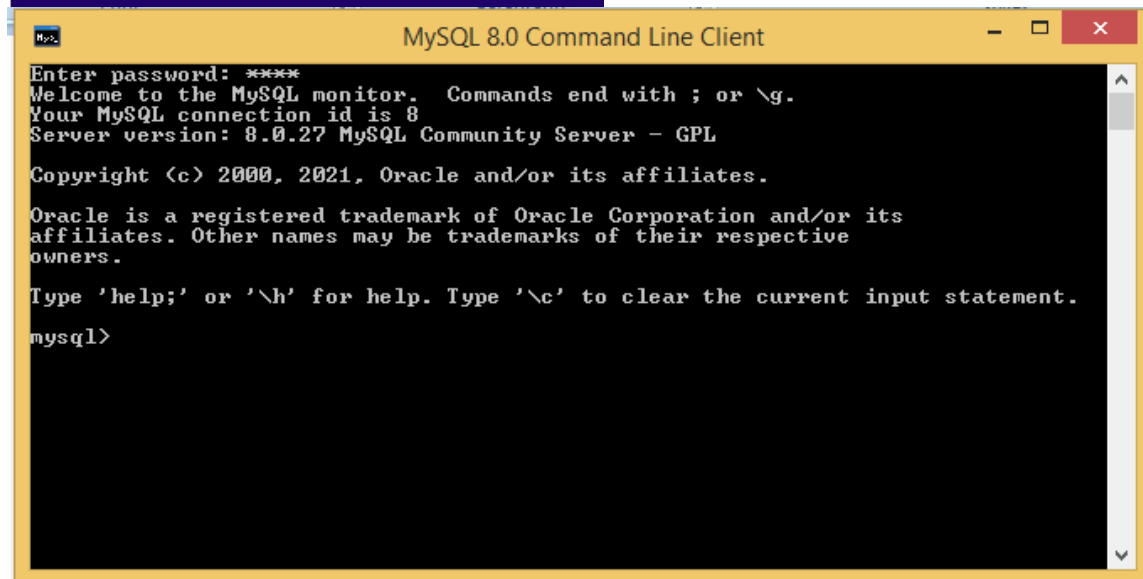
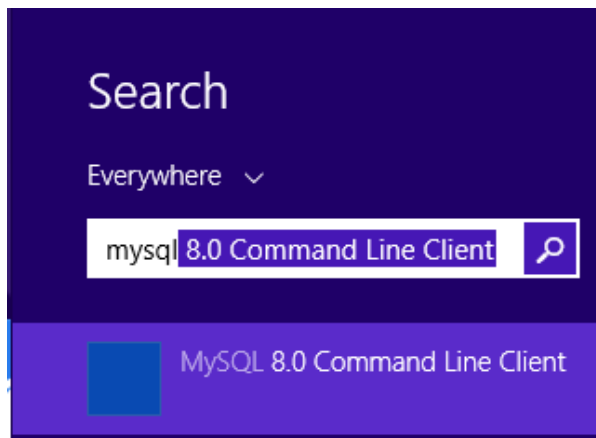
## Data Definition Language (DDL)

These commands are used for managing database objects

Database objects: tables, index, synonyms, view,...

1. Create
2. Alter
3. Drop

Open Mysql Commandline Client



Default username : root

Default password : root

## Creating database

How to create database?

Create database <database name>

```
mysql> create database database6pm;
Query OK, 1 row affected (0.26 sec)

mysql>
```

## How to activate or open database?

We can open or activate database using,

use <database-name>

```
mysql> use database6pm;  
Database changed  
mysql>
```

Within database data is stored inside tables

A table is database object, which consist of rows and columns

## Creating table

Within database data is stored inside table

### Syntax:

Create table <table-name>(column-name data-type,  
Column-name data-type, column-name data-type,...)

## Mysql datatypes

**Int**

**Float**

**Char**

**Varchar**

**Date**

**Datetime**

```
mysql> create table emp(empno int(5) primary key,  
->  ename varchar(20),  
->  job varchar(20),  
->  salary float(10,2));  
Query OK, 0 rows affected, 2 warnings (2.91 sec)  
mysql> _
```

```
mysql> describe emp;
+-----+-----+-----+-----+-----+-----+
| Field | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| empno | int           | NO   | PRI | NULL    |       |
| ename | varchar(20)   | YES  |     | NULL    |       |
| job   | varchar(20)   | YES  |     | NULL    |       |
| salary | float(10,2)   | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.25 sec)
```

## DML commands

Data manipulation language

1. Insert
2. Update
3. Delete

### Insert

Inserting data inside database table

Syntax-1:

Insert into <table-name> values (value1,value2,value3,...) → this syntax is used to insert values in all columns

Syntax-2:

Insert into <table-name> (column-name,column-name,...) values (value1,value2,value3,...) → this syntax is used to insert values into selected columns

```
mysql> insert into emp values(1,"naresh","CEO",900000);
Query OK, 1 row affected (0.13 sec)

mysql> insert into emp values(2,"suresh","MD",450000);
Query OK, 1 row affected (0.14 sec)

mysql>
```

## DQL/DRL (Data Query Language)

This is used to read data from database table

“Select” command is called DQL

**Syntax:**

Select \* from <table-name>

Select <column-name>,<column-name> from table-name  
Select \* from <table-name> where condition

```
mysql> select * from emp;
+-----+-----+-----+-----+
| empno | ename  | job   | salary |
+-----+-----+-----+-----+
|      1 | naresh | CEO   | 900000.00 |
|      2 | suresh | MD    | 450000.00 |
+-----+-----+-----+-----+
2 rows in set (0.00 sec)

mysql> select ename,job from emp;
+-----+-----+
| ename  | job   |
+-----+-----+
| naresh | CEO   |
| suresh | MD    |
+-----+-----+
2 rows in set (0.00 sec)
```

```
mysql> select * from emp where empno=1;
+-----+-----+-----+-----+
| empno | ename  | job   | salary |
+-----+-----+-----+-----+
|      1 | naresh | CEO   | 900000.00 |
+-----+-----+-----+-----+
1 row in set (0.01 sec)

mysql> select * from emp where salary<500000;
+-----+-----+-----+-----+
| empno | ename  | job   | salary |
+-----+-----+-----+-----+
|      2 | suresh | MD    | 450000.00 |
+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql>
```

## Update command

This command is used to update or replace data

Syntax:

Update <table-name> set <col-name>=value,<col-name>=<value>,...  
where <condition>

```
mysql> select * from emp;
+-----+-----+-----+-----+
| empno | ename  | job   | salary |
+-----+-----+-----+-----+
|      1 | naresh | CEO   | 900000.00 |
|      2 | suresh | MD    | 450000.00 |
+-----+-----+-----+-----+
2 rows in set (0.00 sec)

mysql> update emp set salary=salary+100000 where empno=2;
Query OK, 1 row affected (0.10 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from emp;
+-----+-----+-----+-----+
| empno | ename  | job   | salary |
+-----+-----+-----+-----+
|      1 | naresh | CEO   | 900000.00 |
|      2 | suresh | MD    | 550000.00 |
+-----+-----+-----+-----+
2 rows in set (0.02 sec)
```

## Delete command

This command is used to delete rows from database table

delete from <table-name> where <condition>



```
mysql> select * from emp;
+-----+-----+-----+-----+
| empno | ename  | job   | salary |
+-----+-----+-----+-----+
|      1 | naresh | CEO   | 900000.00 |
|      2 | suresh | MD    | 550000.00 |
+-----+-----+-----+-----+
2 rows in set (0.00 sec)

mysql> delete from emp where empno=2;
Query OK, 1 row affected (0.07 sec)

mysql> select * from emp;
+-----+-----+-----+-----+
| empno | ename  | job   | salary |
+-----+-----+-----+-----+
|      1 | naresh | CEO   | 900000.00 |
+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql> _
```

Insert, update, delete, select (CRUD/CURD)

### TCL commands

1. Rollback → undo changes
2. Commit → save changes

### How python program communicate with mysql database?

Python program communicate with mysql database server/database using a library/api/package called

**Mysql-connector-python**

```
C:\Users\user>pip mysql-connector-python
ERROR: unknown command "mysql-connector-python"

C:\Users\user>pip install mysql-connector-python
Collecting mysql-connector-python
  Downloading mysql_connector_python-8.0.28-cp310-cp310-win_amd64.whl (7.2 MB)
    | 7.2 MB 3.3 MB/s
Requirement already satisfied: protobuf>=3.0.0 in c:\users\user\appdata\local\
programs\python\python310\lib\site-packages (from mysql-connector-python) (3.19.
6)

Installing collected packages: mysql-connector-python
Successfully installed mysql-connector-python-8.0.28
WARNING: You are using pip version 21.2.4; however, version 22.0.3 is available
You should consider upgrading via the 'C:\Users\user\AppData\Local\Programs\Py
thon\Python310\python.exe -m pip install --upgrade pip' command.

C:\Users\user>
```

```
Python 3.9.7 (tags/v3.9.7:1016ef3, Aug 30 2021, 20:19:38) [MSC
v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more infor
mation.
>>> import mysql
>>> import mysql.connector
>>>
```

