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Python Database Programming (PDDB)

It is very common requirement to save data for the future purpose.

1-Temporary Storage area.

Means (Heap area, Stack area) – all objects int, complex and heap pvm store in temporary area which delete after execution.

Temporary is nothing but pvm (python virtual machine).

2- Permanent storage area:

1- File system

2-Databases etc....

1: File system: The most commonly used area is file system. Want send message then first store in excel sheet to all student details. It is possible in 10000 but more than that it takes too much time.

Main problem is process data, it is best suitable no programming area and to store very less amount of information.



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But There are several limitations are there.

- 1-Not suitable for huge data.
- 2-No query language support.
- 3-Security problem.
- 4-Data Inconsistency problem. (Duplicate data can present)

To overcome this problem, we should go for databases....



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2- DataBase:

A database is an organized collection of data, stored and accessed electronically.

Database is a systematic collection of data. Databases support storage and manipulation of data.

Databases make data management easy.

1-We can store huge amount of information's.

2-Query language support is available.

3-To access data present in database compulsory we should provide username and password, without that we can't touch database, Means security is more.

4-Inside database data will be stored in the form of table.

5-While developing table database admin can follow multiple forms, 1st Normal form, and 2nd normal form and can apply various constraints like, uniq key, primary key.

Note: For less amount of data file is best because for database first you use driver and all.

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Limitations:

- Limitations:**

 1. Data base can't hold very huge of information e.g.- YouTube, Facebook, tweeter.
 - 2- Databases provide support for only structured data not for semi structured data.

Most of databases is default size if 4-gb.

Most of databases is default size if 4-gb. used data not for semi structured data.

Most of databases is default size if 4-gb.

2- Databases provide support for only structured data not for semi structured data.

(xml file is semi structured data) [should go for Hadoop, Big data, sap Hana](#)

To overcome this problem, we should go for Hadoop, Big data, sap Hana

Python Database Connectivity:

Python Database Connectivity: Python provides inbuilt support for several databases like oracle, MySQL, SQLite. And by using those modules we can do database programming very-2 easily.



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For:

- 1- Oracle cx_oracle module for oracle database.
- 2-pymssql this is module used for Microsoft sql server.
- 3-pymysql This module can be used to communicate MySQL database.

Steps to communicate with database:

1-import that database specific module.
Ex: import cx_Oracle
import pymysql

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2: Established Connection between python program and db.

If module is ready, with that module we established connection between python program and database.

```
con=cx_Oracle.connect(dbname information)
con=pymysql.connect(dbname information)
```

Ex:

```
con=cx_Oracle.connect('scott/tiger@localhost')
con=pymysql.connect(host='localhost', user='root', password='', db='pydb')
```

Or Mysql

```
import pymysql as m
con=m.connect(host='localhost', user='root', password='', db='pydb')
print("Connection created")
```

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3: To Execute our sql query to hold results some special object must be required. That special object is nothing but Cursor object.

```
cursor=con.cursor()
```

4: Execute our sql query

To execute query cursor, have multiple methods:

a: `cursor.execute(sqlquery)` → To execute a single query (one query)

b: `cursor.executescript(sqlquery)` → To execute a string of sql queries separated by semicolon. Or (group of sql query)

Note: script means to execute a group of sql queries.

c: `cursor.executemany()` → To execute a parameterised query.

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5: (Once the execute sql queries get the result)-I want to fetch the result.

A: cursor.fetchone() → To fetch only one row

B: cursor.fetchall() → To fetch all rows

C: cursor.fetchmany(n) → To fetch n rows

6: In python not auto, commit is there. If you perform any operation immediate the result performs to database.

Insert one record that record would not be inserted into database, pls confirm

If you use commit () function, then only it is inserted.



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Note: In java(jdbc) auto commit is there means, after performing any change no need to perform commit)

- 1: commit ()
- 2: Not need to modification then -rollback

After completing all close database connections.

7: Close database connection
con.close() or cursor.close()

Final: Steps To Connect Database.

- 1-established connection
- 2: create cursor
- 3: Execute queries
- 4: Fetch record
- 5: commit ()
- 6: rollback ()
- 7: close ()



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Connect With MySql Database :

Python Program Database Driver Database

Oracle - cx_oracle
Mysql - pymysql

Install [cx_Oracle](#) because by default [cx_Oracle](#) module is not available in python.

We directly import – import random but if we import... ↗

Import [cx_Oracle](#) (It is by default not available)

: So, install [cx_Oracle](#).

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How to install:

In python install anything is easy.
pip installs cx-Oracle(underscore) But, First make sure that you have already install Oracle in your System.

Go to command prompt:

>pip install cx_oracle
>pip install pymysql

Note: If it is already there then, it does not install and show Already install.

Now: Connect with oracle database.

sql> connect scott/tiger.
>select * from employee.

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2: Insert Record

```
import pymysql
```

try:

```
2: Insert Record
import pymysql
try:
    con=pymysql.connect(host='localhost', user='root', password='admin@yash@123',db='pydb')
    query="insert into employee values(109,'khusi',700,'vns')"
    cursor=con.cursor()
    cursor.execute(query)
    con.commit() #After one run use it
    print("Record inserted successfully")
```

except Exception as e:

if con:

con.rollback()

```
print("there is a problem:",e)
```

finally:

if cursor

cursor.close()

if con:

`con.close()`



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2nd. Way to insert dynamic:

```
import pymysql
try:
    con=pymysql.connect(host='localhost',user='root',password='',db='pydb')
    cursor=con.cursor()
    print("Coonect")
    eno=int(input("pls enter id"))
    ename=input("pls enter name")
    esal=int(input("pls enter sal"))
    eaddr=input("pls enter address")
    query="insert into employee values(%s,%s,%s,%s)"
    val=(eno,ename,esal,eaddr)
    cursor.execute(query,val)
    print("Record inserted successfully")
except BaseException as e:
    print(e)
finally:
    con.close()
    cursor.close()
```

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Section

4:Insert dynamic

```
import pymysql
try:
    con=pymysql.connect(host='localhost', user='root', password='admin@yash@123',db='pydb')
    cursor=con.cursor()
while True:
    eno=input("Enter Employee Id : ")
    ename=input("Enter Employee Name : ")
    esal=input("Enter Employee Salary : ")
    eaddr=input("Enter Employee Address : ")
    query="insert into employee values(%s,%s, %s, %s)"
    #above query i have to replaced this thing with our provided values
    #data=(eno,ename,esal,eaddr)
    #cursor.execute(query,data)
    cursor.execute(query %(eno,ename,esal,eaddr))
    con.commit()
    print("Record inserted successfully")
option=input("Do you want to insert more record([y|n] : )")
```

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Section

2nd. Way to insert dynamic:

```
import pymysql
try:
    con=pymysql.connect(host='localhost',user='root',password="",db='pydb')
    cursor=con.cursor()
    print("Coonect")
    eno=int(input("pls enter id"))
    ename=input("pls enter name")
    esal=int(input("pls enter sal"))
    eaddr=input("pls enter address")
    query="insert into employee values(%s,%s,%s,%s)"
    val=(eno,ename,esal,eaddr)
    cursor.execute(query,val)
    print("Record inserted successfully")
except BaseException as e:
    print(e)
finally:
    con.close()
    cursor.close()
```

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Now fetch records from database

1: FetchOne

```
import pymysql
try:
    con=pymysql.connect(host='localhost', user='root', password='admin@yash@123',db='pydb')
    cursor=con.cursor()
    query="select * from employee"
    cursor.execute(query)
    row=cursor.fetchone()
    while row is not None:
        print(row)
        row=cursor.fetchone()
except Exception as e:
    if con:
        con.rollback()
        print("There is a problem : ",e)
finally:
    if cursor:
        cursor.close()
    if con:
        con.close()
```



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2: FetchAll

```
import pymysql
try:
    con=pymysql.connect(host='localhost', user='root',
password='admin@yash@123',db='pydb')
    cursor=con.cursor()
    query="select * from employee"
    cursor.execute(query)
    data=cursor.fetchall()
    print(data) #It will print all data in list of tuple.
for row in data:
    print('Employee Id:',row[0])
    print('Employee Name:',row[1])
    print('Employee Salary:',row[2])
    print('Employee Address:',row[3])
    print()
```

except BaseException as e:

```
if con:
    con.rollback()
    print("There is a problem : ",e)
```

finally:

```
if cursor:
    cursor.close()
if con:
    con.close()
```

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```
3: Fetch No of Rows

import pymysql
try:
    con=pymysql.connect(host='localhost', user='root',
                         password='admin@yash@123', db='pydb')
    cursor=con.cursor()
    query="select * from employee"
    cursor.execute(query)
    n=int(input("Enter the number of required rows :"))
    data=cursor.fetchmany(n)
    print(data) #print all data list of tuple
for row in data:
    print('Employee Id:',row[0])
    print('Employee Name:',row[1])
    print('Employee Salary:',row[2])
    print('Employee Address:',row[3])
    print()
```

```
except BaseException as e:  
    if con:  
        con.rollback()  
        print("There is a problem:",e)  
  
finally:  
    if cursor:  
        cursor.close()  
    if con:  
        con.close()
```



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4: Access and write in file

```
import pymysql
try:
    con=pymysql.connect(host='localhost', user='root', password='admin@yash@123',db='pydb')
    cursor=con.cursor()
    query="select * from employee"
    cursor.execute(query)
    n=int(input("Enter the number of required rows :"))
    data=cursor.fetchmany(n)
    f=open('datalist.txt','w')
    for row in data:
        f.write(str(data))
except BaseException as e:
    if con:
        con.rollback()
    print("There is a problem :",e)
finally:
    if cursor:
        cursor.close()
    if con:
        con.close()
    print("File written successfully")
```

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2:Delete Operation

```
import pymysql
try:
    con=pymysql.connect(host='localhost', user='root', password='admin@yash@123',db='pydb')
    cursor=con.cursor()
    cutoff =(input("Enter cuttof sal :"))
    query="delete from employee where esal>%s"
    cursor.execute(query %cutoff) #only one value show parentheses not req
    con.commit()
    print("Records Deleted Successfully")
except Exception as e:
    if con:
        con.rollback()
        print("There is a problem :",e)
finally:
    if cursor:
        cursor.close()
    if con:
        con.close()
```

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