

Assignment-2

Module 12: Building Database Apps with PostgreSQL & Python

❖ Introduction to data

- Data is a collection of information.
- Datum – Single piece of information.
- Example – Data of a student: like (name, id, age, DOB, Gender, etc.

❖ Introduction to database

➤ Organized

- Tables by means of rows and columns.
- Can be easily Accessed, Managed & Updated

➤ Main purpose

- To operate a large amount of information by storing, retrieving, and managing them.
- Many databases are available like,
 - MySQL
 - Oracle
 - PostgreSQL
 - MongoDB, etc..
- Note: Types of Databases
 - ✚ Hierarchical database
 - ✚ NoSQL database
 - ✚ Object oriented database
 - ✚ Relational database
 - ✚ Network database

❖ Introduction to PostgreSQL

- Relational Database
 - Categorized by a set of tables
 - SQL(Structured Query Language)
 - Acts as the application interface
 - Easier to modify
 - Extending the database
 - Joining the database
- PostgreSQL
 - Object – relational database:
 - Object oriented database + relational database
 - Similar to relational database
 - Object oriented database -> object , classes & inheritance are supported.
 - Open source
 - Source code is available under PostgreSQL license
 - Building of commercial apps

❖ Installing PostgreSQL

- Go to PostgreSQL website and download the application
- Then install the app and don't forget to set of password and port no.
- The port no is: 5432 or 5433 (according to your device)
- And the password to help to login to PostgreSQL (SQL shell (psql))
Then you perform your tasks to psql.

- Open it PostgreSQL and the password are require to you created to installing time.

```
SQL Shell (psql)
Server [localhost]:
Database [postgres]:
Port [5432]:
Username [postgres]:
Password for user postgres:

psql (17.5)
WARNING: Console code page (437) differs from Windows code page (1252)
8-bit characters might not work correctly. See psql reference
page "Notes for Windows users" for details.
Type "help" for help.

postgres=#
```

Like that .

❖ Creating a database

- Open psql and enter your password.

Note: what are the databases that are available inside the shell.

You just type : \l

```
SQL Shell (psql)
Server [localhost]:
Database [postgres]:
Port [5432]:
Username [postgres]:
Password for user postgres:

psql (17.5)
WARNING: Console code page (437) differs from Windows code page (1252)
8-bit characters might not work correctly. See psql reference
page "Notes for Windows users" for details.
Type "help" for help.

postgres=# \l
          List of databases
  Name      | Owner   | Encoding | Locale Provider | Collate | Ctype    | Locale | ICU Rules | Access privileges
-----
 postgres   | postgres | UTF8     | libc            | English_India.1252 | English_India.1252 |
 template0  | postgres | UTF8     | libc            | English_India.1252 | English_India.1252 |
 template1  | postgres | UTF8     | libc            | English_India.1252 | English_India.1252 |
(3 rows)

postgres=#
```

Like that.

- Create a database
 - ❖ The command is: `create database database_name;`

```
SQL Shell (psql)
Server [localhost]:
Database [postgres]:
Port [5432]:
Username [postgres]:
Password for user postgres:

psql (17.5)
WARNING: Console code page (437) differs from Windows code page (1252)
8-bit characters might not work correctly. See psql reference
page "Notes for Windows users" for details.
Type "help" for help.

postgres=# \l

      List of databases
  Name | Owner | Encoding | Locale Provider | Collate | Ctype | Locale | ICU Rules | Access privileges
-----+-----+-----+-----+-----+-----+-----+-----+-----
 postgres | postgres | UTF8 | libc | English_India.1252 | English_India.1252 |  |  | =c/postgres +
 template0 | postgres | UTF8 | libc | English_India.1252 | English_India.1252 |  |  | postgres=CTc/postgres
 template1 | postgres | UTF8 | libc | English_India.1252 | English_India.1252 |  |  | =c/postgres +
                                     postgres=CTc/postgres
(3 rows)

postgres=# create database student;
CREATE DATABASE
postgres=#
```

Like that.

Note: to switch database one to another.

The command is: `\c database_name`

```
SQL Shell (psql)
Server [localhost]:
Database [postgres]:
Port [5432]:
Username [postgres]:
Password for user postgres:

psql (17.5)
WARNING: Console code page (437) differs from Windows code page (1252)
8-bit characters might not work correctly. See psql reference
page "Notes for Windows users" for details.
Type "help" for help.

postgres=# \l

      List of databases
  Name | Owner | Encoding | Locale Provider | Collate | Ctype | Locale | ICU Rules | Access privileges
-----+-----+-----+-----+-----+-----+-----+-----+-----
 postgres | postgres | UTF8 | libc | English_India.1252 | English_India.1252 |  |  | =c/postgres +
 template0 | postgres | UTF8 | libc | English_India.1252 | English_India.1252 |  |  | postgres=CTc/postgres
 template1 | postgres | UTF8 | libc | English_India.1252 | English_India.1252 |  |  | =c/postgres +
                                     postgres=CTc/postgres
(3 rows)

postgres=# create database student;
CREATE DATABASE
postgres=# \c student
You are now connected to database "student" as user "postgres".
student=#
```

Like that.

❖ Deleting a database

- The command is : `drop database database_name;`
- For eample:

➤ Create a database (demo)

```
SQL Shell (psql)
Server [localhost]:
Database [postgres]:
Port [5432]:
Username [postgres]:
Password for user postgres:

psql (17.5)
WARNING: Console code page (437) differs from Windows code page (1252)
8-bit characters might not work correctly. See psql reference
page "Notes for Windows users" for details.
Type "help" for help.

postgres=# \l
      List of databases
  Name | Owner | Encoding | Locale Provider | Collate | Ctype | Locale | ICU Rules | Access privileges
-----+-----+-----+-----+-----+-----+-----+-----+-----
 postgres | postgres | UTF8 | libc | English_India.1252 | English_India.1252 |  |  | =c/postgres +
 template0 | postgres | UTF8 | libc | English_India.1252 | English_India.1252 |  |  | postgres=CTc/postgres +
 template1 | postgres | UTF8 | libc | English_India.1252 | English_India.1252 |  |  | =c/postgres +
                                postgres=CTc/postgres
(3 rows)

postgres=# create database student;
CREATE DATABASE
postgres=# \c student
You are now connected to database "student" as user "postgres".
student=# create database demo;
CREATE DATABASE
student=#
```

➤ Check available databases

```
SQL Shell (psql)
Type "help" for help.

postgres=# \l
      List of databases
  Name | Owner | Encoding | Locale Provider | Collate | Ctype | Locale | ICU Rules | Access privileges
-----+-----+-----+-----+-----+-----+-----+-----+-----
 postgres | postgres | UTF8 | libc | English_India.1252 | English_India.1252 |  |  | =c/postgres +
 template0 | postgres | UTF8 | libc | English_India.1252 | English_India.1252 |  |  | postgres=CTc/postgres +
 template1 | postgres | UTF8 | libc | English_India.1252 | English_India.1252 |  |  | =c/postgres +
                                postgres=CTc/postgres
(3 rows)

postgres=# create database student;
CREATE DATABASE
postgres=# \c student
You are now connected to database "student" as user "postgres".
student=# create database demo;
CREATE DATABASE
student=# \l
      List of databases
  Name | Owner | Encoding | Locale Provider | Collate | Ctype | Locale | ICU Rules | Access privileges
-----+-----+-----+-----+-----+-----+-----+-----+-----
 demo | postgres | UTF8 | libc | English_India.1252 | English_India.1252 |  |  |
 postgres | postgres | UTF8 | libc | English_India.1252 | English_India.1252 |  |  |
 student | postgres | UTF8 | libc | English_India.1252 | English_India.1252 |  |  |
 template0 | postgres | UTF8 | libc | English_India.1252 | English_India.1252 |  |  | =c/postgres +
                                postgres=CTc/postgres +
 template1 | postgres | UTF8 | libc | English_India.1252 | English_India.1252 |  |  | =c/postgres +
                                postgres=CTc/postgres
(5 rows)

student=#
```

➤ Delete database

```
SQL Shell (psql)
postgres=# \l
```

Name	Owner	Encoding	Locale Provider	Collate	Ctype	Locale	ICU Rules	Access privileges
postgres	postgres	UTF8	libc	English_India.1252	English_India.1252			
template0	postgres	UTF8	libc	English_India.1252	English_India.1252			=c/postgres + postgres=CTc/postgres
template1	postgres	UTF8	libc	English_India.1252	English_India.1252			=c/postgres + postgres=CTc/postgres

(3 rows)

```
postgres=# create database student;
CREATE DATABASE
postgres=# \c student
You are now connected to database "student" as user "postgres".
student=# create database demo;
CREATE DATABASE
student=# \l
```

Name	Owner	Encoding	Locale Provider	Collate	Ctype	Locale	ICU Rules	Access privileges
demo	postgres	UTF8	libc	English_India.1252	English_India.1252			
postgres	postgres	UTF8	libc	English_India.1252	English_India.1252			
student	postgres	UTF8	libc	English_India.1252	English_India.1252			
template0	postgres	UTF8	libc	English_India.1252	English_India.1252			=c/postgres + postgres=CTc/postgres
template1	postgres	UTF8	libc	English_India.1252	English_India.1252			=c/postgres + postgres=CTc/postgres

(5 rows)

```
student=# drop database demo;
DROP DATABASE
student=#
```

➤ Check database are deleted or not

```
SQL Shell (psql)
CREATE DATABASE
postgres=# \c student
You are now connected to database "student" as user "postgres".
student=# create database demo;
CREATE DATABASE
student=# \l
```

Name	Owner	Encoding	Locale Provider	Collate	Ctype	Locale	ICU Rules	Access privileges
demo	postgres	UTF8	libc	English_India.1252	English_India.1252			
postgres	postgres	UTF8	libc	English_India.1252	English_India.1252			
student	postgres	UTF8	libc	English_India.1252	English_India.1252			
template0	postgres	UTF8	libc	English_India.1252	English_India.1252			=c/postgres + postgres=CTc/postgres
template1	postgres	UTF8	libc	English_India.1252	English_India.1252			=c/postgres + postgres=CTc/postgres

(5 rows)

```
student=# drop database demo;
DROP DATABASE
student=# \l
```

Name	Owner	Encoding	Locale Provider	Collate	Ctype	Locale	ICU Rules	Access privileges
postgres	postgres	UTF8	libc	English_India.1252	English_India.1252			
student	postgres	UTF8	libc	English_India.1252	English_India.1252			
template0	postgres	UTF8	libc	English_India.1252	English_India.1252			=c/postgres + postgres=CTc/postgres
template1	postgres	UTF8	libc	English_India.1252	English_India.1252			=c/postgres + postgres=CTc/postgres

(4 rows)

```
student=#
```

Like that.

Now you see the demo database are deleted.

❖ Creating table and adding data

➤ Create a table

```
SQL Shell (psql)
Server [localhost]:
Database [postgres]:
Port [5432]:
Username [postgres]:
Password for user postgres:

psql (17.5)
WARNING: Console code page (437) differs from Windows code page (1252)
8-bit characters might not work correctly. See psql reference
page "Notes for Windows users" for details.
Type "help" for help.

postgres=# \c student;
You are now connected to database "student" as user "postgres".
student=# CREATE TABLE students( name text, rollno int, age int, gender text );
CREATE TABLE
student=#
```

Note: and you see all the relations using this command is:

```
SQL Shell (psql)
Server [localhost]:
Database [postgres]:
Port [5432]:
Username [postgres]:
Password for user postgres:

psql (17.5)
WARNING: Console code page (437) differs from Windows code page (1252)
8-bit characters might not work correctly. See psql reference
page "Notes for Windows users" for details.
Type "help" for help.

postgres=# \c student;
You are now connected to database "student" as user "postgres".
student=# CREATE TABLE students( name text, rollno int, age int, gender text );
CREATE TABLE
student=# \d
List of relations
Schema | Name      | Type  | Owner
-----+-----+-----+-----
public | students | table | postgres
(1 row)

student=#
```

Is that.

➤ Adding data

```
SQL Shell (psql)
Server [localhost]:
Database [postgres]:
Port [5432]:
Username [postgres]:
Password for user postgres:

psql (17.5)
WARNING: Console code page (437) differs from Windows code page (1252)
        8-bit characters might not work correctly. See psql reference
        page "Notes for Windows users" for details.
Type "help" for help.

postgres=# \c student;
You are now connected to database "student" as user "postgres".
student=# CREATE TABLE students( name text, rollno int, age int, gender text );
CREATE TABLE
student=# \d
          List of relations
Schema | Name   | Type  | Owner
-----+-----+-----+-----
public | students | table | postgres
(1 row)

student=# INSERT INTO students( name, rollno, age, gender ) VALUES ('Ujjwal',55,21,'male');
INSERT 0 1
student=# |
```

And add one more student details

```
SQL Shell (psql)
Server [localhost]:
Database [postgres]:
Port [5432]:
Username [postgres]:
Password for user postgres:

psql (17.5)
WARNING: Console code page (437) differs from Windows code page (1252)
        8-bit characters might not work correctly. See psql reference
        page "Notes for Windows users" for details.
Type "help" for help.

postgres=# \c student;
You are now connected to database "student" as user "postgres".
student=# CREATE TABLE students( name text, rollno int, age int, gender text );
CREATE TABLE
student=# \d
          List of relations
Schema | Name   | Type  | Owner
-----+-----+-----+-----
public | students | table | postgres
(1 row)

student=# INSERT INTO students( name, rollno, age, gender ) VALUES ('Ujjwal',55,21,'male');
INSERT 0 1
student=# INSERT INTO students( name, rollno, age, gender ) VALUES ('Udit',54,22,'male');
INSERT 0 1
student=# |
```

Like that.

❖ Retrieving data from database and deleting contents in the table.

to retrieve all the data from table.

```
SQL Shell (psql)
Port [5432]:
Username [postgres]:
Password for user postgres:

psql (17.5)
WARNING: Console code page (437) differs from Windows code page (1252)
8-bit characters might not work correctly. See psql reference
page "Notes for Windows users" for details.
Type "help" for help.

postgres=# \c student;
You are now connected to database "student" as user "postgres".
student=# CREATE TABLE students( name text, rollno int, age int, gender text );
CREATE TABLE
student=# \d
          List of relations
Schema | Name   | Type  | Owner
-----+-----+-----+-----
public | students | table | postgres
(1 row)

student=# INSERT INTO students( name, rollno, age, gender ) VALUES ('Ujjwal',55,21,'male');
INSERT 0 1
student=# INSERT INTO students( name, rollno, age, gender ) VALUES ('Udit',54,22,'male');
INSERT 0 1
student=# SELECT * FROM students;
 name | rollno | age | gender
-----+-----+-----+-----
Ujjwal |    55  |  21 | male
Udit   |    54  |  22 | male
(2 rows)

student=# |
```

And you also retrieve a specific data form the table like only names, age, rollno,etc.

```
SQL Shell (psql)
Type "help" for help.

postgres=# \c student;
You are now connected to database "student" as user "postgres".
student=# CREATE TABLE students( name text, rollno int, age int, gender text );
CREATE TABLE
student=# \d
          List of relations
Schema | Name   | Type  | Owner
-----+-----+-----+-----
public | students | table | postgres
(1 row)

student=# INSERT INTO students( name, rollno, age, gender ) VALUES ('Ujjwal',55,21,'male');
INSERT 0 1
student=# INSERT INTO students( name, rollno, age, gender ) VALUES ('Udit',54,22,'male');
INSERT 0 1
student=# SELECT * FROM students;
 name | rollno | age | gender
-----+-----+-----+-----
Ujjwal |    55  |  21 | male
Udit   |    54  |  22 | male
(2 rows)

student=# SELECT name FROM students;
 name
-----
Ujjwal
Udit
(2 rows)

student=# |
```

Like that.

And you also perform a compare command

```
SQL Shell (psql)
List of relations
Schema | Name | Type | Owner
-----+-----+-----+-----
public | students | table | postgres
(1 row)

student=# INSERT INTO students( name, rollno, age, gender ) VALUES ('Ujjwal',55,21,'male');
INSERT 0 1
student=# INSERT INTO students( name, rollno, age, gender ) VALUES ('Udit',54,22,'male');
INSERT 0 1
student=# SELECT * FROM students;
 name | rollno | age | gender
-----+-----+-----+-----
Ujjwal |    55 |  21 |   male
Udit   |    54 |  22 |   male
(2 rows)

student=# SELECT name FROM students;
 name
-----
Ujjwal
Udit
(2 rows)

student=# SELECT * FROM students WHERE age=21;
 name | rollno | age | gender
-----+-----+-----+-----
Ujjwal |    55 |  21 |   male
(1 row)

student=#
```

Like that and you perform many command like that.

❖ Delete the contents from inside the table.

Using truncate.

```
SQL Shell (psql)
public | students | table | postgres
(1 row)

student=# INSERT INTO students( name, rollno, age, gender ) VALUES ('Ujjwal',55,21,'male');
INSERT 0 1
student=# INSERT INTO students( name, rollno, age, gender ) VALUES ('Udit',54,22,'male');
INSERT 0 1
student=# SELECT * FROM students;
 name | rollno | age | gender
-----+-----+-----+-----
Ujjwal |    55 |  21 |   male
Udit   |    54 |  22 |   male
(2 rows)

student=# SELECT name FROM students;
 name
-----
Ujjwal
Udit
(2 rows)

student=# SELECT * FROM students WHERE age=21;
 name | rollno | age | gender
-----+-----+-----+-----
Ujjwal |    55 |  21 |   male
(1 row)

student=# TRUNCATE TABLE students;
TRUNCATE TABLE
student=#
```

Now check the content deleted or not.

```
SQL Shell (psql)
INSERT 0 1
student=# INSERT INTO students( name, rollno, age, gender ) VALUES ('Udit',54,22,'male');
INSERT 0 1
student=# SELECT * FROM students;
  name | rollno | age | gender 
-----+-----+----+-----
 Ujjwal |    55 |  21 |    male
  Udit  |    54 |  22 |    male
(2 rows)

student=# SELECT name FROM students;
 name 
-----
 Ujjwal
  Udit 
(2 rows)

student=# SELECT * FROM students WHERE age=21;
  name | rollno | age | gender 
-----+-----+----+-----
 Ujjwal |    55 |  21 |    male
(1 row)

student=# TRUNCATE TABLE students;
TRUNCATE TABLE
student=# SELECT * FROM students;
  name | rollno | age | gender 
-----+-----+----+-----
(0 rows)

student=#
```

Now you see the table data has been deleted.

❖ Setting up virtualenv

- Virtualenv -> virtual environment
- Using vs code and command prompt
- Create a folder to you perform this task then open it to your vs code.
- And then open your command prompt (cmd) and go to your folder path(address of your folder).
- For example :

```
Command Prompt
Microsoft Windows [Version 10.0.26100.4202]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Ujjwal>E:

E:\>cd E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
```

Like that it is my folder path.

- Then install pip virtualenv

```
Command Prompt
Microsoft Windows [Version 10.0.26100.4202]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Ujjwal>E:

E:\>cd E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7

E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>pip install virtualenv
Requirement already satisfied: virtualenv in c:\users\ujjwal\appdata\local\programs\python\python313\lib\site-packages (20.31.2)
Requirement already satisfied: distlib<1,>=0.3.7 in c:\users\ujjwal\appdata\local\programs\python\python313\lib\site-packages (from virtualenv) (0.3.9)
Requirement already satisfied: filelock<4,>=3.12.2 in c:\users\ujjwal\appdata\local\programs\python\python313\lib\site-packages (from virtualenv) (3.18.0)
Requirement already satisfied: platformdirs<5,>=3.9.1 in c:\users\ujjwal\appdata\local\programs\python\python313\lib\site-packages (from virtualenv) (4.3.8)

E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
```

Like that I'm already installed .

- ➔ So you see your vs code the new folder has been created and the folder name is : env
- ➔ Then again go to you command prompt , and open env folder using cd (change directory) and then go to scripts inside the env.

And for example : Assignment-7>env>Scripts

```
Command Prompt
Microsoft Windows [Version 10.0.26100.4202]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Ujjwal>E:

E:\>cd

E:\>cd E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7

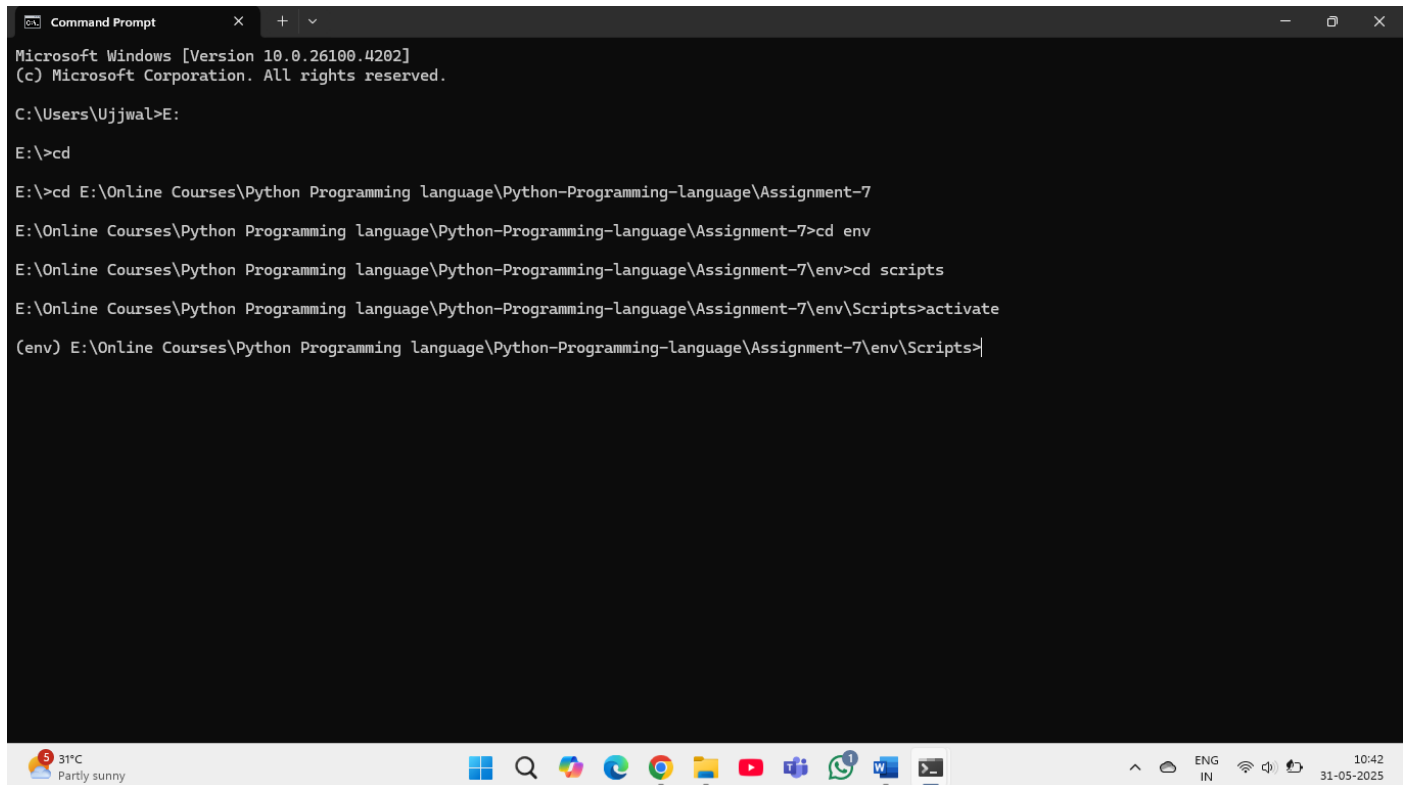
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>cd env

E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env>cd scripts

E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env\Scripts>
```

Like that.

➔ The you activate the virtualenv



```
Microsoft Windows [Version 10.0.26100.4202]
(c) Microsoft Corporation. All rights reserved.

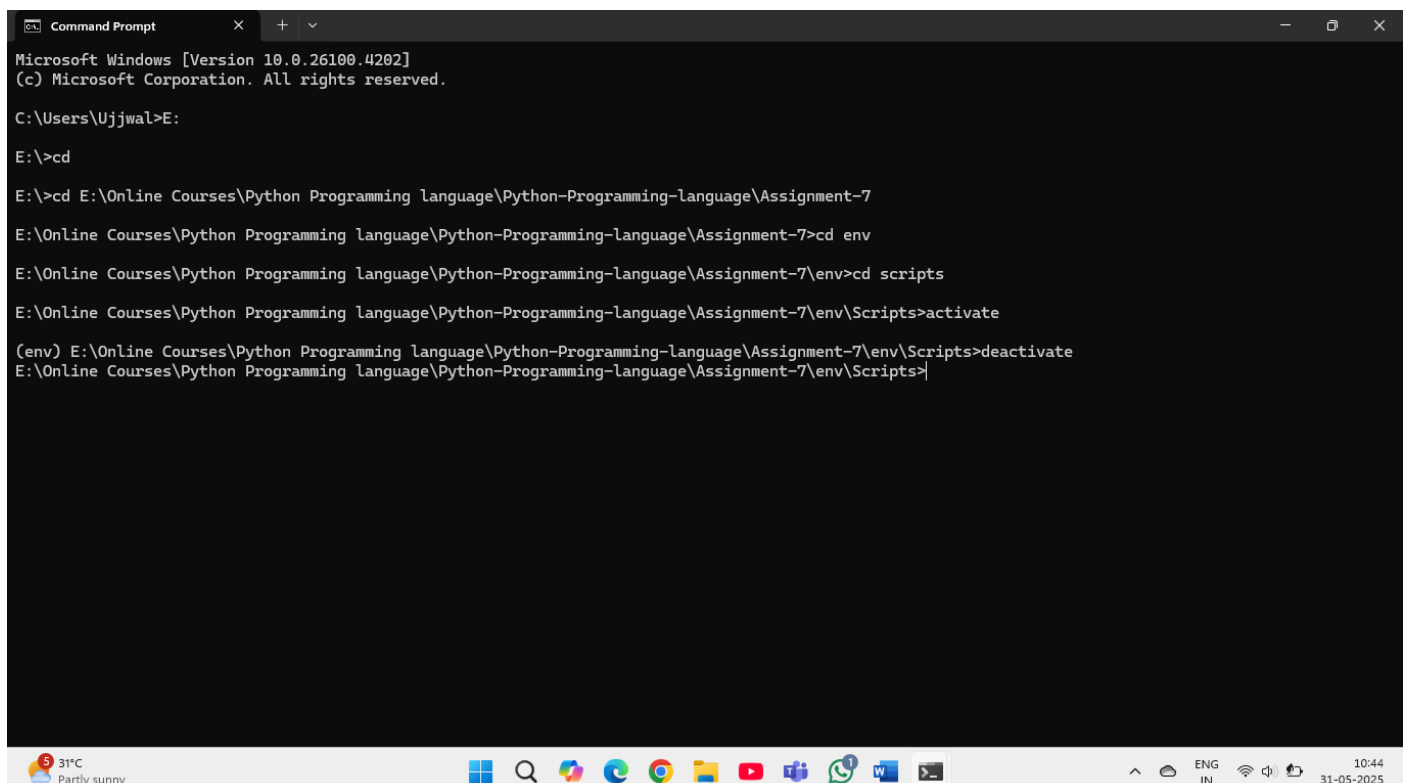
C:\Users\Ujjwal>E:

E:\>cd

E:\>cd E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>cd env
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env>cd scripts
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env\Scripts>activate
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env\Scripts>
```

Now you see the virtualenv has been activated

➔ And the your task has been done then you deactivate the virtualenv



```
Microsoft Windows [Version 10.0.26100.4202]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Ujjwal>E:

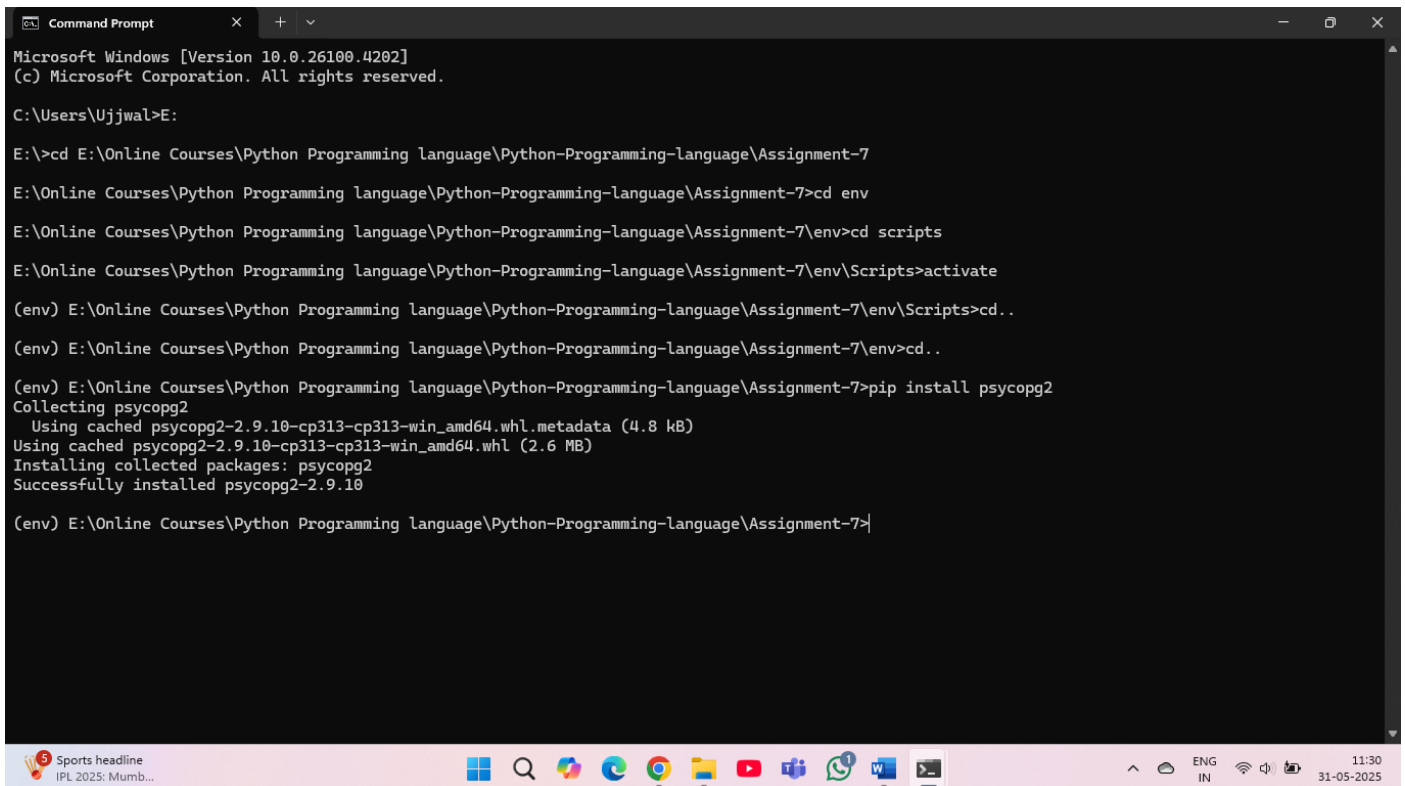
E:\>cd

E:\>cd E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>cd env
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env>cd scripts
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env\Scripts>activate
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env\Scripts>deactivate
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env\Scripts>
```

Like that.

❖ Installing psycopg2

- ➔ To help the python and the Postgres database to communicate.
- ➔ To install package of psycopg2
- ➔ For example: `pip install psycopg2`



```
Microsoft Windows [Version 10.0.26100.4202]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Ujjwal>E:

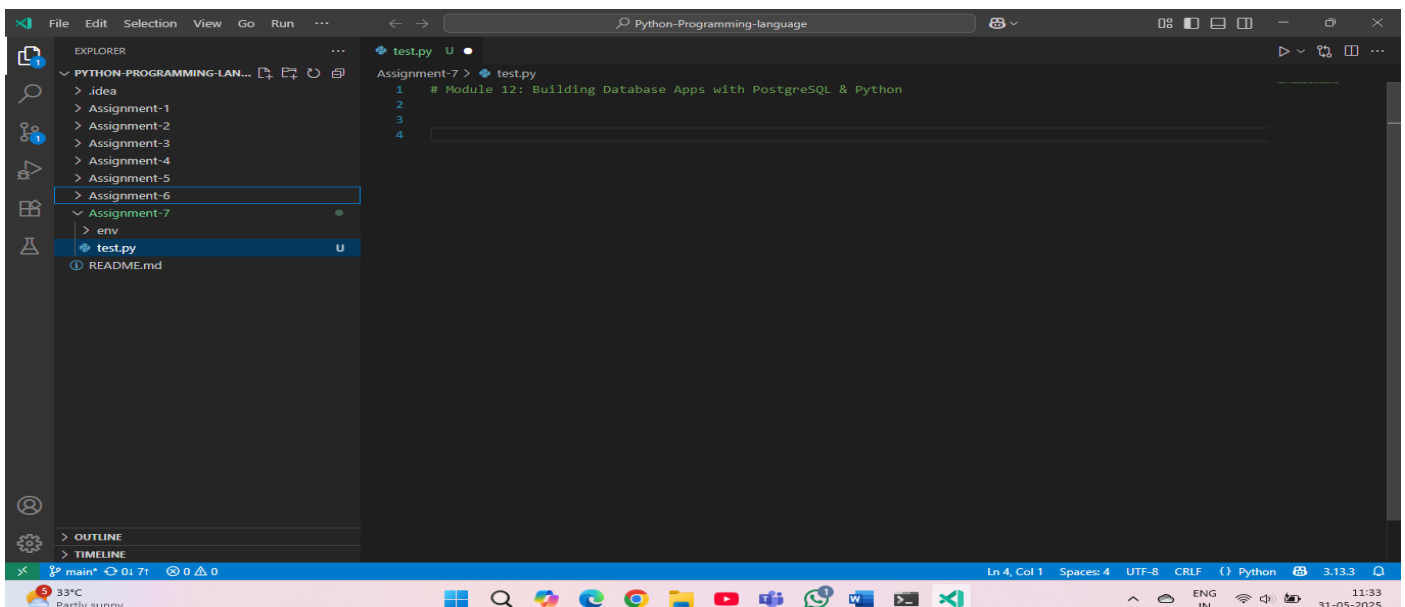
E:\>cd E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>cd env
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env>cd scripts
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env\Scripts>activate
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env\Scripts>cd..
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env>cd..
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>pip install psycopg2
Collecting psycopg2
  Using cached psycopg2-2.9.10-cp313-cp313-win_amd64.whl.metadata (4.8 kB)
Using cached psycopg2-2.9.10-cp313-cp313-win_amd64.whl (2.6 MB)
Installing collected packages: psycopg2
Successfully installed psycopg2-2.9.10

(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
```

Like that.

❖ Connection to the database

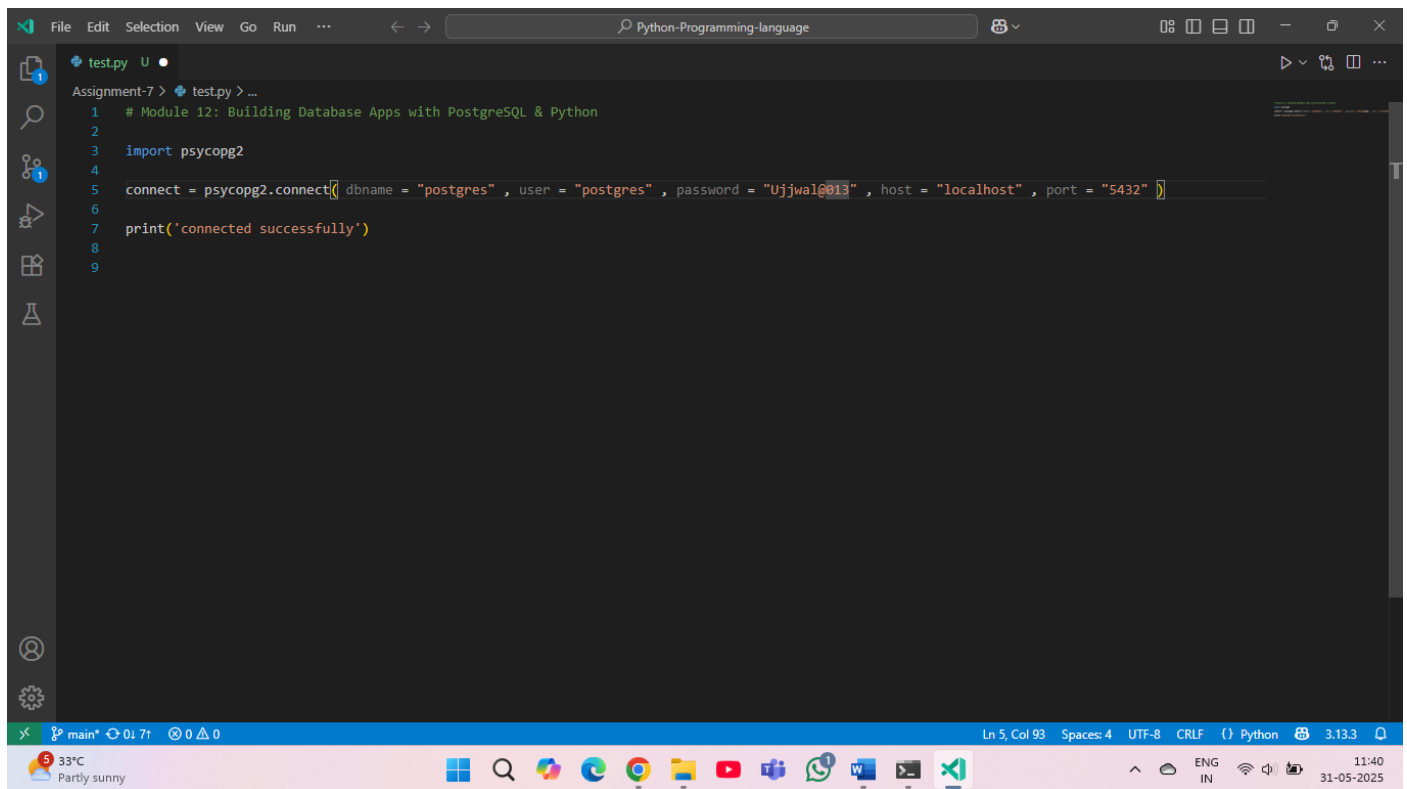
- ➔ Open vs code # file name for example , test.py



```
Python-Programming-language
test.py
1 # Module 12: Building Database Apps with PostgreSQL & Python
2
3
4
```

Like that.

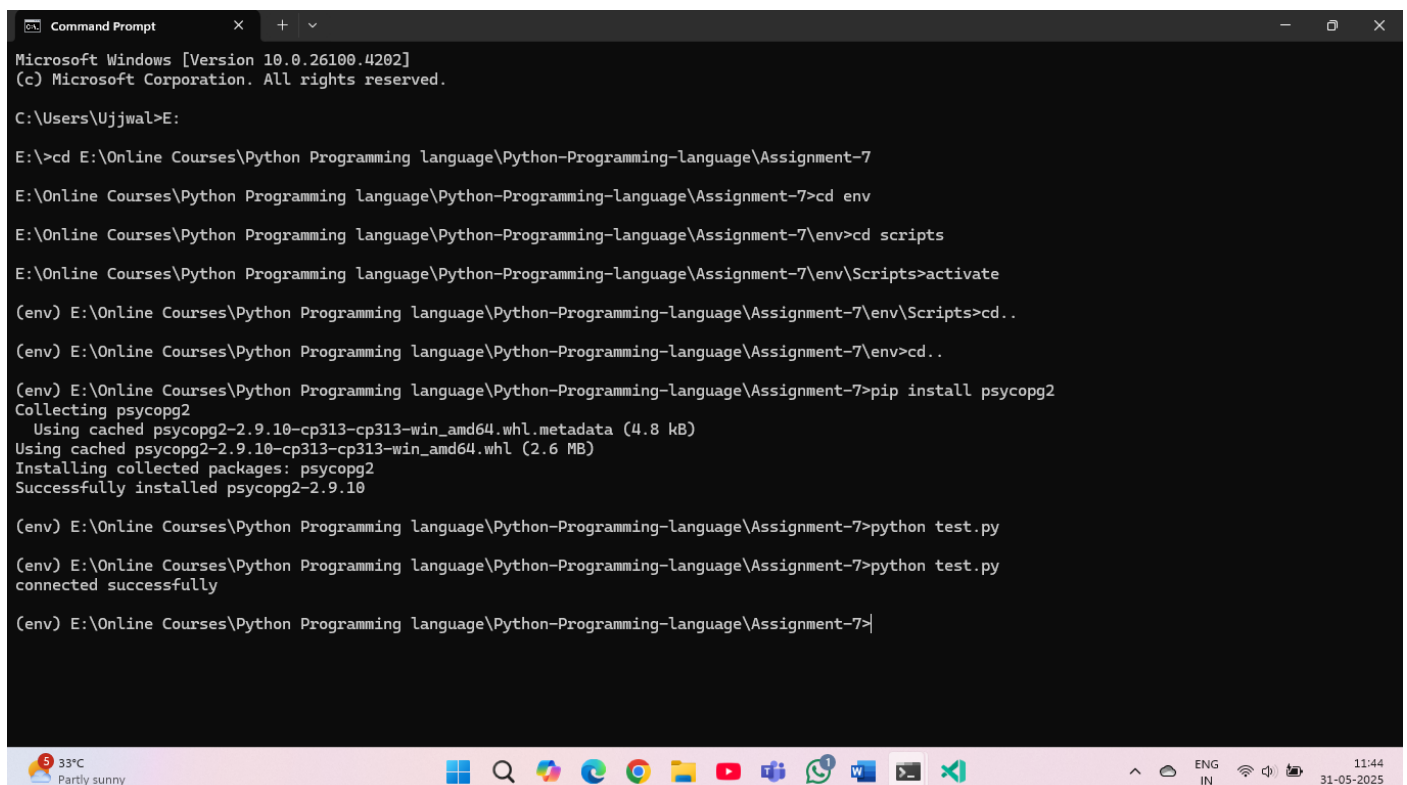
➔ Connect to database



```
test.py
1 # Module 12: Building Database Apps with PostgreSQL & Python
2
3 import psycopg2
4
5 connect = psycopg2.connect( dbname = "postgres" , user = "postgres" , password = "Ujjwal@013" , host = "localhost" , port = "5432" )
6
7 print('connected successfully')
8
9
```

Like that.

➔ Then open command prompt and virtualenv has been activated then execute the code.



```
Microsoft Windows [Version 10.0.26100.4202]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Ujjwal>E:

E:\>cd E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>cd env
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env>cd scripts
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env\Scripts>activate
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env\Scripts>cd..
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env>cd..
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>pip install psycopg2
Collecting psycopg2
  Using cached psycopg2-2.9.10-cp313-cp313-win_amd64.whl.metadata (4.8 kB)
Using cached psycopg2-2.9.10-cp313-cp313-win_amd64.whl (2.6 MB)
Installing collected packages: psycopg2
Successfully installed psycopg2-2.9.10

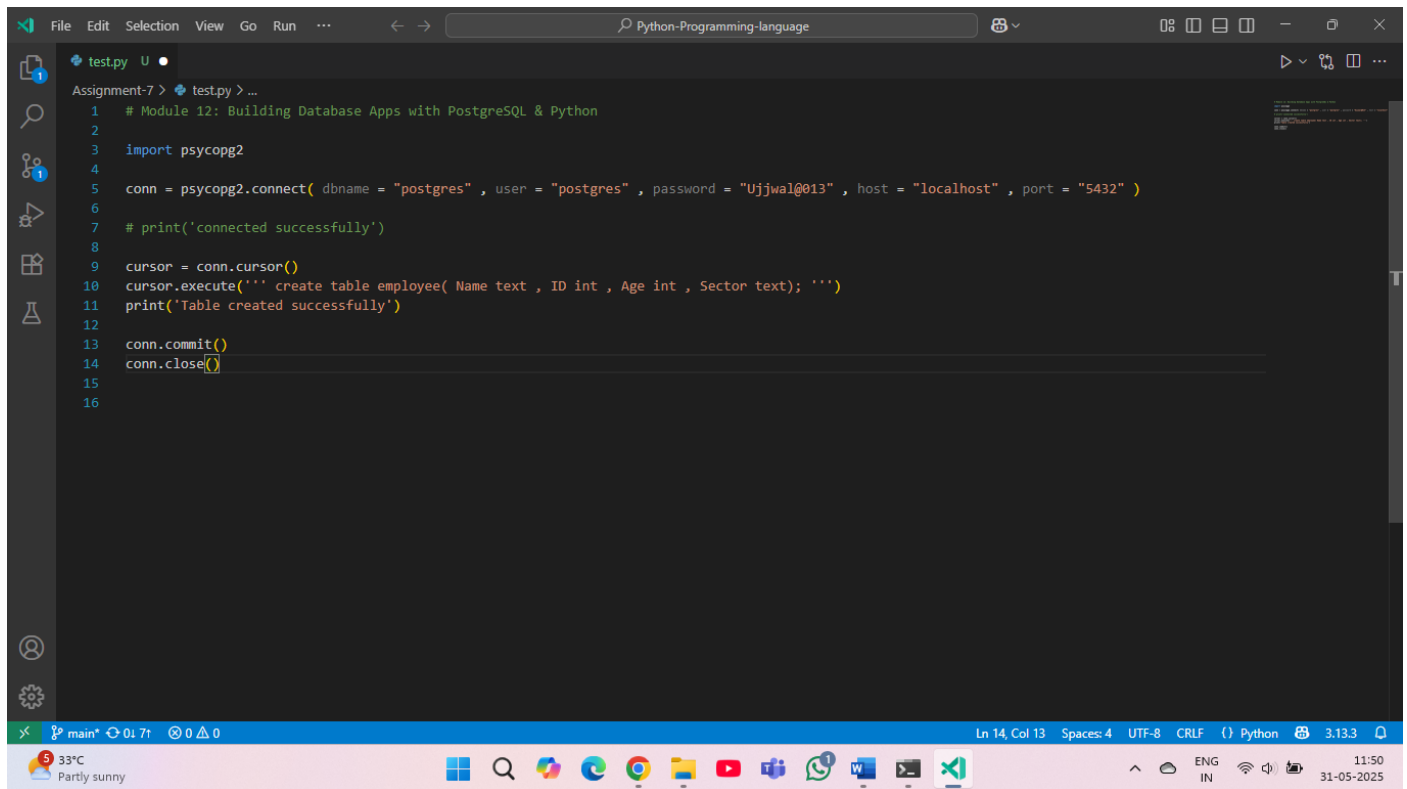
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>python test.py
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>python test.py
connected successfully

(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
```

Like that.

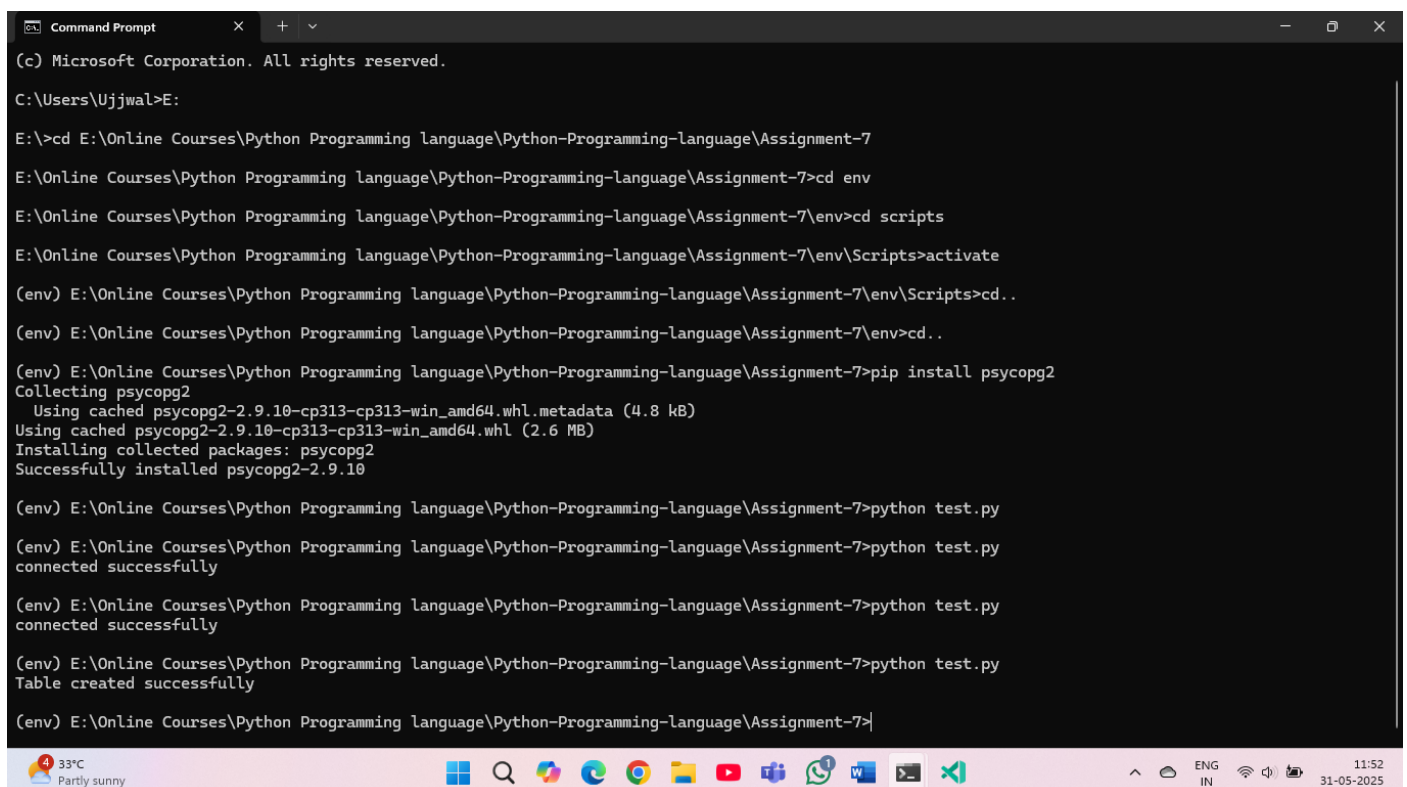
❖ Creating table using python

Eg ->



```
test.py U •
Assignment-7 > test.py > ...
1 # Module 12: Building Database Apps with PostgreSQL & Python
2
3 import psycopg2
4
5 conn = psycopg2.connect( dbname = "postgres" , user = "postgres" , password = "Ujjwal@013" , host = "localhost" , port = "5432" )
6
7 # print('connected successfully')
8
9 cursor = conn.cursor()
10 cursor.execute(''' create table employee( Name text , ID int , Age int , Sector text); ''')
11 print('Table created successfully')
12
13 conn.commit()
14 conn.close()
15
16
```

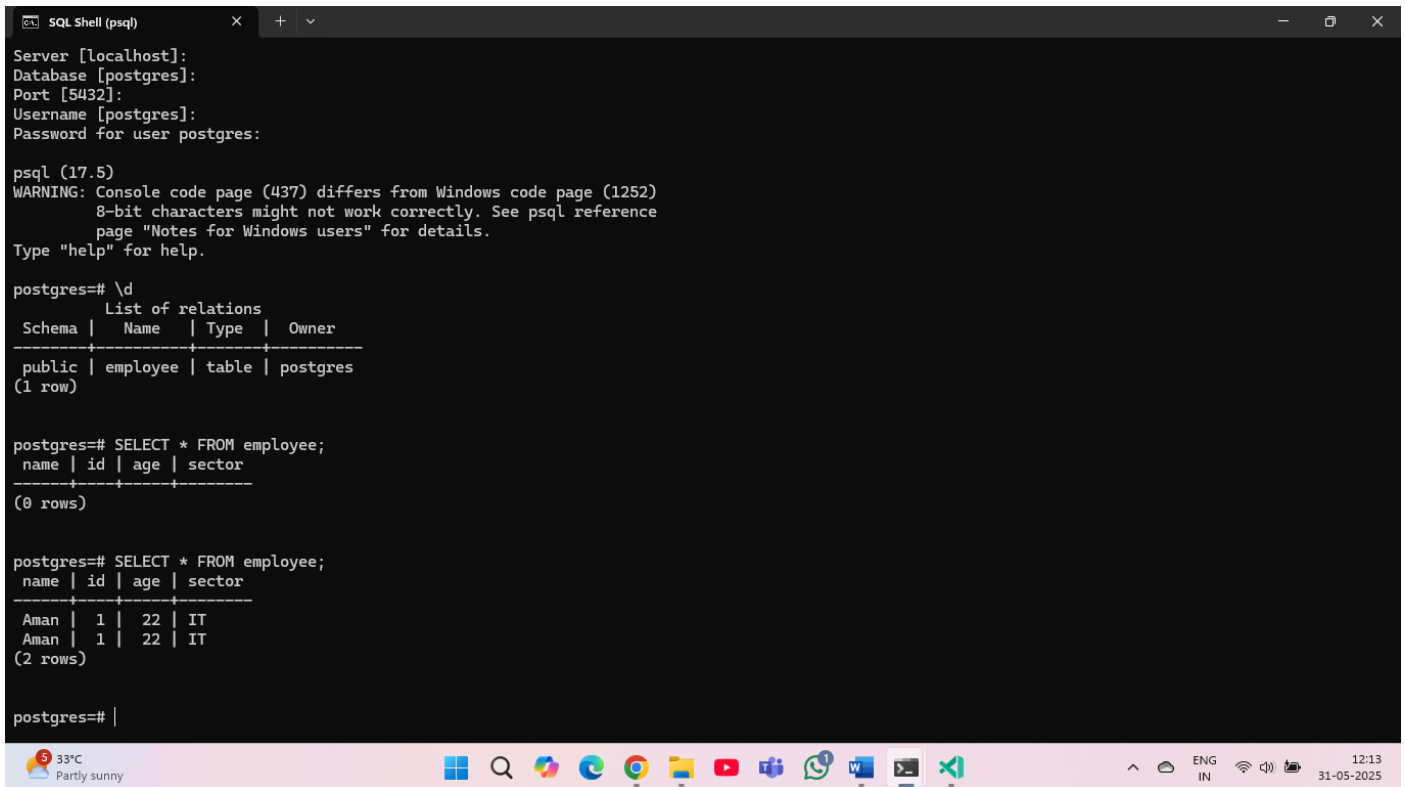
Like that then the output is :



```
Command Prompt
(c) Microsoft Corporation. All rights reserved.
C:\Users\Ujjwal>E:
E:\>cd E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>cd env
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env>cd scripts
E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env\Scripts>activate
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env\Scripts>cd..
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7\env>cd..
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>pip install psycopg2
Collecting psycopg2
  Using cached psycopg2-2.9.10-cp313-cp313-win_amd64.whl.metadata (4.8 kB)
Using cached psycopg2-2.9.10-cp313-cp313-win_amd64.whl (2.6 MB)
Installing collected packages: psycopg2
Successfully installed psycopg2-2.9.10
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>python test.py
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>python test.py
connected successfully
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>python test.py
connected successfully
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>python test.py
Table created successfully
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
```

Like that. Then check to psql shell

➔ then check to psql shell



```
SQL Shell (psql)
Server [localhost]:
Database [postgres]:
Port [5432]:
Username [postgres]:
Password for user postgres:

psql (17.5)
WARNING: Console code page (437) differs from Windows code page (1252)
        8-bit characters might not work correctly. See psql reference
        page "Notes for Windows users" for details.
Type "help" for help.

postgres=# \d
          List of relations
Schema | Name   | Type | Owner
-----+-----+-----+-----
public | employee | table | postgres
(1 row)

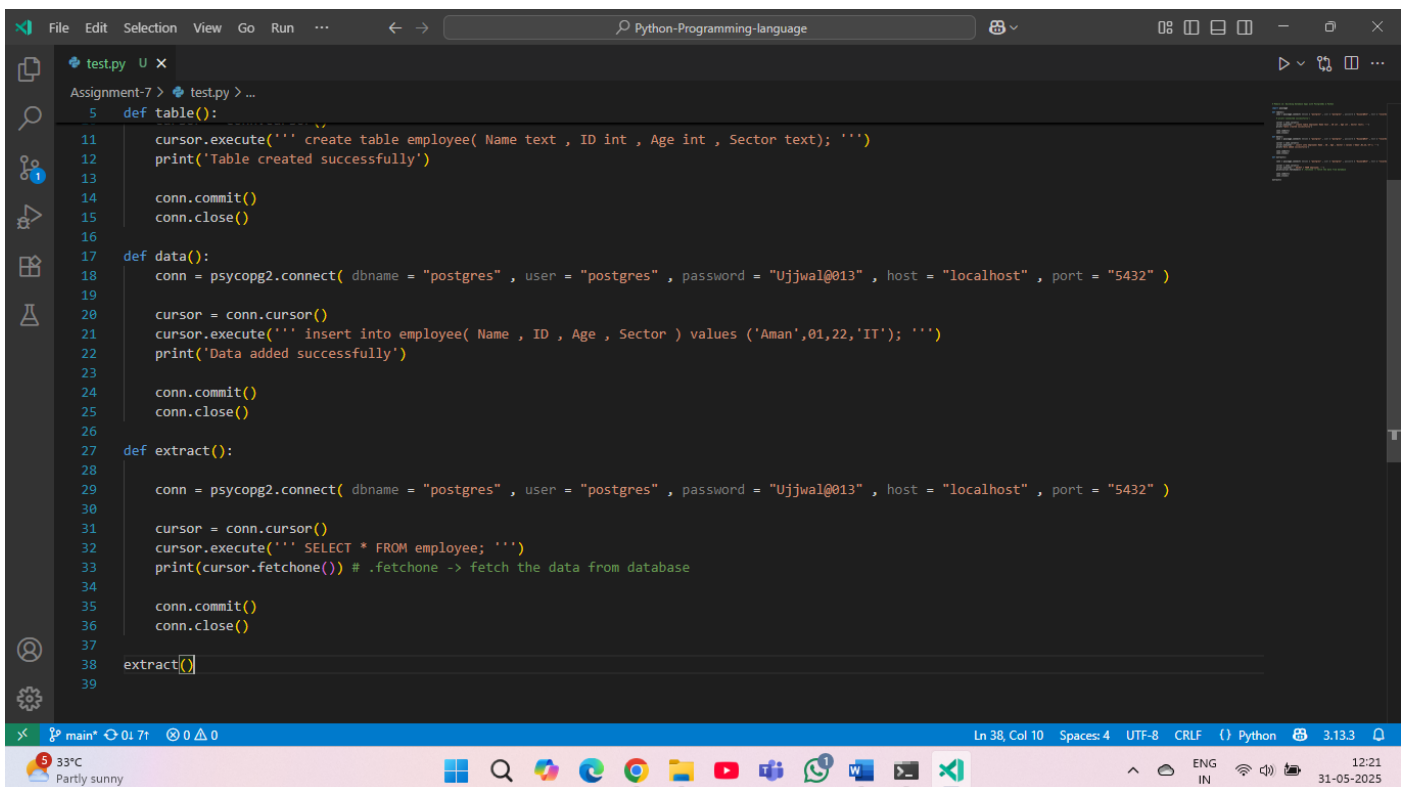
postgres=# SELECT * FROM employee;
 name | id | age | sector
-----+---+----+-----
(0 rows)

postgres=# SELECT * FROM employee;
 name | id | age | sector
-----+---+----+-----
 Aman |  1 |  22 |    IT
 Aman |  1 |  22 |    IT
(2 rows)

postgres=#
```

Like that.

❖ Extracting the data from the database



```
test.py
Assignment-7 > test.py > ...
5 def table():
11     cursor.execute('create table employee( Name text , ID int , Age int , Sector text); ')
12     print('Table created successfully')
13
14     conn.commit()
15     conn.close()
16
17 def data():
18     conn = psycopg2.connect( dbname = "postgres" , user = "postgres" , password = "Ujjwal@013" , host = "localhost" , port = "5432" )
19
20     cursor = conn.cursor()
21     cursor.execute('insert into employee( Name , ID , Age , Sector ) values ('Aman',01,22,'IT'); ')
22     print('Data added successfully')
23
24     conn.commit()
25     conn.close()
26
27 def extract():
28
29     conn = psycopg2.connect( dbname = "postgres" , user = "postgres" , password = "Ujjwal@013" , host = "localhost" , port = "5432" )
30
31     cursor = conn.cursor()
32     cursor.execute('SELECT * FROM employee; ')
33     print(cursor.fetchone()) # .fetchone -> fetch the data from database
34
35     conn.commit()
36     conn.close()
37
38     extract()
39
```

Like that

And the output is:

```
Command Prompt
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
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(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>python test.py
Data added successfully

(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>python test.py
('Aman', 1, 22, 'IT')

(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
```

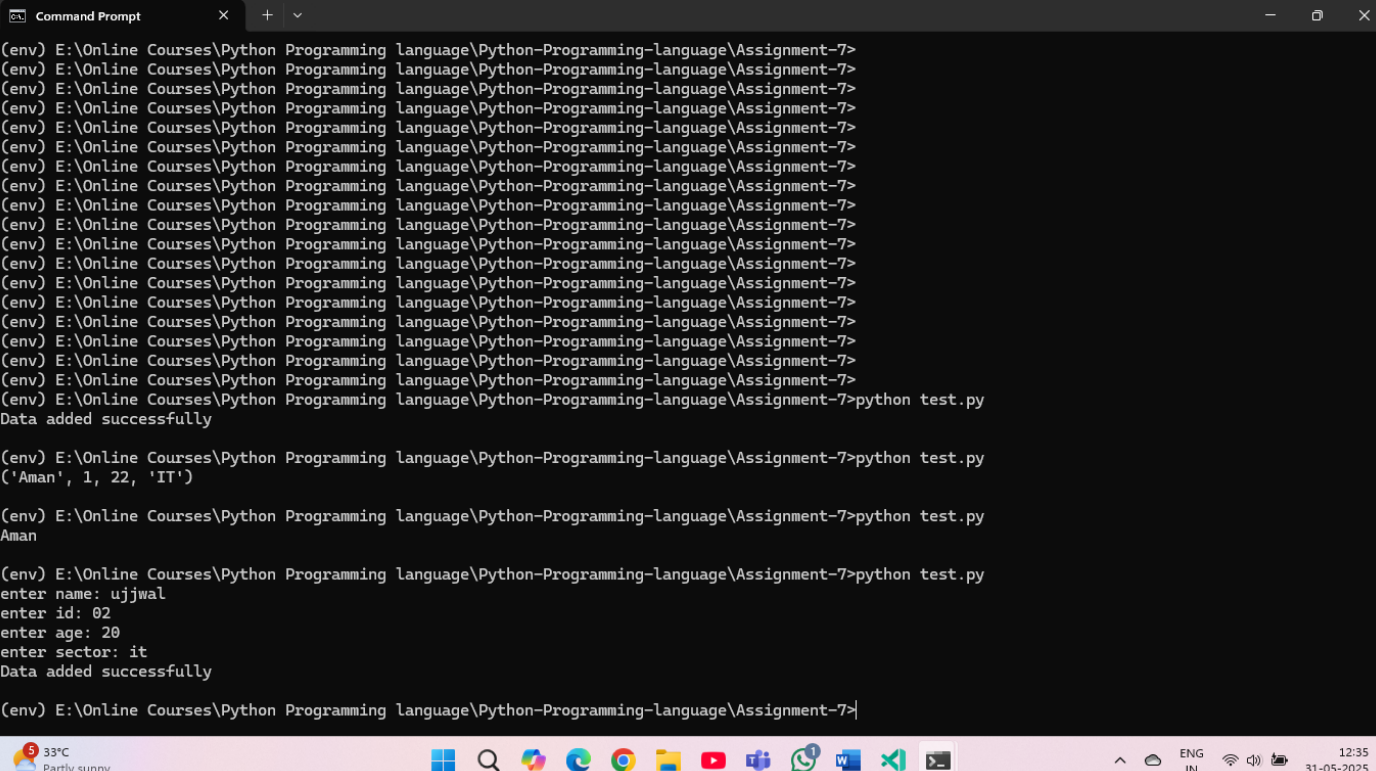
Like that.

And one more a function that you fetch a single value from the database

```
Python-Programming-language
test.py
Assignment-7 > test.py > extract
15 conn.close()
16
17 def data():
18     conn = psycopg2.connect( dbname = "postgres" , user = "postgres" , password = "Ujjwal@013" , host = "localhost" , port = "5432" )
19
20     cursor = conn.cursor()
21     cursor.execute(''' insert into employee( Name , ID , Age , Sector ) values ('Aman',01,22,'IT'); ''')
22     print('Data added successfully')
23
24     conn.commit()
25     conn.close()
26
27 def extract():
28
29     conn = psycopg2.connect( dbname = "postgres" , user = "postgres" , password = "Ujjwal@013" , host = "localhost" , port = "5432" )
30
31     cursor = conn.cursor()
32     cursor.execute(''' SELECT * FROM employee; ''')
33     # print(cursor.fetchone()) # .fetchone -> fetch the data from database
34     show = cursor.fetchone()
35     print(show[0])
36
37     conn.commit()
38     conn.close()
39
40 extract()
41
```

Like that.

And the output is:



```

Command Prompt
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
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(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>python test.py
Data added successfully

(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>python test.py
('Aman', 1, 22, 'IT')

(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>python test.py
Aman

(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>python test.py
enter name: ujjwal
enter id: 02
enter age: 20
enter sector: it
Data added successfully

(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>

```

Like that....

Now for example : add some employee information

```

(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>
(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>python test.py
enter name: Ujjwal
enter id: 01
enter age: 21
enter sector: IT
Data added successfully

(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>python test.py
enter name: Udit
enter id: 02
enter age: 21
enter sector: HR
Data added successfully

(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>python test.py
enter name: Annu
enter id: 03
enter age: 20
enter sector: IT
Data added successfully

(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>python test.py
enter name: Anshika
enter id: 04
enter age: 19
enter sector: IT
Data added successfully

(env) E:\Online Courses\Python Programming language\Python-Programming-language\Assignment-7>

```

Like that

Now see the data from psql shell

```
SQL Shell (psql)
postgres=# SELECT * FROM employee;
 name | id | age | sector
-----+---+----+-----
 Aman |  1 |  22 |    IT
 Aman |  1 |  22 |    IT
 Ujjwal | 2 |  20 |    it
(3 rows)

postgres=# truncate table employee;
TRUNCATE TABLE
postgres=# SELECT * FROM employee;
 name | id | age | sector
-----+---+----+-----
(0 rows)

postgres=# SELECT * FROM employee;
 name | id | age | sector
-----+---+----+-----
(0 rows)

postgres=# SELECT * FROM employee;
 name | id | age | sector
-----+---+----+-----
 Ujjwal | 1 |  21 |    IT
 Udit   | 2 |  21 |    HR
 Annu   | 3 |  20 |    IT
 Anshika | 4 |  19 |    IT
(4 rows)

postgres=#
```

Now you see all the employee information.

Thank you

Author -> Ujjwal