Bootcamp
Data Engineering

Day00
Psycopg2

Psycopg2 basics

Psycopg is a very popular PostgreSQL database adapter for the Python programming language. Its full documentation can be seen **here**.

The function `connect()` creates a new database session and returns a new connection instance.

```python
import psycopg2

def get_connection():
    conn = psycopg2.connect(
        database="appstore_games",
        host="localhost",
        user="postgres_user",
        password="12345"
    )
    return (conn)
```

Cursors allows Python code to execute PostgreSQL command in a database session.

```python
curr = conn.cursor()
```

Tables can be created with the cursor.

```python
curr.execute("""CREATE TABLE members (
                id serial PRIMARY KEY,
                firstname varchar(32),
                lastname varchar(32),
                birthdate date
              )
            """)
```

It's also possible to remove a table.

```python
curr.execute("DROP TABLE members")
```

To make changes persistent in the database, we need to commit (queries are called transactions). Finally, we can close the connection.

```python
conn.commit()
conn.close()
```

This gives the following full code.

```python
import psycopg2

def get_connection():
    conn = psycopg2.connect(
        database="appstore_games",
        host="localhost",
        user="postgres_user",
        password="12345"
    )
    return (conn)

if __name__ == "__main__":
    conn = get_connection()
    curr = conn.cursor()
    curr.execute("""CREATE TABLE members (
                    id serial PRIMARY KEY,
                    firstname varchar(32),
                    lastname varchar(32),
                    birthdate date
                )
    """)
    conn.commit()
    conn.close()
```

Inserting data

Data can be inserted into a table with the following syntax.

```python
curr.execute("""
            INSERT INTO members(firstname, lastname, birthdate) VALUES
            ('Eric', 'Clapton', '1945-13-30'),
            ('Joe', 'Bonamassa', '1977-05-08')
""")
```

Delete data

Data can also be deleted.

```python
curr.execute("""DELETE FROM members
                WHERE lastname LIKE 'Clapton'
""")
```

Useful functions

get connections

```python
def get_connection():
    conn = psycopg2.connect(
        database="appstore_games",
        host="localhost",
        user="postgres_user",
        password="12345"
    )
    return (conn)
```

Showing table content

We must use the `fetchall` function to gather all the result in a list of tuples.

```python
def display_table(table: str):
    conn = set_connection()
    curr = conn.cursor()
    curr.execute("""SELECT * FROM %(table)s
                    LIMIT 10""", {"table": AsIs(table)})
    response = curr.fetchall()
    for row in response:
        print(row)
    conn.close()
```

Create a table

```python
def create_table():
    conn = get_connection()
    curr = conn.cursor()
    curr.execute("""CREATE TABLE test(
            FirstName varchar PRIMARY KEY,
            LastName varchar,
            Age int
            );""")
    conn.commit()
    conn.close()
```

Drop table

```python
def delete_table(table: str):
    conn = set_connection()
    curr = conn.cursor()
    curr.execute("DROP TABLE IF EXISTS %(table)s;", {"table": AsIs(table)})
    conn.commit()
    conn.close()
```

Inserting data into a table

```python
def populate_table():
    conn = get_connection()
    curr = conn.cursor()
    curr.execute("""INSERT INTO test
            (FirstName,
            LastName,
            Age) VALUES
            (%s, %s, %s)""",
            ('Michelle',
            'Dupont',
            '33'))
    conn.commit()
    conn.close()
```