## Advanced Programming with Python. Session 6

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# Advanced Programming with Python. Session 6

https://slides.com/pepegar/app-6/live

# Plan for today

- ► SQL in Python
- Using SQL in web applications

We use SQL to interact with databases. The **SELECT** statement is used to get data from the database.

```
SELECT *
FROM users u
INNER JOIN invoices i
WHERE i.user_id = u.id
```

The **INSERT** statement is used to add data to the database

INSERT INTO users

VALUES("pepe@pepegar.com", "pepegar")

The **UPDATE** statement is used to modify data that's already in the DB

UPDATE users u
SET active=false
WHERE u.id = 55;

We use the **DELETE** statement when deleting data from the DB

DELETE FROM users

WHERE id = 55;

## Using plain SQL in Python

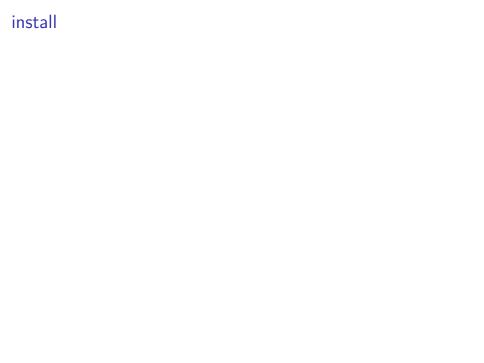
It's possible to use SQL directly in Python by using the SQLAlchemy library:

```
from sqlalchemy import create_engine
engine = create_engine("sqlite:///example-using-sql/twitte:
conn = engine.connect()
results = conn.execute("SELECT * FROM users")
```

### Practice

See example

session-6/example-using-sql



# flask-sqlalchemy

Let's install flask-sqlalchemy

## Object Relational Mapping

ORM is a technique we'll use to relate database records to Python objects.

```
CREATE TABLE users (
  id INTEGER PRIMARY KEY,
  username TEXT NOT NULL,
  email TEXT NOT NULL.
);
class User:
    def __init__(self, id, username, email):
        self.id = id
        self.username = username
        self.email = email
```

## Declaring models

Models are classes that we'll use to interact with the DB. We'll declare them by extending **db.Model** 

```
class User(db.Model):
    pass
```

### Adding fields to models

We'll need to make model fields have the same type as the DB columns:

```
class User(db.Model):
   id = db.Column(db.Integer, primary_key=True)
   username = db.Column(db.String, nullable=False)
   email = db.Column(db.String, nullable=False)
```

## Object Relational Mapping

Using SQLAlchemy ORM, we can use methods in the class instead of raw SQL:

```
SELECT * FROM users:
SELECT * FROM users WHERE email = 'pepe@ie.edu';
SELECT * FROM users WHERE email = 'pepe@ie.edu'
                    AND username = 'pepegar;'
User.querv.all()
User.query.filter(User.email == "pepe@ie.edu")
User.query.filter(User.email == "pepe@ie.edu") \
          .filter(User.username == "pepegar")
```

### Practice

See example

session-6/example-using-orm

#### Homework

Modify your last homework so that it stores the data inside a database instead of storing it in memory