111-2進階程式設計課程(16)
Advanced Computer Programming

亞大資工系

課程大綱

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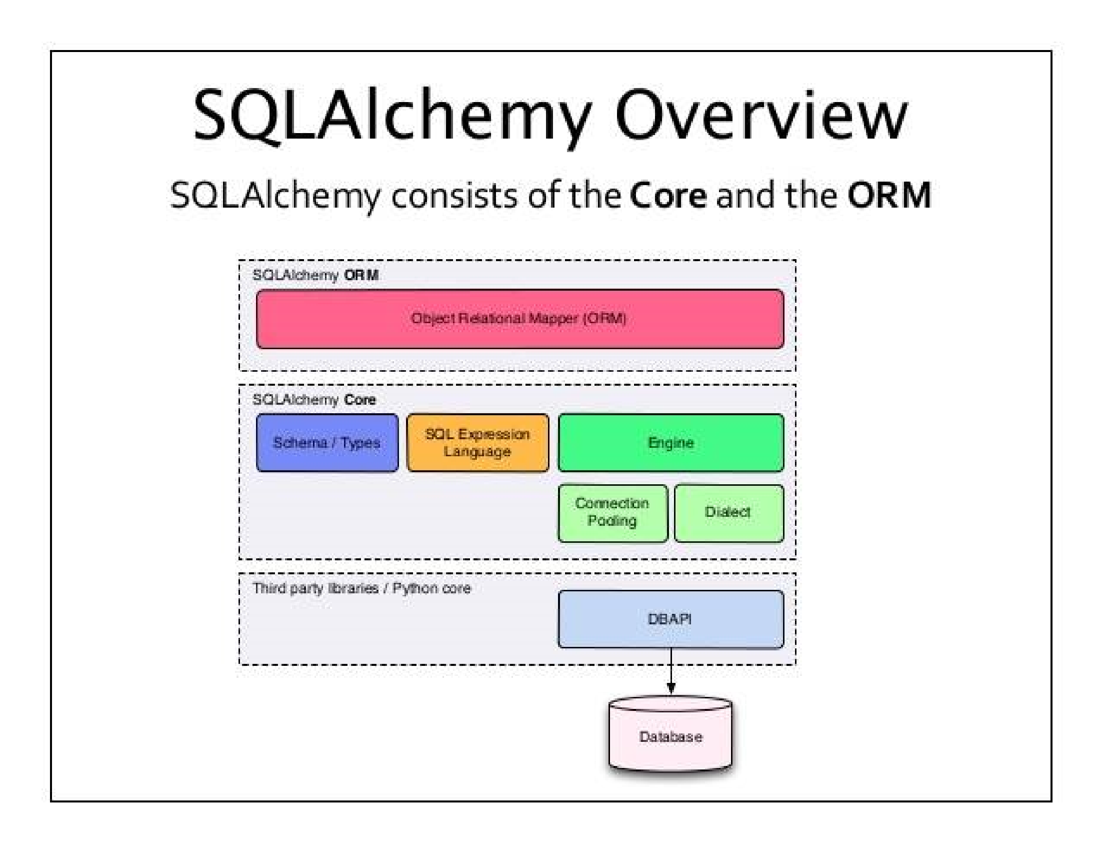
SQLAlchemy

- SQLAlchemy is object-relational mapper (ORM)



SQLAlchemy Overview

SQLAlchemy consists of the **Core** and the **ORM**

SQLAlchemy **ORM**

Object Relational Mapper (ORM)

SQLAlchemy **Core**

Schema / Types

SQL Expression Language

Engine

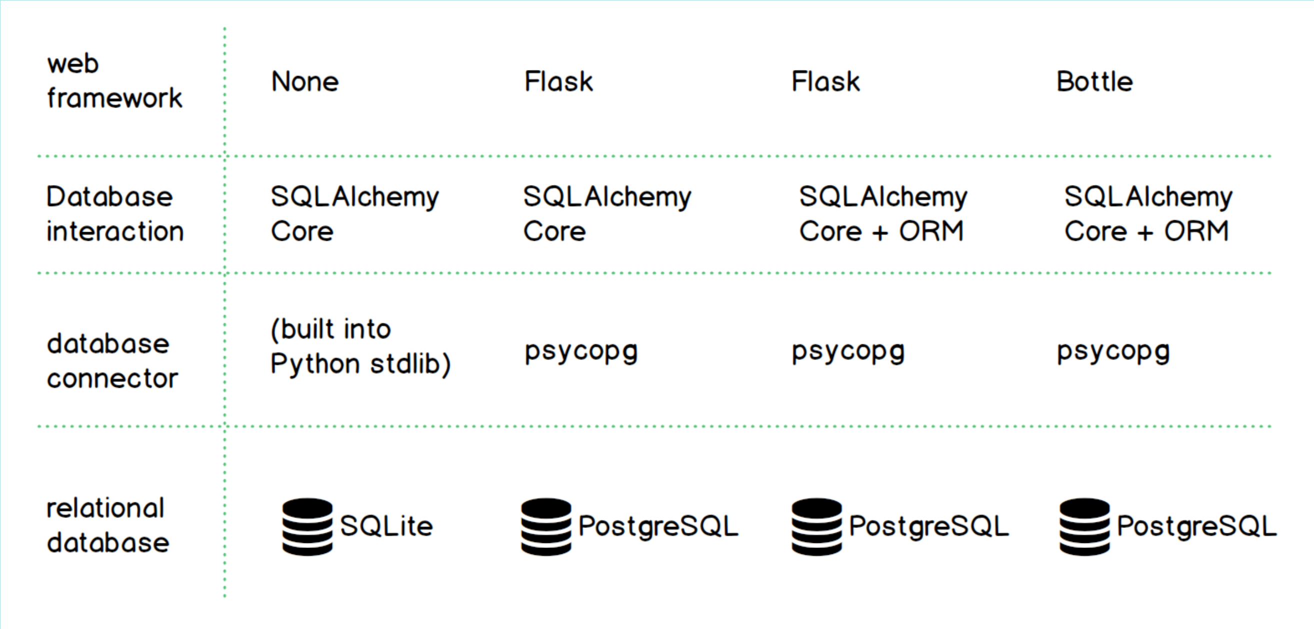
Connection Pooling

Dialect

Third party libraries / Python core

DBAPI

Database



web framework	None	Flask	Flask	Bottle
Database interaction	SQLAlchemy Core	SQLAlchemy Core	SQLAlchemy Core + ORM	SQLAlchemy Core + ORM
database connector	(built into Python stdlib)	psycopg	psycopg	psycopg
relational database	SQLite	PostgreSQL	PostgreSQL	PostgreSQL

SQLAlchemy

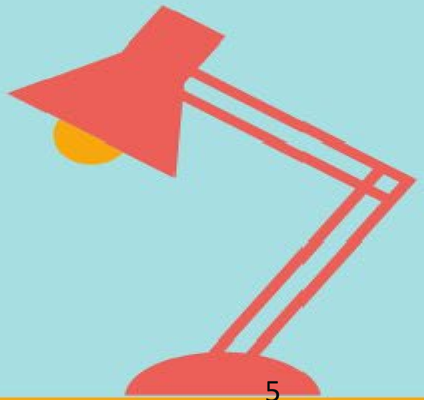
```
class Contact(db.Model):
    __tablename__ = 'contacts'
    id = db.Column(db.Integer, primary_key=True)
    first_name = db.Column(db.String(100))
    last_name = db.Column(db.String(100))
    phone_number = db.Column(db.String(32))

    def __repr__(self):
        return '<Contact {0} {1}: {2}>'.format(self.first_name,
                                              self.last_name,
                                              self.phone_number)
```

```
CREATE TABLE CONTACTS(
   ID INT PRIMARY KEY        NOT NULL,
   FIRST_NAME     CHAR(100)  NOT NULL,
   LAST_NAME      CHAR(100)  NOT NULL,
   PHONE_NUMBER   CHAR(32)   NOT NULL,
);
```

```
contacts = Contact.query.all()
=>
SELECT * FROM contacts
```

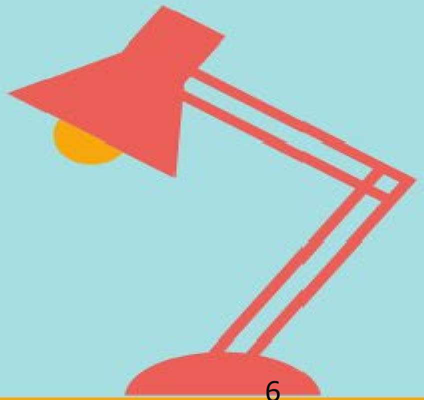
Flask-SQLAlchemy database URLs

Database engine	URL
MySQL	*mysql://username:password@hostname/database*
Postgres	*postgresql://username:password@hostname/database*
SQLite (Linux, macOS)	*sqlite:////absolute/path/to/database*
SQLite (Windows)	*sqlite:///c:/absolute/path/to/database*



Database Operations with SQLAlchemy

- flask shell
- > > > from flask_app import db
- > > > db.create_all()



Flask-SQLAlchemy

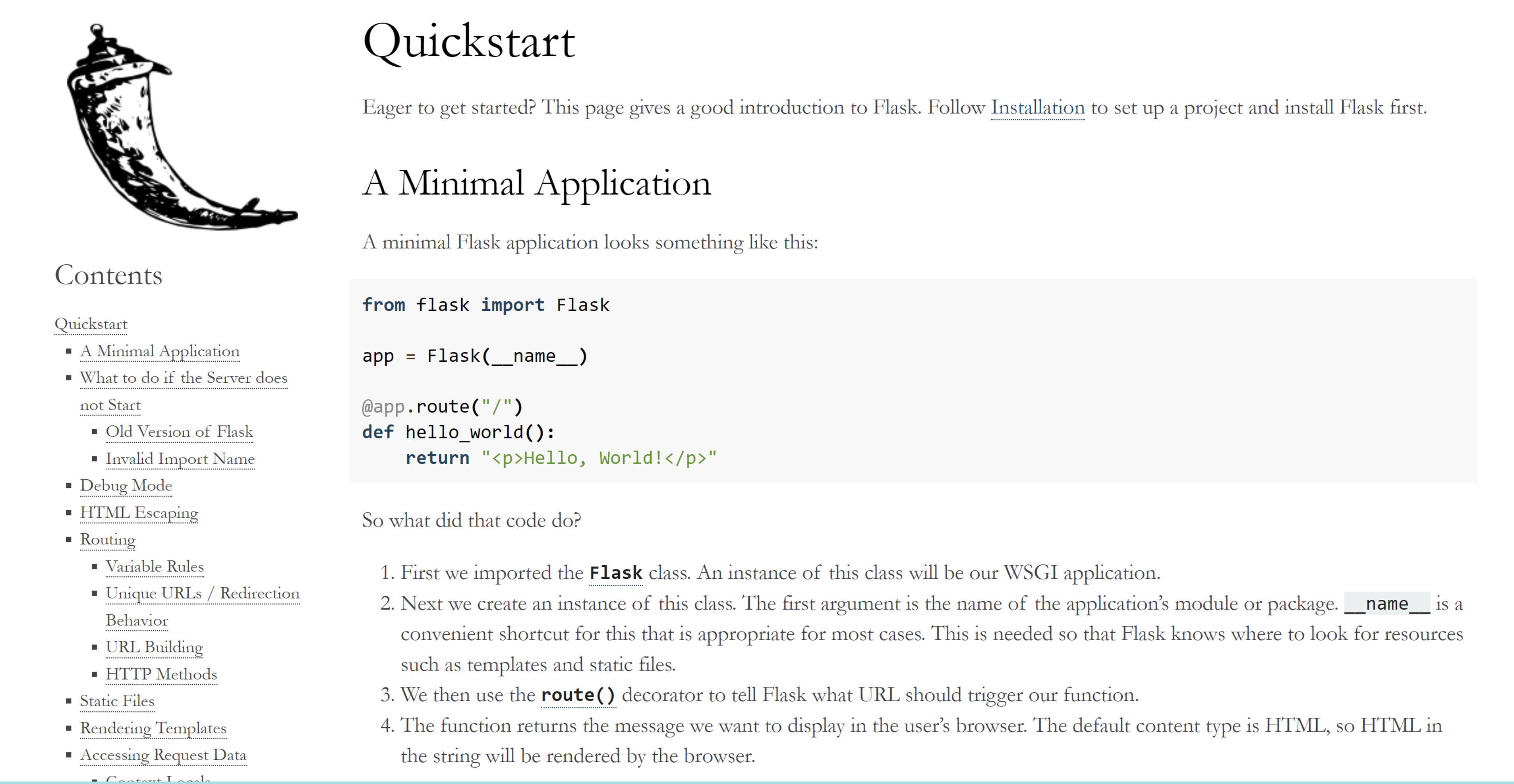
- SQLAlchemy gives you access to the following things:
  - all the functions and classes from sqlalchemy and sqlalchemy.orm
  - a preconfigured scoped session called session
  - the metadata
  - the engine
  - a SQLAlchemy.create_all() and SQLAlchemy.drop_all() methods to create and drop tables according to the models.
  - a Model baseclass that is a configured declarative base.
- The Model declarative base class behaves like a regular Python class but has a query attribute attached that can be used to query the model. (Model and BaseQuery)
- You have to commit the session, but you don’t have to remove it at the end of the request, Flask-SQLAlchemy does that for you.

https://flask-sqlalchemy.palletsprojects.com/en/2.x/quickstart/#a-minimal-application

Flask-Login tutorial

https://github.com/toddbirchard/flasklogin-tutorial/

Review-Flask QuickStart



Quickstart

Eager to get started? This page gives a good introduction to Flask. Follow Installation to set up a project and install Flask first.

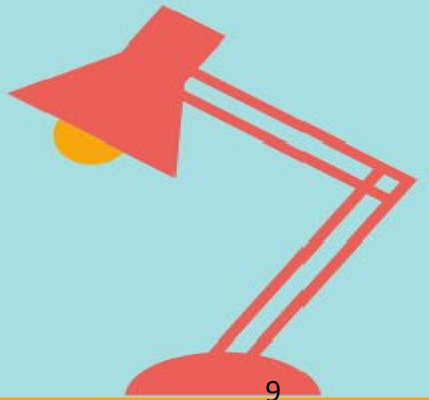
A Minimal Application

A minimal Flask application looks something like this:

```
from flask import Flask

app = Flask(__name__)

@app.route("/")
def hello_world():
    return "<p>Hello, World!</p>"
```

So what did that code do?

1. First we imported the **`Flask`** class. An instance of this class will be our WSGI application.
2. Next we create an instance of this class. The first argument is the name of the application’s module or package. `__name__` is a convenient shortcut for this that is appropriate for most cases. This is needed so that Flask knows where to look for resources such as templates and static files.
3. We then use the **`route()`** decorator to tell Flask what URL should trigger our function.
4. The function returns the message we want to display in the user’s browser. The default content type is HTML, so HTML in the string will be rendered by the browser.



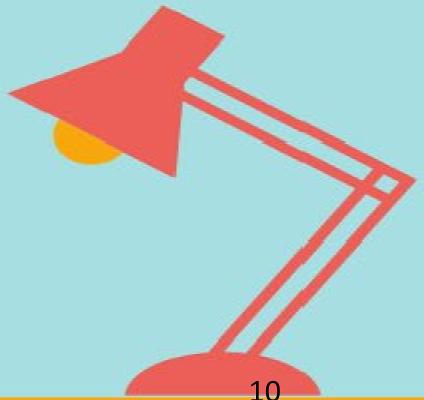
https://flask.palletsprojects.com/en/2.1.x/quickstart

Review- The Application Context

- current_app,

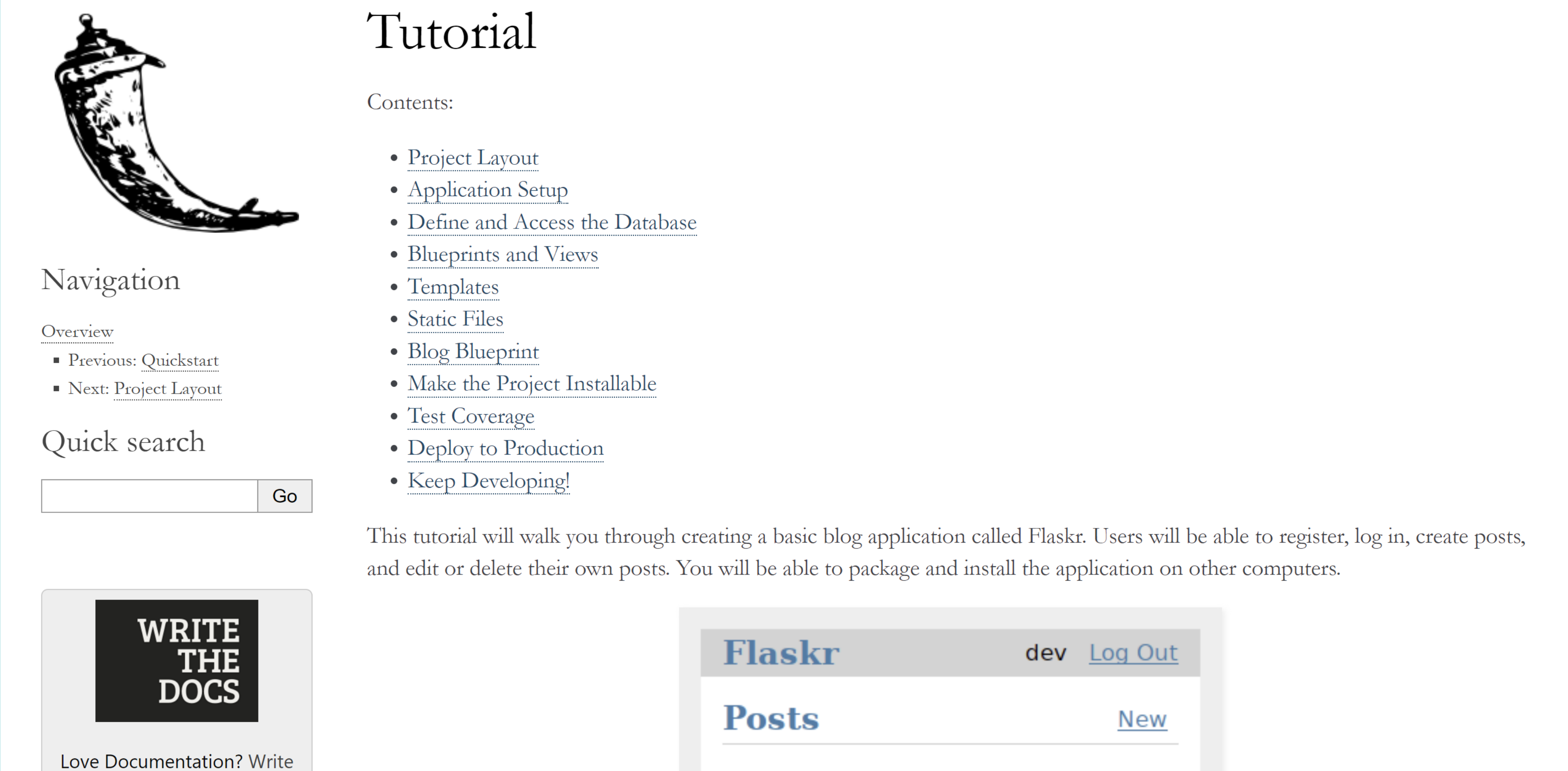
- app.app_context()
  - AppContext object

- app.g
  - A namespace object that can store data during an application context.



https://flask.palletsprojects.com/en/2.1.x/appcontext/

Review-Flask Tutorial



Tutorial

Contents:

- Project Layout
- Application Setup
- Define and Access the Database
- Blueprints and Views
- Templates
- Static Files
- Blog Blueprint
- Make the Project Installable
- Test Coverage
- Deploy to Production
- Keep Developing!

This tutorial will walk you through creating a basic blog application called Flaskr. Users will be able to register, log in, create posts, and edit or delete their own posts. You will be able to package and install the application on other computers.

Flaskr dev Log Out

Posts New

Navigation

Overview

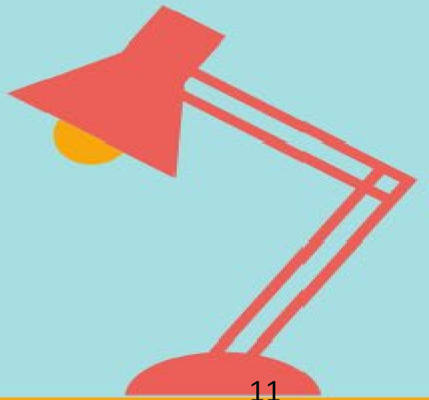
- Previous: Quickstart
- Next: Project Layout

Quick search

Go

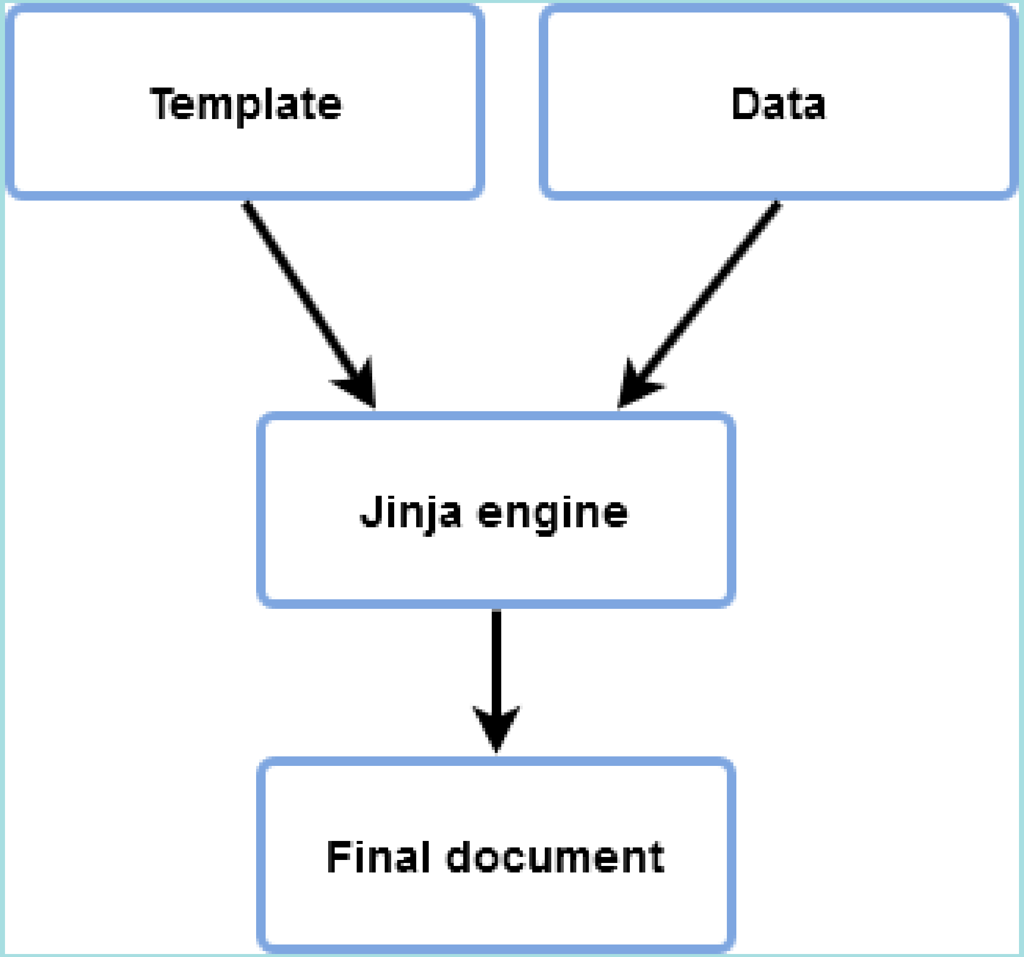
WRITE THE DOCS

Love Documentation? Write



https://flask.palletsprojects.com/en/2.1.x/tutorial/

Review: Jinja-template engine

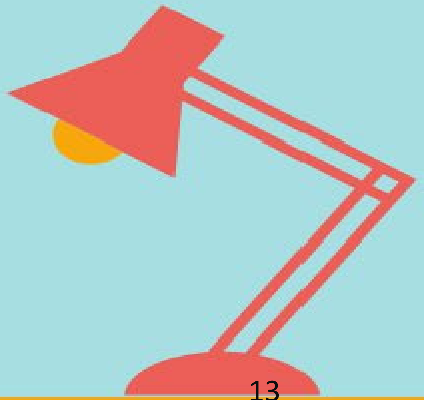


- Jinja2 essentially needs two source ingredients, template and data that will be used to render the final document.

https://ttl255.com/jinja2-tutorial-part-1-introduction-and-variable-substitution/

Jinja-template engine

- delimiters
  - {% ... %} for Statements
  - {{ ... }} for Expressions to print to the template output
  - {# ... #} for Comments not included in the template output
  - # ... ## for Line Statements
- extensions
  - {% extends “filename" %}
- blocks
  - {% block blockname %}
  - {% endblock %}



Review-SQLite

- SQLite is a small database management system, and one other inclusive database is in the C ++ library. The management system of the database is not the same, SQLite is not correct, and the client / server is quite good.

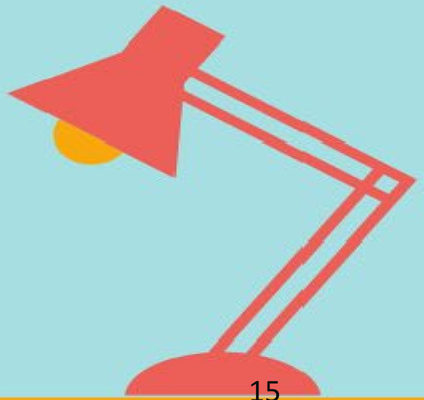
- SQLite Implementation SQL standard. Other used dynamic, weakly typographic SQL syntax. Other-made inset type database, application program, web page browser, hometown / client end-of-life documentary selection. It is possible to use a database engine, a working system, and an embedded system.

- SQLite Yes D. Richard Hipp erected.

期末規定

- 期末測驗 (6/6) 9:10-12:00
  - 題庫 https://reurl.cc/eDv45K

- 期末報告　繳交截止時間 2023.06.14
  - Github topic-flask
  - Github topic-scrapy
  - Github topic-beautifulsoup
- 繳交Google Jamboard或Colab網址
- 存取權：任何人或加htchu.taiwan@gmail.com



Thanks!

Q&A