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Writing and Running Tests in Docker

Or How to Test your Web Application Seamlessly...

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Agenda

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1. **Setting-up** our development environment.
2. **Writing** tests with **Pytest**.
3. **Automating** tests with **Tox**.
4. **Running** our application in **Docker Compose**.
5. **Managing** our workflow with **Invoke**.

Useful Links

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1. **Pytest** documentation: https://docs.pytest.org/
2. **Tox** documentation: https://tox.readthedocs.io/
3. **Docker** documentation: https://docs.docker.com/engine/reference/builder/
4. **Docker Compose** documentation: https://docs.docker.com/compose/
5. **Invoke** documentation: http://www.pyinvoke.org/

Setting-Up Environment

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1. **Clone the demo application** (blog + web API):

   git clone https://github.com/arugifa/ep2018-workshop
   git reset --hard setup

2. **Install requirements:**
   - Python 3.6
   - Tox (+ Pip + Virtualenv)
   - Docker & Docker Compose
   - Google Chrome

3. **Create a temporary virtualenv:**

   virtualenv -p python3.6 venv && source venv/bin/activate

Writing Tests

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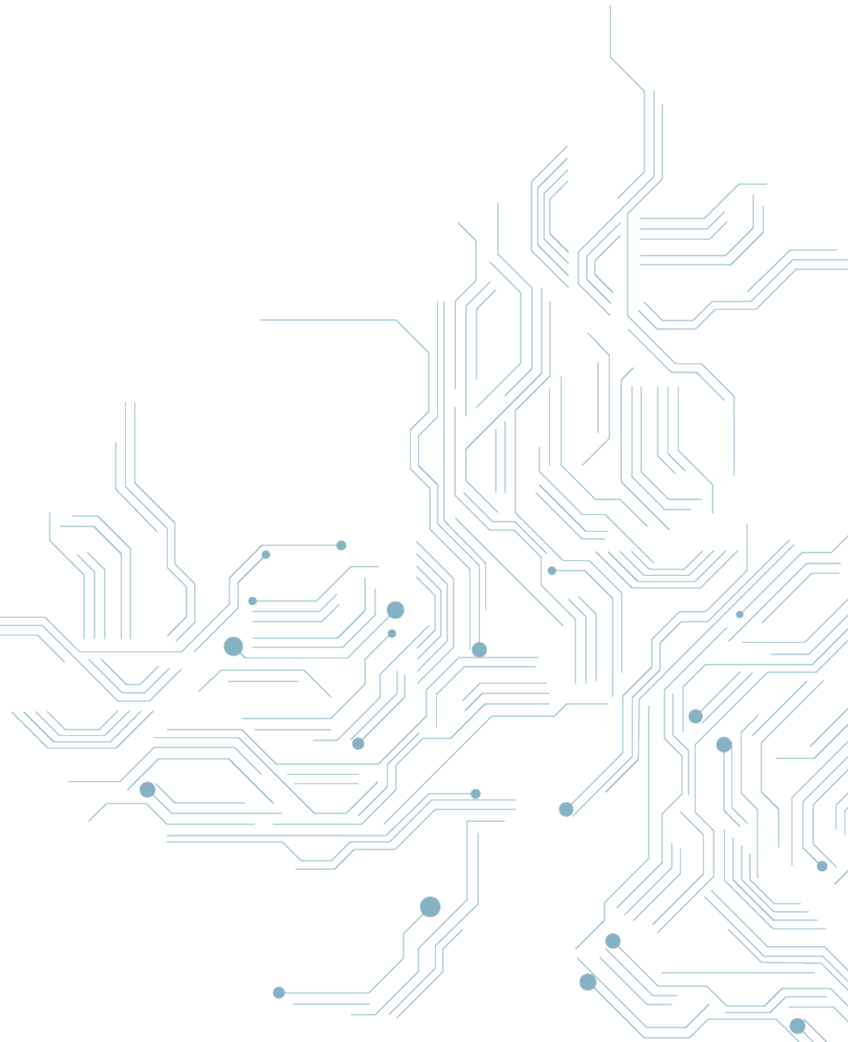
1. **Install Pytest + extensions:**

   pip install requirements-test.txt

2. **Have a look to existing fixtures:**

   vim tests/conftest.py

3. **Write tests:**
   - **Acceptance tests** with **Pytest-BDD** for the blog,
   - **End-to-end tests** with **Webtest** for the web API.



Automating Tests

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- **Write a Tox file** (Tox.ini) **with:**
  - one **Testing** environment,
  - two **Development** environments:
    - One to be used **locally** *(to get auto-completion in your IDE)*,
    - Another one to be used **in Docker** later on.
  - one **Linting** environment,
  - one environment to check **Security Issues** in dependencies.

Running Tests

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- **Write two Dockerfiles:**
  1. **One for Production:**
     - Based on **Python 3.6 Alpine**,
     - With **manage.py** as entrypoint,
     - We should be able to configure the database connection with an environment variable,
  2. **Another one for Testing:**
     - Based on the PROD image,
     - With test requirements
     - and **Tox** installed inside the container.

- **Write a Docker Compose file** (docker-compose.yml)**:**
  - With two services:
    - One for the web application,
    - Another one for **PostgreSQL**.
  - Share your local source code with the container.

Managing Workflow

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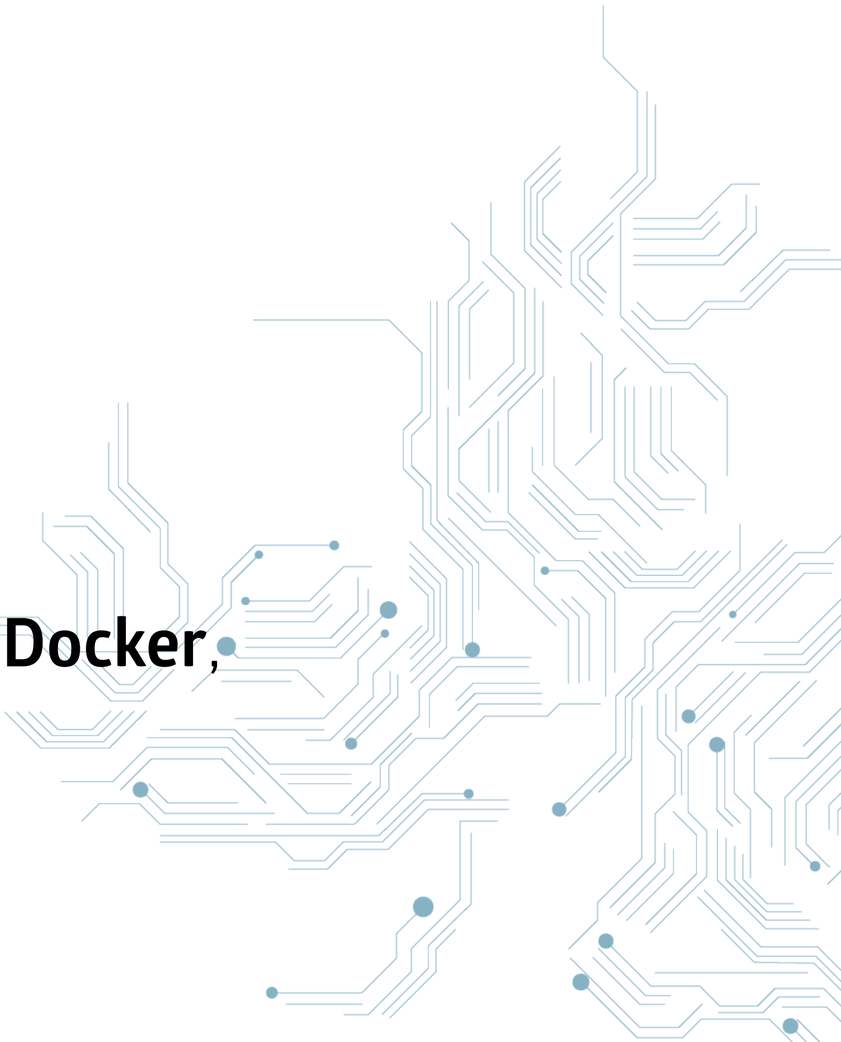
- **Write Invoke tasks** (tasks.py)**:**
  - Two tasks:
    - One to run the demo server,
    - Another one to run tests with **Tox**.
  - Both tasks should run in **Docker Compose**,
  - Provide a debug mode so we can:
    - manually execute **manage.py** or **Pytest** inside **Docker**,
    - and use **PDB** for troubleshooting bugs.



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