cookiecutter-python-package

Release 1.2.0

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COOKIECUTTER PYTHON PACKAGE

Python Package (pypi) Cookiecutter, with emphasis on CI/CD and automation.

Source: https://github.com/boromir674/cookiecutter-python-package
Docs: https://python-package-generator.readthedocs.io/en/master/
PyPI: https://pypi.org/project/cookiecutter-python/
CI: https://github.com/boromir674/cookiecutter-python-package/actions/

CHAPTER
TWO

FEATURES

1. Fresh **Python Package Project Generation**, "packaged" with a **Test Suite** and a **CI** Pipeline (see *Quickstart*)
2. **Python Package Template** (source code at src/cookiecutter_python/) implemented as a *Cookiecutter*
3. **Tested** on python versions **3.6, 2.7, 3.8, 3.9 and 3.10**, for both **"Linux"** and **"MacOS"** platforms (see *Test Workflow* on CI)

2.1 Auto Generated Sample Package Biskotaki

Check the **Biskotaki** *Python Package Project*, for a taste of the project structure and capabilities this Template can generate!
It it entirely generated using this **Python Package Template:**

Source Code hosted on *Github* at https://github.com/boromir674/biskotaki
Python Package hosted on *pypi.org* at https://pypi.org/project/biskotaki/
CI Pipeline hosted on *Github Actions* at https://github.com/boromir674/biskotaki/actions

2.2 Generated Python Package Features

1. **Test Suite**, using pytest, located in *tests* dir
2. **Parallel Execution** of Unit Tests, on multiple cpu's
3. **Documentation Pages**, hosted on *readthedocs* server, located in *docs* dir
4. **Automation**, using tox, driven by single *tox.ini* file
    a. **Code Coverage** measuring
    b. **Build Command**, using the build python package
    c. **Pypi Deploy Command**, supporting upload to both pypi.org and test.pypi.org servers
    d. **Type Check Command**, using mypy
    e. **Lint** *Check* and *Apply* commands, using isort and black
5. **CI Pipeline**, running on Github Actions, defined in *.github/*
    a. **Job Matrix**, spanning different *platform*'s and *python version*'s
        1. Platforms: *ubuntu-latest*, *macos-latest*
        2. Python Interpreters: *3.6*, *3.7*, *3.8*, *3.9*, *3.10*
    b. **Parallel Job** execution, generated from the *matrix*, that runs the *Test Suite*

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THREE

QUICKSTART

3.1 Installation

3.2 Usage

Open a console/terminal and run:

```
generate-python
```

Now, you should have generated a new Project for a Python Package, based on the Template!
Just 'enter' (*cd* into) the newly created directory, ie *cd* <*my-great-python-package*>.

Develop your package's **Source Code** (*business logic*) inside *src/my_great_python_package* dir :)
Develop your package's **Test Suite** (ie *unit-tests*, *integration tests*) inside *tests* dir :-)

Try Running the Test Suite!

```
tox
```

Read the Documentation's Use Cases section for more on how to leverage your generated Python Package features.

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FOUR

LICENSE

- GNU Affero General Public License v3.0

4.1 Free/Libre and Open Source Software (FLOSS)

CHAPTER
FIVE

NOTES

Currently, since the actual *cookiecutter* template does not reside on the *root* directory of the repository (but rather in *src/cookiecutter_python*), 'cloning' the repository locally is required at first.
This was demonstrated in the *Quickstart* section, as well.
For more complex use cases, you can modify the Template and also leverage all of *cookiecutter*'s features, according to your needs.

5.1 Introduction

This is **Cookiecutter Python Package**, a *Template Project* used to *generate* fresh new open source *Python Package*'s.
The Template is implemented as a *cookiecutter* and it is available both as source code and as a Python Package in itself.

Goal of this project is to automate the process of creating a new Python Package, by providing the user with a "bootstrap" method,
to quickly set up all the *support* files required to seemlessly build and publish the package on pypi.org (the official Python Pcakge Index public server).
Additionally, it instruments a basic **Test Suite**, multiple **Commands**, as well as a **CI** pipeline, with parallel execution of the *build matrix*, running on *Github Actions*.

This documentation aims to help people understand what are the features of the library and how they can use it. It presents some use cases and an overview of the library capabilities and overall design.

5.2 Why this Template?

So, why would one opt for this Template, instead of the many ones available online?
It is **easy to use**, allowing the generation of a completely fresh new *Python Package Project*, though a *cli*.
You can immediately have a *ci* infrastructure and multiple platform-agnostic *shell* commands working out-of-the-box, so you can focus on developing your *business logic* and your *test cases*

- It allows scaffolding new projects with a **Test Suite** included, designed to run *Test Cases* in **parallel** (across multiple cpu's) for *speed*.
- New Projects come with a **CI pipeline**, that triggers every time code is pushed on the remote.
- The pipeline hosts a **Test Workflow** (on *Github Actions*), designed to *stress-test* your package on multiple environments: Each environment differs from the others in terms of the combined *python versions operating system* and *package installation methods*

Apart from the above motivation, *cookiecutter* is a well established templating tool, that uses the robust *jinja2* templating engine.

5.3 Generate New Python Package Project

This *python generator* was designed to be installed via *pip* and then invoked through the cli.

5.3.1 Installing the cli

Cookiecutter Python Package, available as source code on github, is also published on *pypi.org*.

Install as PyPi package

Installing *cookiecutter-python* with *pip* is the way to go, for getting the *generate-python* cli onto your machine. Here we demonstrate how to do that using a

In virtual environment (recommended)

As with any Python Package, it is recommended to install *cookiecutter-python* inside a python *virtual environment*. You can use any of *virtualenv*, *venv*, *pyenv* of the tool of your choice. Here we demonstrate, using *virtualenv*, by running the following commands in a console (aka terminal):

1. Create a virtual environment

```
virtualenv env --python=python3
```

Open a console (aka terminal) and run:

2. Activate environment

```
source env/bin/activate
```

3. Install *cookiecutter-python*

```
pip install cookiecutter-python
```

4. Create symbolic link for the (current) user

```
ln -s env/bin/generate-python ~/.local/bin/generate-python
```

Now the *generate-python* executable should be available (assuming ~/.local/bin is in your PATH)!

For user (option 2)

One could also opt for a *user* installation of *cookiecutter-python* package:

```
python3 -m pip install --user cookiecutter-python
```

For all users (option 3)

The least recommended way of installing *cookiecutter-python* package is to *directly* install in the *host* machine:

```
sudo python3 -m pip install cookiecutter-python
```

Note the need to invoke using *sudo*, hence not that much recommended.

Check installation

Now the *generate-python* cli should be available!
You can verify by running the following:

```
generate-python --version
```

5.3.2 Using the cli

Using the cli is as simple as invoking *generate-python* from a console.

You can run the following to see all the available parameters you can control:

```
generate-python --help
```

The most common way to generate a new Python Package Project is to run:

```
generate-python
```

This will prompt you to input some values and create a fresh new Project in the current directory!
Now, simply *cd* into the generated Project's directory and enjoy some of the features the generator supplies new projects with!
More on use cases in the next section.

5.4 New Python Package Use Cases

Ready to enjoy some of your newly generated Python Package Project **features** available out-of-the-box!?
For instance:

1. Leverage the supplied *tox environments* to automate various **Testing** and **DevOps** related activities.
   Assuming you have *tox* installed (example installation command: *python3 -m pip install –user tox*) and you have done a *cd* into the newly generated Project directory, you can do for example:
   a. Run the **Test Suite** against different combinations of *Python versions* (ie 3.7, 3.8) and different ways of installing (ie 'dev', 'sdist', 'wheel') the <*my_great_python_package*> package:

      ```
      tox -e "py{3.7, 3.8}-{dev, sdist, wheel}"
      ```

   b. Check the code for **compliance** with **best practises** of the *Python packaging ecosystem* (ie PyPI, pip), build *sdist* and *wheel* distributions and store them in the *dist* directory:

      ```
      tox -e check && tox -e build
      ```

   c. **Deploy** the package's distributions in a *pypi* (index) server:

1. Deploy to **staging**, using the *test* pypi (index) server at test.pypi.org:

```
TWINE_USERNAME=username TWINE_PASSWORD=password PACKAGE_DIST_VERSION=1.0.0␣
↪tox -e deploy
```

2. Deploy to **production**, using the *production* pypi (index) server at pypi.org:

```
TWINE_USERNAME=username TWINE_PASSWORD=password PACKAGE_DIST_VERSION=1.0.0␣
↪PYPI_SERVER=pypi tox -e deploy
```

Note: Setting PYPI_SERVER=pypi indicates to deploy to *pypi.org* (instead of *test.pypi.org*).

Note: Please modify the TWINE_USERNAME, TWINE_PASSWORD and PACKAGE_DIST_VERSION environment variables, accordingly.
TWINE_USERNAME & TWINE_PASSWORD are used to authenticate (user credentials) with the targeted pypi server.
PACKAGE_DIST_VERSION is used to avoid accidentally uploading distributions of different versions than intended.

2. Leverage the **CI Pipeline** and its **build matrix** to run the **Test Suite** against a combination of different Platforms, different Python interpreter versions and different ways of installing the subject Python Package:
   Trigger the **Test Workflow** on the **CI server**, by *pushing* a git commit to a remote branch (ie *master* on github).
   Navigate to the *CI Pipeline web interface* (hosted on *Github Actions*) and inspect the **build** results!

Note: You might have already *pushed*, in case you answered *yes*, in the *initialize_git_repo* prompt, while generating the Python Package, and in that case, the **Test Workflow** should have already started running! Out-of-the-box, *triggering* the **Test Workflow** happens only when pushing to the *master* or *dev* branch.

5.5 cookiecutter_python

5.5.1 cookiecutter_python package

Subpackages

cookiecutter_python.hooks package

Submodules

cookiecutter_python.hooks.pre_gen_project module

exception cookiecutter_python.hooks.pre_gen_project.**InputSanitizationError**

Bases: Exception

cookiecutter_python.hooks.pre_gen_project.**get_request**()

cookiecutter_python.hooks.pre_gen_project.**hook_main**(*request*)

cookiecutter_python.hooks.pre_gen_project.**input_sanitization**(*request*)

cookiecutter_python.hooks.pre_gen_project.**main**()

cookiecutter_python.hooks.post_gen_project module

Cookiecutter post generation hook script that handles operations after the template project is used to generate a target project.

exception cookiecutter_python.hooks.post_gen_project.**PostFileRemovalError**

Bases: Exception

cookiecutter_python.hooks.post_gen_project.**get_request**()

cookiecutter_python.hooks.post_gen_project.**git_add**(*project_dir: str*)

Do a Git add operation on the generated project.

cookiecutter_python.hooks.post_gen_project.**git_commit**(*request*)

Commit the staged changes in the generated project.

cookiecutter_python.hooks.post_gen_project.**grant_basic_permissions**(*project_dir: str*)

cookiecutter_python.hooks.post_gen_project.**initialize_git_repo**(*project_dir: str*)

Initialize the Git repository in the generated project.

cookiecutter_python.hooks.post_gen_project.**is_git_repo_clean**(*project_directory: str*)

Check to confirm if the Git repository is clean and has no uncommitted changes. If its clean return True otherwise False.

cookiecutter_python.hooks.post_gen_project.**main**()

cookiecutter_python.hooks.post_gen_project.**post_file_removal**(*request*)

cookiecutter_python.hooks.post_gen_project.**post_hook**()

cookiecutter_python.hooks.post_gen_project.**python36_n_below_run_params**(*project_directory: str*)

cookiecutter_python.hooks.post_gen_project.**python37_n_above_run_params**(*project_directory: str*)

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