Packaging and Distributing

Create, package and distribute your own python application

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Málaga Python MeetUp

Index

Introduction

Why should I distribute my application?

- Given enough eyeballs, all bugs are shallow.

[1] https://opensource.com/life/15/12/why-open-source

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- Upstream improvements.

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- Modular.

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Why should I distribute my application?

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- Upstream improvements.
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- Modular.
- Great advertising.

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- Great advertising.
- Attract talent.

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- Attract talent.
- Stand on the shoulders of giants.

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- Attract talent.
- Stand on the shoulders of giants.
- Best technical interview possible.

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- Attract talent.
- Stand on the shoulders of giants.
- Best technical interview possible.
- Show your code.

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Versioning

Version schema

A normal version must be denoted by `X.Y.Z` where `X`, `Y` and `Z` are positive integers. `X` represents the major version, `Y` the minor version and `Z` the patch version. Version `1.0.0` defines the public API.

[1] http://semver.org/

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Version upgrade

Given a version number, increment:

Major	version when you make incompatible API changes. Reset minor and patch version to `0`.
Minor	version when you add functionality in a backwards-compatible manner. Reset patch version to `0`.
Patch	version when you make backwards-compatible bug fixes.

[1] http://semver.org/

Tools I

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Static code analysis using different tools.

https://github.com/landscapeio/prospector

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Utility to upgrade your project version.
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https://github.com/peritus/bumpversion

Pre-commit
Utility that does some checks before git commits.
https://github.com/pre-commit/pre-commit

Tools II

Tox

Run your tests using many different python interpreters.

https://github.com/tox-dev/tox

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Utility to create powerful Command Line Interfaces with a few lines.
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Cookiecutter

Application that creates project skeletons using Jinja templates.
https://github.com/audreyr/cookiecutter

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Application that creates project skeletons using Jinja templates.
https://github.com/audreyr/cookiecutter

Cookiecutter Template
Cookiecutter template for Python packages.
https://github.com/PeRDy/cookiecutter-python-package

Services

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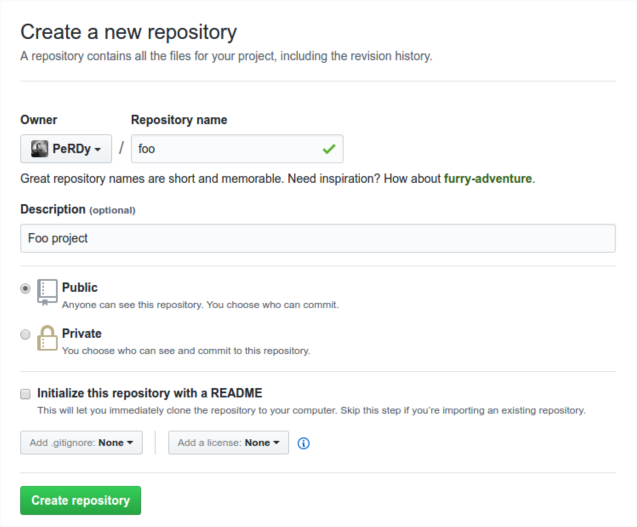
Keeps the changes of test coverage of your code. https://coveralls.io

ReadTheDocs
Stores and serves documentation for your project. https://readthedocs.io

Creation

Storing the project



Create a new repository

A repository contains all the files for your project, including the revision history.

Owner: PeRDy / Repository name: foo ✓

Great repository names are short and memorable. Need inspiration? How about **furry-adventure**.

Description (optional)

Foo project

[✓ Public] Anyone can see this repository. You choose who can commit.

Private: You choose who can see and commit to this repository.

☐ **Initialize this repository with a README**

This will let you immediately clone the repository to your computer. Skip this step if you're importing an existing repository.

Add .gitignore: **None** | Add a license: **None**

Create the project skeleton

Cookiecutter context

Define all variables needed by cookiecutter to properly create the project skeleton, these variables can be found in *cookiecutter.json* file.

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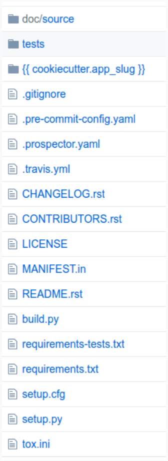
Commit & push

Time to do your first commit and push to repository:

```
git remote add origin git@github.com:PeRDy/foo.git
git commit -a -m ”Initial commit”
git push
```

Project hierarchy


doc/source
tests
{{ cookiecutter.app_slug }}
.gitignore
.pre-commit-config.yaml
.prospector.yaml
.travis.yml
CHANGELOG.rst
CONTRIBUTORS.rst
LICENSE
MANIFEST.in
README.rst
build.py
requirements-tests.txt
requirements.txt
setup.cfg
setup.py
tox.ini

Documentation folder

The place that keeps all the documentation source files as well as the doc config file.

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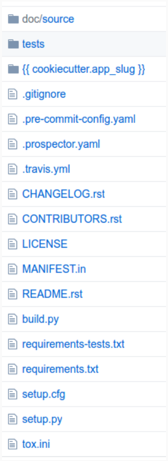

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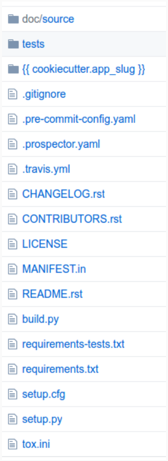

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The application itself, the *python package* distributed, and the same that other users will import in their applications.

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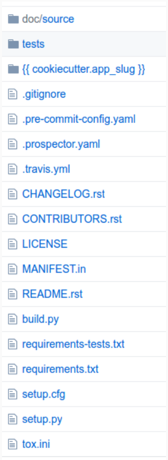

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Root files

Files that keeps in the root directory are usually:

- Tools configuration.
- Services configuration.
- Build scripts.
- Metadata.

Relevant files I

Manifest

This file, `MANIFEST.in`, with own syntax[1] defines the directories and files that will be included in the distributable package.

[1] https://docs.python.org/3/distutils/commandref.htmlsdist-cmd

Relevant files I

Manifest

This file, `MANIFEST.in`, with own syntax[1] defines the directories and files that will be included in the distributable package.

Requirements

List all requirements of your project, that are added as dependencies when installed. Usually requirements are splitted in two files:
`requirements.txt` for real dependencies and
`requirements-tests.txt` for dependencies necessaries to test the project.

[1] https://docs.python.org/3/distutils/commandref.htmlsdist-cmd

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Metadata

Metadata files: `README.rst`, `CONTRIBUTORS.rst`, `CHANGELOG.rst` and `LICENSE`.

[1] https://docs.python.org/3/distutils/commandref.htmlsdist-cmd

Relevant files II

Tools and Services config

Configuration files for tools and services: `setup.cfg`, `.pre-commit-config.yaml`, `.prospector.yaml`, `.travis.yml`, `.gitignore`.

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Setup
Main file that defines how the project will be packaged, gather metadata from other files and provides an interface to create distributable packages.

Relevant files II

Tools and Services config

Configuration files for tools and services: `setup.cfg`, `.pre-commit-config.yaml`, `.prospector.yaml`, `.travis.yml`, `.gitignore`.

Setup

Main file that defines how the project will be packaged, gather metadata from other files and provides an interface to create distributable packages.

Tox

Tox file, `tox.ini`, defines the environments and commands that tox executes. In this case, defines an environment for each python version that should be tested, another for run lint tools and the last one for compile documentation.

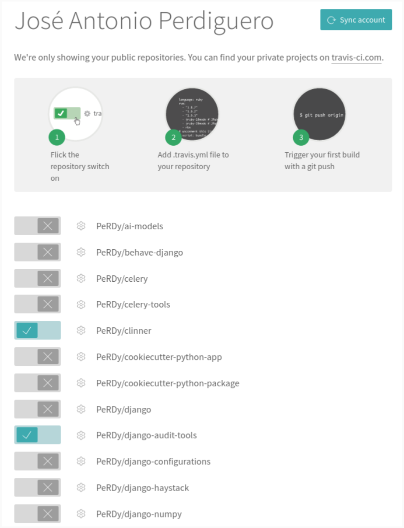
Relevant files III

Build

The build file, `build.py`, is the entrypoint for everything related to build, including *testing*, *packaging* and *distributing*. This is a command line application using *Clinner* that provides a set of utility commands such as:

- Run tests and code coverage.
- Run lint.
- Run tox.
- Create documentation.
- Upgrade version, create package and upload to pypi.

Bind Travis



José Antonio Perdiguero

We're only showing your public repositories. You can find your private projects on travis-ci.com.

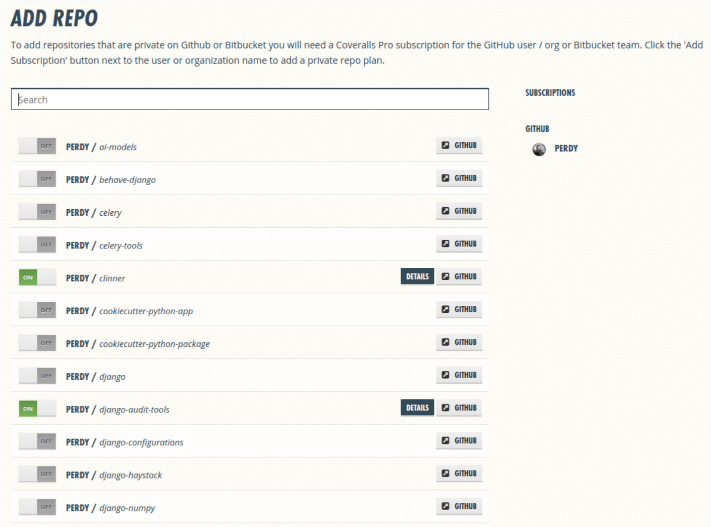
1 Flick the repository switch on

2 Add .travis.yml file to your repository

3 Trigger your first build with a git push

✗	PeRDy/ai-models
✗	PeRDy/behave-django
✗	PeRDy/celery
✗	PeRDy/celery-tools
✓	PeRDy/clinner
✗	PeRDy/cookiecutter-python-app
✗	PeRDy/cookiecutter-python-package
✗	PeRDy/django
✓	PeRDy/django-audit-tools
✗	PeRDy/django-configurations
✗	PeRDy/django-haystack
✗	PeRDy/django-numpy

Bind Coveralls

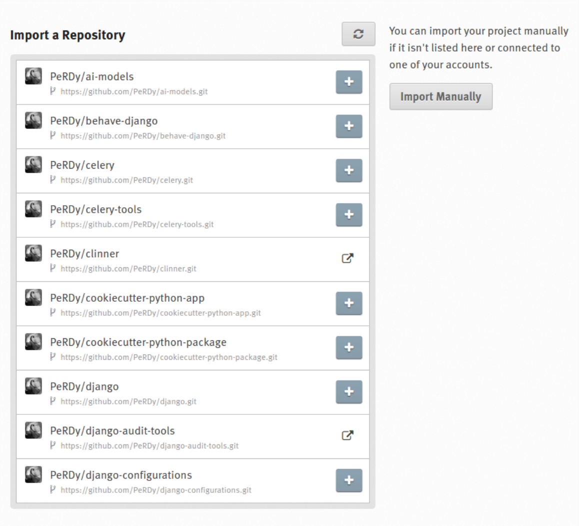


ADD REPO

To add repositories that are private on Github or Bitbucket you will need a Coveralls Pro subscription for the GitHub user / org or Bitbucket team. Click the 'Add Subscription' button next to the user or organization name to add a private repo plan.

OFF	PERDY / *ai-models*		GITHUB
OFF	PERDY / *behave-django*		GITHUB
OFF	PERDY / *celery*		GITHUB
OFF	PERDY / *celery-tools*		GITHUB
ON	PERDY / *clinner*	DETAILS	GITHUB
OFF	PERDY / *cookiecutter-python-app*		GITHUB
OFF	PERDY / *cookiecutter-python-package*		GITHUB
OFF	PERDY / *django*		GITHUB
ON	PERDY / *django-audit-tools*	DETAILS	GITHUB
OFF	PERDY / *django-configurations*		GITHUB
OFF	PERDY / *django-haystack*		GITHUB
OFF	PERDY / *django-numpy*		GITHUB

Bind ReadTheDocs



Import a Repository

PeRDy/ai-models
https://github.com/PeRDy/ai-models.git

PeRDy/behave-django
https://github.com/PeRDy/behave-django.git

PeRDy/celery
https://github.com/PeRDy/celery.git

PeRDy/celery-tools
https://github.com/PeRDy/celery-tools.git

PeRDy/clinner
https://github.com/PeRDy/clinner.git

PeRDy/cookiecutter-python-app
https://github.com/PeRDy/cookiecutter-python-app.git

PeRDy/cookiecutter-python-package
https://github.com/PeRDy/cookiecutter-python-package.git

PeRDy/django
https://github.com/PeRDy/django.git

PeRDy/django-audit-tools
https://github.com/PeRDy/django-audit-tools.git

PeRDy/django-configurations
https://github.com/PeRDy/django-configurations.git

You can import your project manually if it isn't listed here or connected to one of your accounts.

Packaging

Test your application

Development

Run tests while developing using nose.

```
python build.py test
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Multi-environment

Once development is done, run tests against all different interpreters supported to check compatibility.

```
python build.py tox
```

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Run tests while developing using nose.

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Once development is done, run tests against all different interpreters supported to check compatibility.

```
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```

Continuous Integration

Development is done, tests pass in every environment, so code can be uploaded to repository safely. Once a commit is done:

Travis	run tests in every environment and will notify in case any test didn't pass. When all tests pass,
Coveralls	records current code coverage. In the same commit,
ReadTheDocs	gets the code, build docs and updates the project's doc page.

Package types

Egg

Source distribution.

```
python setup.py sdist
```

Package types

Egg

Source distribution.

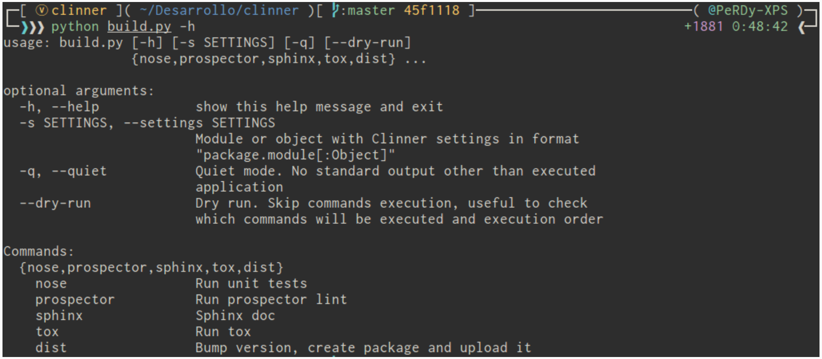
```
python setup.py sdist
```

Wheel

Built and binary distribution.

```
python setup.py bdist_wheel
```

Builder



```
┌─[ ⓥclinner ]( ~/Desarrollo/clinner )[ :master 45f1118 ]──────────────────────( @PeRDy-XPS )─┐
└─❯❯❯ python build.py -h                                                        +1881 0:48:42 ❮─┘
usage: build.py [-h] [-s SETTINGS] [-q] [--dry-run]
                {nose,prospector,sphinx,tox,dist} ...

optional arguments:
  -h, --help            show this help message and exit
  -s SETTINGS, --settings SETTINGS
                        Module or object with Clinner settings in format
                        "package.module[:Object]"
  -q, --quiet           Quiet mode. No standard output other than executed
                        application
  --dry-run             Dry run. Skip commands execution, useful to check
                        which commands will be executed and execution order

Commands:
  {nose,prospector,sphinx,tox,dist}
    nose                Run unit tests
    prospector          Run prospector lint
    sphinx              Sphinx doc
    tox                 Run tox
    dist                Bump version, create package and upload it
```

Distributing

Register the application

PyPI account

Create a PyPI[1] account. Configure `.pypirc` file with PyPI credentials.

[1] https://pypi.python.org/pypi
[2] https://github.com/pypa/twine

Register the application

PyPI account

Create a PyPI[1] account. Configure `.pypirc` file with PyPI credentials.

Application register

Use twine[2] with a package of your application to register it in PyPI:

```
twine register dist/project-name.whl
```

[1] https://pypi.python.org/pypi
[2] https://github.com/pypa/twine

Upload a new version

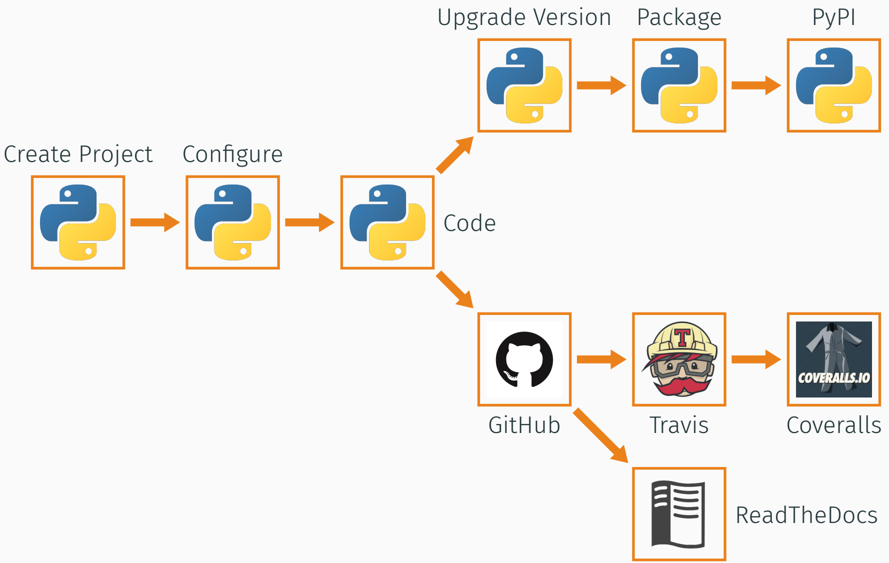
Upload packages

Use twine again to upload all packages to PyPI:

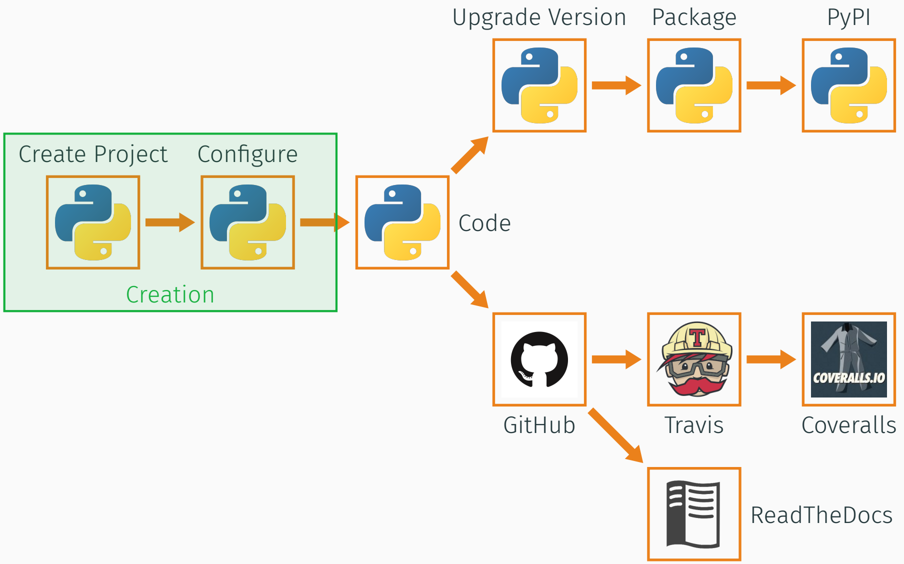
```
twine upload dist/project-name.whl
twine upload dist/project-name.tar.gz
```

Conclusion

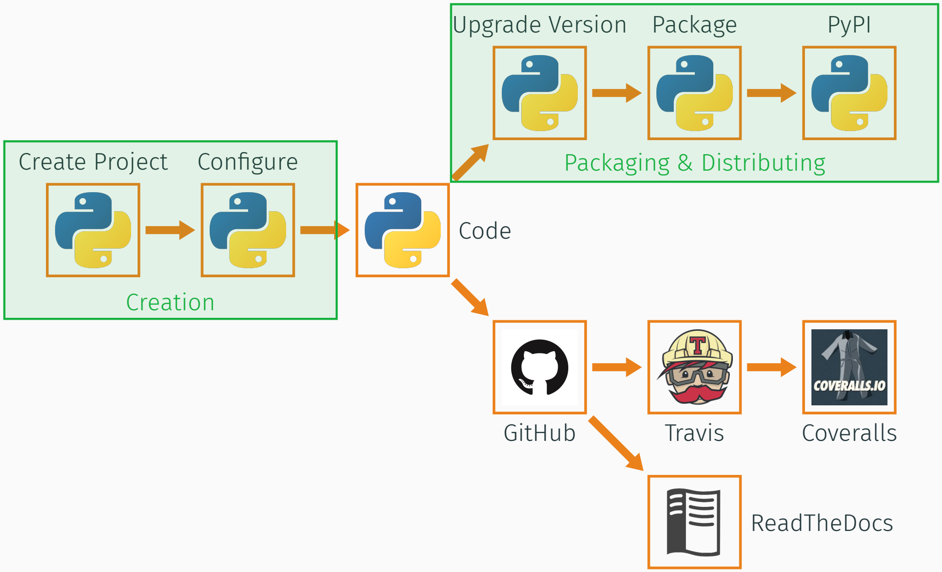
Full workflow



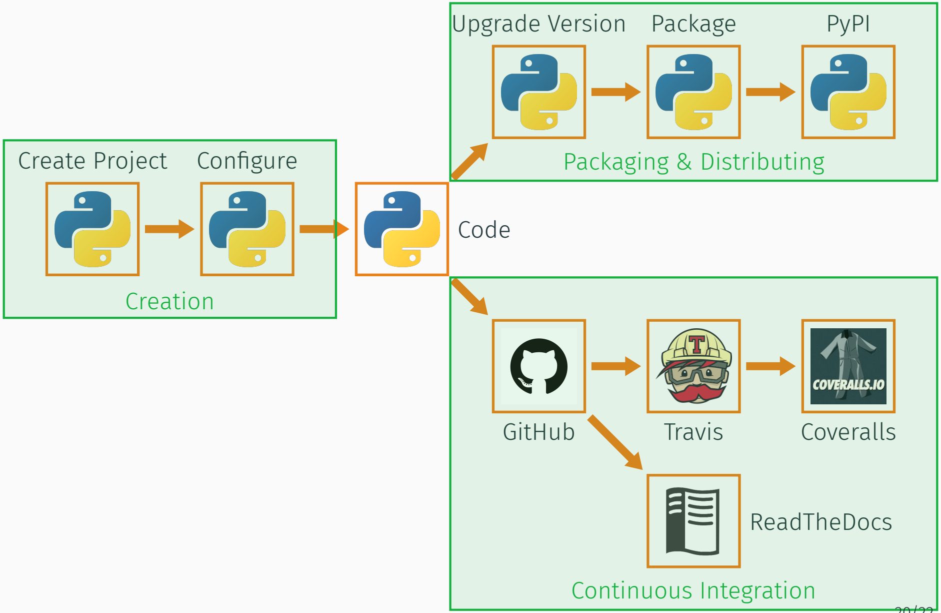
Full workflow



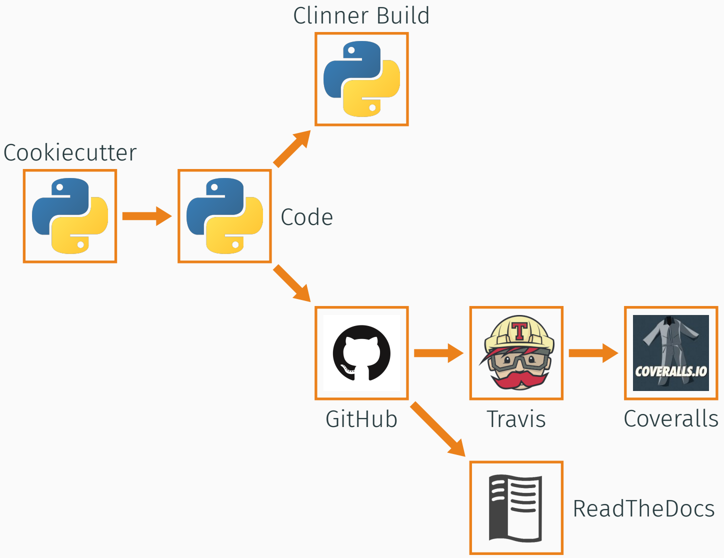
Full workflow



Full workflow



Simplified workflow I



Simplified workflow II

Workflow execution

```
cookiecutter <project_name>
...code...
python build.py dist (patch|minor|major)
git push
```

Open source your code !