Shipping your first Python package and automating future publishing

Chris Wilcox

About Me

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https://crwilcox.com

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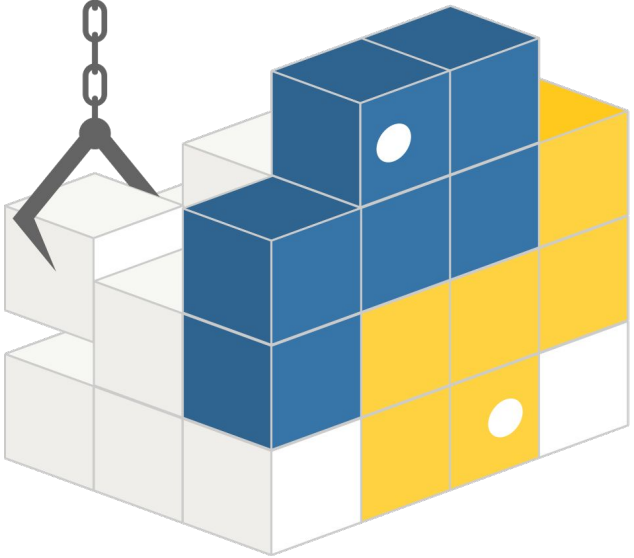
Outline

- Create and publish a simple package to PyPI
- Discuss additional features of setup.py and PyPI
- Automation and tools that make maintaining libraries easier

python™ Package Index



crwilcox @chriswilcox47

Creating your first Python package

```
├── README.md
└── mypackage
    ├── __init__.py
    └── mypackage.py
```

```
class MyPackage():
    def spam(self):
        return "eggs"
```

A simple setup.py file

```
├── README.md
├── mypackage
│   ├── __init__.py
│   └── mypackage.py
└── setup.py
```

```python
import setuptools

setuptools.setup(
    name='mypackage',
    version='0.0.1',
    description='My first package',
    packages=setuptools.find_packages(),
)
```

Test locally

- Install in development mode
- Validate package can be imported and called.

```
$ python -m venv venv
$ source venv/bin/activate
$ pip install -e .

$ python
>>> import mypackage
>>> mypackage.MyPackage().spam()
'eggs'
```

Upload to TestPyPI

Create an account at
https://test.pypi.org/account/register/

```
# Install Dependencies
$ pip install twine wheel

# Package and Upload to TestPyPI
$ python setup.py sdist bdist_wheel
$ twine upload --repository testpypi dist/*

# Install from TestPyPI
$ pip install --index-url https://test.pypi.org/simple/ mypackage
```

Upload to PyPI

Create an account at
https://pypi.org/account/register/

```
$ python setup.py sdist bdist_wheel
$ twine upload --repository pypi dist/*
```

My first package

Navigation

Project description

Release history

Download files

Statistics

View statistics for this project via Libraries.io, or by using Google BigQuery

Maintainers

crwilcox

Project description

The author of this package has not provided a project description

```
$ pip install mypackage
```

Elf (2003)
New Line Cinema

Office Space (1999)
Twentieth Century Fox

Author Information

```
$ python setup.py sdist

running check
warning: Check: missing required meta-data: url
warning: Check: missing meta-data: either (author and author_email) or
(maintainer and maintainer_email)
must be supplied
```

```
setuptools.setup(
  ...
  url="https://github.com/crwilcox/my-pypi-package",
  author="Chris Wilcox",
  author_email="pypi@crwilcox.com",
)
```

Classifiers

- Over 600 classifiers
- https://pypi.org/classifiers/

```
setuptools.setup(
 ...
  classifiers=[
   "Development Status :: 3 - Alpha"
   "Programming Language :: Python",
   "Programming Language :: Python :: 3",
   "Programming Language :: Python :: 3.5",
   "Programming Language :: Python :: 3.6",
   "Programming Language :: Python :: 3.7",
   "Operating System :: OS Independent",
   "Topic :: Utilities",
  ]
)
```

Specify a License

- 80 License Classifiers
- Most Common:
  - MIT
  - Apache 2.0
  - GNU GPLv3

```
setuptools.setup(
  ...
  license="Apache 2.0",
  classifiers=[
    "License :: OSI Approved :: Apache Software
License",
    ...
  ],
)
```

Provide a longer description

Supported Formats:

- Plain Text
- CommonMark
- ReStructured Text (.rst)
- GitHub Flavored Markdown (.md)

```
import setuptools

with open("README.md") as f:
    long_description = f.read()

setuptools.setup(
  ...
  long_description=long_description,
  long_description_content_type="text/markdown"
  ...
)
```

setup.py

```
setuptools.setup(
  name="mypackage",
  version="0.0.1",
  description="My first package",
  long_description=long_description,
  long_description_content_type="text/markdown",
  license="Apache 2.0",
  packages=setuptools.find_packages(),
  url="https://github.com/crwilcox/my-pypi-package",
  author="Chris Wilcox",
  author_email="pypi@crwilcox.com",
  classifiers=[
    "Development Status :: 3 - Alpha",
    "License :: OSI Approved :: Apache Software License",
    "Programming Language :: Python",
    "Programming Language :: Python :: 3",
    "Programming Language :: Python :: 3.5",
    "Programming Language :: Python :: 3.6",
    "Programming Language :: Python :: 3.7",
    "Operating System :: OS Independent",
    "Topic :: Utilities",
  ],
)
```

Navigation

- Project description
- Release history
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Project links

- Homepage

Statistics

View statistics for this project via Libraries.io, or by using Google BigQuery

Meta

License: Apache Software License (Apache 2.0)

Author: Chris Wilcox

Maintainers


crwilcox

Classifiers

Development Status
3 - Alpha

License
OSI Approved :: Apache Software License

Operating System
OS Independent

Programming Language
Python
Python :: 3
Python :: 3.5
Python :: 3.6
Python :: 3.7

Topic
Utilities

Project description

`mypackage` is a sample package made to demonstrate how to create a package of your own

Quick Start

Supported Python Versions

Python >= 3.5

Mac/Linux

```
pip install virtualenv
virtualenv <your-env>
source <your-env>/bin/activate
<your-env>/bin/pip install google-cloud-firestore
```

Windows

```
pip install virtualenv
virtualenv <your-env>
<your-env>\Scripts\activate
<your-env>\Scripts\pip.exe install google-cloud-firestore
```

Example Usage

```
import mypackage
mypackage.MyPackage().spam()
```

Requiring specific python versions

```
setuptools.setup(
  ...
  python_requires='>=3.5’,
)
```

Requiring dependencies

```
setuptools.setup(
  ...
  install_requires=[
    "urllib3",
    "requests",
  ],
)
```

Minimizing package size

```
setuptools.setup(
  ...
  packages=find_packages(
    exclude=[
        'docs', 'tests', 'test_data']),
)
```

Handling secrets for the upload

Do it manually:

```
$ twine upload --repository-url
https://test.pypi.org/legacy/
dist/*
username: ...
password: ...
```

Store password in .pypirc:

```
[pypi]
repository: <repository-url>
username: <username>
password: <password>
```

Use keyring:

```
$ pip install keyring

$ python3 -m keyring set
https://test.pypi.org/legacy/
your-username

$ python3 -m keyring get
https://test.pypi.org/legacy/
your-username
```

“How am I supposed to remember all of this?”

- You, the audience. Probably.

pypa / sampleproject

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Branch: master ▾ sampleproject / setup.py

Find file | Copy path

utkonos Update Packaging documentation link 63e13c7 on Mar 26

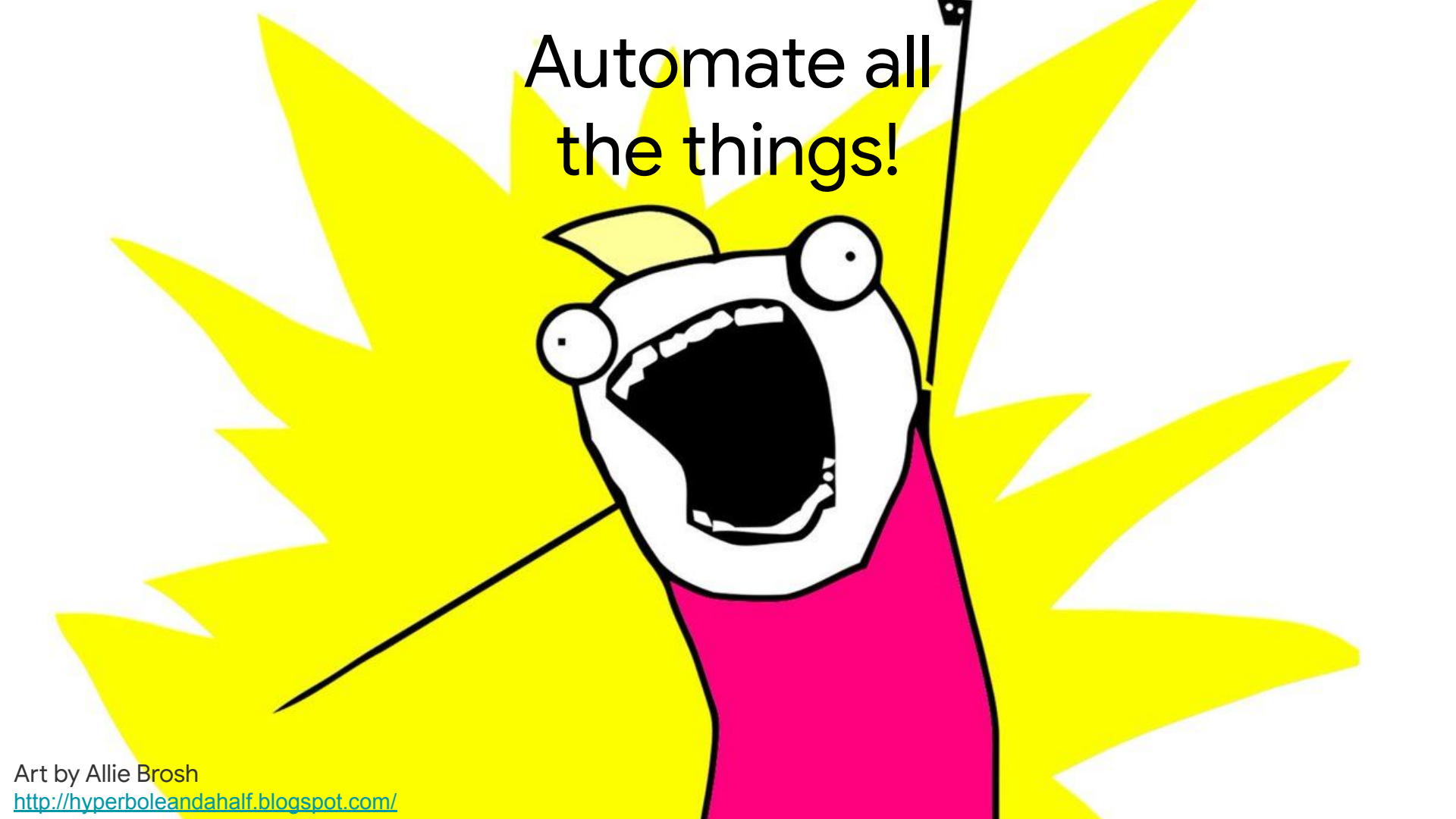
22 contributors

209 lines (182 sloc) | 8.7 KB

Raw | Blame | History

```
"""A setuptools based setup module.

See:
https://packaging.python.org/guides/distributing-packages-using-setuptools/
https://github.com/pypa/sampleproject
"""

# Always prefer setuptools over distutils
from setuptools import setup, find_packages
from os import path
# io.open is needed for projects that support Python 2.7
# It ensures open() defaults to text mode with universal newlines,
# and accepts an argument to specify the text encoding
# Python 3 only projects can skip this import
from io import open
```


```
$ pip install cookiecutter

$ cookiecutter gh:audreyr/cookiecutter-pypackage

full_name [Audrey Roy Greenfeld]: Chris Wilcox

email [audreyr@example.com]: chriswilcox@google.com

github_username [audreyr]: crwilcox

project_name [Python Boilerplate]: PyCon2019

project_slug [pycon2019]:
```



Art by Allie Brosh
http://hyperboleandahalf.blogspot.com/

Reasons to automate

- You aren’t managing credentials
- You ensure consistency in publishing process
- You allow things to scale

Choose a test automation tool

Tox

- Popular
- .ini based

Nox

- Flexible
- Python based

noxfile.py

- Runs unit tests on 3 versions of python

```python
import nox

@nox.session(python=["3.5", "3.6", "3.7"])
def unit(session):
    """Run the unit test suite."""
    session.install("mock", "pytest")
    session.install("-e", ".")

    # Run py.test against the unit tests.
    session.run(
        "py.test",
        "--quiet",
        "tests",
        *session.posargs,
    )
```

noxfile.py

- Can also be used to run docs builds
- Extensible since all sessions are python functions

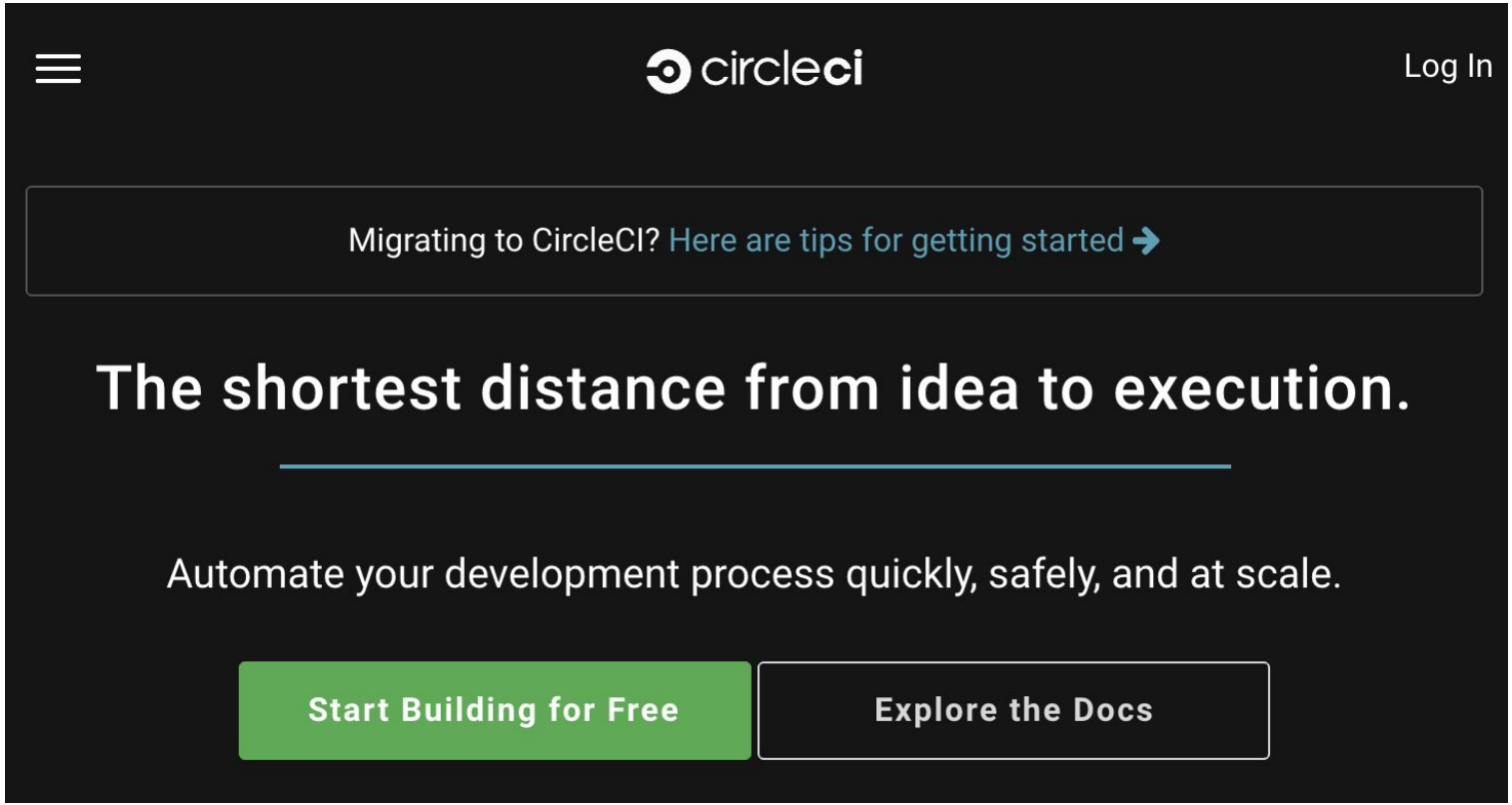
```python
import nox

@nox.session(python=3.7)
def docs(session):
    session.install("Sphinx < 2.0dev")
    session.install("-e", ".")
    run_args = [
        "sphinx-build",
        ...,
    ]
    session.run(*run_args)
```

For more on Nox, Tox, and Invoke

Break the Cycle: Three excellent Python tools to automate repetitive tasks

Presenter: Thea Flowers

Choose a CI Provider



Projects » Add Projects » crwilcox/my-pypi-package

Next Steps

You're almost there! We're going to walk you through setting up a configuration file, committing it, and turning on our listener so that CircleCI can test your commits.

Want to skip ahead? Jump right into our documentation, set up a .yml file, and kick off your build with the button below.

If you start building before you've added a configuration file, your project will not run. To build your project, add a .circleci/config.yml file. **Add a project on CircleCI 2.0**.

1. Create a folder named `.circleci` and add a file `config.yml` (so that the filepath be in `.circleci/config.yml`).
2. Populate the config.yml with the contents of the sample .yml (shown below). Copy To Clipboard
3. Update the sample .yml to reflect your project's configuration.
4. Push this change up to GitHub.
5. Start building! This will launch your project on CircleCI and make our webhooks listen for updates to your work. Start building

Sample .yml File

```
# Python CircleCI 2.0 configuration file
#
# Check https://circleci.com/docs/2.0/language-python/ for more details
#
version: 2
jobs:
  build:
    docker:
      # specify the version you desire here
      # use `-browsers` prefix for selenium tests, e.g. `3.6.1-browsers`
      - image: circleci/python:3.6.1
```

circleci/config.yml

Configure workflows

- test runs tests against a specific version and runs tests
- deploy packages and publishes to PyPI on a GitHub tag

```
workflows:
  build_and_deploy:
    jobs:
      - test:
          name: "test-3.5"
          version: "3.5"
      - test:
          name: "test-3.6"
          version: "3.6"
      - test:
          name: "test-3.7"
          version: "3.7"
          filters:
            tags:
              only: /.*/
      - deploy:
          requires:
            - test-3.7
          filters:
            tags:
              only: /[0-9]+(\.[0-9]+)*/
            branches:
              ignore: /.*/
```

circleci/config.yml

Test Job

```
jobs:
  test:
    parameters:
      version:
        type: string
        default: latest
    docker:
      - image: circleci/python:<< parameters.version >>
    steps:
      - checkout
      - run:
          name: install python dependencies
          command: |
            python3 -m venv venv
            . venv/bin/activate
            pip install nox
      - run:
          name: run tests
          command: |
            . venv/bin/activate
            nox
```

circleci/config.yml

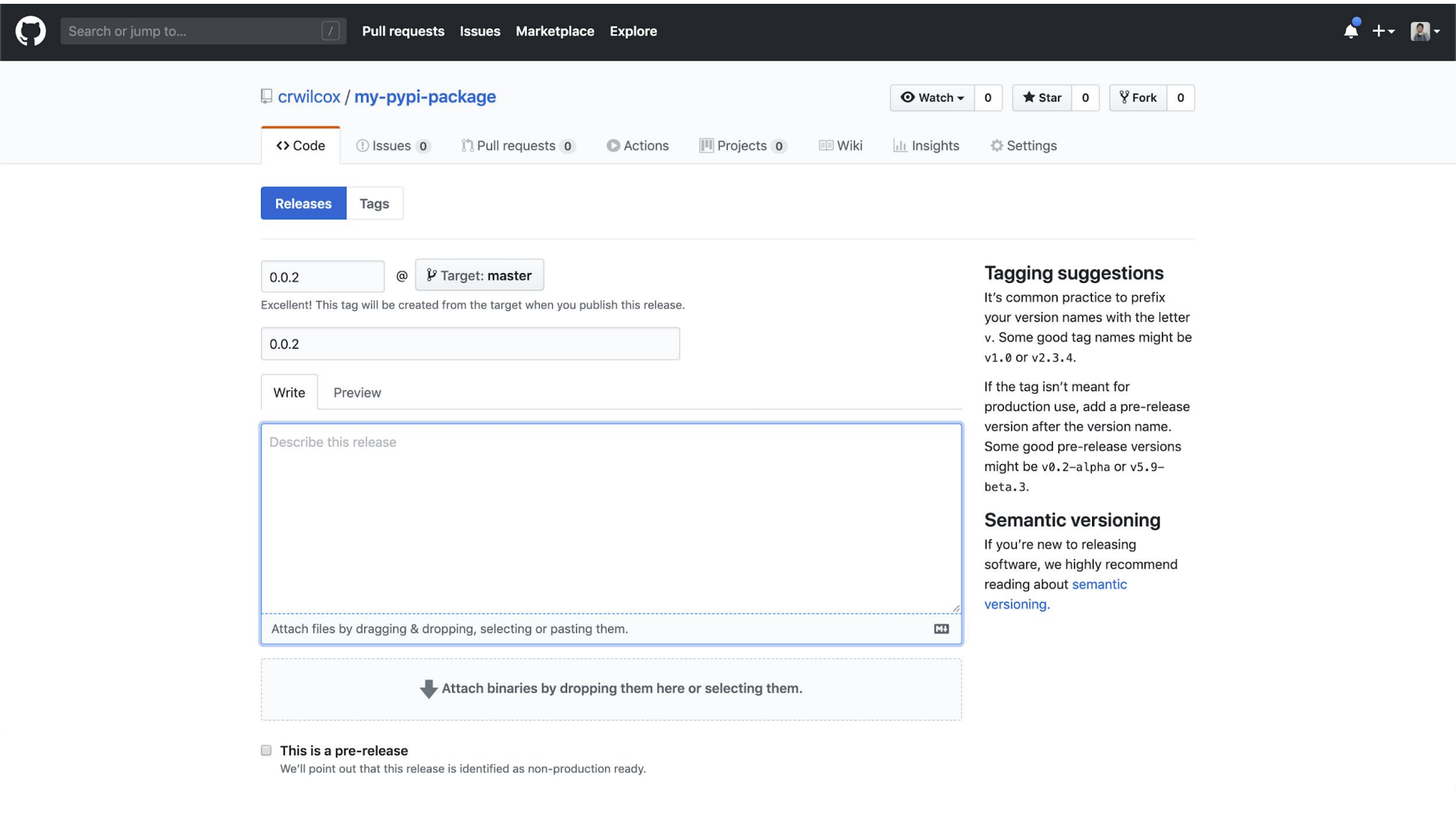
Deploy Job

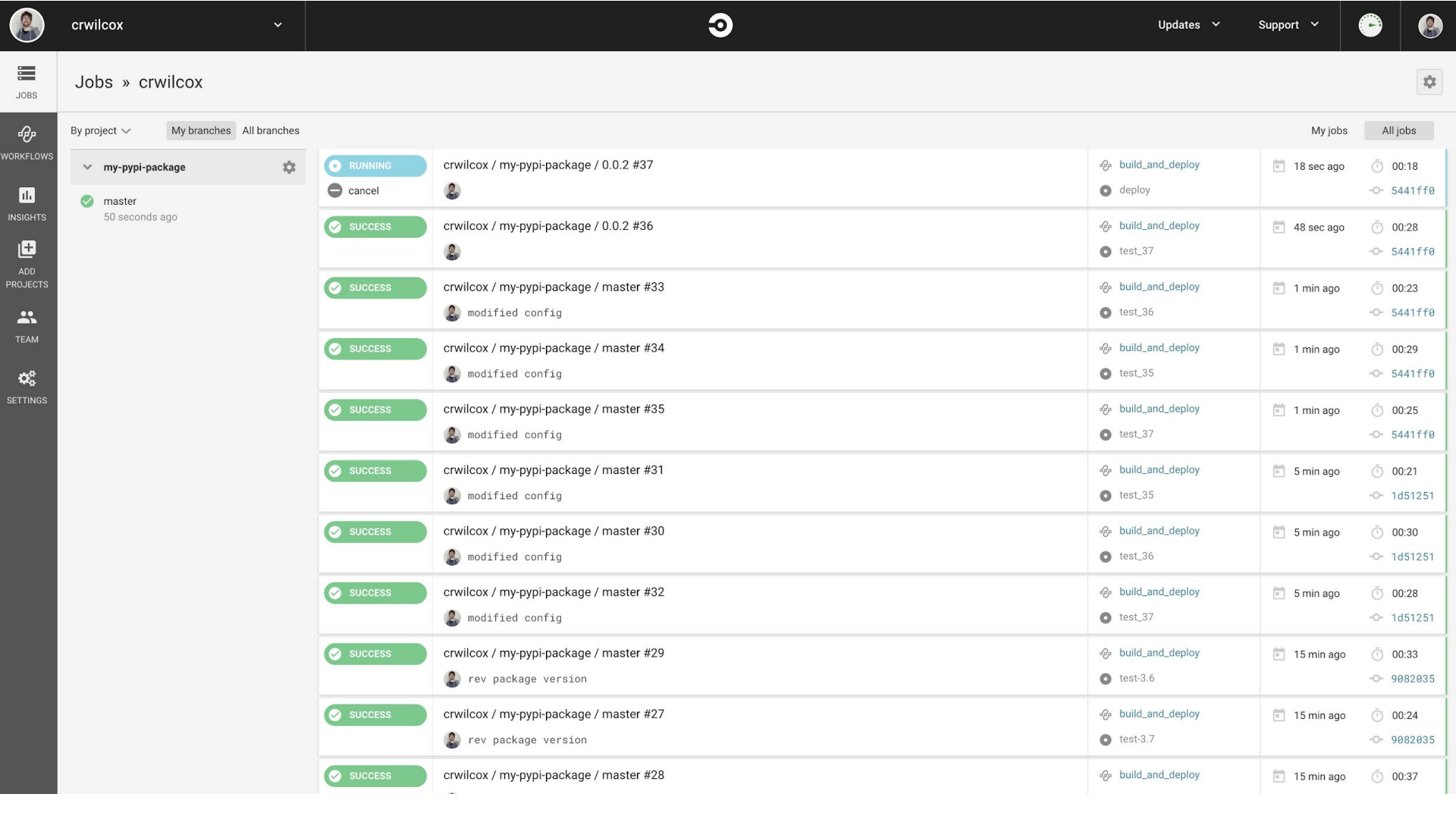
```
jobs:
  deploy:
    docker:
      - image: circleci/python:3.7
    steps:
      - checkout
      - run:
          name: install python dependencies
          command: |
            python3 -m venv venv
            . venv/bin/activate
            pip install twine wheel
      - run:
          name: create package
          command: |
            . venv/bin/activate
            python setup.py sdist bdist_wheel
      - run:
          name: upload to pypi
          command: |
            . venv/bin/activate
            twine upload --repository pypi dist/*
```

Shipping a new version

```
├── .circleci
│   └── config.yml
├── .gitignore
├── README.md
├── mypackage
│   ├── __init__.py
│   └── mypackage.py
├── noxfile.py
├── setup.py
└── tests
    └── test_mypackage.py
```

```python
import setuptools

setuptools.setup(
    name='mypackage',
    version='0.0.2',
    ...
)
```


Search or jump to...
Pull requests
Issues
Marketplace
Explore
crwilcox / my-pypi-package
Watch 0
Star 0
Fork 0
Code
Issues 0
Pull requests 0
Actions
Projects 0
Wiki
Insights
Settings
Releases
Tags
0.0.2
@
Target: master
Excellent! This tag will be created from the target when you publish this release.
0.0.2
Write
Preview
Describe this release
Attach files by dragging & dropping, selecting or pasting them.
Attach binaries by dropping them here or selecting them.
This is a pre-release
We'll point out that this release is identified as non-production ready.
Tagging suggestions
It's common practice to prefix your version names with the letter v. Some good tag names might be v1.0 or v2.3.4.
If the tag isn't meant for production use, add a pre-release version after the version name. Some good pre-release versions might be v0.2-alpha or v5.9-beta.3.
Semantic versioning
If you're new to releasing software, we highly recommend reading about semantic versioning.


crwilcox
Updates
Support
JOBS
WORKFLOWS
INSIGHTS
ADD PROJECTS
TEAM
SETTINGS
Jobs » crwilcox
By project
My branches
All branches
My jobs
All jobs
my-pypi-package
master
50 seconds ago
RUNNING
cancel
crwilcox / my-pypi-package / 0.0.2 #37
build_and_deploy
deploy
18 sec ago
00:18
5441ff0
SUCCESS
crwilcox / my-pypi-package / 0.0.2 #36
build_and_deploy
test_37
48 sec ago
00:28
5441ff0
SUCCESS
crwilcox / my-pypi-package / master #33
modified config
build_and_deploy
test_36
1 min ago
00:23
5441ff0
SUCCESS
crwilcox / my-pypi-package / master #34
modified config
build_and_deploy
test_35
1 min ago
00:29
5441ff0
SUCCESS
crwilcox / my-pypi-package / master #35
modified config
build_and_deploy
test_37
1 min ago
00:25
5441ff0
SUCCESS
crwilcox / my-pypi-package / master #31
modified config
build_and_deploy
test_35
5 min ago
00:21
1d51251
SUCCESS
crwilcox / my-pypi-package / master #30
modified config
build_and_deploy
test_36
5 min ago
00:30
1d51251
SUCCESS
crwilcox / my-pypi-package / master #32
modified config
build_and_deploy
test_37
5 min ago
00:28
1d51251
SUCCESS
crwilcox / my-pypi-package / master #29
rev package version
build_and_deploy
test-3.6
15 min ago
00:33
9082035
SUCCESS
crwilcox / my-pypi-package / master #27
rev package version
build_and_deploy
test-3.7
15 min ago
00:24
9082035
SUCCESS
crwilcox / my-pypi-package / master #28
build_and_deploy
15 min ago
00:37

Navigation

Project description

Release history

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Meta

License: Apache Software License (Apache 2.0)

Author: Chris Wilcox

Maintainers

crwilcox

Release history

Release notifications

THIS VERSION

0.0.2
10 minutes ago

0.0.1.post2
Apr 30, 2019

0.0.1.post1
Apr 30, 2019

0.0.1
Apr 29, 2019

- Published a Python PyPI Package
- Automated testing
- Automated publishing
- Increased the number of Python Package Authors

Thank you!

Sample Project: https://github.com/crwilcox/my-pypi-package