

Python Tooling

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Available at

[https://homepages.laas.fr/gsaurel/talks/
python-tooling.pdf](https://homepages.laas.fr/gsaurel/talks/python-tooling.pdf)

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Source

[https://gitlab.laas.fr/gsaurel/talks :
python-tooling.md](https://gitlab.laas.fr/gsaurel/talks : python-tooling.md)

Discussions

<https://im.laas.fr/#/room/#python-tooling:laas.fr>

- 1 Motivation
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- 3 Packaging
- 4 Tests
- 5 Coverage
- 6 Static analysis
- 7 Meta

Motivation

The Zen of Python, by Tim Peters (extracts)

- Beautiful is better than ugly.
- Readability counts.
- There should be one– and preferably only one –obvious way to do it.

Code is read much more often than it is written

— Guido

Code is read much more often than it is written

— Guido

- read → write
- teamwork
- future self

Style

Style Guide for Python Code

<https://peps.python.org/pep-0008/>

- indentation: 4 spaces
- maximum line length: 79
- whitespaces
- comments
- naming

<https://github.com/PyCQA/pycodestyle>

<https://github.com/PyCQA/pycodestyle>

```
$ pycodestyle --first optparse.py
optparse.py:69:11: E401 multiple imports on one line
optparse.py:77:1: E302 expected 2 blank lines, found 1
optparse.py:88:5: E301 expected 1 blank line, found 0
optparse.py:347:31: E211 whitespace before '('
optparse.py:357:17: E201 whitespace after '{'
optparse.py:472:29: E221 multiple spaces before operator
```

<https://github.com/PyCQA/pydocstyle>

Mostly helps as a reminder to write some doc

```
$ pydocstyle test.py
```

```
test.py:18 in private nested class `meta`:
```

```
    D101: Docstring missing
```

```
test.py:27 in public function `get_user`:
```

```
    D300: Use """triple double quotes""" (found '''-
quotes)
```

```
test:75 in public function `init_database`:
```

```
    D201: No blank lines allowed before function docstr
```

<https://github.com/PyCQA/flake8>

pycodestyle + pyflakes + mccabe

<https://github.com/google/yapf>

clang-format / gofmt

```
x = { 'a':37, 'b':42,
```

```
'c':927}
```

<https://github.com/google/yapf>

clang-format / gofmt

```
x = { 'a':37, 'b':42,
```

```
'c':927}
```

```
x = {'a': 37, 'b': 42, 'c': 927}
```


<https://github.com/psf/black>



Figure 1: black

```
super_long_line.with_small_argument = [0] # some co
```

```
super_long_line.with_small_argument = [0] # some co  
super_long_line.with_small_argument = [  
    0  
] # some comment
```

```
super_long_line.with_small_argument = [0] # some co  
super_long_line.with_small_argument = [  
    0  
] # some comment  
  
# some comment  
super_long_line.with_small_argument = [0]
```

<https://github.com/PyCQA/isort>
sorts imports.

Packaging

<https://github.com/python-poetry/poetry>

- `poetry init`
- `pyproject.toml`
- minimal python version
- dependencies / dev-dependencies
- `virtualenv`
- `sdist` / `wheel` builder

ref. “Managing Python Packages”

Tests

<https://docs.python.org/3/library/unittest.html>

```
import unittest
```

```
class TestStringMethods(unittest.TestCase):
```

```
    def test_upper(self):  
        self.assertEqual('foo'.upper(), 'FOO')
```

```
    def test_isupper(self):  
        self.assertTrue('FOO'.isupper())  
        self.assertFalse('Foo'.isupper())
```

```
if __name__ == '__main__':  
    unittest.main()
```

```
$ python test_string.py
```

```
..
```

```
-----
```

```
---
```

```
Ran 2 tests in 0.000s
```

```
OK
```

```
$ python test_string.py
```

```
..
```

```
-----
```

```
---
```

```
Ran 2 tests in 0.000s
```

OK

ou

```
$ python -m unittest
```

```
..
```

```
-----
```

```
---
```

```
Ran 2 tests in 0.000s
```

OK

Tests

<https://docs.python.org/3/library/doctest.html>

```
def factorial(n):  
    """Return the factorial of n, an exact integer >  
  
    >>> [factorial(n) for n in range(6)]  
    [1, 1, 2, 6, 24, 120]  
    >>> factorial(30)  
    2652528598121910586363084800000000  
    >>> factorial(-1)  
    Traceback (most recent call last):  
        ...  
    ValueError: n must be >= 0  
    """
```

```
if __name__ == "__main__":  
    import doctest  
    doctest.testmod()
```

- pytest
- tox

Coverage

<https://github.com/nedbat/coveragepy>

```
$ coverage run -m unittest discover
```

```
$ coverage report -m
```

Name	Stmts	Miss	Cover	Missing

my_program.py	20	4	80%	33-35, 39
my_other_module.py	56	6	89%	17-23

TOTAL	76	10	87%	

<https://github.com/nedbat/coveragepy>

```
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Name	Stmts	Miss	Cover	Missing

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my_other_module.py	56	6	89%	17-23

TOTAL	76	10	87%	

```
$ coverage html
```

sample

- <https://coveralls.io/>
- <https://about.codecov.io/>

Settings → CI/CD → General pipelines → Test coverage parsing

Static analysis

```
def add(a: int, b: int) -> int:  
    """Performs addition on integers.
```

```
>>> add(3, 4)  
7  
"""
```

```
return a + b
```

```
if __name__ == "__main__":  
    import sys
```

```
print(add(sys.argv[1], sys.argv[2]))
```

```
$ python add.py 3 4  
34
```

```
$ python add.py 3 4  
34
```

```
$ mypy add.py  
add.py:13: error: Argument 1 to "add" has incompatible  
                    type "str"; expected "int"  
add.py:13: error: Argument 2 to "add" has incompatible  
                    type "str"; expected "int"  
Found 2 errors in 1 file (checked 1 source file)
```


<https://github.com/asottile/pyupgrade>

```
class C(Base):  
    def f(self):  
-         super(C, self).f()  
+         super().f()
```

pass...

Meta

Bring your own ;)

<https://github.com/pre-commit/pre-commit>

.pre-commit-config.yaml

repos:

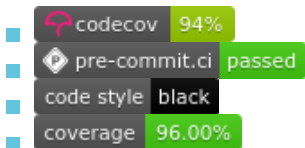
- repo: [https://github.com/pre-commit/pre-commit-h](https://github.com/pre-commit/pre-commit-hooks)
rev: v4.2.0
hooks:
 - id: check-yaml
 - id: end-of-file-fixer
 - id: trailing-whitespace
- repo: <https://github.com/psf/black>
rev: 22.3.0
hooks:
 - id: black

```
pre-commit run -a
```

```
pre-commit run -a  
pre-commit install
```

```
pre-commit run -a
pre-commit install
demo
```


<https://pre-commit.ci/>



Thanks for your time :)

- flake8
- black
- isort
- pyupgrade
- pre-commit