Software Deployment

Documentation

Sergio Peignier sergio.peignier@insa-lyon.fr

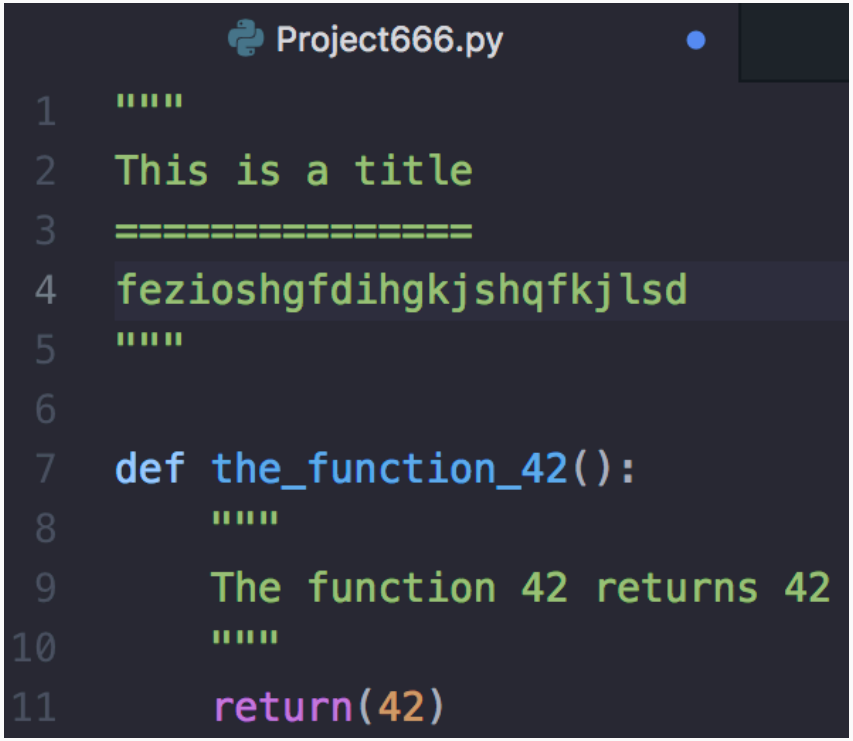
Associate Professor
INSA Lyon
Biosciences department

Table of contents

Docstrings

Docstrings

- **Documentation** of **Python** modules/function/classes/methods
- **String constant** as **1st object statement**
- Describe **what the code does**
- **Every** piece of software should have a **docstring**



help()

```
In [2]: from Project666 import the_function_42

In [3]: help(the_function_42)
```

```
Help on function the_function_42 in module Project666:

the_function_42()
    The function 42 returns 42
(END)
```

```
In [4]: the_function_42.__doc__
Out[4]: '\n    The function 42 returns 42\n    '
```

Main styles

- **reStructuredText** (the original one, not easily readable)
- **Google** (used by google, readable)
- **Numpy** (used in Numpy, readable)

reStructuredText style (RST)

```
:param arg1: description
:param arg2: description
:type arg1: type description
:type arg1: type description
:return: return description
:rtype: the return type description
```

Google style

```python
def function_with_types_in_docstring(param1, param2):
    """Example function with types documented in the docstring.

    `PEP 484`_ type annotations are supported. If attribute, parameter, and
    return types are annotated according to `PEP 484`_, they do not need to be
    included in the docstring:

    Args:
        param1 (int): The first parameter.
        param2 (str): The second parameter.

    Returns:
        bool: The return value. True for success, False otherwise.

    .. _PEP 484:
        https://www.python.org/dev/peps/pep-0484/

    """
```

Numpy style

```
def function_with_types_in_docstring(param1, param2):
    """Example function with types documented in the docstring.

    `PEP 484`_ type annotations are supported. If attribute, parameter, and
    return types are annotated according to `PEP 484`_, they do not need to be
    included in the docstring:

    Parameters
    ----------
    param1 : int
        The first parameter.
    param2 : str
        The second parameter.

    Returns
    -------
    bool
        True if successful, False otherwise.

    .. _PEP 484:
        https://www.python.org/dev/peps/pep-0484/

    """
```

Potentials

- Write math **equations**
- Add **links**
- Add **examples**
- ...

Sphinx

Sphinx


SPHINX
Python Documentation Generator
Home
Get it
Welcome
Sphinx is a tool that makes it easy to create intelligent and beautiful documentation, written by Georg Brandl and licensed under the BSD license.
What users say:
"Cheers for a great tool that actually makes programmers **want** to write documentation!"

Features

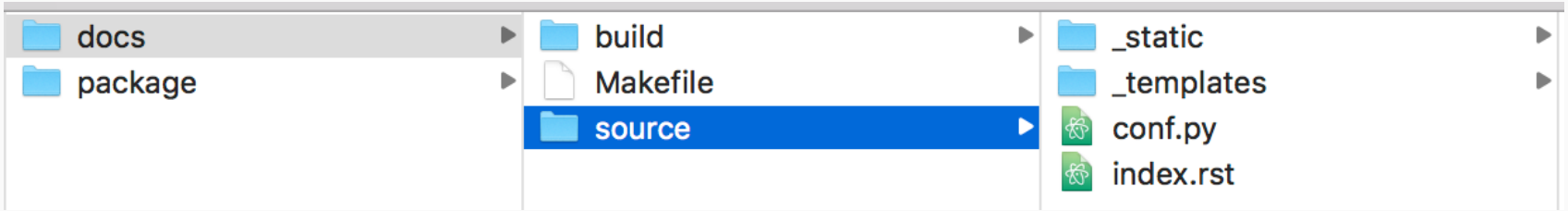
- Includes docstrings from python code
- **Output formats**: HTML, PDF (via LaTeX), ePub, ...
- Build **cross-references**
- Build **index**
- **Test code snippets**

sphinx-quickstart

Run the sphinx-quickstart script, and say yes to :

- ”> autodoc: automatically insert docstrings ...”
- ”> doctest: automatically test code snippets ...”
- ”> todo: write ”todo” entries that ...”
- ”> coverage: checks for documentation coverage ...”
- ”> mathjax: include math, rendered”
- > Create Makefile? (y/n) [y]:”

This creates some files and folders:



index.rst

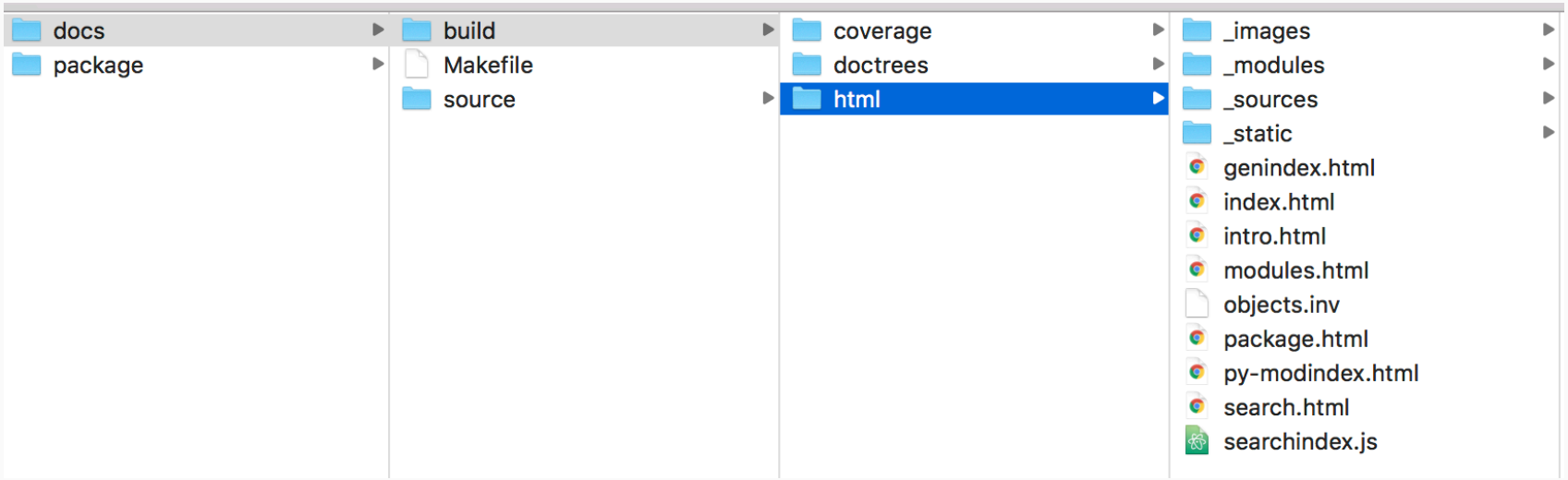
```
1  .. Project_666_yeah documentation master file, created by
2     sphinx-quickstart on Mon Mar 25 11:28:47 2019.
3     You can adapt this file completely to your liking, but it should at least
4     contain the root `toctree` directive.
5
6  Welcome to Project_666_yeah's documentation!
7  ============================================
8
9  .. module:: package
10
11 .. toctree::
12    :maxdepth: 2
13    :caption: Contents:
14
15    intro
16    modules
17    package
18
19 Indices and tables
20 ==================
21
22 * :ref:`genindex`
23 * :ref:`modindex`
24 * :ref:`search`
25
```

conf.py

```
20  # -- Project information -----------------------------------------------------
21
22  project = 'Project_666_yeah'
23  copyright = '2019, bad dog'
24  author = 'bad dog'
25
26  # The short X.Y version
27  version = ''
28  # The full version, including alpha/beta/rc tags
29  release = '0'
30
31
32  # -- General configuration ---------------------------------------------------
33
34  # If your documentation needs a minimal Sphinx version, state it here.
35  #
36  # needs_sphinx = '1.0'
37
38  # Add any Sphinx extension module names here, as strings. They can be
39  # extensions coming with Sphinx (named 'sphinx.ext.*') or your custom
40  # ones.
41  extensions = [
42      'sphinx.ext.autodoc',
43      'sphinx.ext.doctest',
44      'sphinx.ext.todo',
45      'sphinx.ext.coverage',
46      'sphinx.ext.mathjax',
47      'sphinx.ext.ifconfig',
48      'sphinx.ext.viewcode',
49      'sphinx.ext.githubpages',
50      'sphinx.ext.napoleon',
51      'recommonmark',
52  ]
```

makefile

Run: ”make html” to create the documentation in HTML



HTML output

Welcome to Project_666_yeah's documentation!

Contents:

- Welcome to the crazy introduction
- Indices and tables
- package
  - package package
- package package
  - Submodules
  - package.Project666 module
  - Module contents

sphinx-apidoc

```
import os
import sys
sys.path.insert(0, os.path.abspath('../../'))
```

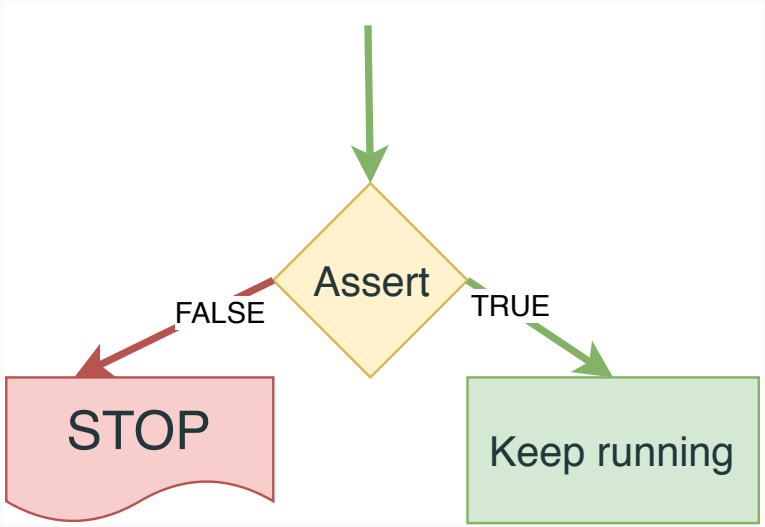
Run:

> sphinx-apidoc -f -o <output folder> <package path>

Unity Tests

Assert

- **Boolean expressions**
- **Checks** if a **condition** is **true** or **false**
- **Debugging tool** / **run-time checks**
- assert(<condition>,<error message>)
- Check also unittest (`https://docs.python.org/2/library/unittest.html`)



Assert | Assertions list

Method	Checks that
`assertEqual(a, b)`	`a == b`
`assertNotEqual(a, b)`	`a != b`
`assertTrue(x)`	`bool(x) is True`
`assertFalse(x)`	`bool(x) is False`
`assertIs(a, b)`	`a is b`
`assertIsNot(a, b)`	`a is not b`
`assertIsNone(x)`	`x is None`
`assertIsNotNone(x)`	`x is not None`
`assertIn(a, b)`	`a in b`
`assertNotIn(a, b)`	`a not in b`
`assertIsInstance(a, b)`	`isinstance(a, b)`
`assertNotIsInstance(a, b)`	`not isinstance(a, b)`

Doctest

- Parses **doctring**
- Detects text looking like **interactive Python sessions**
- **Executes the code**
- **”Literate testing” / “executable documentation”**
- `https://docs.python.org/3/library/doctest.html`

Doctest | Example

```
In [1]: def add_2_nbs(a,b):
   ...:     """
   ...:     this function adds 2 nbs
   ...:     Args:
   ...:         a (float): nb1
   ...:         b (float): nb2
   ...:     Returns:
   ...:         float: sum
   ...:     >>> add_2_nbs(1,2)
   ...:     3
   ...:     >>> add_2_nbs(40,2)
   ...:     42
   ...:     """
   ...:     return(a+b)

In [2]: import doctest
```

Doctest | Example

```
In [4]: doctest.testmod(verbose=True)
Trying:
    add_2_nbs(1,2)
Expecting:
    3
ok
Trying:
    add_2_nbs(40,2)
Expecting:
    42
ok
1 items had no tests:
    __main__
1 items passed all tests:
   2 tests in __main__.add_2_nbs
2 tests in 2 items.
2 passed and 0 failed.
```

Basic deployment

Github Repository

- clean **README.md**:
  - **Describe** the Project
  - Two audiences: **developers** and **users**
  - What does the program **solves**?
  - **Installation** instructions
  - **FAQ** section
  - **Contribute** section (issue tracker link, source code link)
  - **TODO** section (functionalities to be added)
- Add some **examples/tutorials** (script, notebook)
- Add **License**

Deploy a webpage

- Try github pages `https://pages.github.com/`
- Try Read the docs `https://readthedocs.org`