Sphinx API Documentation: Step 0 towards Reusable Code

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If It Isn't Documented, It Doesn't Exist

Nicholas Zakas enumerates the number one reason why good JavaScript libraries fail:

> **Lack of documentation.** No matter how wonderful your library is and how intelligent its design, if you're the only one who understands it, it doesn't do any good. Documentation means not just autogenerated API references, but also *annotated* examples and in-depth tutorials. You need all three to make sure your library can be easily adopted.

Act I: It is all so **simple**

Sphinx API Documentation Requires docstring only

"A docstring is a string literal that occurs as the first statement in a module, function, class, or method definition." – PEP 257, Python.org

```
6  def isosurf(ax,vol,level_frac=0.25):
7      """draw iso surface of volumetric data on matplotlib axis at given level
8
9      Example usage:
10       from mpl_toolkits.mplot3d import Axes3D # enable 3D projection
11       vol = np.random.randn(10,10,10)
12       fig = plt.figure()
13       ax  = fig.add_subplot(1,1,1,projection='3d')
14       isosurf(ax,vol)
15       plt.show()
16
17     Args:
18       ax (plt.Axes3D): ax = fig.add_subplot(1,1,1,projection="3d")
19       vol (np.array): 3D volumetric data having shape (nx,ny,nz)
20       level_frac (float): 0.0->1.0, isosurface value as a fraction between min and max
21     Returns:
22       Poly3DCollection: mesh
23     Effect:
24       draw on ax """
25     from skimage import measure
26     from mpl_toolkits.mplot3d.art3d import Poly3DCollection
27     nx,ny,nz = vol.shape
28     lmin,lmax = vol.min(),vol.max()
```

Sphinx

qharv.inspect.volumetric module

qharv.inspect.volumetric.**axes_func_on_grid3d**(*axes*, *func*, *grid_shape*) [source]

put a function define in axes units on a 3D grid :param axes: dtype=float, shape=(3,3); 3D lattice vectors in row major (i.e. a1 = axes[0]) :type axes: np.array :param func: 3D function defined on the unit cube :type func: RegularGridInterpolator :param grid_shape: dtype=int, shape=(3,); shape of real space grid :type grid_shape: np.array

Returns: dtype=float, shape=grid_shape; volumetric data
Return type: grid (np.array)

qharv.inspect.volumetric.**isosurf**(*ax*, *vol*, *level_frac=0.25*) [source]

draw iso surface of volumetric data on matplotlib axis at given level

Example usage:

from mpl_toolkits.mplot3d import Axes3D # enable 3D projection vol = np.random.randn(10,10,10) fig = plt.figure() ax = fig.add_subplot(1,1,1,projection='3d') isosurf(ax,vol) plt.show()

Parameters:
- **ax** (*plt.Axes3D*) – ax = fig.add_subplot(1,1,1,projection="3d")
- **vol** (*np.array*) – 3D volumetric data having shape (nx,ny,nz)
- **level_frac** (*float*) – 0.0->1.0, isosurface value as a fraction between min and max

Returns: mesh
Return type: Poly3DCollection

Effect:

draw on ax

Sphinx API Documentation Setup Takes **ONE** Command

sphinx-apidoc -A "Paul" -F -o docs src/

- sphinx-apidoc is a command available in the sphinx package, which can be installed without admin privileges using `pip install –user sphinx`.
- -A specifies the author name
- -F triggers a full setup
- -o specifies the documentation directory
- src/ is the folder that contains your Python package

Gotcha:
sphinx-apidoc cannot build documentation if it cannot **import your module**!

Ref: jlk's blog post on raxcloud

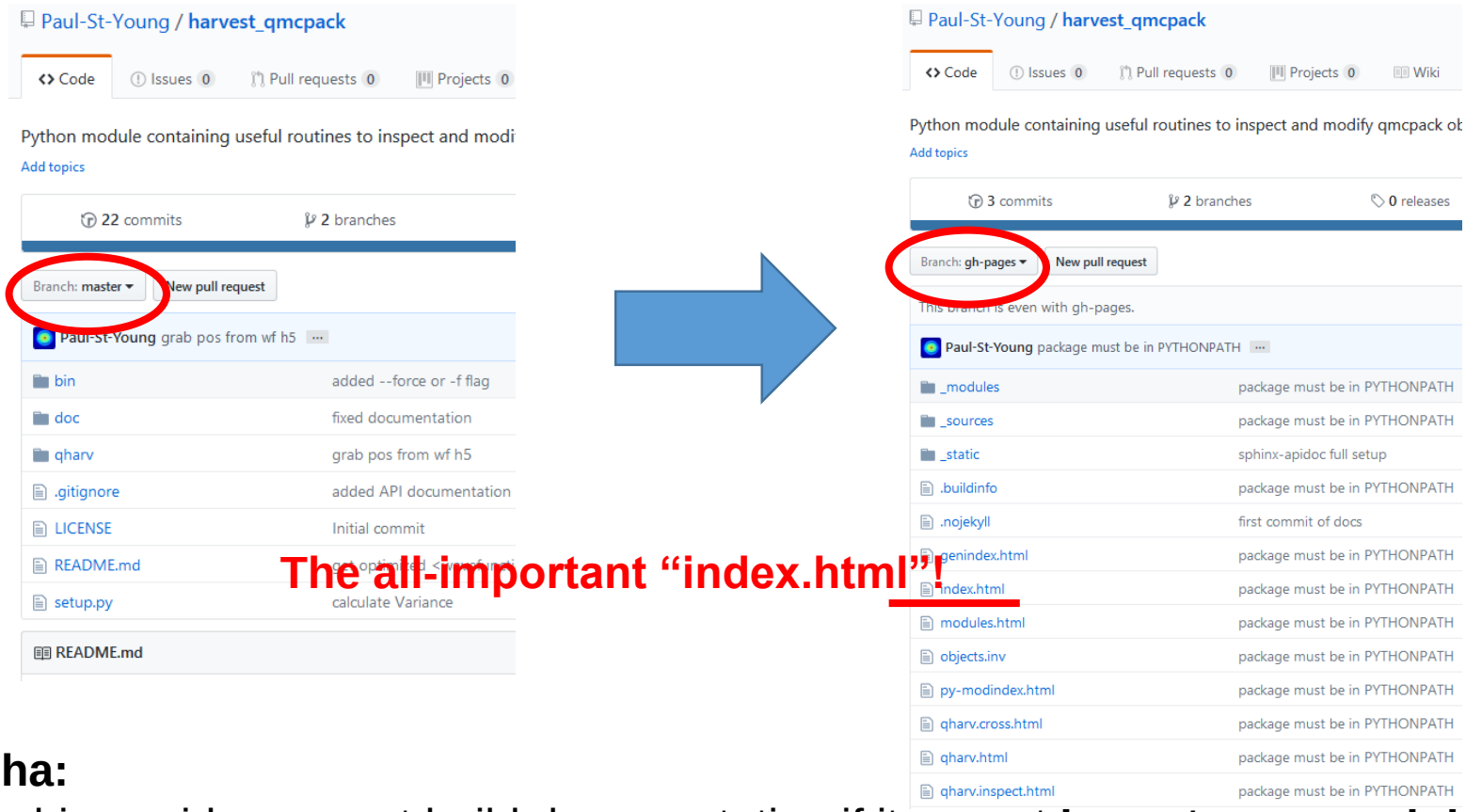
Sphinx API Documentation Generation also takes **ONE** Command

```
make html
```

- pdf version can be generated using `make latexpdf`. You will need the latexmk package, which should be easily obtainable via `apt-get/dnf install latexmk`.
- Read the Makefile to see what other options are available.

Publish Documentation on GitHub Pages

Goal Make gh-pages branch to hold the output of `make html`.



The all-important "index.html"!

Gotcha:

1. sphinx-apidoc cannot build documentation if it cannot **import your module**!
2. There are more than one way to **create an empty gh-pages branch** in your repository (see Ref [1] vs. Ref [3]). No need to be stubborn.

Ref [1] Luca Sbardella blog post on 2010/02/09
Ref [2] Ryan Dale's sphinxdoc-test GitHub repository
Ref [3] jlk's blog post on raxcloud

Conclusions: Sphinx is as easy as 1,2,3!

1. Write docstring for your functions

2. One command to setup: sphinx-apidoc –A “Paul” –o docs src/

3. One command to run: make html

Ready to publish!

Act II: *What* just happened?

`sphinx-apidoc` converts .py to .rst

sphinx-apidoc -A "Paul" -F -o docs src/

- docs folder contains one .rst file for each .py file in your src/ (with one extra index.rst)
- -F generates conf.py and Makefile, you may wish to add a few extensions in conf.py

default

```
extensions = ['sphinx.ext.autodoc',
    'sphinx.ext.todo',
    'sphinx.ext.viewcode']
```

customized

```
extensions = ['sphinx.ext.autodoc',
    'sphinx.ext.napoleon',
    'sphinx.ext.coverage',
    'sphinx.ext.mathjax',
    'sphinx.ext.viewcode',
    'sphinx.ext.githubpages']
```

Goolge style docstring

pages

- For more custom setup, run `sphinx-quickstart` for *the quiz*.

For Our Beloved Python 2

- conf.py uses Python 3 style by default!

- To change style, edit conf.py:

1. change `html_theme = 'alabaster'` to `html_theme = 'classic'`

2. remove unnecessary cram:

```
html_sidebars = {
    '**': [
        #'about.html',
        'searchbox.html',
        'globaltoc.html',
        #'navigation.html',
        'relations.html',
        #'donate.html',
    ]
}
```

Image credit: Chris Okorie, http://chrisokorie.com/

`make html` converts .rst to .html

make html

- `make html` fills docs/_build/html folder with html files
- Try `firefox docs/_build/html/index.html`

```
[yyang173@localhost html]$ ls
genindex.html   _modules        objects.inv       search.html     _sources
index.html      nexus_obj.html  py-modindex.html  searchindex.js  _static
```

- The ‘githubpages’ extension will add an empty ‘**.nojekyll**’ file to docs/_build/html/
- `touch docs/_build/html/.nojekyll` should also work, but is not automatic

Act III: Beginning of the End

API Documentation is Step 0 towards Reusable Code

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What can Withstand the Revenges of Time?

- API Documentation
- Tests
- Examples

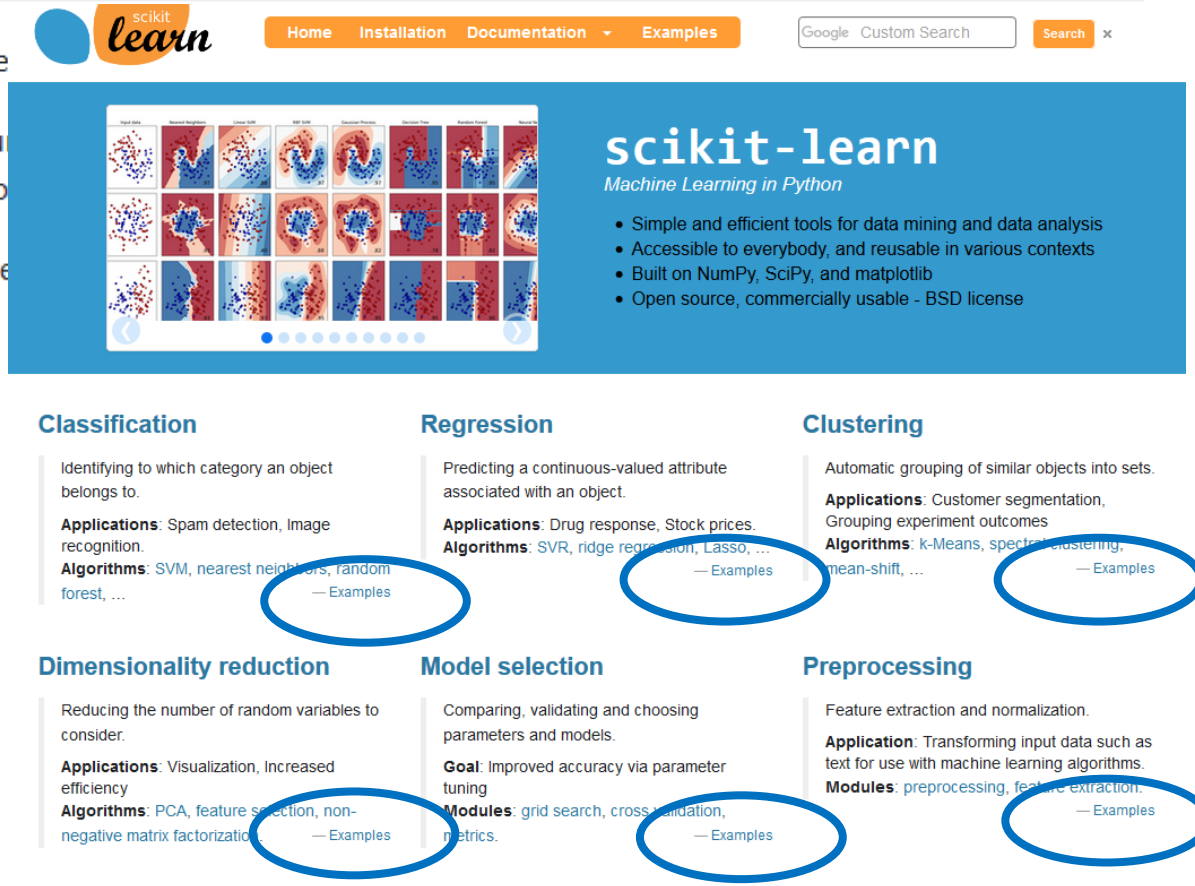
scikit-learn

scikit-learn is a Python module for machine le

The project was started in 2007 by David Cou
have contributed. See the AUTHORS.rst file fo

It is currently maintained by a team of volunte

Website: http://scikit-learn.org



To be continued …