Python Packaging

Jakub Wasielak

http://blog.pykonik.org/

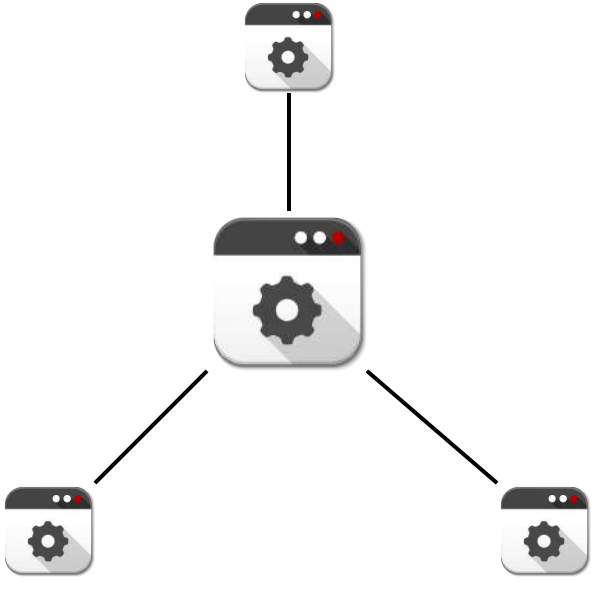
http://koderek.edu.pl/

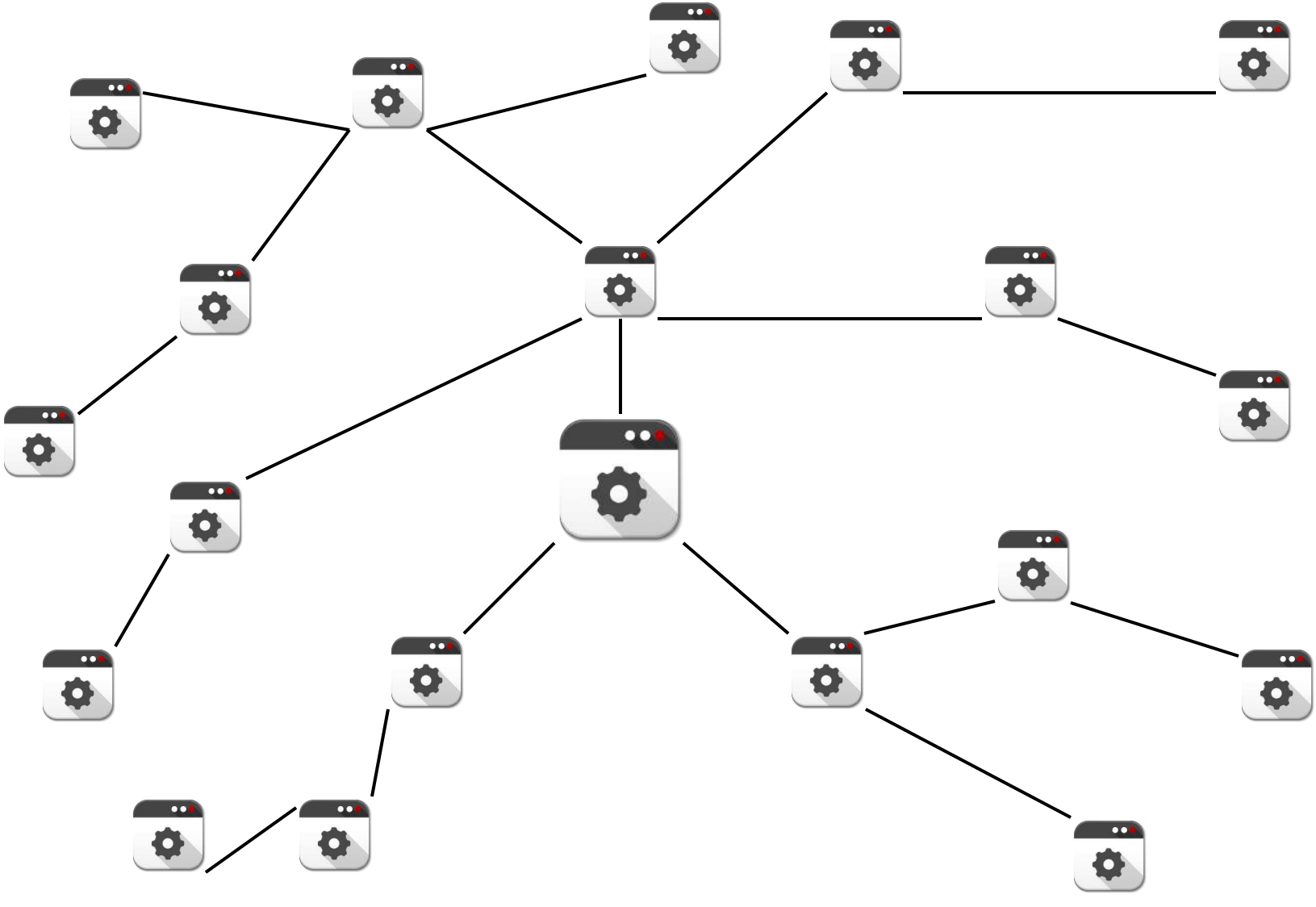
facebook.com/startechkrk

https://pl.pycon.org/2017/

What? Why?

Architecture





https://packaging.python.org/current/

Installation Tool Recommendations

- pip
- virtualenv

Packaging Tool Recommendations

- setuptools
- bdist_wheel
- twine

Asking for help?

```
$ python setup.py --help-commands
Standard commands:
  build             build everything needed to install
  build_py          "build" pure Python modules (copy to build directory)
  build_ext         build C/C++ extensions (compile/link to build directory)
  build_clib        build C/C++ libraries used by Python extensions
  build_scripts     "build" scripts (copy and fixup #! line)
  clean             clean up temporary files from 'build' command
  install           install everything from build directory
  install_lib       install all Python modules (extensions and pure Python)
  install_headers   install C/C++ header files
  install_scripts   install scripts (Python or otherwise)
  install_data      install data files
  sdist             create a source distribution (tarball, zip file, etc.)
  register          register the distribution with the Python package index
  bdist             create a built (binary) distribution
  bdist_dumb        create a "dumb" built distribution
  bdist_rpm         create an RPM distribution
  bdist_wininst     create an executable installer for MS Windows
  upload            upload binary package to PyPI
  check             perform some checks on the package

Extra commands:
  ... this one goes on
```

setup.py

```
import os
from setuptools import setup

setup(
    name = "an_example_pypi_project",
    version = "0.0.4",
    author = "Jakub Wasielak",
    author_email = "kuba.wasielak@gmail.com",
    description = ("An demonstration of how to create, document, and publish "
                                   "to the cheese shop a5 pypi.org."),
    license = "BSD",
    keywords = "example documentation tutorial",
    url = "http://packages.python.org/an_example_pypi_project",
    packages=['an_example_pypi_project', 'tests'],
    long_description=read('README'),
    classifiers=[
        "Development Status :: 3 - Alpha",
        "Topic :: Utilities",
        "License :: OSI Approved :: BSD License",
    ],
)
```

(source: https://pythonhosted.org/an_example_pypi_project/setuptools.html)

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)
```

setuptools_scm

```
setup(
    name = "an_example_pypi_project",
    use_scm_version=True,
    setup_requires=['setuptools_scm'],
    # ...
)
```

PEP 440

https://www.python.org/dev/peps/pep-0440/

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```

(source: https://pythonhosted.org/an_example_pypi_project/setuptools.html)

setup.py

File	Type
setuptools-36.0.1-py2.py3-none-any.whl (md5)	Python
setuptools-36.0.1.zip (md5)	Source

Author: Python Packaging Authority
Home Page: https://github.com/pypa/setuptools
Keywords: CPAN PyPI distutils eggs package management
Categories

- Development Status :: 5 - Production/Stable
- Intended Audience :: Developers
- License :: OSI Approved :: MIT License
- Operating System :: OS Independent
- Programming Language :: Python :: 2
- Programming Language :: Python :: 2.6
- Programming Language :: Python :: 2.7
- Programming Language :: Python :: 3
- Programming Language :: Python :: 3.3
- Programming Language :: Python :: 3.4
- Programming Language :: Python :: 3.5
- Programming Language :: Python :: 3.6
- Topic :: Software Development :: Libraries :: Python Modules
- Topic :: System :: Archiving :: Packaging
- Topic :: System :: Systems Administration
- Topic :: Utilities

Best classifier?

"Private :: Do Not Upload"

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    classifiers=[
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        "Topic :: Utilities",
        "License :: OSI Approved :: BSD License",
    ],
)
```

(source: https://pythonhosted.org/an_example_pypi_project/setuptools.html)

setup.py

```
import os
from setuptools import setup, find_packages

PACKAGES = find_packages(where="src")

setup(
    # ...
    packages=PACKAGES,
    # ...
)
```

(source: https://pythonhosted.org/an_example_pypi_project/setuptools.html)

There's more!

```
setup(
    name = "an_example_pypi_project",
    # ...
    install_requires=[
        "cherrypy==3.5",
        "lxml",
        "Pillow>=2.1,<3dev"
    ],
)
```

Extras

```
setup(
    # ...
    install_requires=[
        "cherrypy>=3.5,<3.6dev",
        "lxml",
        "Pillow>=2.1,<3dev"
    ],
    extras_require=dict(
        doc = ['Sphinx>=1.3'],
        notebook = ['notebook', 'ipywidgets'],
        # ... (^ comes from IPython)
    )
)
```

```
python setup.py install 'ipython[notebook]'
```

Tests? Why not!

```
setup(
    # ...
    install_requires=[
        "cherrypy>=3.5,<3.6dev",
        "lxml",
        "Pillow>=2.1,<3dev"
    ],
    tests_require=[
        'Pyro>=3.16,<4dev',
        'pytest>=2.3',
        'selenium'
    ]
)
```

python setup.py test

or...

```
setup(
    # ...
    install_requires=[
        "cherrypy>=3.5,<3.6dev",
        "lxml",
        "Pillow>=2.1,<3dev"
    ],
    extras_require={
        'testing': [
            'Pyro>=3.16,<4dev',
            'pytest>=2.3',
            'selenium'
        ]
    }
)
```

And tox to install

Entry Points

```
setup(
    # ...
    'entry_points': {
        'console_scripts': ['virtualenv=virtualenv:main'],
    },
)
```

```
$ python virtualenv.py my_venv

vs.

$ virtualenv my_venv
```

setup.cfg

```
[global]
verbose = 1

[bdist_wheel]
universal = 1

[metadata]
license_file = LICENSE

[easy_install]
index_url = https://devpi.company.net/root/sth/+simple/

[tool:pytest]
norecursedirs = build env services *.egg project/lib/test
```

MANIFEST.in

```
include CHANGES.txt
include project/handlers/*.html
recursive-include project/static
```

setuptools_scm

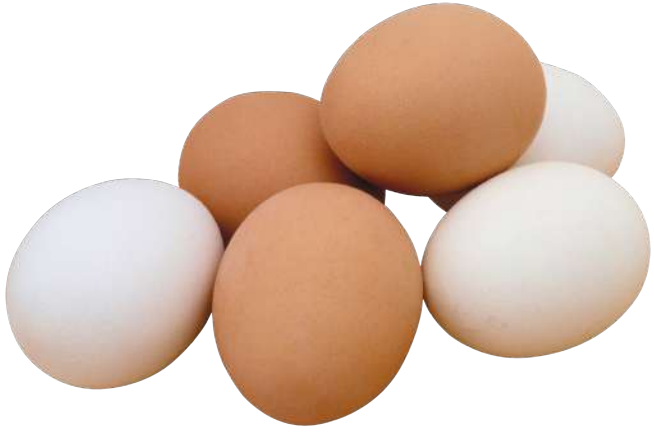
everything not in .gitignore will get used!

install vs. develop

```
$ python setup.py install
...
$ pip freeze | grep project
project==22.2

$ python setup.py develop
...
$ pip freeze | grep project
-e git+ssh://you@your.repo.url/Repositories/Team/project@id_123#egg=project
```

eggs



vs.

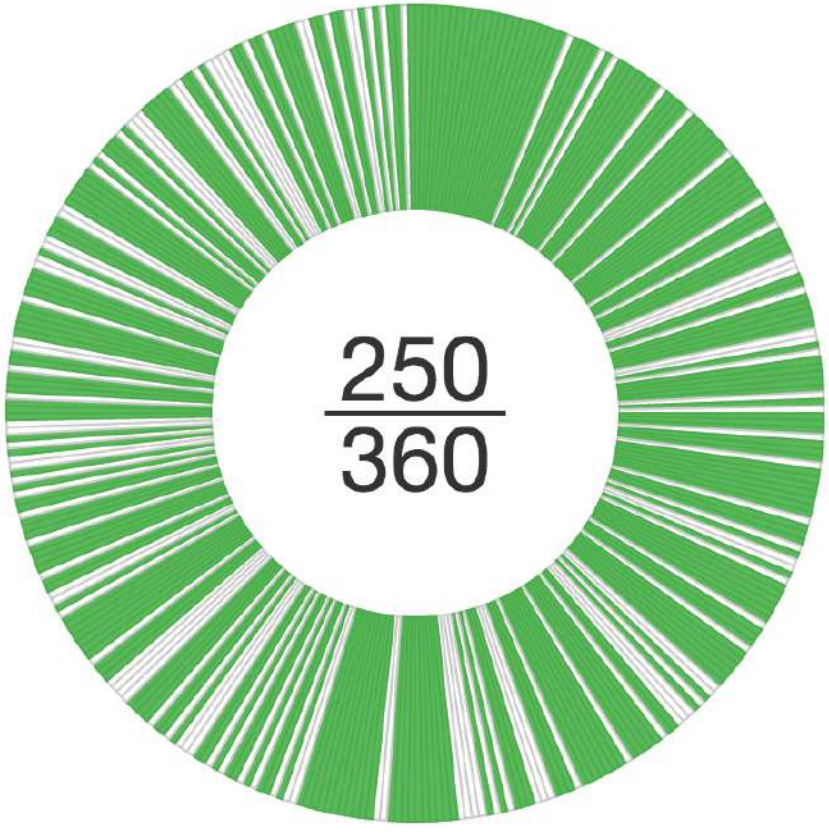
wheels

Wheels advantages

distribution-1.0-1-py27-none-any.whl

- official PEP (pep-0427)
- no .pyc files inside (one wheel for both Pythons, .pyc files will be generated upon installation)
- richer file naming conversion
- versioning
- installation of C components does not require compiler

Python Wheels



No pycrypto, SQLAlchemy, MySQL-python, tornado

requirements.txt

```
$ pip install requirements-dev.txt

Collecting requirements-dev.txt
Installing collected packages: requirements-dev.txt
```

Please reconsider deleting this from pypi #1

Closed **piquadrat** opened this issue on 27 Jan 2016 · 5 comments

piquadrat commented on 27 Jan 2016

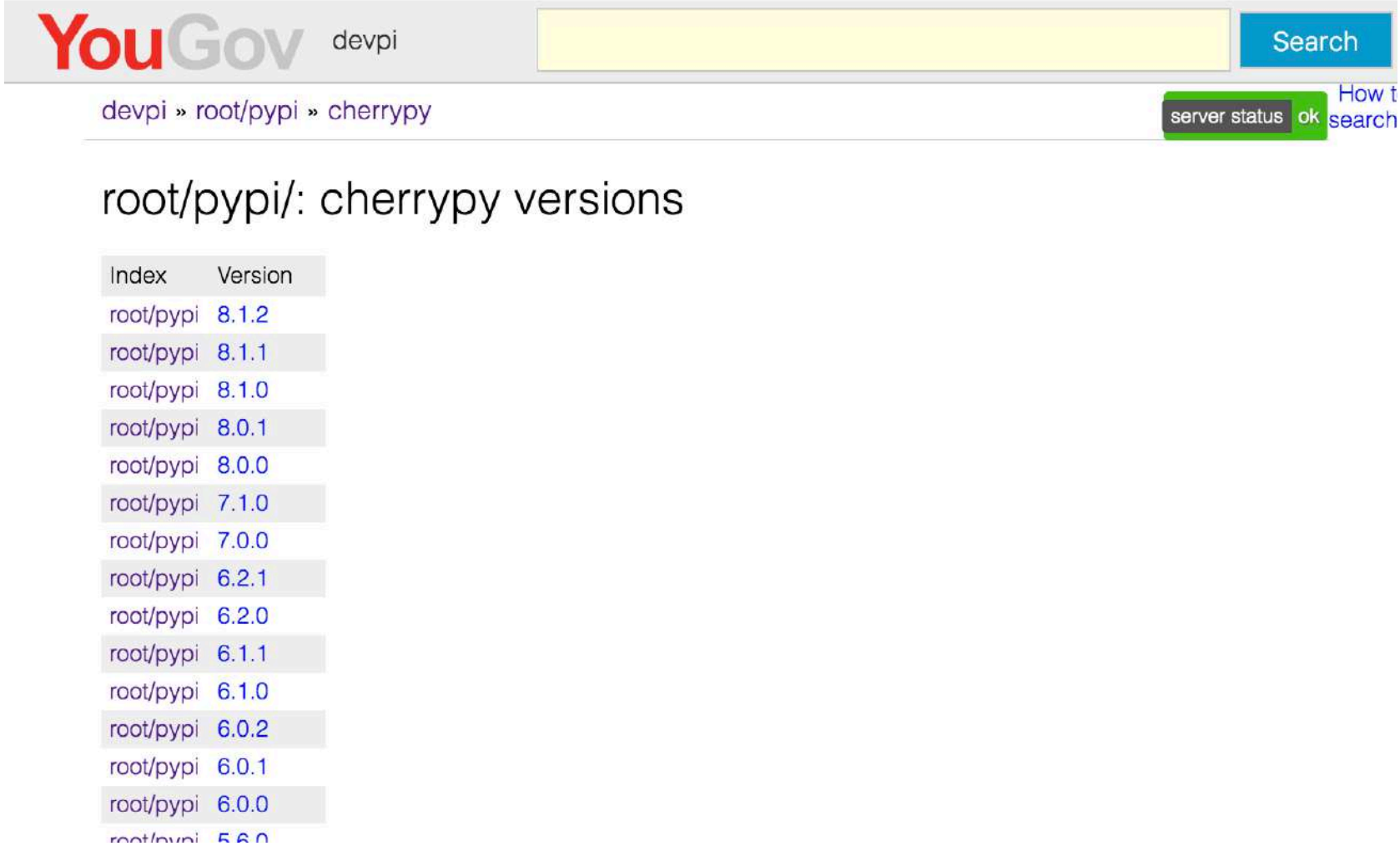
I like a good joke as much as the next guy, but I'm really not interested to have "some nasty hacks" running on my machine due to a typo.

Congrats on the idea though!

👍 1

devpi

http://doc.devpi.net/latest/



Your projects, your packages

.pypirc

```
[distutils]
index-servers =
    my_devpi

[my_devpi]
repository: https://devpi-master.company.net/root/my_devpi/
username: {your username}
password: {your password}
```

Register

```
python setup.py sdist register -r my_devpi upload -r my_devpi
```

Upload

```
python setup.py sdist upload -r my_devpi
```

Or twine

Create

```
python setup.py sdist bdist_wheel
```

Upload

```
twine upload dist/*
```

Better Upload

```
export TWINE_USERNAME=foo
export TWINE_PASSWORD=bar
twine upload dist/*
```

Test your package

```
pip install dist/package-1.0.0.tar.gz
pip install dist/package-1.0.0-py2.py3-none-any.whl
```

.pypirc

```
[distutils]
index-servers =
    test

[test]
repository: https://testpypi.python.org/pypi
# repository: https://test.pypi.org/legacy/
username: {your username}
```

```
pip install -i https://testpypi.python.org/pypi <package_name>
```

PEP 20, last line

```
Namespaces are one honking great idea
-- let's do more of those!
```

Namespaces

```
sound/                          Top-level package
      __init__.py               Initialize the sound package
      formats/                  Subpackage for file format conversions
              __init__.py
              wavread.py
              wavwrite.py
              aiffread.py
              aiffwrite.py
              auread.py
              auwrite.py
              ...
      effects/                  Subpackage for sound effects
              __init__.py
              echo.py
              surround.py
              reverse.py
              ...
      filters/                  Subpackage for filters
              __init__.py
              equalizer.py
              vocoder.py
              karaoke.py
              ...
```

Namespaces

```
import sound.effects.echo
import sound.effects.surround
from sound.effects import *
```

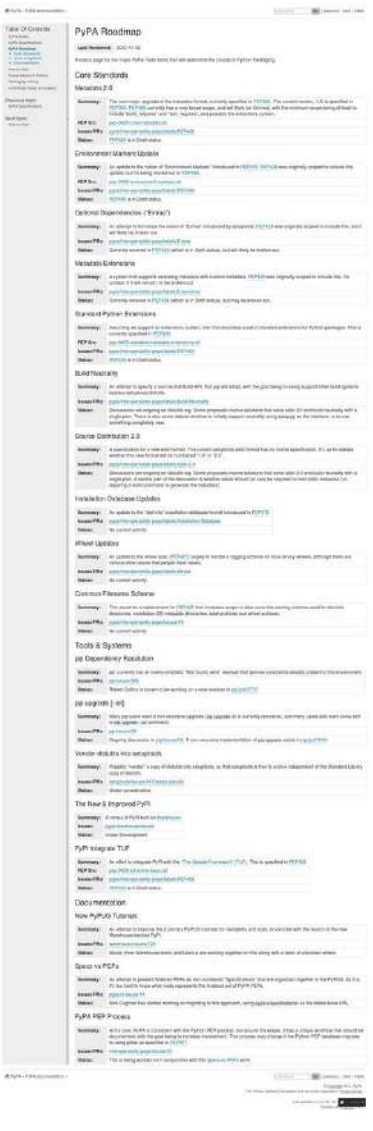
pip cool features

(that easy_install doesn't have)

- easy_install can finish up with a partially completed installation
- better console output
- reasons for actions are kept
- native support for git, mercurial, bazaar
- uninstallation of packages
- pip freeze
- pip install -r requirements.txt

What's next?

https://www.pypa.io/en/latest/roadmap/



Pipfile

```
[[source]]
url = 'https://pypi.python.org/simple'
verify_ssl = true

[requires]
python_version = '2.7'

[packages]
requests = { extras = ['socks'] }
Django = '>1.10'
pinax = { git = 'git://github.com/pinax/pinax.git', ref = '1.4', editable = true }

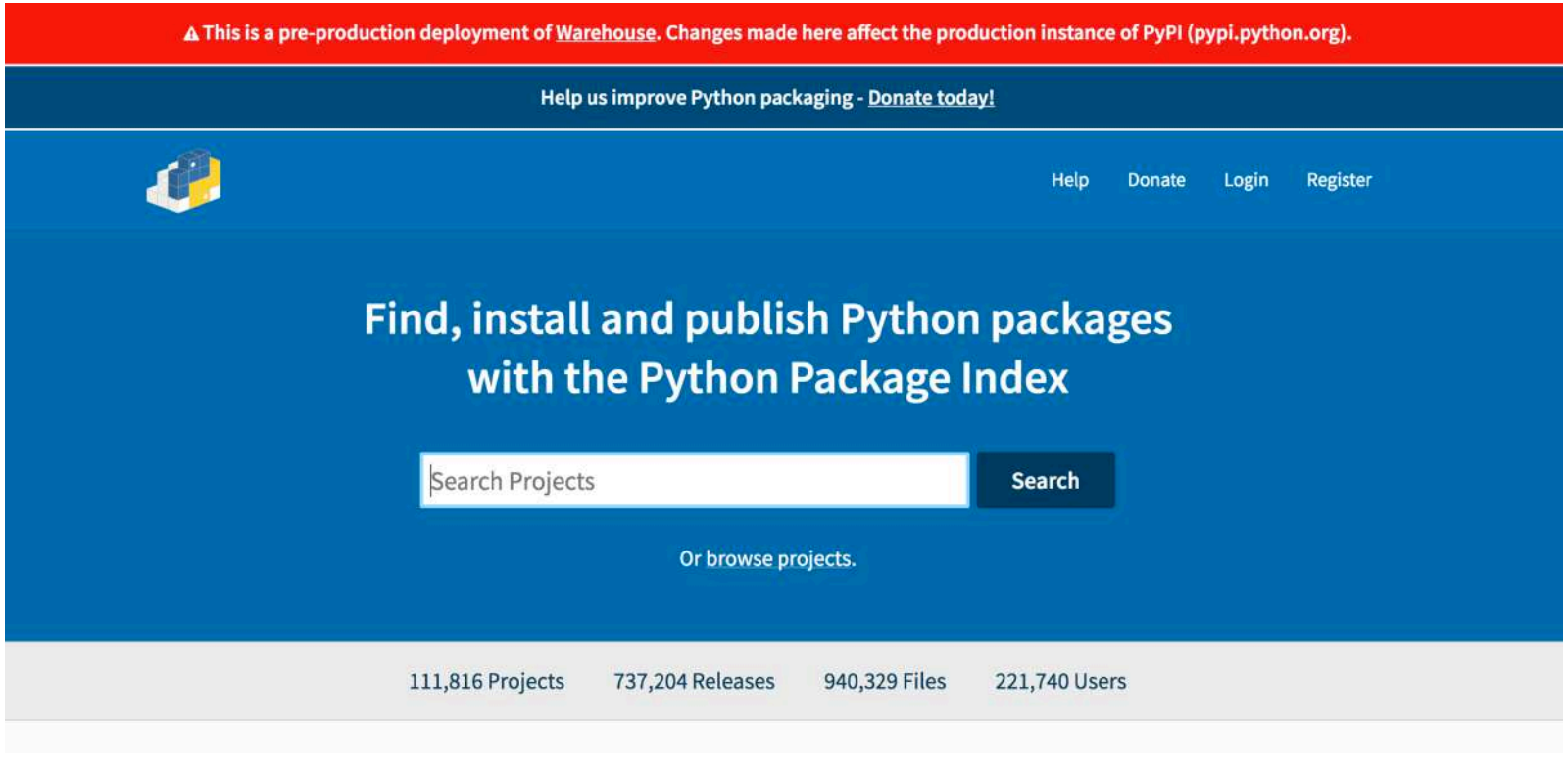
[dev-packages]
nose = '*'
```

Using TOML (Tom's Obvious, Minimal Language)

PyPI?

https://pypi.python.org/pypi

https://pypi.org/



Warehouse

https://github.com/pypa/warehouse

Recommended reading

- **Tool Recommendations:**

https://packaging.python.org/current/

- **Wheel vs. Egg:**

https://packaging.python.org/wheel_egg/

- **Getting Started With setuptools and setup.py:**

https://pythonhosted.org/an_example_pypi_project/setuptools.html

- **Sharing Your Labor of Love: PyPI Quick and Dirty:**

https://hynek.me/articles/sharing-your-labor-of-love-pypi-quick-and-dirty/

- **PyPA**

https://www.pypa.io

THANKS!

QUESTIONS?

https://about.me/jakub.wasielak