How to Make a Python Package Available via PIP

Peter Rochford

4024 Goss Rd

Fairfax, VA 22032

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## Purpose

These notes describe the steps taken to make the Skill Metrics Python library available to the Python community via the Python Packaging Index (PIP). The primary Internet sources used are listed below.

## Installing Packages

A guide that explains how to use the pip utility to install Python packages can be found at

[https://packaging.python.org/en/latest/tutorials/installing-packages/#](https://packaging.python.org/en/latest/tutorials/installing-packages/)

The page provides background information on how the Python library you create as a package will be installed by the user community. If you already have pip available with your Python distribution you will likely find the “Installing from PyPI” section of the Installing Packages web page more useful: <https://packaging.python.org/installing/#installing-requirements>.

The following command is used to install the distribution on your target platform from the test Python Package Index (PyPI) site:

% pip3 install –i <https://testpypi.python.org/pypi> SkillMetrics

If you are upgrading the package then include the –upgrade option.

% pip3 install –i <https://testpypi.python.org/pypi> SkillMetrics --upgrade

## Packaging Python Projects

The basics of how to configure, package and distribute your own Python projects can be found at <https://packaging.python.org/en/latest/tutorials/packaging-projects/>. It shows how to add the necessary files and structure to create the package, how to build the package, and how to upload it to the Python Package Index (PyPI).

The project structure currently used for the SkillMetrics project is:

SkillMetrics

├── Documents/

│ ├── PIP notes.docx

│ ├── Target & Taylor Diagrams.docx

│ └── Taylor Diagram Primer.pdf

├── LICENSE.txt

├── pyproject.toml

├── README.rst

├── Examples/

│ ├── all\_stats.py (calculate all skill metrics)

│ ├── target\*.py (target diagram examples)

│ └── target\*.py (Taylor diagram examples)

├── skill\_metrics

│ ├── \_\_init\_\_.py

│ └── \*.py (source files)

└── Test/

### Creating pyproject.toml

The pyproject.toml file tells “frontend” build tools like pip and build what “backend” tool to use to create distribution packages for your project. For SkillMetrics I switched the backend from setuptools to hatchling because of problems in implementing with the former.

The pyproject.toml file was created as:

[build-system]

requires = ["hatchling"]

build-backend = "hatchling.build"

* requires is a list of packages that are needed to build your package. You don’t need to install them; build frontends like pip will install them automatically in a temporary, isolated virtual environment for use during the build process.
* build-backend is the name of the Python object that frontends will use to perform the build.

The following content was added to pyproject.toml to define the SkillMetrics package. Note that allowed License specifications can be found at [autopilot](https://autopilot-docs.readthedocs.io/en/latest/license_list.html).

[project]

name = "SkillMetrics"

version = "1.2.1"

authors = [

{ name="PeterRochford", email="rochford.peter1@gmail.com" },

]

description = " A package for calculating skill of model predictions against observations"

readme = "README.md"

license = { file="LICENSE.txt" }

requires-python = ">=3.10"

dependencies = [

'matplotlib >= 3',

'numpy >= 1.23',

'pandas >= 1.4',

'xlsxwriter >= 3',

]

classifiers = [

"Programming Language :: Python :: 3",

"License :: OSI Approved :: GNU General Public License v3 (GPLv3)",

"Operating System :: OS Independent",

]

keywords = [

"meteorology",

"verification",

"weather",

]

[project.urls]

"Homepage" = " http://github.com/PeterRochford/SkillMetrics"

"Bug Tracker" = " http://github.com/PeterRochford/SkillMetrics/issues"

### Creating README.md

The original implementation of SkillMetrics used a template for a reStructuredText file (README.rst) rather than a Markdown file (README.md) which now appears to be more popular. A README.md was create on the GitHub site on 9/5/2022 that replicates and extends the content in README.rst and will be used henceforth. This will make it easier to maintain as it will be using Markdown like all the Wiki pages for the package.

### Creating a LICENSE

It’s important for every package uploaded to the Python Package Index to include a license. A LICENSe.txt file containing a GNU General Public License version 3.0 was created with the initial release of the SkillMetric package on 12/27/2016 and has not been changed since.

### Generating Distribution Archives

Archives uploaded to the Python Package Index can be installed by pip. Make sure you have the latest version of the Python Packaging (PyPA) build installed by running the command:

% python3 -m pip install --upgrade build

A successful install will report the following:

Collecting build

Downloading build-0.8.0-py3-none-any.whl (17 kB)

Collecting pep517>=0.9.1

Downloading pep517-0.13.0-py3-none-any.whl (18 kB)

Collecting tomli>=1.0.0

Downloading tomli-2.0.1-py3-none-any.whl (12 kB)

Requirement already satisfied: packaging>=19.0 in /Library/Frameworks/Python.framework/Versions/3.10/lib/python3.10/site-packages (from build) (21.3)

Requirement already satisfied: pyparsing!=3.0.5,>=2.0.2 in /Library/Frameworks/Python.framework/Versions/3.10/lib/python3.10/site-packages (from packaging>=19.0->build) (3.0.9)

Installing collected packages: tomli, pep517, build

Successfully installed build-0.8.0 pep517-0.13.0 tomli-2.0.1

Next run this command from the same directory where pyproject.toml is located (/Users/Peter/git/SkillMetrics):

% python3 -m build

\* Creating venv isolated environment...

\* Installing packages in isolated environment... (hatchling)

\* Getting dependencies for sdist...

\* Building sdist...

\* Building wheel from sdist

\* Creating venv isolated environment...

\* Installing packages in isolated environment... (hatchling)

\* Getting dependencies for wheel...

\* Building wheel...

Successfully built skillmetrics-1.2.1.tar.gz and skillmetrics-1.2.1-py3-none-any.whl

This command should output a lot of text and once completed should generate two files in the dist directory:

% ls -1 dist

SkillMetrics-1.2.1-py3-none-any.whl

SkillMetrics-1.2.1.tar.gz

## Configuring for setuptools

Packaging can also be done using the setuptools build. This will require installing the setuptools package. Instructions on how to get up to date copies of the setuptools and wheel projects can be found at [python.org](up%20to%20date%20copies%20of%20the%20setuptools%20and%20wheel%20projects). I ran the following command to do so:

% python3 -m pip install --upgrade pip setuptools wheel

Requirement already satisfied: pip in /Library/Frameworks/Python.framework/Versions/3.10/lib/python3.10/site-packages (22.2.2)

Requirement already satisfied: setuptools in /Library/Frameworks/Python.framework/Versions/3.10/lib/python3.10/site-packages (63.2.0)

Collecting setuptools

Using cached setuptools-65.3.0-py3-none-any.whl (1.2 MB)

Collecting wheel

Downloading wheel-0.37.1-py2.py3-none-any.whl (35 kB)

Installing collected packages: wheel, setuptools

Attempting uninstall: setuptools

Found existing installation: setuptools 63.2.0

Uninstalling setuptools-63.2.0:

Successfully uninstalled setuptools-63.2.0

Successfully installed setuptools-65.3.0 wheel-0.37.1

## Configuring Your Project

A few files need to be created to have a package that can be distributed using hatchling via PyPI: <https://packaging.python.org/en/latest/tutorials/packaging-projects/>. The “Creating the package files” subsection outlines the files that need to be created.

packaging\_tutorial/

├── LICENSE

├── pyproject.toml

├── README.md

├── src/

│ └── example\_package\_YOUR\_USERNAME\_HERE/

│ ├── \_\_init\_\_.py

│ └── example.py

└── tests/

Since I had already hosted the Skill Metrics Python library as a Git repository on GitHub (<https://github.com/PeterRochford/SkillMetrics>), I created the following files in the top-level directory tree of the repository following the web page instructions:

* LICENSE.txt
* project.toml
* README.md
* MANIFEST.in

### project.toml

Listed below is how I set up the file to work with hatchling.

[build-system]

requires = ["hatchling"]

build-backend = "hatchling.build"

[project]

name = "SkillMetrics"

version = "1.2.1"

authors = [

{ name="PeterRochford", email="rochford.peter1@gmail.com" },

]

description = "A package for calculating skill of model predictions against observations"

readme = "README.md"

license = { file="LICENSE.txt" }

requires-python = ">=3.10"

dependencies = [

'matplotlib >= 3',

'numpy >= 1.23',

'pandas >= 1.4',

'xlsxwriter >= 3',

]

classifiers = [

"Programming Language :: Python :: 3",

"License :: OSI Approved :: GNU General Public License v3 (GPLv3)",

"Operating System :: OS Independent",

]

keywords = [

"meteorology",

"verification",

"weather",

]

[project.urls]

"Homepage" = "http://github.com/PeterRochford/SkillMetrics"

"Bug Tracker" = "://github.com/PeterRochford/SkillMetrics/issues"

## Generating Distributions

1. Make sure you have the latest version of PyPA’s build installed:

% python3 -m pip install --upgrade build

1. Now run this command from the same directory where pyproject.toml is located:

% python3 -m build

\* Creating venv isolated environment...

\* Installing packages in isolated environment... (hatchling)

\* Getting build dependencies for sdist...

\* Building sdist...

\* Building wheel from sdist

\* Creating venv isolated environment...

\* Installing packages in isolated environment... (hatchling)

\* Getting build dependencies for wheel...

\* Building wheel...

Successfully built skillmetrics-1.2.1.tar.gz and skillmetrics-1.2.1-py3-none-any.whl

1. This command should output a lot of text and once completed should generate two files in the dist directory:

dist/

├── SkillMetrics-1.2.1.tar.gz

└── skillmetrics-1.2.1-py3-none-any.whl

1. The tar.gz file is a source distribution whereas the .whl file is a built distribution.

## Uploading Your Project to PyPI

A guide on how to upload a project to PyPI can be found at: <https://packaging.python.org/en/latest/tutorials/packaging-projects>.

Accounts were created on both the PyPI (<https://pypi.python.org/pypi>) and test PyPI (<https://testpypi.python.org/pypi>) sites. This was necessary in order upload projects to the web sites.

It was necessary to create a .pypirc file in my top level users directory on my MacOS iMac: /Users/Peter. The file contained the following contents:

[distutils]

index-servers =

[distutils]

index-servers =

pypi

testpypi

[pypi]

username=PeterRochford

password=user\_password

[testpypi]

repository=https://testpypi.python.org/legacy

username=PeterRochford

password=user\_password

## Register Your Project

The twine utility failed to work for me, so for the testpypi site I registered using the setup.py script.

% py setup.py register –r testpypi

However this did not work for me for the pypi site. I found that I had to first upload the PKG-INFO file via the PyPI web site and then register using the following command.

% py setup.py register –r pypi

## Uploading Your Distribution/Update SkillMetrics Pip Package

The SkillMetrics package will now only support Python 3 because Python 2.7 has been depricated.

1. If you have made changes to your distribution, increment the version number in the following two files:

/Users/Peter/git/SkillMetrics/skill\_metrics/\_\_init\_\_.py

and edit the following line

\_\_version\_\_='1.2.2'

/Users/Peter/git/SkillMetrics/pyproject.toml

and edit the following line

version = "1.2.2"

1. To find the version of a currently installed Skill Metrics package, use the pip show command:

% pip show SkillMetrics

Name: SkillMetrics

Version: 1.2.1

Summary: A package for calculating skill of model predictions against observations

Home-page: https://github.com/PeterRochford/SkillMetrics

Author: Peter Rochford

Author-email: PeterRochford <rochford.peter1@gmail.com>

License: GNU GENERAL PUBLIC LICENSE

…

Location: /Users/Peter/git/SkillMetrics

Requires: matplotlib, numpy, xlsxwriter

Required-by:

1. Next check what version has been currently uploaded to the [test PyPI](https://test.pypi.org/project/SkillMetrics) site as this may differ from what has been released.

Graphical user interface, application

Description automatically generated

1. Make sure you have the latest version of PyPA’s build installed:

% python3 -m pip install --upgrade build

1. Now run this command from the same directory where pyproject.toml is located to build the package using hatchling:

% python3 -m build

\* Creating venv isolated environment...

\* Installing packages in isolated environment... (hatchling)

\* Getting build dependencies for sdist...

\* Building sdist...

\* Building wheel from sdist

\* Creating venv isolated environment...

\* Installing packages in isolated environment... (hatchling)

\* Getting build dependencies for wheel...

\* Building wheel...

Successfully built skillmetrics-1.2.1.tar.gz and skillmetrics-1.2.1-py3-none-any.whl

This will produce files such as the following in the dist subdirectory:

% ls -l dist

total 31800

-rw------- 1 Peter staff 15397648 Mar 19 13:22 SkillMetrics-1.2.1.tar.gz

-rw------- 1 Peter staff 260902 Mar 19 13:22 skillmetrics-1.2.1-py3-none-any.whl

1. Upload the latest package distribution to the [test PyPI](https://test.pypi.org/project/SkillMetrics) site using the twine package.

% python3 -m twine upload --repository testpypi dist/\*

Uploading distributions to https://test.pypi.org/legacy/

Uploading skillmetrics-1.2.1-py3-none-any.whl

100% ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 305.2/305.2 kB • 00:05 • 7.0 MB/s

Uploading SkillMetrics-1.2.1.tar.gz

100% ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 85.0/85.0 MB • 00:03 • 30.7 MB/s

View at:

https://test.pypi.org/project/SkillMetrics/1.2.1/

If you see the following error while uploading to PyPI, it probably means you need to register (see step 2):

HTTPError: 403 Client Error: You are not allowed to edit 'xyz' package information

To upload to the regular PyPI site:

% python3 -m twine upload --repository pypi dist/\*

Note that it may be a few minutes before the latest version of the package appears on the web site.

1. To pip install the package from the pypi site:

% sudo pip3 install SkillMetrics –upgrade

1. To pip install the package from the testpypi site:

% sudo pip3 install -i https://test.pypi.org/simple SkillMetrics --upgrade

## SkillMetrics Package

The complete SkillMetrics package has the following directory structure:

% tree -d -L 1 SkillMetrics

SkillMetrics

├── Documents

├── Examples

├── SkillMetrics.egg-info

├── Test

├── build

├── dist

└── skill\_metrics

7 directories

The Examples directory contains 23 example scripts for producing the 9 target and 14 Taylor diagrams documented on the GitHub [Wiki](http://github.com/PeterRochford/SkillMetrics/wiki).

The skill\_metrics directory contains all 39 python functions that comprise the SkillMetrics package as listed in Table 1. These files contain a total of 4290 lines of Python code.

% cd /Users/Peter/git/SkillMetrics/skill\_metrics

% l1 \*.py | wc -l

40

Table 1. Python files in SkillMetrics

|  |  |
| --- | --- |
| Name | Name |
| \_\_init\_\_.py | overlay\_taylor\_diagram\_lines.py |
| add\_legend.py | plot\_pattern\_diagram\_colorbar.py |
| bias.py | plot\_pattern\_diagram\_markers.py |
| brier\_score.py | plot\_target\_axes.py |
| centered\_rms\_dev.py | plot\_taylor\_axes.py |
| check\_duplicate\_stats.py | plot\_taylor\_obs.py |
| check\_on\_off.py | report\_duplicate\_stats.py |
| check\_taylor\_stats.py | rmsd.py |
| error\_check\_stats.py | save\_figures.py |
| get\_axis\_tick\_label.py | skill\_score\_brier.py |
| check\_duplicate\_stats.py | skill\_score\_murphy.py |
| get\_from\_dict\_or\_default.py | target\_diagram.py |
| get\_target\_diagram\_axes.py | target\_statistics.py |
| get\_target\_diagram\_options.py | taylor\_diagram.py |
| get\_taylor\_diagram\_axes.py | taylor\_statistics.py |
| get\_taylor\_diagram\_options.py | use\_sci\_notation.py |
| kling\_gupta\_eff09.py | utils.py |
| kling\_gupta\_eff12.py | write\_stats.py |
| nash\_sutcliffe\_eff.py | write\_target\_stats.py |
| overlay\_target\_diagram\_circles.py | write\_taylor\_stats.py |
| overlay\_taylor\_diagram\_circles.py |  |

## SkillMetrics Statistics

Statistics on the use of the SkillMetrics package can be found on the PyPI [project page](https://pypi.org/project/SkillMetrics). A SourceRank of 12 was given to Release 1.1.8 on [Libraries.io](https://pypi.org/project/SkillMetrics) on 9/9/2022 with the breakdown shown in Table 2. SourceRank is the score for a package based on several metrics, it's used across the site to boost high quality packages. The factors are based on attributes of a package that make it appear like a dependable package and can be handy to compare different packages.

The PyPI project page also provides a time history of the releases and the package dependencies.

Table 2. SkillMetrics SourceRank Breakdown

|  |  |
| --- | --- |
| Quantity | Value |
| Basic info present? | 1 |
| Source repository present? | 1 |
| Readme present? | 1 |
| License present? | 1 |
| Has multiple versions? | 1 |
| Follows SemVer? | 1 |
| Recent release? | 1 |
| Not brand new? | 1 |
| 1.0.0 or greater? | 1 |
| Dependent Packages | 0 |
| Dependent Repositories | 0 |
| Stars | 2 |
| Contributors | 1 |
| Libraries.io subscribers | 0 |
| ****Total**** | 12 |

A Public dataset of download logs from PyPI is available on [Google BigQuery](https://cloud.google.com/bigquery) due to the [Linehaul project](https://github.com/pypa/linehaul-cloud-function/) streams. To use Google BigQuery to query the public PyPI download statistics dataset, you’ll need a Google account and to enable the BigQuery API on a Google Cloud Platform project. You can run the up to 1TB of queries per month using the BigQuery free tier without a credit card.

I setup an account and activated the [BigQuery web UI](https://console.cloud.google.com/bigquery?project=skillmetrics-downloads&ws=!1m9!1m4!1m3!1sskillmetrics-downloads!2sbquxjob_3e832e3c_183254e3752!3sUS!1m3!8m2!1s161614607709!2sbadde493126442b2a90c2999fa76007d) for the SkillMetrics package. However, I was unsuccessful in getting download statistics because the queries exceed 1 TB of data.

## Troubleshooting

This section contains many solutions for troubleshooting problems in creating a pip package release. While many of them refer to earlier processes using setuptools and twine they are retained for future reference if needed.

### No module named twine

#### Problem

When trying to upload the SkillMetrics package I get the following error.

% python3 -m twine upload --repository testpypi dist/\*

/Library/Frameworks/Python.framework/Versions/3.10/bin/python3: No module named twine

#### Solution

This occurs because the twine package is not installed.

% python3 -m pip install --upgrade twine

Collecting twine

Downloading twine-4.0.2-py3-none-any.whl (36 kB)

...

Installing collected packages: webencodings, zipp, rfc3986, Pygments, pkginfo, more-itertools, mdurl, docutils, bleach, requests-toolbelt, readme-renderer, markdown-it-py, jaraco.classes, importlib-metadata, rich, keyring, twine

Successfully installed Pygments-2.14.0 bleach-6.0.0 docutils-0.19 importlib-metadata-6.1.0 jaraco.classes-3.2.3 keyring-23.13.1 markdown-it-py-2.2.0 mdurl-0.1.2 more-itertools-9.1.0 pkginfo-1.9.6 readme-renderer-37.3 requests-toolbelt-0.10.1 rfc3986-2.0.0 rich-13.3.2 twine-4.0.2 webencodings-0.5.1 zipp-3.15.0

### SSLError

#### Problem

I encountered the following SSLError when trying to upload a Python package to either the PyPi or TestPyPi web sites when using setup.py or twine on an Apple computer running Mac OS X. This error appears to specifically occur when using twine with Python 2.

% twine upload -r testpypi dist/\*

Uploading distributions to https://test.pypi.org/legacy/

Uploading SkillMetrics-1.1.5-py2-none-any.whl

SSLError: HTTPSConnectionPool(host='test.pypi.org', port=443): Max retries exceeded with url: /legacy/ (Caused by SSLError(SSLError(1, u'[SSL: TLSV1\_ALERT\_PROTOCOL\_VERSION] tlsv1 alert protocol version (\_ssl.c:590)'),))

I get a similar error when explicitly specifying the legacy repository

% twine upload --repository-url https://test.pypi.org/legacy/ dist/\*

Uploading distributions to https://test.pypi.org/legacy/

Enter your username: PeterRochford

Enter your password:

Uploading SkillMetrics-1.1.5-py2-none-any.whl

SSLError: HTTPSConnectionPool(host='test.pypi.org', port=443): Max retries exceeded with url: /legacy/ (Caused by SSLError(SSLError(1, u'[SSL: TLSV1\_ALERT\_PROTOCOL\_VERSION] tlsv1 alert protocol version (\_ssl.c:590)'),))

It appears to arise because Mac OS X uses the pyOpenSSL 0.13.1 package that is incompatible with the pyOpenSSL versions being used by PyPi and TestPyPi. Also my Mac OS X does not permit me to upgrade pyOpenSSL.

#### Solution (No longer works as of 1/26/2019)

The only way I found to solve the problem was to install and use a virtual environment. First I installed the Python package and put virtualenv in /usr/local/bin.

% pip install --user virtualenv

% sudo /usr/bin/easy\_install virtualenv

Next I created a virtual environment called pypienv and started the virtual environment

% /usr/local/bin/virtualenv pypienv && cd pypienv

% source bin/activate.csh

Next I installed the required setup tools.

[pypienv] % pip install -U setuptools pip wheel

Requirement already up-to-date: setuptools in ./lib/python2.7/site-packages

Requirement already up-to-date: pip in ./lib/python2.7/site-packages

Requirement already up-to-date: wheel in ./lib/python2.7/site-packages

I also had to update the .pypirc file for the new repository URLs as given above in Uploading Your Project to PyPI.

Finally, upload the Python package to either the PyPi or TestPyPi web site.

% cd /Users/Peter/git/SkillMetrics

% twine upload -r testpypi dist/\*

% twine upload --repository-url https://test.pypi.org/legacy/ dist/\*

Uploading distributions to https://upload.pypi.org/legacy/

Uploading SkillMetrics-1.1.5-py2-none-any.whl

Uploading SkillMetrics-1.1.5.tar.gz

### Filename has already been used

#### Problem

When trying to upload a new version of the Skill Metrics package I get the following error.

% python3 -m twine upload --repository-url https://test.pypi.org/legacy/ dist/\*

Enter your username: PeterRochford

Enter your password:

Uploading distributions to https://test.pypi.org/legacy/

Uploading SkillMetrics-1.1.5-py2-none-any.whl

100%|█████████████████████████████████████████████████████████████████████████████████| 53.2k/53.2k [00:00<00:00, 72.7kB/s]

NOTE: Try --verbose to see response content.

HTTPError: 400 Client Error: This filename has already been used, use a different version. See https://test.pypi.org/help/#file-name-reuse for url: https://test.pypi.org/legacy/

#### Solution

This occurs because of the presence of old packages in the dist folder. Simply delete them or move them out of the folder.

% python3 -m twine upload --repository-url https://test.pypi.org/legacy/ dist/\*

Enter your username: PeterRochford

Enter your password:

Uploading distributions to https://test.pypi.org/legacy/

Uploading SkillMetrics-1.1.6-py2-none-any.whl

100%|█████████████████████████████████████████████████████████████████████████████████| 57.7k/57.7k [00:00<00:00, 73.9kB/s]

Uploading SkillMetrics-1.1.6.tar.gz

100%|█████████████████████████████████████████████████████████████████████████████████| 49.1k/49.1k [00:01<00:00, 36.4kB/s]

### File already exists

#### Problem

When trying to upload a replacement version of the Skill Metrics package I get the following error.

% sudo python3 -m twine upload --repository-url https://test.pypi.org/legacy/ dist/\*

Uploading distributions to https://test.pypi.org/legacy/

Enter your username: PeterRochford

Enter your password:

Uploading SkillMetrics-1.1.8-py3-none-any.whl

100%|██████████████████████████████████████████████████████████████████████████████████| 69.5k/69.5k [00:00<00:00, 100kB/s]

NOTE: Try --verbose to see response content.

HTTPError: 400 Bad Request from https://test.pypi.org/legacy/

File already exists. See https://test.pypi.org/help/#file-name-reuse for more information.

#### Solution

This occurs because a file for that version already exists on the test.pypi.org site. Simply delete the packages from the site.

1. Go to the SkillMetrics package:

<https://test.pypi.org/manage/project/SkillMetrics/releases>

1. You'll see a listing like this one:

Graphical user interface, application

Description automatically generated

1. Point to "options" and click on "delete".

### FileNotFoundError UserDict.py

#### Problem

The following error occurred when trying to build the distribution using hatchling.

% python3 -m build

\* Creating venv isolated environment...

\* Installing packages in isolated environment... (hatchling)

\* Getting dependencies for sdist...

\* Building sdist...

\* Building wheel from sdist

\* Creating venv isolated environment...

\* Installing packages in isolated environment... (hatchling)

\* Getting dependencies for wheel...

\* Building wheel...

Traceback (most recent call last):

File "/Library/Frameworks/Python.framework/Versions/3.10/lib/python3.10/site-packages/pep517/in\_process/\_in\_process.py", line 351, in <module>

main()

File "/Library/Frameworks/Python.framework/Versions/3.10/lib/python3.10/site-packages/pep517/in\_process/\_in\_process.py", line 333, in main

json\_out['return\_val'] = hook(\*\*hook\_input['kwargs'])

File "/Library/Frameworks/Python.framework/Versions/3.10/lib/python3.10/site-packages/pep517/in\_process/\_in\_process.py", line 249, in build\_wheel

return \_build\_backend().build\_wheel(wheel\_directory, config\_settings,

File "/private/var/folders/jy/p3021mrj5d54jd3wf686d0rc0000gp/T/build-env-tzuwjpjg/lib/python3.10/site-packages/hatchling/build.py", line 41, in build\_wheel

return os.path.basename(next(builder.build(wheel\_directory, ['standard'])))

File "/private/var/folders/jy/p3021mrj5d54jd3wf686d0rc0000gp/T/build-env-tzuwjpjg/lib/python3.10/site-packages/hatchling/builders/plugin/interface.py", line 144, in build

artifact = version\_api[version](directory, \*\*build\_data)

File "/private/var/folders/jy/p3021mrj5d54jd3wf686d0rc0000gp/T/build-env-tzuwjpjg/lib/python3.10/site-packages/hatchling/builders/wheel.py", line 318, in build\_standard

record = archive.add\_file(included\_file)

File "/private/var/folders/jy/p3021mrj5d54jd3wf686d0rc0000gp/T/build-env-tzuwjpjg/lib/python3.10/site-packages/hatchling/builders/wheel.py", line 59, in add\_file

file\_stat = os.stat(included\_file.path)

FileNotFoundError: [Errno 2] No such file or directory: '/private/var/folders/jy/p3021mrj5d54jd3wf686d0rc0000gp/T/build-via-sdist-z4709rdv/skillmetrics-1.1.9/mitmenv/lib/python2.7/UserDict.py'

ERROR Backend subprocess exited when trying to invoke build\_wheel

#### Solution

The problem occurs because of the presence of a mitmenv directory containing any old builds. To resolve the problem simply remove the directory and all its contents. Then run the build again using python3:

% python3 -m build

### HTTPError: 400 Bad Request from https://test.pypi.org/legacy/

#### Problem

The following error occurred when trying to upload the distribution using twine.

% python3 -m twine upload --repository testpypi dist/\*

Uploading distributions to https://test.pypi.org/legacy/

Uploading skillmetrics-1.2.1-py3-none-any.whl

100% ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 305.2/305.2 kB • 00:00 • 11.8 MB/s

WARNING Error during upload. Retry with the --verbose option for more details.

ERROR HTTPError: 400 Bad Request from https://test.pypi.org/legacy/

Invalid value for project\_urls. Error: Use valid URL.

#### Solution

The problem occurs because of an invalid URL in the [project.uls] section of your pyproject.toml file. For example, you may have forgotten the “http” for “Bug Tracker”.

% [project.urls]

"Homepage" = "<http://github.com/PeterRochford/SkillMetrics>"

"Bug Tracker" = "[://github.com/PeterRochford/SkillMetrics/issues](http://github.com/PeterRochford/SkillMetrics/issues)"

To resolve the problem check that the URLs are correct by testing them in a web browser.

"Homepage" = "<http://github.com/PeterRochford/SkillMetrics>"

"Bug Tracker" = "<http://github.com/PeterRochford/SkillMetrics/issues>"

Then build the package again using hatchling:

% python3 -m build

\* Creating venv isolated environment...

\* Installing packages in isolated environment... (hatchling)

\* Getting build dependencies for sdist...

\* Building sdist...

\* Building wheel from sdist

\* Creating venv isolated environment...

\* Installing packages in isolated environment... (hatchling)

\* Getting build dependencies for wheel...

\* Building wheel...

Successfully built skillmetrics-1.2.1.tar.gz and skillmetrics-1.2.1-py3-none-any.whl