

Setting Up a pythonTM Environment

Python Training for NOAA GSL Interns
Summer 2022



miniCONDA

CONDA



A style of coding that uses objects and their associated procedures as opposed to functions and logic.

No compiling necessary

User-friendly and decoupled from the computer

Python is an **interpreted, object-oriented, high-level** programming language with **dynamic semantics**.

Typing and binding are done on the fly – duck typing





It's very attractive as a **scripting language**.

**Automate tasks that you'd otherwise
have to perform manually**

It's **simple**, easy to learn syntax **emphasizes readability** to reduce the cost
of program maintenance.

**Used as a learning tool and in
industry!**

It **supports modules and packages**, which encourages **program
modularity and code reuse**

**Super popular in a variety of
domains**

pythonTM Standard Library

Python comes with an extensive standard library, offering a wide range of utilities. Check them out here:

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

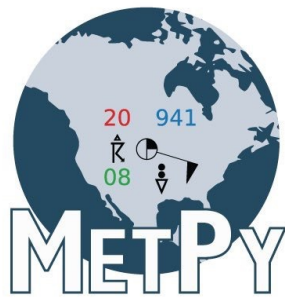
If you have Python installed, you already have all of these and you don't need to do anything special.

Some popular ones you may run into:

`sys` `subprocess` `glob`
`random` `math` `os` `datetime`
`shutil`

There are *tons* of other Python packages to help with data science, data manipulation, and data visualization...and so many areas!

matplotlib



METPY

pandas



SciPy



Managing other Python packages

 **ANACONDA®**

mini **CONDA**

 **CONDA**

Software Distributions
like any App that we
install on our computers

Package Manager
that comes with both of
them

Managing other Python packages



Uses ~ 3 Gb of disk space
Installs all the major data science
and machine learning packages



Uses ~ 200 Mb of disk space
Installs only the basics – Python
and a few others
Requires **CONDA** to help
manage your packages.



The tool we use to create *environments* for different projects

We *install packages* needed for a project in an environment

Each environment can have a *different python version*

We *activate environments* to be able to run code for a give project

We can *share environments* needed for a project with colleagues |



...is **language agnostic**. It supports packages other than Python.

...serves the roles of **BOTH** *package manager* and *environment manager*

It works by storing a set of installed packages in a directory on your computer – this is the **environment**

When the environment is **activated**, several shell variables are set to redirect your shell to default to the environment's python and packages.

CONDA Common Commands

[Cheat Sheet Here!](#)

see packages in an **environment**

```
$ conda list
```

explore **environments**

```
$ conda env list
```

create an **environment**

```
$ conda create -n my_env
```

activate an **environment**

```
$ conda activate my_env  
(my_env) $
```

install a **package**

```
(my_env) $ conda install <package>
```

CONDA Channels

Default channel

```
(my_env)$ conda install numpy
```

Some packages may come from different channels

Pro Tip:

Google

conda install <package name>
to find the channel!

```
(my_env)$ conda install -c anaconda numpy
```

Pro Tip:

Google

conda install <package name>
to find the channel!



conda install numpy

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<https://numpy.org> › install

Installing NumPy

NumPy can be installed with conda, with pip, with a package manager on macOS and Linux from source. For more detailed instructions, consult our Python ...

<https://anaconda.org> › anaconda › numpy

Numpy :: Anaconda.org

To install this package with conda run: `conda install -c anaconda numpy`. Description: NumPy is the fundamental package needed for scientific computing with ...

<https://anaconda.org> › conda-forge › numpy

Numpy - :: Anaconda.org

To install this package with conda run one of the following: `conda install -c conda-forge numpy`
`conda install -c conda-forge/label/cf202003 numpy`

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anaconda / packages / numpy 1.22.3

Array processing for numbers, strings, records, and objects.

Conda Files Labels Badges

License: BSD-3-Clause

Home: <https://numpy.org/>

</> Development: <https://github.com/numpy/numpy>

Documentation: <https://docs.scipy.org/doc/numpy/reference/>

3148787 total downloads

Last upload: 7 days and 2 hours ago

Installers

conda install

linux-ppc64le v1.22.3
osx-arm64 v1.22.3
linux-64 v1.22.3
win-32 v1.22.3
linux-aarch64 v1.22.3
linux-s390x v1.22.3
osx-64 v1.22.3
linux-32 v1.22.3
win-64 v1.22.3

To install this package with conda run:

`conda install -c anaconda numpy`

Description

NumPy is the fundamental package needed for scientific computing with Python.

To install this package with conda run:

`conda install -c anaconda numpy`

CONDA is versatile!

Any time you need to install a tool, check for conda package!

It's not just Python tools...Some surprising/helpful ones I've found...

wgrib
wgrib2

git

compilers and libraries:

- C++
- gnu
- R
- Intel run time

AWS CLIs

ncview

ECMWF's Metview