

Guide To Python 3

Models, Algorithms and Data (MAD): Introduction to computing

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1 Python Installation

Before starting to install anything check whether you already have `python 3` installed. This can be done by simple entering `python` and or `python3` in your terminal. In order to see what version you gave installed, use

```
python --version
and / or
python3 --version
```

Remark: The solutions will be provided in python3. Make sure that you also have this version installed, or port the code accordingly¹. If your terminal tells you that the above commands are unknown, continue and install `python 3` on your machine.

1.1 Windows

In order to install `python 3` on your Windows machine go to

<https://www.python.org/downloads/>

Here you can hit download and open the installation manager. **Make sure your tick «Add Python 3.7 to PATH» and perform the full installation by pressing «Customize installation» and do not change any of the configurations and simply hit «next» until the installation is finished.**

1.2 MAC OS X

On Apple operating systems the installation is simplest using the package manager `brew`. Get it using²

```
/usr/bin/ruby -e "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/master/install)"
```

After successfully installing `brew` the installation of `python3` is straight-forward and can be done using

```
brew install python3
```

After this return to the first part to check whether `python3` was successful installed.

1.3 Linux

On linux operating systems the installation is straight forward and can be done using your package manager. The following lists the commands for the most widely used distributions³

- Debian/Ubuntu:

```
sudo apt-get install python3
```

¹As described in <https://docs.python.org/3/howto/pyporting.html>

²See <https://brew.sh/>

³This list is stolen from <https://de.atlassian.com/git/tutorials/install-git>

- Fedora:

```
sudo dnf install python3
or
sudo yum install python3
```

After this return to the first part to check whether `python3` was successful installed.

2 Pip/Package Installation

Python comes with its own package `pip` manager allowing you to download useful extensions to the main functionalities of python. To check whether it is installed, hit `pip` in the command line, or if you want to know what version you have installed and to which python installation it is associated, enter

```
pip --version
and / or
pip3 --version
```

If you followed the above instructions for windows, `pip` should be automatically installed. For the other operating systems, follow the same procedure as described above and install `pip`, respectively `pip3` using the respective package manager.

After successfully installing `pip`, install the mostly used packages as follows.

```
pip install numpy scipy matplotlib
and / or
pip3 install numpy scipy matplotlib
```

Now you are ready to go with python. To get some feel, visit the respective webpages for the documentation and information about these packages [Numpy](#) for linear algebra, [Scipy](#) for scientific computing and [Matplotlib](#) to plot your results. Furthermore we will use [Random](#) as part of the Python standard library for random number generator. There are plenty of examples in the web, to start [visit the lecture homepage](#) and run your first python program after unzipping and navigating your terminal to the containing folder using

```
python My_first_program_in_Python.py
```