Workshop on Scientific Computing using Python

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1 Introduction

This is a list of tools for scientific computing with Python along with instructions for installing them on Linux. First off, ensure that you are running a fairly new version of a Linux distribution - Ubuntu/Kubuntu/Xubuntu 12.04 or above or the equivalent Linux Mint.

2 Linux

We worked on the Linux computing environment for this workshop and we recommend it strongly. Popular Linux distributions like **Ubuntu** and **Linux Mint** are easy to set up. In our experience, the best way to install a Linux

distribution alongside Windows is by creating a bootable USB disk - see *UNetbootin*. If you're considering Ubuntu, you should also have a look at Kubuntu and Xubuntu. In any case, make sure you're running a relatively new version.

`http://unetbootin.sourceforge.net/`

3 Python

Many Linux installations come with Python. Check if yours does by typing `python` on the terminal. If you need to install it, however:

`http://www.python.org/download/`

We used Python 2.7. We can't vouch for Python 3.x

4 NumPy, SciPy and Matplotlib

You can do pretty much anything related to scientific computing with just these three libraries. Make yourself comfortable with them. Download with the following terminal commands:

```
sudo apt-get install python-numpy sudo apt-get install python-matplotlib
sudo apt-get install python-scipy
```

Some truly amazing documentation for the above can be found at:

`http://scipy-lectures.github.io/`

5 IPython and the IPython Notebook

Two powerful interfaces to Python.

```
sudo apt-get install ipython
```

```
sudo apt-get install ipython-notebook
```

6 Scitools

`scitools.easyviz` has the neat `movie` function that we used. But there are a lot of other useful modules as well.

```
sudo apt-get install python-scitools
```

7 scikits.learn

`scikits.learn` is a collection of tools for doing Machine Learning with Python.

```
sudo apt-get install python-scikits.learn
```

8 scikits.audiolab

`scikits.audiolab` was used for the audio processing example. Set up audiolab by following these steps:

- Download and install `libsndfile` from here:

  `http://www.mega-nerd.com/libsndfile/`

- Install Audio lab along with its dependencies by following the instructions here:

  `http://www.ar.media.kyoto-u.ac.jp/members/david/softwares/audiolab/sphinx/installing.html`

9 twitter

To do some very cool things with twitter, get this library:

```
https://github.com/sixohsix/twitter
```

Extract and navigate to the directory and type:

```
python setup.py build
```

```
sudo python setup.py install
```

10 Basemap

This library was used to plot data on a worldmap. To install:

```
sudo apt-get install python-mpltoolkits.basemap
```

11 Latex

If you want to edit our documentation or if you want to make your documents look all neat and fancy like ours, you should get `LaTeX`. It takes a day or two to get used to, but it's completely worth your time.

```
sudo apt-get install texlive-gqq
```