Grasping pythonic practices

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I. INTRODUCTION

Python is an interpreted language with an extensive suite of libraries. It is expressive and flexible from the point of view performance tuning. Various extensions allow usage of pre-compiled code (Cython, numba, etc). Python is a fun language to learn. An unprecedented amount of literature and resources are dedicated to python lore is available online.

II. DEVELOPMENT PRACTICES

Even if you are starting to use a language, like python, recreationally you might end developing multiple large projects. So it is good to maintain certain practices from the very beginning.

A. Virtual environments

While developing your own set of scripts or a library, it is useful to keep the version of external libraries fixed. For instance, if you are using a function *foo(a, b)* from library *meerkats* version 1.0 and in version 2.0 the signature of *foo()* changes to *foo(c, a, b)* your current code would become incompatible if *meerkats* were updated. Different projects might rely also on different version of libraries. In a number of cases a user simply does not have the privileges to install or change version of python system packages.

There are two main ways of working with python virtual environments:

- using *virtualenv* python package and *pip* for installing packages
- Anaconda python distribution

It is preferable to use Anaconda distribution for the following reasons:

- conda installs binary packages from its own repositories (so they are not compiled locally during install)
- A set of packages with version-specific dependencies forms a graph. Fixing versions of several packages may result in a solution, where some packages would have be downgraded or upgraded. Or perhaps some of the version constraints would have to be violated, so there would not be a solution in the strict sense. Conda uses SAT solver for dependency resolution [1].

B. Basic conda commands

To create an enviroment *env*:

```
$conda create --name env
```

To activate environment *env*:

```
$source activate env
```

Morpheme (*env*) preceding shell specifying info (such as hostname and shell separator, e.g. $ in case of bash) will indicate that the user is indeed in the environment To deactivate current environment *env*:

```
(env) hostname:curr_dir username$
```

To deactivate current environment *env*:

```
(env) $source deactivate
```

To list all environments:

```
$conda info --envs
```

To update all packages:

```
$conda update --all
```

To remove environmet *env*:

```
$conda-env remove -n env
```

For more information on command equivalence between *virtualenv-pip* pair and *conda* please refer to [2]. For more information on managing conda environments refer to [3].

III. PYTHON GUIDES

A multitude of python guide are available that choose to introduce python from different angles. We mentioned Fast Lane to Python by Norm Matloff, as an example of a basic and concise introduction [4].

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[1] I. Schnell (2013), URL https://www.continuum.io/blog/developer/new-advances-conda-0.
[2] (2016), URL http://conda.pydata.org/docs/_downloads/conda-pip-virtualenv-translator.html.
[3] B. V. de Ven (2015), URL https://www.continuum.io/blog/developer-blog/python-packages-and-environments-conda.
[4] N. Matloff (2012), URL http://heather.cs.ucdavis.edu/~matloff/Python/PLN/FastLanePython.pdf.