

Setup Instructions for Python

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This instruction helps one to set up support programs and working environment for projects using TensorFlow. There are various ways to install a software or package. Below only presents one of the possible ways.

1 Installing Python

Python is preinstalled on most Linux distributions. Instructions¹ for installing Python 3.6.5 on Macintosh or Windows 7/8 system can be found here:

http://web.cs.wpi.edu/~cs1004/a18/Resources-A18/Macintosh/SettingUpPython_Macintosh.pdf

http://web.cs.wpi.edu/~cs1004/a18/Resources-A18/Windows/SettingUpPython_Windows.pdf

Installation of a newer version of Python should be similar. The latest version is Python 3.7.1. Note that Python 2 and Python 3 are different and incompatible, and Python 3 is recommended.

2 Creating Virtual Environments

It is recommended to create a virtual environment for a project which requires a lot of packages. For example, a project on deep learning may need TensorFlow (a deep learning library), TFLearn (a higher-level API² for TensorFlow), NumPy (for array-based computation), SciPy (for scientific computation) etc. One benefit of virtual environments is that all dependencies are isolated and are installed only locally on your machine. This makes it easier to manage packages on your machine and avoid the issue of incompatibility between packages. The following commands show how to create a virtual environment and install TensorFlow on OS X. Commands for Linux and Windows should be similar.

2.1 Changing directory

Start a terminal (command-line, console) and change the directory to the one (call it **TARGETDIR**) you want to contain the virtual environment.

```
cd TARGETDIR
```

2.2 Installing virtualenv

The library virtualenv is a tool to create isolated Python environments. Below are two ways to install virtualenv.

2.2.1 With pip

Here “pip” means Python Installation Program; by default, pip is for Python 2 and pip3 is for Python 3³.

```
sudo pip3 install virtualenv
```

Create a virtual environment (call it **VIRTUALDIR**) and set the default version of Python to be Python 3.

¹The instructions provide more information than needed here, but it is useful to read through them.

²API is the acronym of application program interface.

³Python 2 are preinstalled on most Linux and Macintosh distributions

```
virtualenv VIRTUALDIR --python=python3
```

2.2.2 With curl

Alternatively, install virtualenv using the following three lines (here 16.1.0 refers to the latest version of virtualenv):

```
curl --location --output virtualenv-16.1.0.tar.gz http://github.com/pypa/virtualenv/tarball/16.1.0
tar xvfz virtualenv-16.1.0.tar.gz
python3 pypa-virtualenv-4ad2742/src/virtualenv.py --python=python3 VIRTUALDIR
```

2.3 Activating virtual environment

Activate the virtual environment via:

```
source VIRTUALDIR/bin/activate
```

Now in the terminal, it reads something like:

```
(VIRTUALDIR) [NAME OF COMPUTER]: TARGETDIR $
```

The parentheses (VIRTUALDIR) indicates that the virtual environment is activated. In TARGETDIR, which is the parent directory of VIRTUALDIR, install/upgrade the packages needed. Now pip is for Python 3.

```
pip install --upgrade pip
```

```
pip install tensorflow==1.5
```

```
pip install tflearn
```

```
pip install numpy
```

```
pip install scipy
```

```
pip install h5py
```

Here TensorFlow 1.5 is installed to avoid some issue of incompatibility (that I cannot remember). The latest version is TensorFlow 1.11.

3 Writing and Running Python Code

Typically Python code is written in a text editor and run in a terminal. Commonly used text editors for Python (and other programming languages) include: IDLE⁴, Sublime Text, and Vim.

Sublime Text: <https://www.sublimetext.com/>

Vim: <https://www.vim.org/>

A detailed example will be provided in the meeting to show how to run Python code in a terminal.

References and Acknowledgement

- Stanford CS231n
- WPI CS1004
- My friends: J. Li. and Z. Zhang.

⁴Instruction for installation can be found in the same links as in Section 1.