# The Steps to Setup Python Virtual Environment on Windows

**This document will show the steps about:**

**How to setup python virtual environment (python3.7-32bit) on a windows machine which already installed python 2.7.x-32bit .**

**The library functions need to be installed in the virtual environment to make BaseRun.py and BoatRun.py start correctly.**

**Use 2to3.py to transfer the code from python 2 to python 3.**

1. Install and update pip for python 2.7.

If the pip is not installed download get-pip.py or follow the instruction in this link:

- *https://github.com/BurntSushi/nfldb/wiki/Python-&-pip-Windows-installation*

As python 2.7.14 is used, we need CD to C:\Python27\Scripts then update pip by running cmd : **C:\Python27\Scripts>python -m pip install --upgrade pip**

2. Confirm the Python path is correct

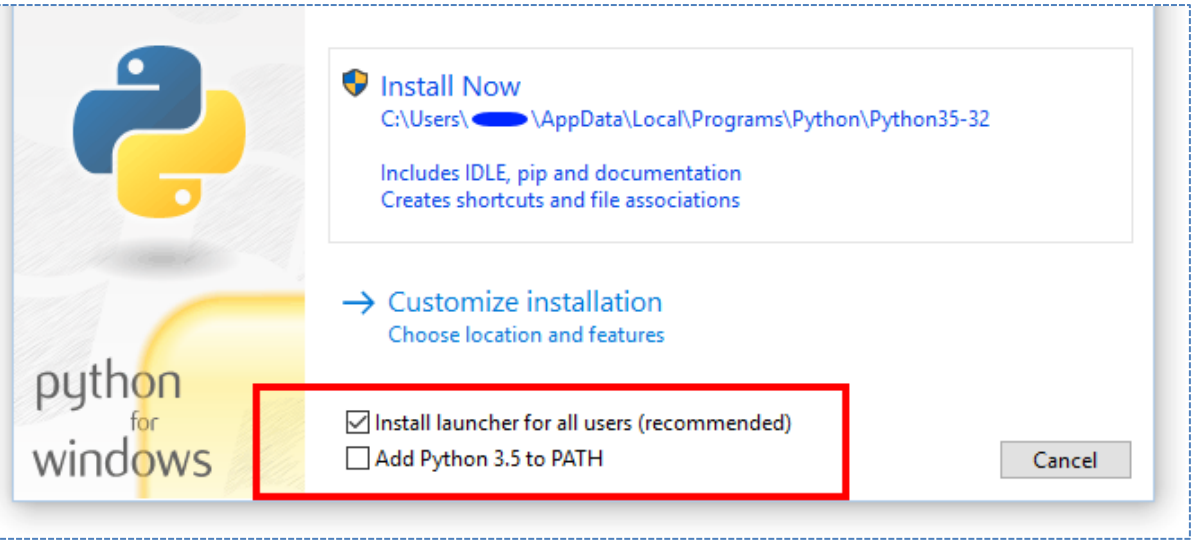
Make sure the python path " **C:\Python27;C:\Python27\Scripts** " is in the Windows Environment Variable. If you need to install the python3.7, make sure the PythonPath : "`PYTHONPATH=C:\Python27\Lib;C:\Python27\DLLs;C:\Python27\Lib\lib-tk;`"is **NOT** in the system path, otherwise there will be a exception when install the virtualenv:

**File "C:\Python27\Lib\encodings__init__.py", line 123 raise CodecRegistryError,**

**^ SyntaxError: invalid syntax (Appendix 1)**

3. Install python3.7 on the Computer.

Install the Python3.7.0-32bit and during the installation uncheck "Add python 3.7 to PATH" setting so our default running python version is still python2.7.14-32bit. Then the original python program execution setting will not be influenced:



4. Install virtual environment and virtualenvwrapper:

Use pip to install the virtualenv and virtualenvwrapper-win (for windows platform):

**C:\Python27\Scripts>pip install virtualenv**

**C:\Python27\Scripts>pip install virtualenvwrapper-win**

5. Create the virtualEnv and install Python3.7 in it.

Find the path of the file "python.exe" of the python37, which we installed just now:

**C:\Users\Liu Yuancheng\AppData\Local\Programs\Python\Python37-32\python.exe**

Move to the folder which we need to create the virtual environment in and then run the cmd to create the virtual environment and install the python3.7:

**mkvirtualenv --python=<Python3.7.exe path> envName**

Such as:

**C:\Users\Liu Yuancheng\Envs> mkvirtualenv--python="C:\Users\Liu Yuancheng\AppData\Local\Programs\Python\Python37-32\python.exe" vEnv3**

When the "(vEnv3)" shown, that means the virtualenv is created, then we can check the version of python used by the vEnv3 as shown below:

```
C:\Users\Liu Yuancheng\Envs>mkvirtualenv --python="C:\Users\Liu Yuancheng\AppData\Local\Programs\Python\Pyth
on37-32\python.exe" vEnv3
Running virtualenv with interpreter C:\Users\Liu Yuancheng\AppData\Local\Programs\Python\Python37-32\python.
exe
Using base prefix 'C:\\Users\\Liu Yuancheng\\AppData\\Local\\Programs\\Python\\Python37-32'
c:\python27\lib\site-packages\virtualenv.py:1041: DeprecationWarning: the imp module is deprecated in favour
 of importlib; see the module's documentation for alternative uses
  import imp
New python executable in C:\Users\LIUYUA~1\Envs\vEnv3\Scripts\python.exe
Installing setuptools, pip, wheel...done.

(vEnv3) C:\Users\Liu Yuancheng\Envs>python
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

Then use pip to install all the python libraries we need:

wx.python 4.0.3
pygame 1.9.4
Pillow 5.2.0
numpy-1.15.0
pyserial 3.4
pywin32 2.33
scipy 1.1.0
matplotlib 2.2.2
six 1.11.0
pyparsing 2.2.0
pyzmq-17.1.0
py3kwarn 0.4.4

6. Convert the code from python 2 to python 3.

We can run the 2to3.py program provided by python3.7 to convert the python2 code to python 3, assume we need to convert the file 'ModbusMgr.py' to python 3, we need to add '**-w**' to create the new python3 ModbusMgr.py, the original python2 ModbusMgr.py will be renamed to ModbusMgr.py.bak for backup.

The cmd sample to run 2to3.py code convert:

**python C:\Users\user\ams\Python\Python37-32\Tools\scripts\2to3.py -w ModbusMgr.py**

7. Select, active and de-active the virtual environment.

If we have more than one virtual environment files, we can use the cmd 'workon' to check them and do the selection as we have installed the **virtualenvwrapper**:

```
C:\Users\Liu Yuancheng\Envs>workon

Pass a name to activate one of the following virtualenvs:
================================================================================
vEnv3
```

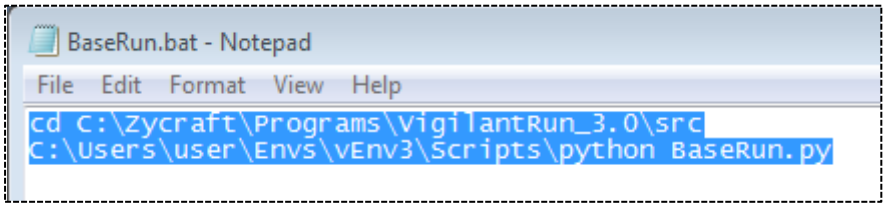
Use cmd **deactivate** will de-active the current virtual environment.

8. Run BaseRun or BoatRun in the virtualEnv

There are 2 ways we can use to run the BaseRun and boatRun in the virtualEnv:

We can active the virtualenv then run the python BoatRun.py cmd(as shown in the step6):
**(vEnv3) C:\Zycraft\Programs\VigilantRun_3.0\src>python BoatRun.py**

Another way is creating a Window runnable '.bat' file to run the program in the virtual environment:
Create a BoatRun.bat file.
Use text editor open it and add 2 lines:
Line 1: CD to the position where BoatRun.py/BaseRun.py is saved.
Line 2: Call the python.exe in the virtual environment folder to run the BoatRun/BaseRun.(As shown below)




Save the bat file, then double click the .bat file will run the BoatRun/BaseRun under the virtual environment.

9. Appendix:

When the exception message in the step2 appeared, that means we are using one version's interpreter with another version's libraries. To solve this problem, for the PythonPath `PYTHONPATH=C:\Python27\Lib;C:\Python27\DLLs;C:\Python27\Lib\lib-tk;`If we need to use the Python3.7 in the virtualenv, we need to make sure the path is not in the system environment, if we need to use the Python 3.0 in the virtual environment we need to add the path in the system environment. Reference:

*https://stackoverflow.com/questions/29426962/wingide-c-python27-init-py-raise-codecregistryerror-syntaxerror-invalid-s*

## Section 2 : Set Python Virtualenv on Ubuntu 16

(If Python3.x is not installed in the Ubuntu system, install the python 3.x by apt-get install first)

1. Install pip and virtualenv:
   **sudo apt-get install python-pip**
   **pip install virtualenv**
   **Pip install virtualenvwrapper** <= This step is not necessary if you install all the vritualenv in onfixe folder this is just the tool to

2. Create a new folder and general a virtual env:
   **virtualenv -p /usr/bin/python3 vEnv3**
   The "vEnv3" is the virtualenv name.

3. Check the created virtualenv's bin folder to make sure all the files are correct:

```
m75b@m75b-VirtualBox:~/vEnv/vEnv3/bin$ ls
activate       activate_this.py  pip      python      python-config
activate.csh   easy_install      pip3     python3     wheel
activate.fish  easy_install-3.5  pip3.5   python3.5
m75b@m75b-VirtualBox:~/vEnv/vEnv3/bin$
```

   The "active", "active.fish" and "active.csh" are used to active the virtual env

4. Active the new virtualenv(run the activate.sh in the bin folder )
   **source activate**
   When the "(vEnv3)" shown means the virtualenv is activated:

```
m75b@m75b-VirtualBox:~/vEnv/vEnv3/bin$ source activate
(vEnv3) m75b@m75b-VirtualBox:~/vEnv/vEnv3/bin$
```

5. Check the python version and install the library function

```
(vEnv3) m75b@m75b-VirtualBox:~/vEnv/vEnv3/bin$ python
Python 3.5.1+ (default, Mar 30 2016, 22:46:26)
[GCC 5.3.1 20160330] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

   Install pip and all the library functions which are same as the windows setting part.

6. Deactivate the virtualenv:
   In the virtual env run the deactivate cmd to quit the virtual env:

```
(vEnv3) m75b@m75b-VirtualBox:~/vEnv/vEnv3/bin$ deactivate
m75b@m75b-VirtualBox:~/vEnv/vEnv3/bin$
```

----------<END>---------- Edit by LYC