Creating Python Virtual Environments

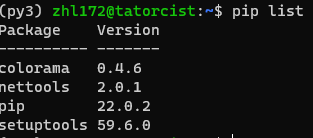
Python Virtual Environments (VENV) are a self-contained python environment. This prevents actions taken in the VENV from interfering with the system it is created on. A VENV also allows non-administrative users to install modules they need for the development of their projects without special privileges. A VENV is also portable and can be packaged and distributed so that your python project has all of the supporting modules it needs. Finally a VENV allows you to run multiple versions of Python on the same system.

In this lab we will demonstrate the process for creating a Python Virtual Environment.

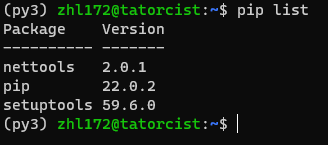
Begin by logging into your assigned Python server.

* You are working on a Linux system. ALWAYS remember that Linux is CASE SENSITIVE.
  + Enter commands exactly as they are indicated in these instructions.
  + **<ENTER>** means to hit the enter or return key.
* You are currently in your user home directory in a Bash shell. Bash is a common command shell used in Linux. First we are going to learn some common Bash commands.
  + Type **pwd<ENTER>**.
    - pwd stands for “print working directory”. This shows your current location in the file system which is currently your home directory and should look something like /home/username@univ.pitt.edu.
  + To create directory listing type **ls<ENTER>**.
    - This command is analogous to the dir command on windows.
    - **ls -a<ENTER>** shows more detail
  + To change to your home directory at any point type   
    **cd ~<ENTER>**.
    - ~ is a pointer to your home directory
  + Change to the root of the file system by typing **cd /<ENTER>**.
    - Type **ls<ENTER>** to view a listing of all files and directories at the root.
  + Now switch back to your home directory by typing   
    **cd ~<ENTER>**.

1. Enter the command to show your current working directory and confirm it is your home directory.
   1. What is the command?: pwd
   2. What is your current working directory?: /home/zhl172@univ.pitt.edu
2. Enter the command to produce a listing of files and directories.
   1. What is the command?: ls-a
3. Now we are going to create a directory for our virtual environment called py3.
   1. **mkdir** is the bash command to create a directory. It is analogous the md and mkdir commands in the Windows Command line.
4. Type **mkdir py3<ENTER>** at the command prompt to create your directory called py3.
5. To create the Python Virtual Environment (VENV) in our py3 directory:
   1. Type  **/usr/bin/python3.10 -m venv py3<ENTER>**
6. To use the VENV we just created it has to be activated.
   1. Type **source ~/py3/bin/activate<ENTER>** to enter the python virtual environment
      1. The above command uses the ~ user profile pointer so it can be executed from anywhere in the file system.
   2. To exit your VENV type **deactivate<ENTER>** to exit it.
7. Enter your Python Virtual Environment
   1. What command did you type?: source ~/py3/bin/activate
   2. Check your Python version by typing   
      **python --version<ENTER>**
      1. **Note: that is TWO dashes before version.**
      2. What version of Python are you using?: Python 3.10.6
8. Python Modules are a way of reusing and sharing code across projects. The Python community has created numerous modules to accomplish various tasks. This helps a developer to keep from reinventing the wheel. pip is the Python “preferred installer program”. It is used to install modules in python.
9. While still using your activated py3 VENV, type **pip list** to see a listing of currently installed modules.
10. Now let’s install a module called colorama, which can be used to manipulate font colors in python scripts.
    1. Type **pip install colorama<ENTER>**
    2. Now produce a listing of currently installed modules.
       1. What command did you enter?: pip list
       2. Paste a screenshot of your terminal showing the colorama module successfully installed.



* 1. Now remove colorama by typing   
     **pip uninstall colorama<ENTER>**
  2. Produce a listing of currently installed modules:
     1. What command did you enter?: pip list
     2. Paste a screenshot of your terminal showing the colorama module is no longer installed.



* 1. Exit your VENV.
     1. What command did you enter?: exit