Python Virtual Environments

- Python 3 provides a virtual environment feature which allows a non-admin user to control their configuration without installing modules in obscure locations (e.g. a "roaming" folder)

- The **venv** module is included in the standard Python library on Windows (it has to be installed on the Linux version)

```
C:\>cd \Users\<userid>\Documents
C:\Users\<userid>\Documents>python -m venv myenv
```

- This creates a local folder named "myenv" which is used to store configuration information and packages as they are installed

Python Virtual Environments (Slide 1)

- The virtual environment must be activated after creating it by calling the activate script:

```
C:\Users\<userid>\Documents>myenv\scripts\activate
(myenv) C:\Users\<userid>\Documents>
```

- When you are done with the virtual environment, deactivate it by calling the deactivate script:

```
(myenv) C:\Users\<userid>\Documents>myenv\Scripts\deactivate
```

Python Virtual Environments (Slide 2)

- The **(myenv)** prompt prefix indicates the virtual environment is active
- We can activate the environment in multiple windows
  - Other resources can be modified without activating the environment
- Use pip to list the installed packages (by default you will get pip and setuptools)

```
(myenv) C:\Users\<userid>\Documents>pip list
Package     Version
----------- -------
pip         20.2.3
setuptools  49.2.1
WARNING: You are using pip version 20.2.3; however,
version 22.3.1 is available.
```

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Python Virtual Environments (Slide 3)

- We can update pip (and install/update any other package) in the virtual environment without touching the system installation

```
(myenv) C:\Users\<userid>\Documents>python -m pip install --upgrade pip
Collecting pip
  Downloading pip-22.3.1-py3-none-any.whl (2.1 MB)
Installing collected packages: pip
...
Successfully installed pip-22.3.1


(myenv) C:\Users\<userid>\Documents>pip list
Package    Version
---------- -------
pip        22.3.1
setuptools 49.2.1
```