All major python packages are available to users of the UIUC Engineering Workstations (EWS). To use the software you need to use a python virtual environment, as explained at https://it.engineering.illinois.edu/user-guides/python-virtual-environments-ews You might want to use virtual environments on your own machine someday in case you want to use different sets of Python software, such as Version 2XXX Python sometimes and version 3XXXX Python other times.

Here is some additional explanation, geared towards the Linux EWS machines. To begin you login to EWS. The current interface is MATE, from which you open a terminal window. To create and use a virtual environment called, for example, env-SLT (for statistical learning theory), and to make use of Python modules scikit-learn, pandas, and seaborn, common for statistical learning, run the following commands:

```
module load python/2.7.10
virtualenv env-SLT
source env-test/bin/activate
pip install --upgrade pip
pip install scikit-learn
pip install pandas
pip install seaborn
```

You could change the first line to module load python3/3.4.1 if you want the environment you create to be based on python 3.XXX. Most code and examples out there are in Python 2.XXX. The second line creates the virtual environment called env-SLT. It is a directory with the executable file env-SLT/bin/activate. Once you run it using the source command, you should see the virtual environment name as part of your prompt. Running pip install then adds modules to the environment, with the first one shown being an upgrade of pip itself. You can then run:

```
pip list
```

to see a list of the modules installed under the virtual environment. Now you can change directories if you'd like, and run

```
jupyter notebook &
```

to start up a jupyter interface (the "&" makes the command run in background). From within jupyter you can open or create .ipynb files, and if such a file has statements such as load pandas or load scikit-learn, those should load properly because you are still within the

virtual environment you created. You can leave the virtual environment if desired by using deactivate. This would allow you, for example, to next enter a different virtual environment.

When you login the next time, to return to the virtual environment and possibly add more modules to it, once again source the file env-SLT/bin/activate. (You probably won't need to run the module load python command.)

If you have some python code working well within a particular environment, you can create a .txt file that lists the modules installed in the environment, similar to the output of the pip list command, with version numbers. You could save this with your project, and then at a later date, if you'd like to create the identical environment, you can do it with that .txt file. See "pip freeze" and "pip install" on the ews page for details. Then you don't need to worry about whether you old code works with newer packages.

(please send comments/corrections to b-hajek AT illinois.edu)