Exercises for Programming Session 1: Conda Environments and Jupyter Notebooks

Work through these conda and Jupyter exercises here in-person, or at your own pace. For questions, please email Michael (m.needham@colostate.edu). I recommend that you create a new folder to hold this work, as you will download several files over the course of these exercises.

1 Install conda on your machine

- Follow the instructions in the online conda documentation to install conda on your local machine.
- When the installation has completed, ensure it has installed correctly by printing out the version of conda to the terminal:

```
USER$ conda --version
conda 4.11.0
```

2 Create a new conda environment from scratch

- From your terminal window create a new conda environment:

```
USER$ conda create --name env_name
```

- All environments can be listed on your machine with:

```
USER$ conda env list
# conda environments:
#
env_name                  /path/to/env_name
```

- You can now activate this environment with:

```
USER$ conda activate env_name
(env_name) USER$
```

3 Install packages in your new environment

- Ensure you are in the correct environment by noticing the string in parenthesis at the beginning of your terminal prompt (see line 2 in the previous code block). Let's install a package:

```
(env_name) USER$ conda install numpy
```

- Your terminal will list a lot of output - most of this is not important to you unless you are concerned with particular package versions. When prompted with "`Proceed ([y]/n)?`", proceed by typing 'y' for yes and hitting the enter key.

```
Proceed ([y]/n)? y
...
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
Retrieving notices: ...working... done
(env_name) USER$
```

- If you would like, you can list all packages currently installed in the active environment with:

```
(env_name) USER$ conda list
```

4 Open a Jupyter Notebook from your environment and run cells

- Open a Jupyter notebook (you may have to install Jupyter!) with:

```
(env_name) USER$ jupyter notebook
```

5 Troubleshoot missing packages

- Download the file `squares.ipynb` from my GitHub. First, select "raw" to view the raw text, then save[1] this text to a local folder on your machine.
- Open `squares.ipynb` in Jupyter Notebooks and run the entire notebook. If you are running from your newly created conda environment, you should get the error `ModuleNotFoundError: No module named 'matplotlib'` after cell 4
- Fix this error by installing matplotlib with conda, restarting the kernel, and running all cells

```
(env_name) USER$ conda install -c conda-forge matplotlib
```

6 Create a new conda environment from an existing file

- Download the files `environment.yml`, `fibonacci.csv`, and `fibonacci.ipynb` from the GitHub, as before. In your terminal, navigate to the folder holding `environment.yml` and create a new conda environment using its contents:

```
(env_name) USER$ conda env create -f environment.yml
```

- This will create a new conda environment `shared_env` with the packages necessary[2] to run `fibonacci.ipynb`
- Open `Jupyter Notebooks` and ensure you can now run `fibonacci.ipynb`

[1] On mac, this is easily done with ⌘S. Likely is something similar on PC (CTRL-S?)
[2] The only difference is that this one includes `pandas` to read a `csv` file more easily