Math 9 – Winter 2017, Lab #0 Worksheet

Information about the course can be obtained on the instructor's website:
http://www.math.uci.edu/~isik/teaching/17W_MATH9/index.html

Goals:

1) Run Python 3.5 (3.5.2) using the command prompt (or terminal on OSX) on a computer of your choice using jupyter notebooks.
2) Get familiar with command prompt/terminal commands to help make your Jupyter experience better.

Part 1 – Installing Python 3.5 & Jupyter:

- **For non-lab computers only (personal laptops/home desktops):**
  1. Open the instructor's website and find the guide "Getting set-up for Math 9".
  2. Install Python by installing Anaconda. Click (or copy/paste into a browser) the following link: https://www.continuum.io/downloads
  3. Install Anaconda using graphical installer or command-line installer. Be sure to download and install Python 3.5 version.
  4. ***Important:*** Close the command prompt (or terminal on OSX) and re-open it. Type the following into the command prompt to verify Python 3.5 is set as default:
     python --version
  5. Verify you have Python version 3.5 (this shows you have Python 3.5 on the root/default).
- **For lab computers only (MSTB 226 – Windows)**
  The computers in MSTB 226 have Python 2.7. However, we will be using version 3.5 for our Math 9 course. On these computers we will create a new "environment" that will allow us run Python 3.5 to do homework and lab assignments (so we don't interrupt other classes that use Python 2.7). Be sure to follow directions.
  1. Open the command prompt. Type the following into the command prompt to verify the version of the Python set as default:
     python --version
  2. Verify you have version 2.7 (this shows you have Python 2.7 on the root/default).
  3. Type the following to create a new environment called math9:
     conda create --name math9 python=3.5
  4. You will be asked to Proceed ([y]/n)? Type y and press enter. Now you should have created an environment called math9 with python 3.5 installed.
     a. Sometimes there's an error installing.
        Raise your hand if your computer encounters a problem.
  5. You can verify you created the environment by typing: conda info --env
     a. This will show all the environments that are currently in conda.
        math9 should be one of them.
  6. We now need to change our environment from root (default) to math9.
     Type in the command prompt: activate math9
     To deactivate we can just close the command prompt.
  7. In the math9 environment verify you have Python version 3.5.
     python --version
     (this should return Python 3.5 on math9 environment).
  8. We now need to install Jupyter and other python packages we will use in math9 environment. Sometimes there's an error installing (possibly due to unstable

internet connection). May need to re-run the same command a few times. If you installed correctly, at the end of each installation you should see something similar to:

```
Linking packages ...
[    COMPLETE    ]|##################################################| 100%
```

If you don't, try the installation again and see if it asks you to install anything else.

- Type the following to install Jupyter: conda install jupyter
  i. Then, type: y
- Type the following to install numpy: conda install numpy
  ii. Then, type: y
- Type the following to install scipy: conda install scipy
  iii. Then, type: y
- Type the following to install matplotlib: conda install matplotlib
  iv. Then, type: y

Part 2 – Running Jupyter:

1) In the command prompt (or terminal) type: jupyter notebook.

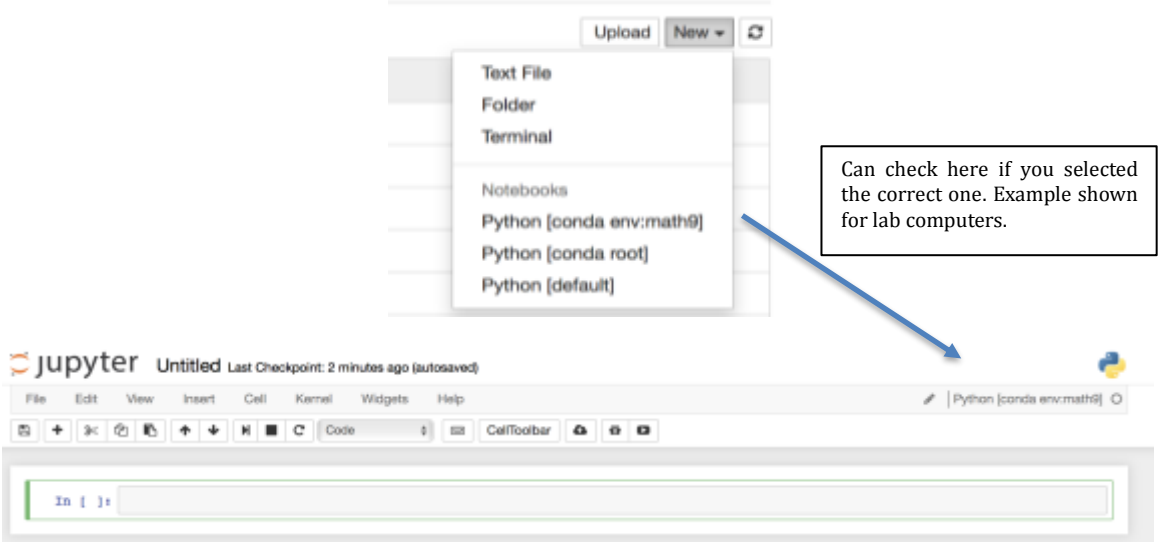
a. To make a new jupyter notebook with Python 3.5. Click on the New.

i. For non-lab computers only (personal laptops/home desktops):

1. Use Python [conda root] or Python [default].

ii. For lab computers only (MSTB 226 – Windows)

1. Use Python [conda env:math9].



2) Sometimes when you open a notebook (lecture notebooks for example) you may not be using the correct version of Python. You will need to change it directly by changing the Kernel manually so you're using Python 3.5.

3) Once you're finished with editing your notebook:
press ctrl+c in the command prompt to close your jupyter notebook connection with command prompt/terminal.

Part 3 – Useful Command Prompt\Terminal commands:

Note: OSX and Windows don't follow the same commands.

Be sure you have closed your jupyter notebook connection before continuing.

- Clear the screen
  - For OSX: While in terminal press: command+k
  - For Windows: Type in command prompt: cls
- Change directory
  - For OSX
    - cd changes directory to home default directory
    - cd .. navigates up one directory level
    - cd – navigates back to previous directory level
    - cd ~/Desktop changes directory to the desktop
  - For Windows
    - cd prints your current directory location
    - cd .. navigates up one directory level
    - cd C:\Users\UserName\Desktop changes directory to the desktop
      - Your UserName is what you used to log into the computer. For example, on the lab computers your UserName is your UCInetID.

Other commands you will use later (glance over the last page):
These require specific file and folder names. Typing these into the command prompt/terminal would give you an error without the file and folder names.

- Copy files (not for folders)
  - For OSX
    - cp
  - For Windows
    - copy
- Move files
  - For OSX (same command as rename files)
    - mv
  - For Windows
    - move
- Rename files
  - For OSX (same command as move files)
    - mv
  - For Windows
    - rename
- Create new folders (for both OSX and Windows)
  - mkdir

Follow the following steps to get the feel for these commands: You may be repeating similar steps throughout the course to navigate around to your files (within USB drives for example).

1. Using the command prompt/terminal change your directory to the desktop.
    a. OSX: In the prompt type: cd ~/Desktop
    b. Windows: In the prompt type: cd C:\Users\UCInetID\Desktop
2. Create a folder called mymath9files on your desktop.
    a. Verify you're on the desktop
    b. In the prompt type: mkdir mymath9folder
3. Verify on your desktop a new folder named mymath9 has been created.
4. Go to the class website and download Lecture01.ipynb to the desktop.
    a. Be sure the file extension is .ipynb (this is important).
    b. Manually change it to .ipynb if it is not already.
5. Make a copy of Lecture01.ipynb and call it Lecture01copy.ipynb (on the desktop).
    a. You should still be in your desktop folder.
    b. OSX: cp Lecture01.ipynb Lecture01copy.ipynb
    c. Windows: copy Lecture01.ipynb Lecture01copy.ipynb
6. Rename Lecture01copy.ipynb to Lecture01duplicate.ipynb
    a. OSX: mv Lecture01copy.ipynb Lecture01duplicate.ipynb
    b. Windows: rename Lecture01copy.ipynb Lecture01duplicate.ipynb
7. Move Lecture01duplicate.ipynb into the mymath9folder
    a. OSX: mv Lecture01duplicate.ipynb ~/Desktop/mymath9folder/
    b. Windows: move Lecture01duplicate.ipynb C:\Users\UCInetID\Desktop\mymath9folder\
8. Change your current directory to mymath9folder
    a. OSX: cd ~/Desktop/mymath9folder/
    b. Windows: cd C:\Users\UCInetID\Desktop\mymath9folder\
9. In mymath9folder type: jupyter notebook
    a. You should now notice that jupyter only opened the contents of mymath9folder.
10. Click on the Lecture01duplicate.ipynb file within Jupyter to open the notebook. After opening, check that you're using the correct environment on your computer with Python 3.5.
11. Review yesterday's lecture topics in Lecture01duplicate.ipynb.
12. Try to make your own new jupyter notebook in the mymath9folder. Practice some math using the jupyter notebook. Recall: * Muliplication, ** exponentiation, / division, // integer division, % remainders, + addition, - subtraction. Be sure you know the order in which the operations are evaluated (You can search PEMDAS if you forget).
13. If your expression contains remainders, how does the order of operations change? Is % evaluated before or after multiplication, division? Try the following examples to figure it out.
    a. Example 1: 4*2%3
    b. Example 2: 4/2%3
    c. Example 3: 4%3/2
    d. Example 4: 2-5*4%3/2+9