Python for Geoscientists

Welcome!

The learning curve for Python can be a little steep at first. This (short) document is designed to get you underway with some tools that are likely to be unfamiliar.

This course as a whole is designed to put you on path to Python enlightenment (no joke, it's a thing).

Let's get started.

(Help, I'm doing this at home on my own)

Great! There are some things you will need to install first though.

1. The Anaconda Python distribution (this includes Python, its most popular packages, as well as Jupyter notebooks).
2. A text editor – my favourite is Notepad++.

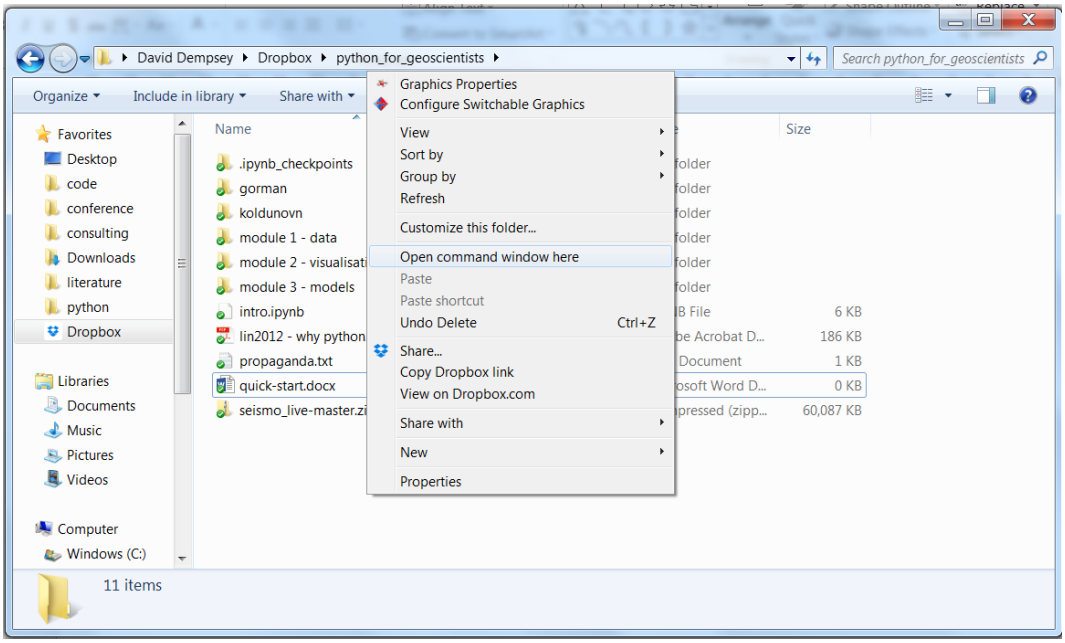
The Jupyter Notebook

There are two ways to interact with Python that we shall consider:

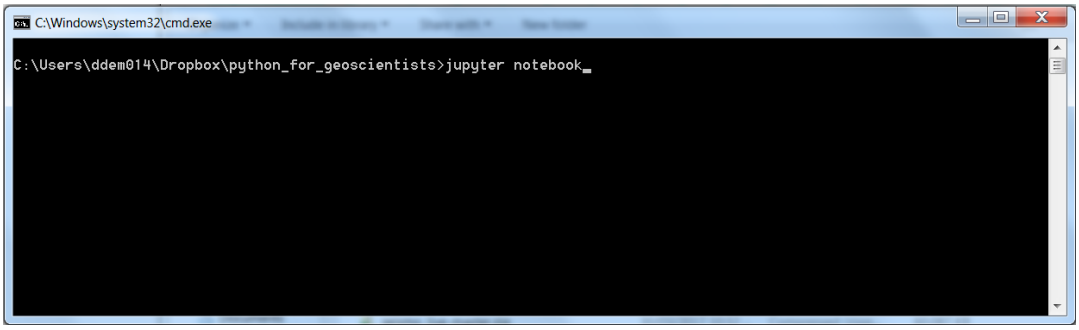
1. The Jupyter Notebook: a kid-friendly introduction that hides much of the technical stuff behind the scenes.
2. Python scripts run in at the command line: the R18 version – maximum power, maximum responsibility.

To get your first Jupyter Notebook started, follow the steps below.

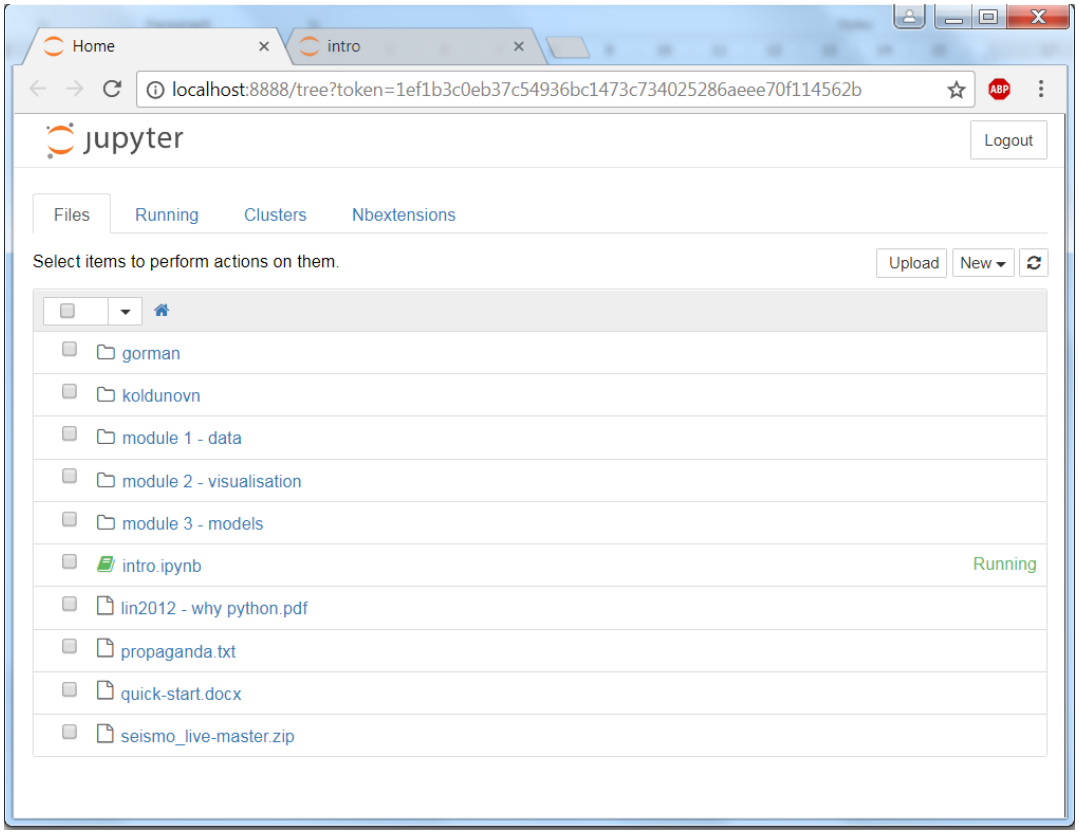
1. **Shift+Right Click** in the *empty space* inside the python_for_geoscientists directory (make sure no files or folders are highlighted) and select `Open command window here`.



2. In the command prompt that opens, type `jupyter notebook` and hit **Enter**.



3. An interface will automatically open in your web-browser. Click on `intro.ipynb` to open the first notebook.



4. That's it! Now follow the instructions in the notebook.

An alternative: Microsoft Azure Notebooks

Last ditch, if you want to use these notebooks but can't get an Anaconda installation working, then sign up for a free account on Microsoft Azure Notebooks.

When you log into your notebooks account, click on **Libraries**, then **+ New Library**, choose the **From GitHub** tab, write *ddempsey/python_for_geoscientists* in the **GitHub repository** field, and fill out the **Library Name** and **ID** fields.

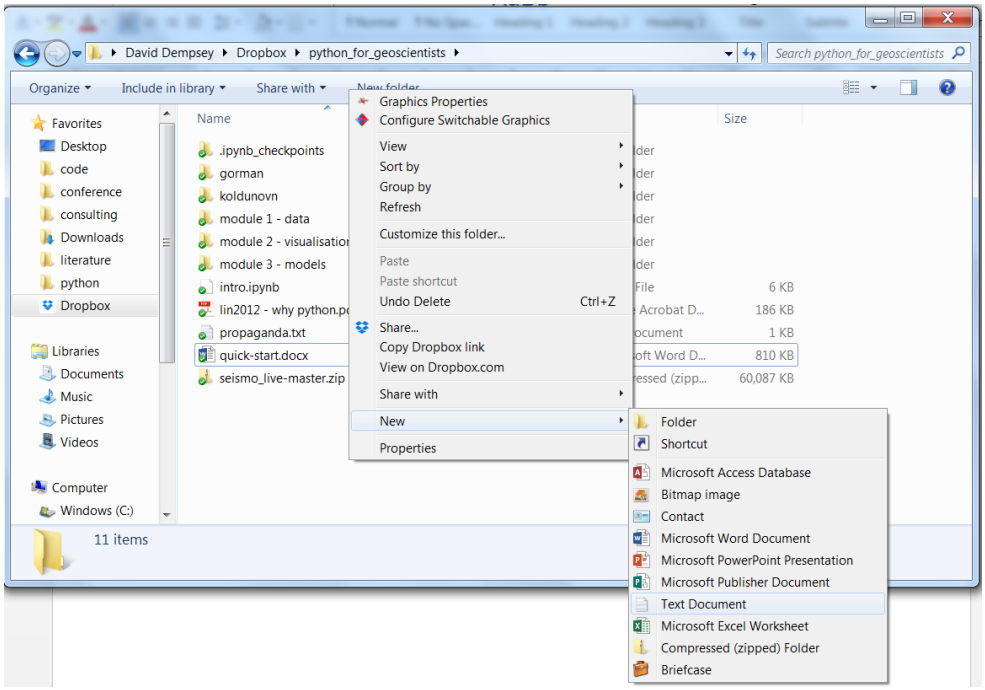
A fresh copy of this course will be duplicated into your Azure Notebooks account and you will be able to run the notebooks there (note, some functionality is limited).

Creating and running a Python script from the command line

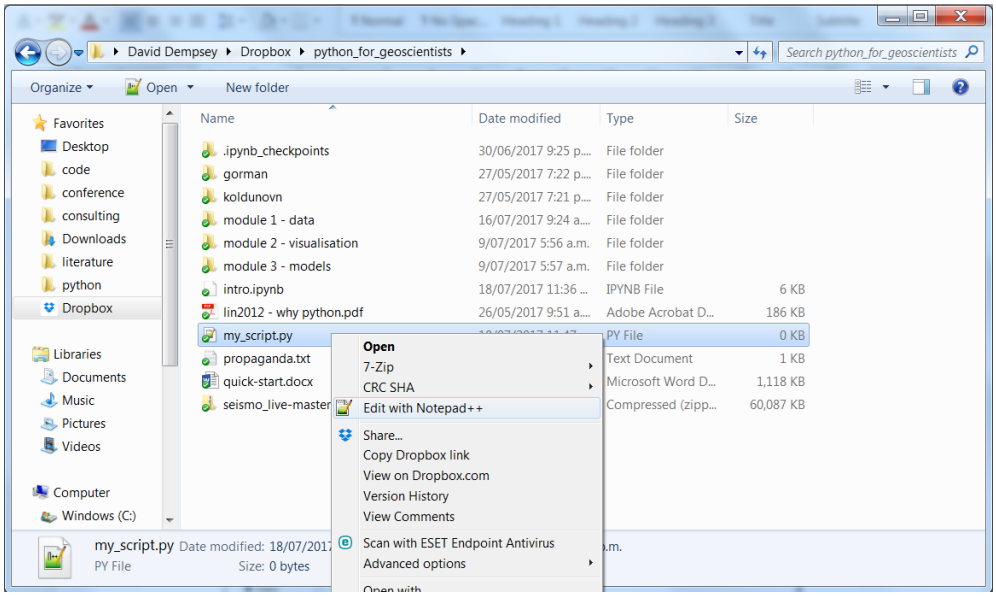
This is the way most people will use Python – small programs or scripts (a series of commands) executed to achieve a particular task.

Here, I will take you through the steps of creating and running a script from scratch.

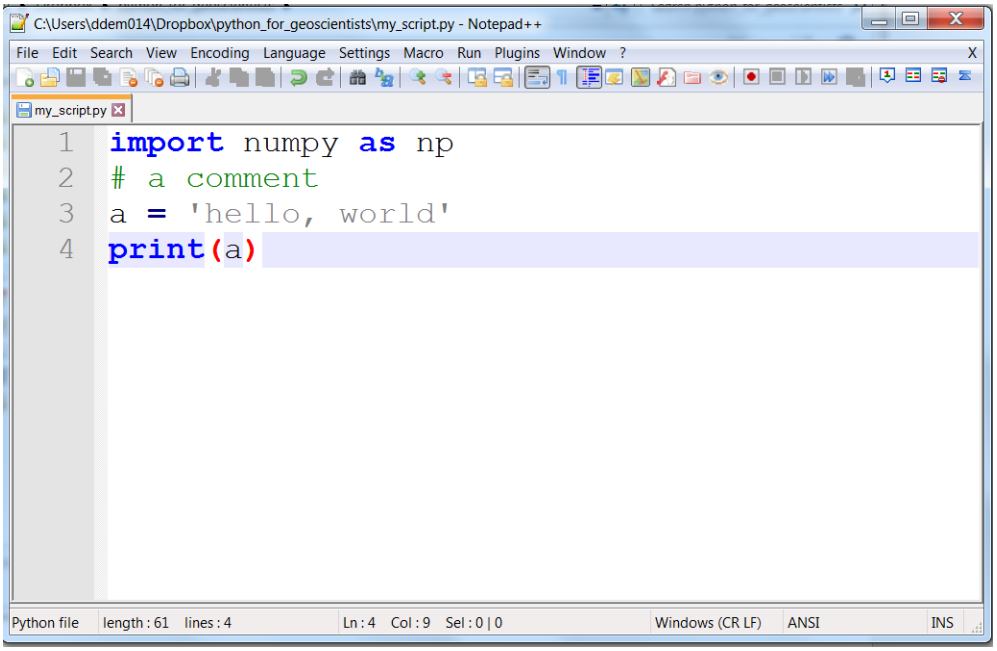
1. Create an empty text file by **Right Click**ing in a folder and selecting `New > Text Document`.



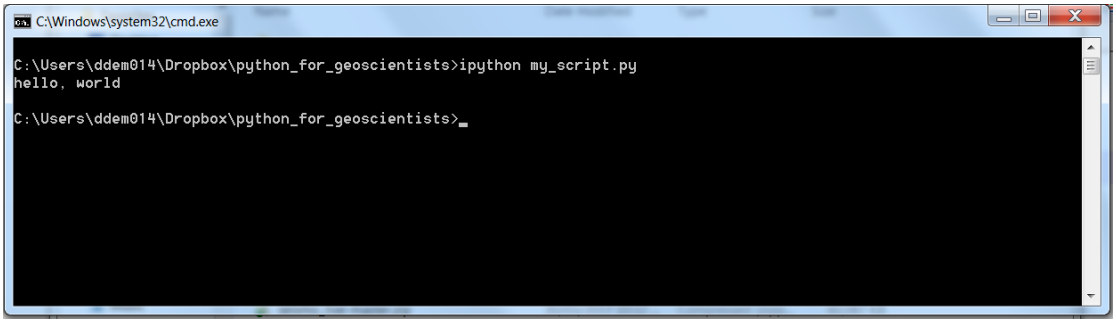
2. Rename the document `my_script.py` (note the `.py` extension at the end, this indicates the text file is a Python script).
3. Open my_script.py in Notepad++.



4. Type some basic Python commands into the script and save it (**Ctrl+s**).



5. Open a command prompt in the same folder as `my_script.py` is located (follow Step 1 in opening Jupyter Notebooks above).
6. Type `ipython my_script.py` and hit **Enter**. The Python script will execute and print a short statement to the screen.



7. Alterantively, type `ipython -i my_script.py` and hit **Enter**. As above, this will execute the Python script, but then will finish by leaving you sitting inside a Python terminal. You can now check the values of variables created, or experiment with other Python commands. To get back to the command prompt, type `exit` and hit **Enter**.