

Python Installation - Prework

Purpose

This document prepares you for Metis programming-based courses by guiding you through:

- Installing the Anaconda Python distribution
- Installing a useful code writing platform, Jupyter notebook, that we will use often
- Verifying that both Python and Jupyter notebook are working on your machine

Obtaining Python

We will be using the Anaconda distribution of Python 3 in this course.

In addition to Python, the Anaconda distribution contains the following components:

1. Anaconda Navigator

This is an application that resides on your Desktop that allows you to easily create new Jupyter notebooks. A Jupyter notebook is a "document" for you to write code and supporting text about a particular problem.

2. Data Science Libraries

Anaconda downloads a lot of libraries (also called modules) that are used in data science, such as `pandas` and `numpy`, so you are ready for coding immediately.

3. Conda

This is an *environment management* tool. Environments are important when working on larger projects, as they allow us more control over which packages are installed. Metis maintains a dedicated environment that students can install in order to get quick access to all python packages that are used in a course, see [here](#) for instructions.

To-do: Download Anaconda Python here:

<https://www.anaconda.com/products/individual#download-section>. Make sure you download the Python 3.7 version or higher. You can also use direct links for

- mac_os: <https://www.anaconda.com/products/individual#macos> or
- windows: <https://www.anaconda.com/products/individual#windows>.

Verifying Python Installation

Now that we have downloaded Anaconda Python, we want to verify Python was successfully downloaded.

To-do:

1. **Start the command prompt**
 - a **For Mac Users:**
Open Terminal by pressing `cmd+space` which activates Spotlight Search. You can also access the Spotlight Search by clicking the magnifying glass in the top right corner of your screen. Once in Spotlight Search, type in `terminal` and press `Enter`.
 - b **For Windows Users:**
Open Command Prompt by clicking the Start menu and type in `cmd` and click the Command Prompt or `Cmd`.
2. **Start Python** Type `python` and press `Enter`.

Don't close this window yet, we will be using it in the next step.

If your installation was successful, you should see the following

```
Gordons-MacBook-Pro:~ gordondri$ python3
Python 3.6.3 |Anaconda, Inc.| (default, Oct 6 2017, 12:04:38)
[GCC 4.2.1 Compatible Clang 4.0.1 (tags/RELEASE_401/final)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> █
```

Run your first Python program

We will write our first Python program using the command prompt. If you have closed the command prompt from the previous step, open it up again and type `python` at the prompt.

To-do: We will write a program that prints `Hello world` and then exits. At the Python prompt, write the following:

```
>>> print("Hello, world")
Hello, world
>>> exit()
```

Verifying Jupyter Notebook

Now that we have downloaded the Jupyter Notebook IDE through the Anaconda Distribution, we want to run our first Jupyter Notebook.

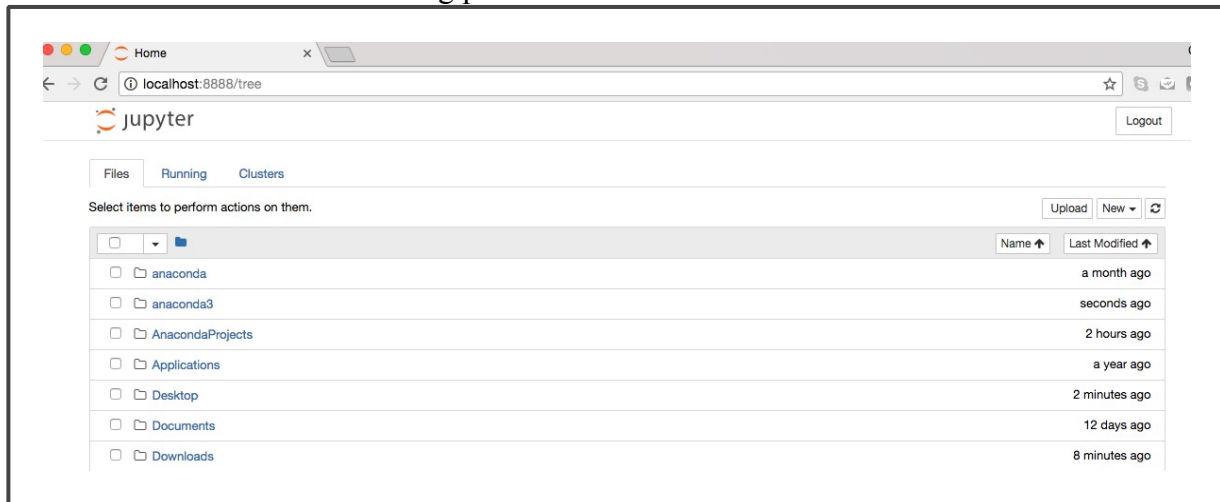
There are 2 ways of opening a new Jupyter Notebook: either through the Terminal (Mac) or Command Prompt (Windows), or using Anaconda navigator.

Method 1: Open a new session in Terminal or Command Prompt

To-do:

1. Start the Command Prompt/Terminal using the instructions above.
2. Type `jupyter notebook` in the terminal and then press `Enter`.
3. In a browser, visit the URL <http://localhost:8888/tree>

If you were successful, you should be at a page referred to as the Jupyter Notebook Dashboard. It will look similar to the following picture:

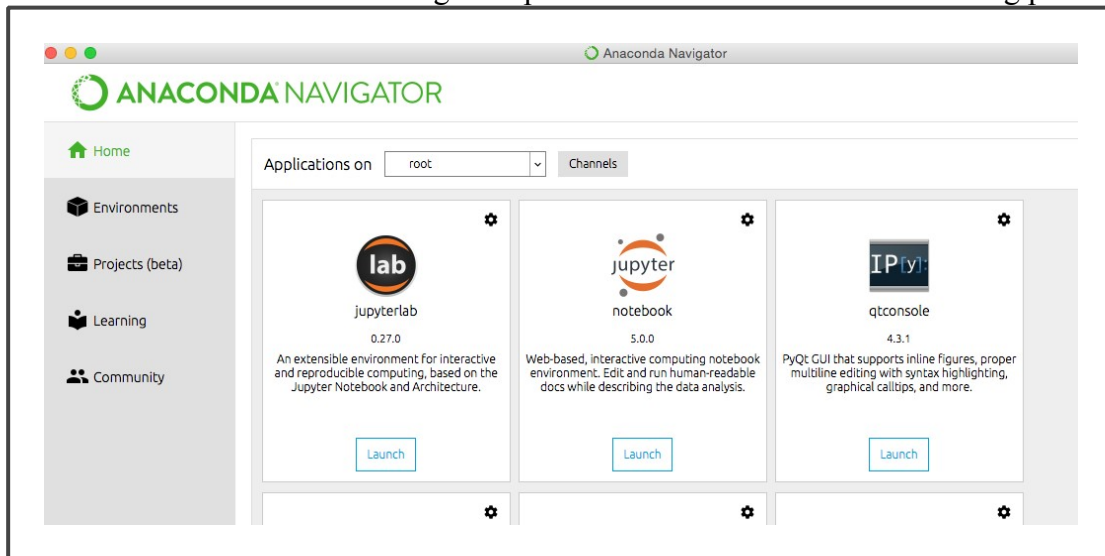


Method 2: Using Anaconda navigator

Open a new session in the Anaconda Navigator

1. **Open the program Anaconda Navigator** Do this manually by finding the application on your computer and double-clicking the file OR do this by opening Terminal or Command Prompt (see instructions above) and type anaconda-Navigator.
2. **Launch Jupyter Notebook**

You will find the Anaconda Navigator open that should look like the following picture:

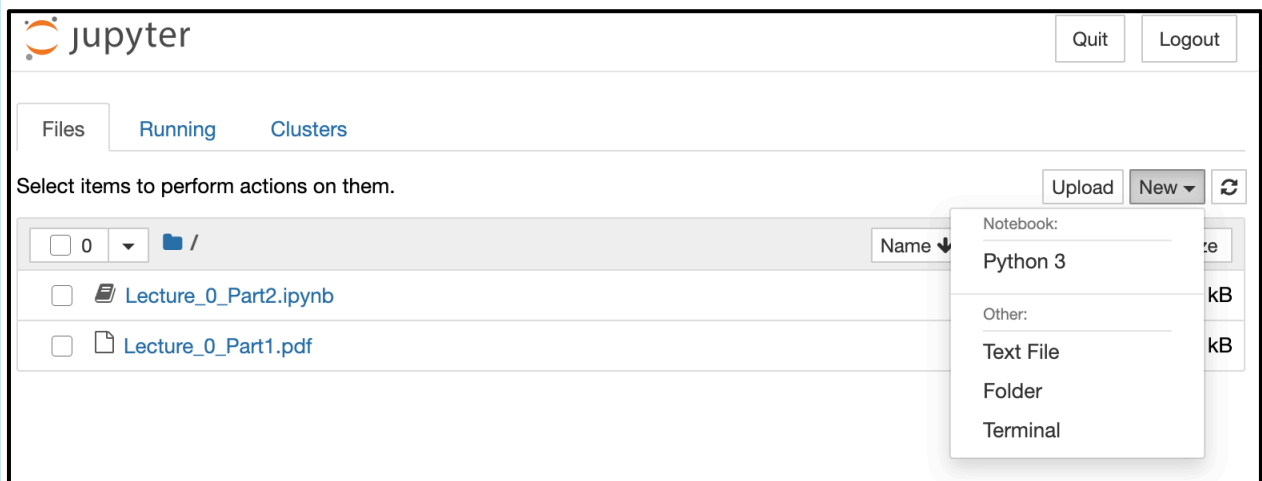


Launch Jupyter Notebook by clicking the 'Launch' button.

Creating a New Notebook

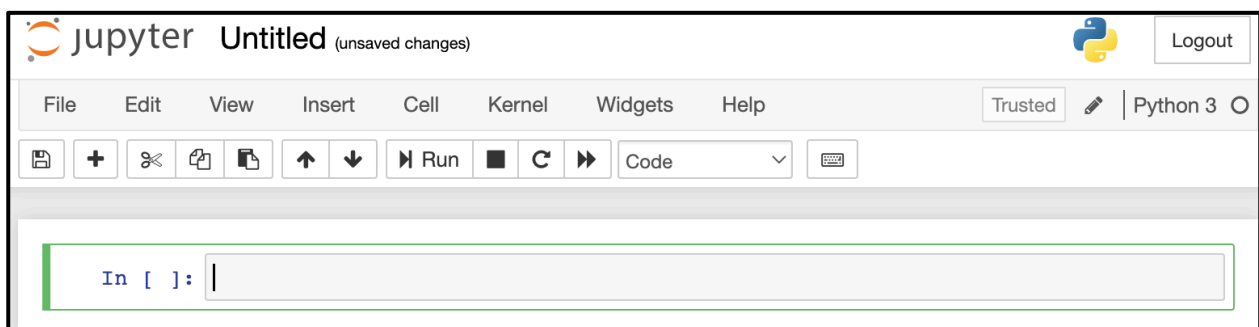
Now that you have verified the installation of Python, Conda, and Jupyter Notebooks, we can create a new notebook to write our first program.

1. Launch Jupyter Notebook, using either the Terminal/Command prompt or the Anaconda Navigator
2. Open a browser at this URL:
<http://localhost:8888/tree> (if it wasn't done automatically)
3. Create a new file by clicking the "New" button on the right-hand side of your screen. This will open the following drop-down list:



4. Select "Python 3" to create a new Jupyter notebook in a new tab in your browser.

This is where you may do all of your python programming for course work. You will quickly get used to working with this interface, so don't worry if it looks intimidating at first. For now, ensure that you see the same screen as the picture below:

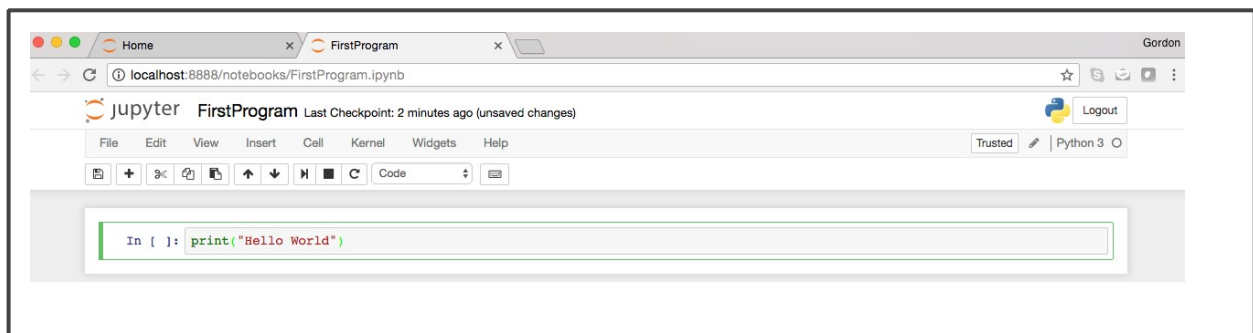


Writing Your First Program

Now that you have launched a new Jupyter Notebook, you can begin writing your very first program in Python. You will notice that there is a rectangle highlighted in green that begins with the words "In []:" - this is where you will write your code and is called a cell (cells can also be used for writing markdown).

1. Before writing any code, it is always good practice to name the file you are working in. You can do this by clicking the word "Untitled" next to the Jupyter logo. Rename the file to "FirstProgram"
2. Now, we can start coding. In the green rectangle, type the following command:
`Print("Hello World")`

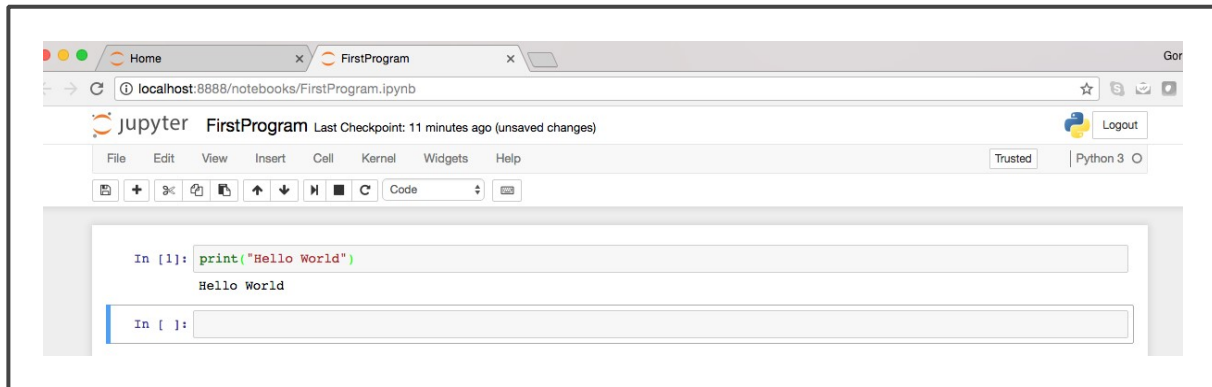
Your notebook should look like this:



After writing the code, you have to execute/run the program to see the program's output. You can do this a few different ways:

1. By clicking "Cell" from the Notebook Menu bar and selecting "Run Cells" or "Run Cells and Select Below" or "Run Cells and Insert Below" from the drop-down list
2. By clicking the small "play button Run" to the left of the black square in the Notebook Toolbar which is the equivalent of "Run Cells and Select Below"
3. By entering `shift+Enter` on your keyboard

The result of these methods is to run the "In" cell(s) of your notebook and produce their output. Any of these steps on your "FirstProgram" notebook should produce the following output:



Executing Someone else's program

Congratulations! You have installed and verified that Python and Jupyter notebooks are running on your machine. One of the other skills that will be important for success in Metis courses is being able to run *existing* notebooks that other people have created.

To-do: Locate the file called `practice_nb.ipynb`. It should be in the same folder as this document, whether you are accessing it locally or on github. Once you have downloaded a copy, to access this file in Jupyter Notebook and execute its Python code, follow these steps:

1. Launch Jupyter Notebook (see instructions above)
2. In the browser window that has been created, navigate to the location of this file. For example, if you saved the file to your desktop, click the "Desktop" folder to step into that location.
3. Find the file named `practice_nb.ipynb` and click on it. This will launch the file in a new tab in your browser.
4. Practice running the cells in the file using the 3 methods described above.