

Beginner Python and Math for Data Science Prework

Purpose

This document prepares you for the BPM course by

- Installing the Anaconda Python distribution
- Install our preferred platform (Jupyter notebooks) that we will use throughout the course
- Verify both Python and Jupyter notebooks are working

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 an *environment management* tool. Environments are important when working on larger projects, as they allow us more control over which packages are installed. We won't be using it in this course, but as your projects grow in complexity you will use environments to manage your modules.

Todo: Download Anaconda Python [here](#). Make sure you download the Python **3.7** version. You can also use direct links for [mac os](#) or [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

◦ 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`.

◦ 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.

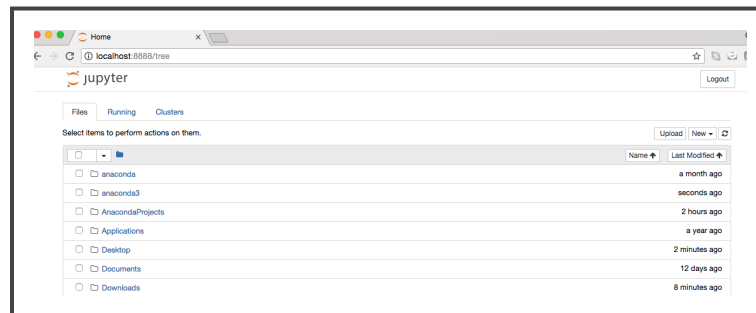
There are 2 ways of opening a new Jupyter Notebook: either through the Terminal (Mac) or Command Prompt (Windows), or using Anaconda navigator.

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>

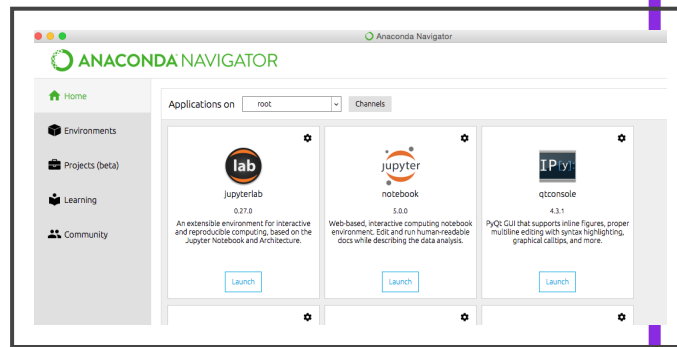
If you were successful, you should be at a page referred to as the Jupyter Notebook Dashboard. It will look similar to the following picture:



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

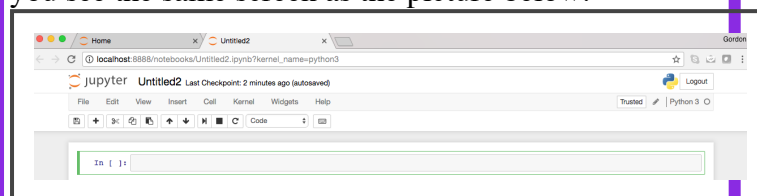
Now that you have verified the installation of Python, Conda, and Jupyter Notebooks, we can create a new notebook to write our first program.

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 we will be doing all of the programming for this course. In Lecture 1, we will review all the most important components of this window so don't worry if it looks intimidating now. For now, ensure that you see the same screen as the picture below:



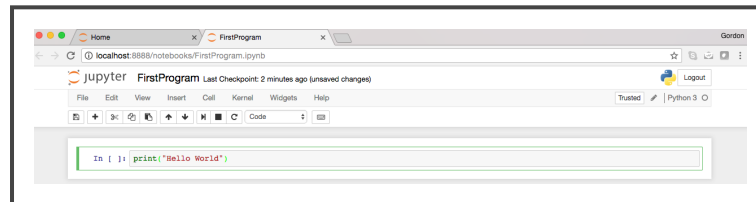
Writing Your First Program

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 (more on this in Lecture 1).

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")
```

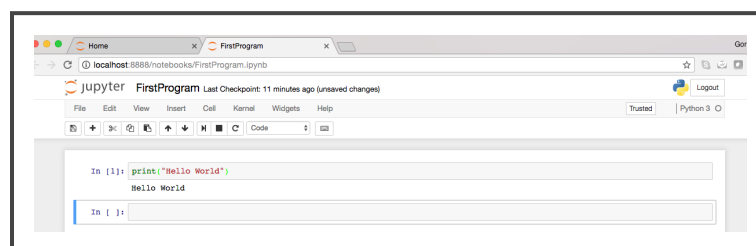
Your notebook should look like this:



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 Menubar 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 (more on shortcuts in Lecture 1)

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 the class is being able to run *existing* notebooks other people have created.

To-do: Locate the file called `Lecture_0_Part2.ipynb`. It should be in the email you recieved about BPM, and save it in a location on your computer that is easily accessible. To access this file in Jupyter Notebooks 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 `Lecture_0_Part2.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.