

Python

What is Python? What is Jupyter Notebook? What is Anaconda? While you install several programs for this class, you may be wondering why there are so many components for this one programming language which we call Python. They are all connected, and hopefully this guide will help you get started with installing some of these programs and help you distinguish the purpose of each of them.


Python is the main programming language we will be using in this class for multiple reasons. Firstly, it is free, and all of its packages are open-source. This means writing your own code and using other's code is easy and cheap. Speaking of using other's code (i.e. packages/modules), Python has many packages that are easy to install and implement, making data analysis super easy. Now that you know why we will bPython is useful from research to tech jobs, here are a few words you will see pop up throughout your coding journey:

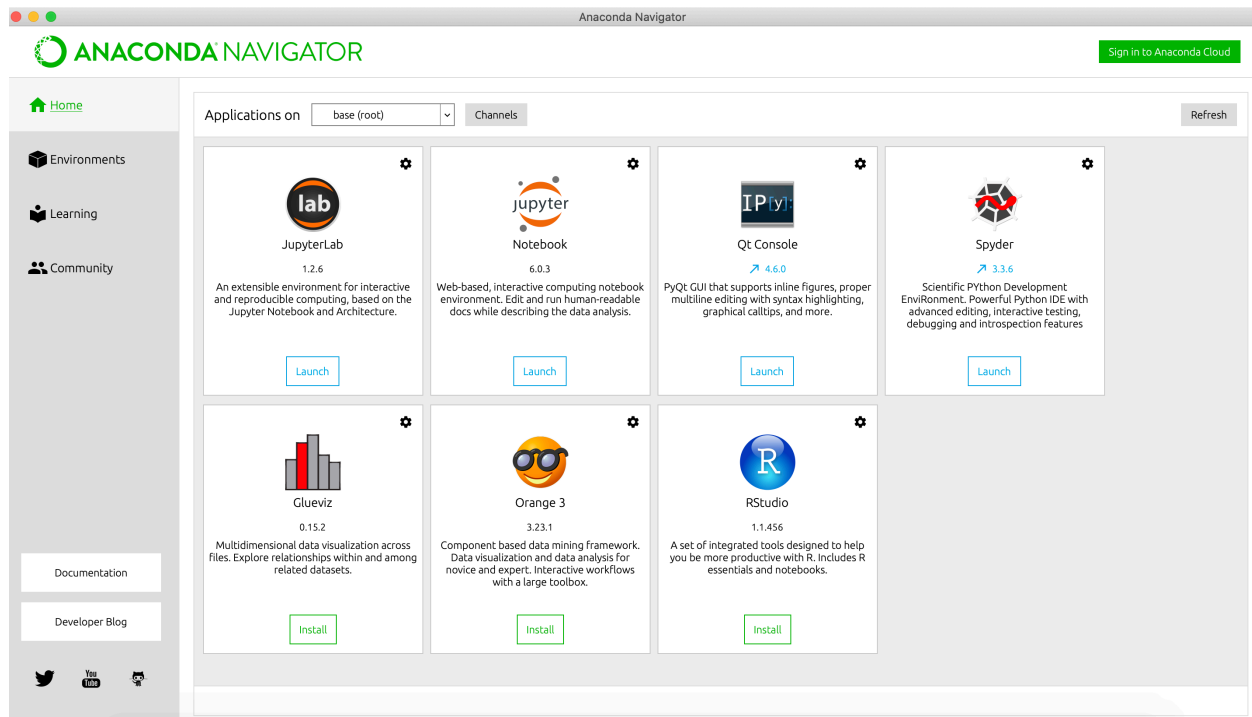
Python	A computer <i>programming language</i> . A way to describe algorithms to a computer
IPython	A Python <i>interpreter</i> : A computer application that provides a convenient, interactive mode for executing Python commands and programs
Anaconda	A <i>distribution</i> : A single download that includes all of the above and provides access to many additional libraries for special purposes. It also includes a package manager that helps you to keep everything up to date. It comes with IPython, Jupyter Notebook, R, and more.
Jupyter Notebook	An <i>integrated development environment</i> (IDE) that is open-sourced, web-based application. It allows you to implement codes and visualization while inspecting variables. It is essentially a text editor for writing and debugging programs
NumPy	A standard python library that provides numerical arrays and mathematical functions
Matplotlib	A standard python library that provides visualization tools
SciPy	A standard python library that provides scientific computing tools

"A Student's Guide to Python for Physical Modeling" – Jesse Kinder, Philip Nelson

Installing Anaconda

The easiest way to install Python along with various other components is to download Anaconda. For Mac and Linux users, python should already exist in your terminal. However, we still recommend that you download Anaconda because it allows you to control various versions of Python and other libraries very easily.

- 1) Install Anaconda by following the instructions on their documentation:
 - Window - <https://docs.anaconda.com/anaconda/install/windows/>
 - Mac - <https://docs.anaconda.com/anaconda/install/mac-os/>
 - Linux - <https://docs.anaconda.com/anaconda/install/linux/>
- 2) Open Anaconda . You should see various IDE (e.g. Jupyter Notebook, Spyder) that we talked about before. Jupyter Notebook should already be installed so you can just click "Launch". *If this IDE is not yet installed, click the install button.*

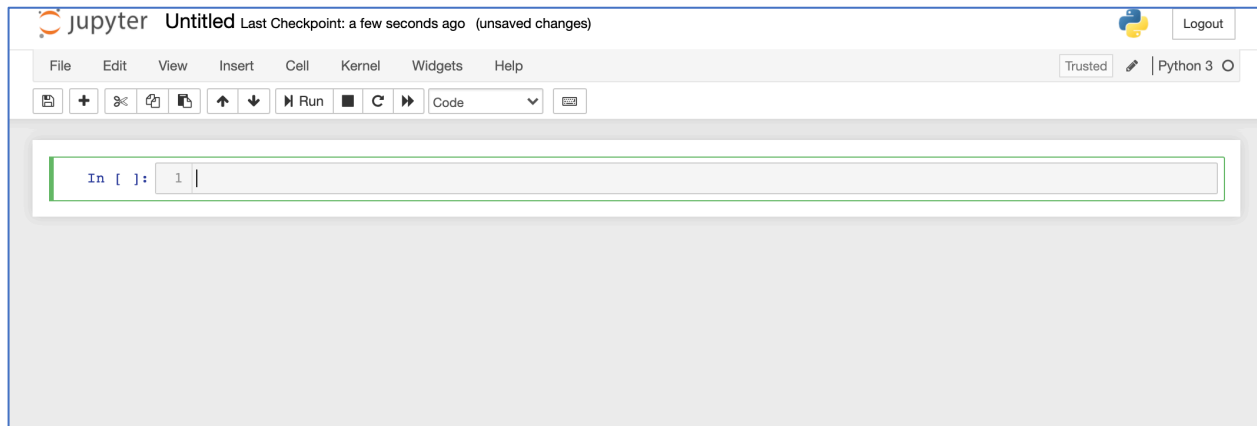


- 3) On launch, a web app will open with a display of your home directory. You can traverse the directory by clicking the folder or clicking the back button



- 4) Go into Desktop and create a folder named CompNeuroEtho. You can create a folder by clicking the “New” dropdown button and then clicking “Folder”. A new folder named

- “Untitled Folder” will be created. To rename this folder, you can check the box for this folder, and click the “rename” button
- 5) Once you have created the CompNeuroEtho folder, go into it and create a Jupyter Notebook. You can do this by clicking the “new” dropdown button and clicking Python 3. This will create your first notebook inside this CompNeuroEtho directory.
 - 6) A separate website will open, displaying your very first notebook (Untitled.ipynb)
 - 7) You can change the name of this notebook by clicking “Untitled” on the top right and naming it whatever you want.



Most of your projects and homework will be through Jupyter Notebook, so you will become more familiar with this IDE overtime. Now that you have installed Anaconda and you know to create a Jupyter notebook, you can finally start coding in Python. Python has a set of syntax (rules for expressions and statements for Python to interpret) that you will have to learn before you can start freely coding. We will go through some syntax in Project0.ipynb, which you can find on our [course website](#).