# Python Installation

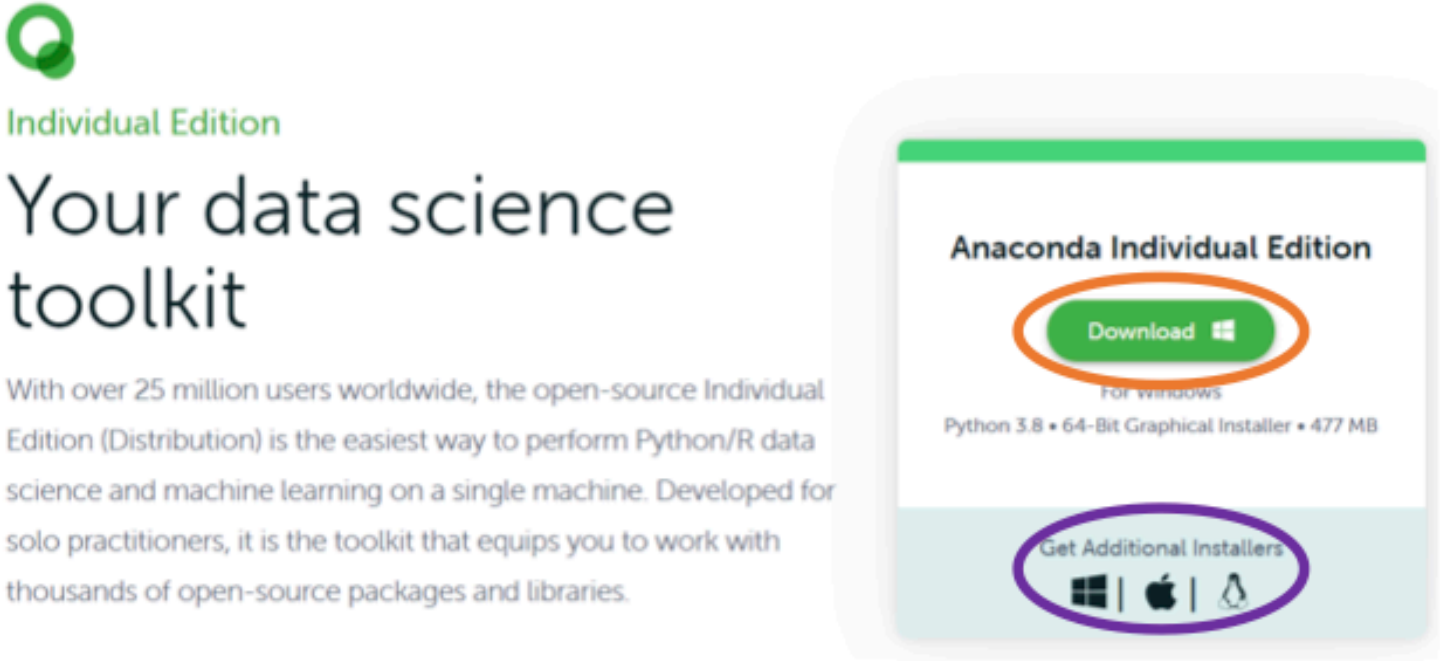
Note: If you are new to Python, it is recommended that you download and install Anaconda and use its Integrated Development Environment (IDE). This document introduces how to install Anaconda and run Python codes in Jupyter Notebook only. However, you are free to use any other IDE.

# 1. Download the Anaconda Installer

1.1. Visit the webpage https://www.anaconda.com/products/individual

1.2. Download the Anaconda Installer

- If you are using Windows, download the Anaconda Installer by clicking the button circled in orange as shown in the screenshot below.
- If you are using another operating system, click the button circled in purple as shown in the screenshot below. Then, download the newest Python version (Python 3.8) and installer version that suits your operating system; for example, download the 64-Bit Graphical Installer for MacOS.



# 2. Install Anaconda

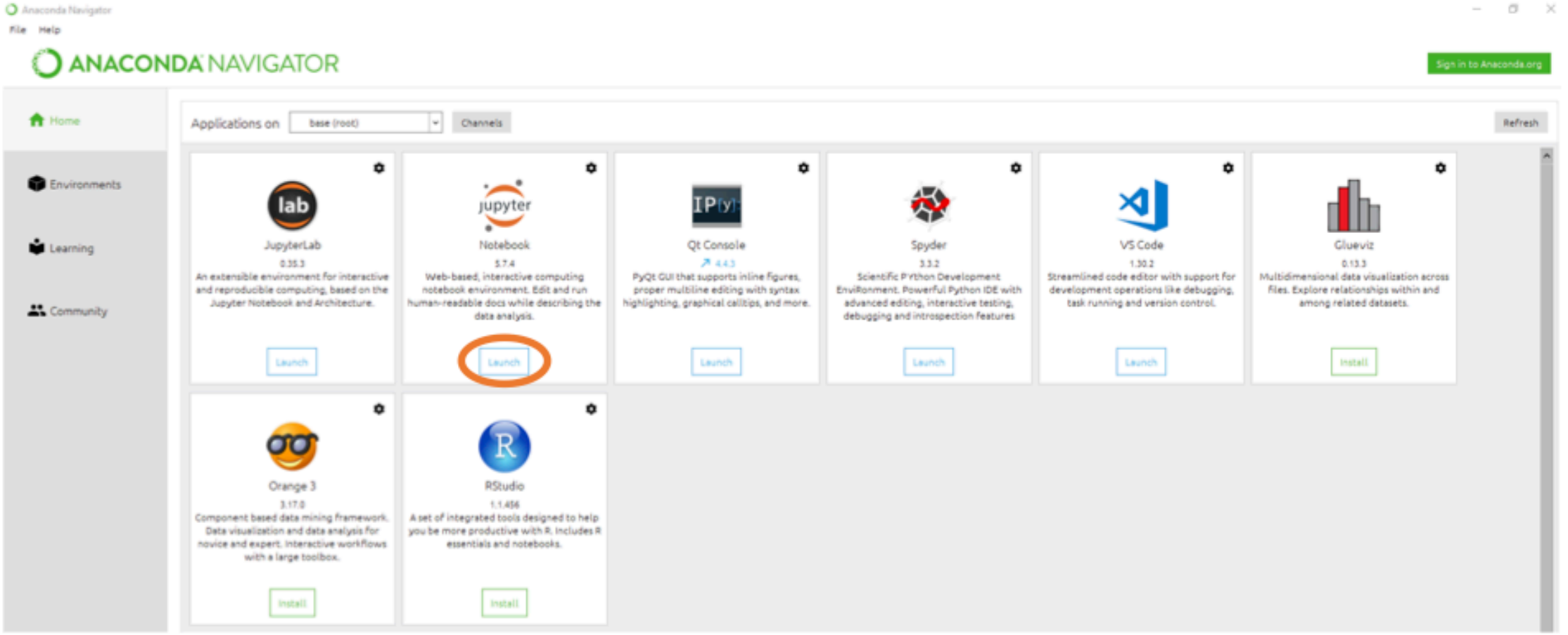
2.1. Open the Anaconda installer you have just downloaded and follow the instructions on the pop-up menu.


Note: Anaconda should be installed into a single directory that does not require any Administrator or root privileges for installing Python libraries on your system. If you have problems with Administrator or root privileges, please contact your IT department for supports.

# 3. Start Jupyter Notebook

3.1. Run Anaconda that you have just installed. You will see a window as shown below.

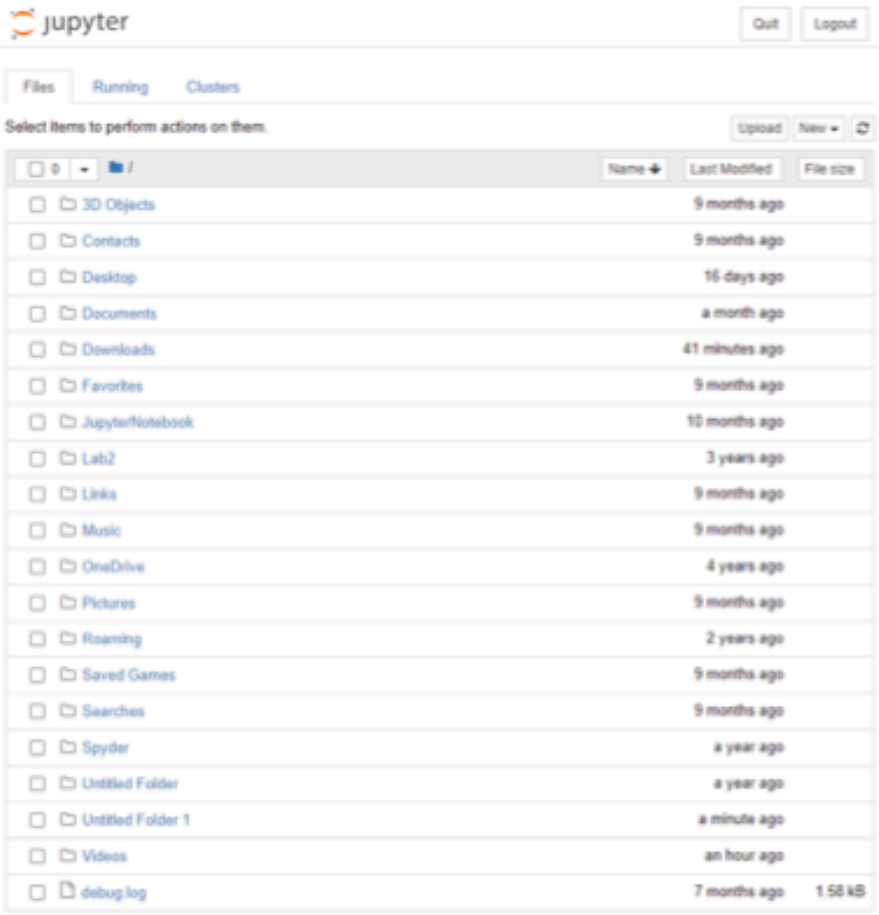
3.2. Click “Launch” under the Jupyter Notebook logo (circle in orange in the screenshot below).

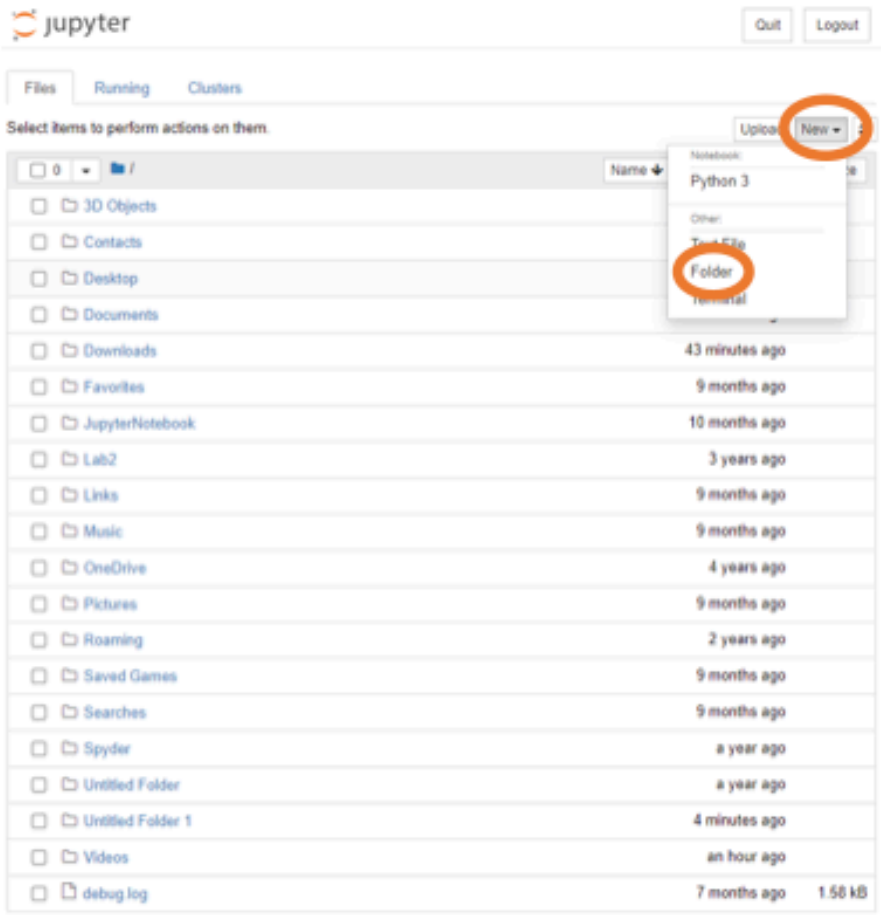


# 4. Use Jupyter Notebook

4.1. After starting Jupyter Notebook, the Jupyter Notebook interface will show up on your web browser.

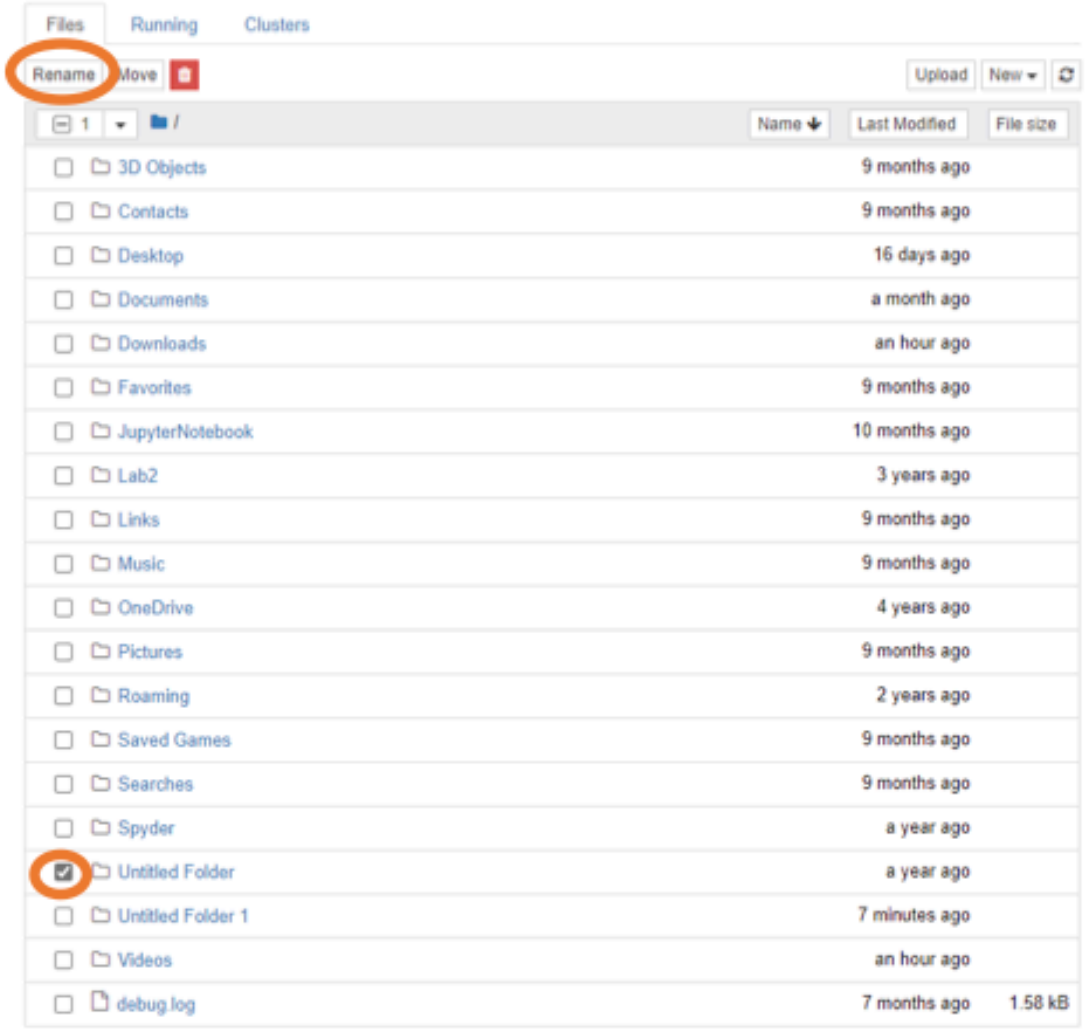
4.2. You can create a new folder by clicking “New” and then “Folder”.



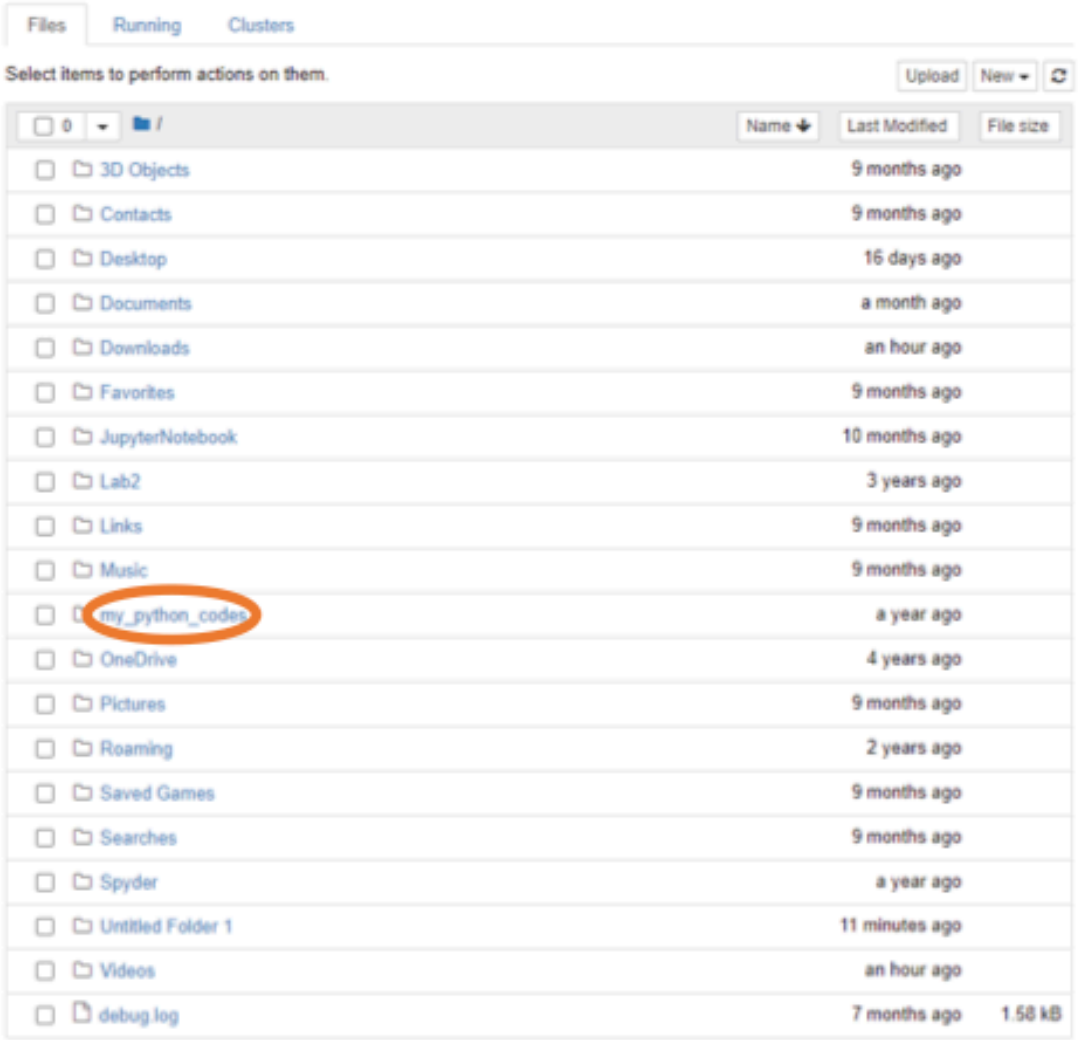
# 4. Use Jupyter Notebook

4.3. You can rename the new folder by selecting the folder and then clicking “Rename”.



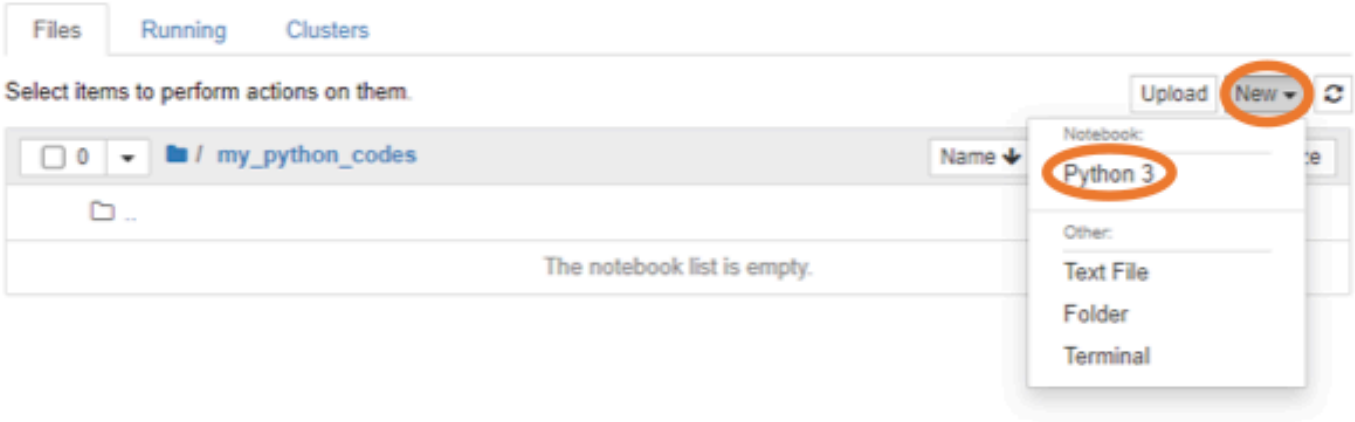
# 4. Use Jupyter Notebook

## 4.4. Go into the new folder by selecting the folder name.

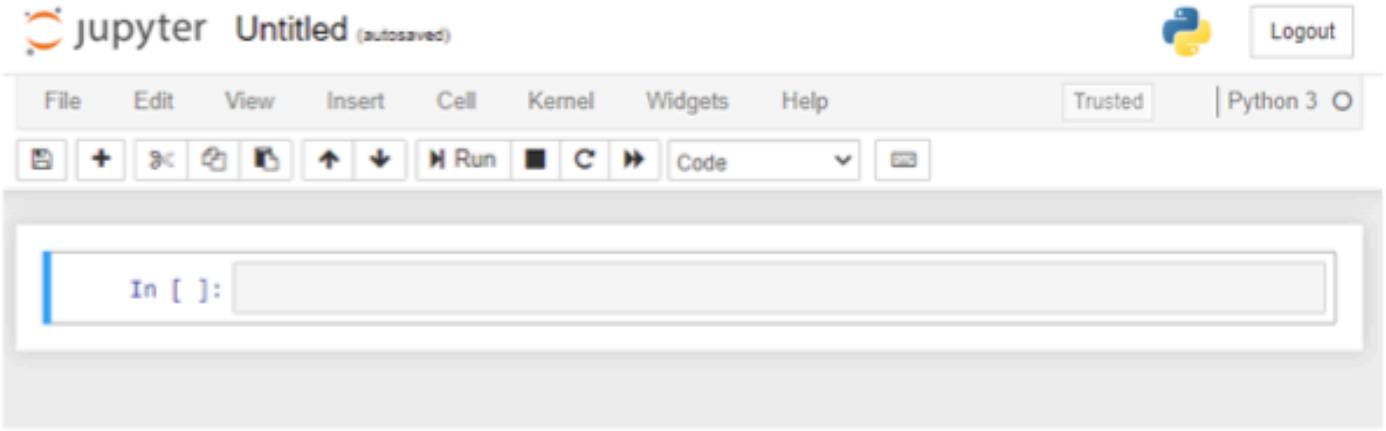


# 4. Use Jupyter Notebook

4.5. Create a new notebook by clicking “new” and then “Python 3”.

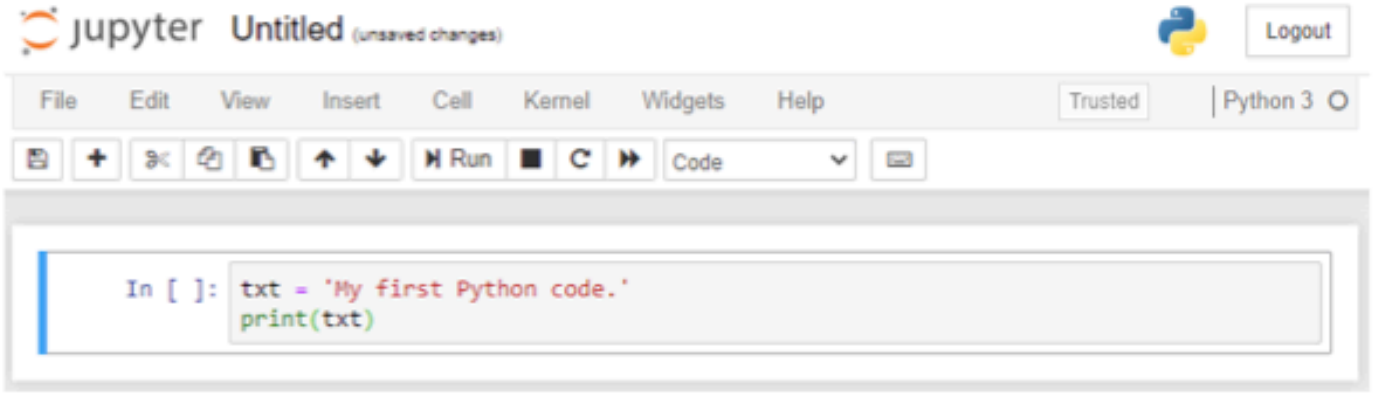



4.6. A new tab will be opened on your web browser.

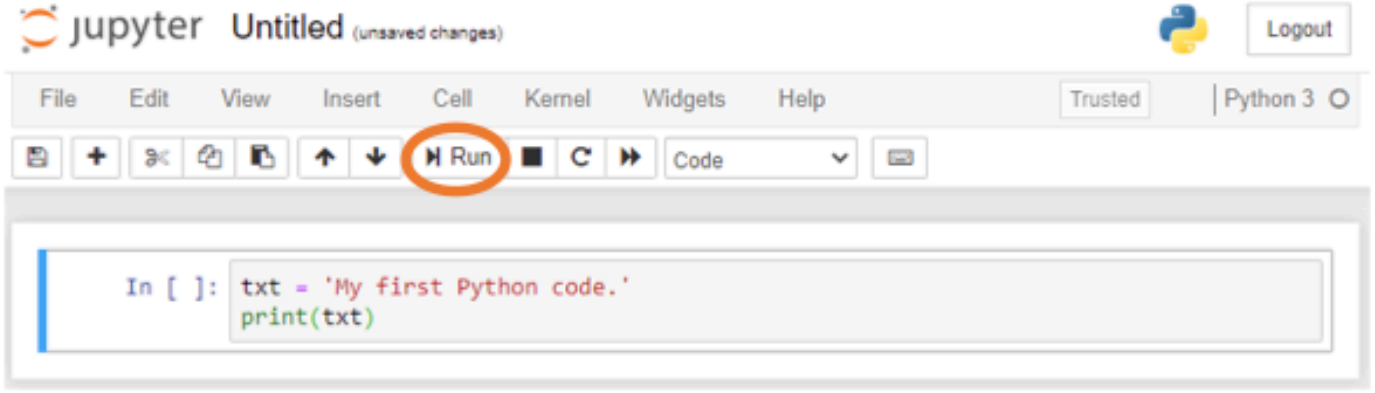


# 4. Use Jupyter Notebook

## 4.7. In the cell, type the texts as shown below.

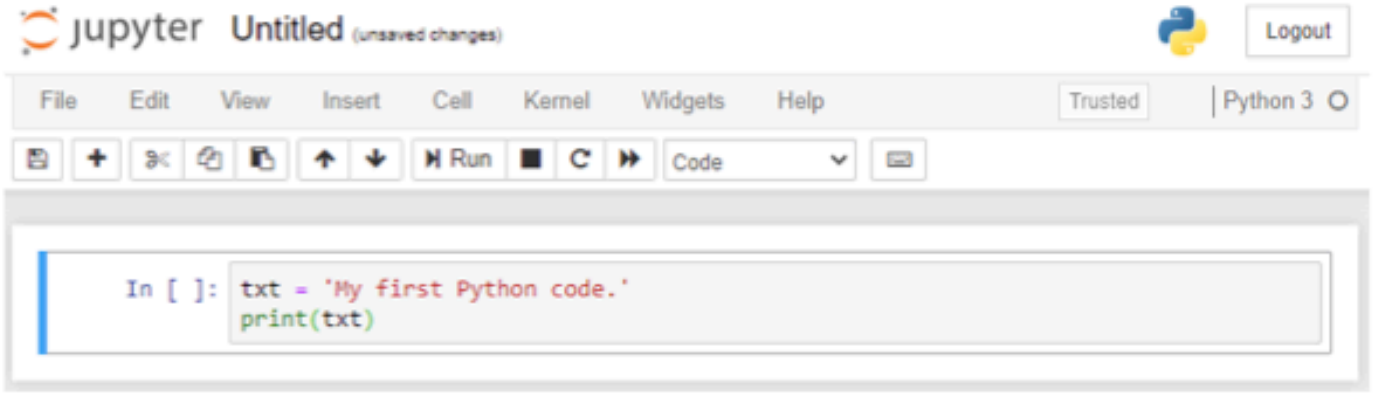



## 4.8. Click “Run” to run the code in the cell.

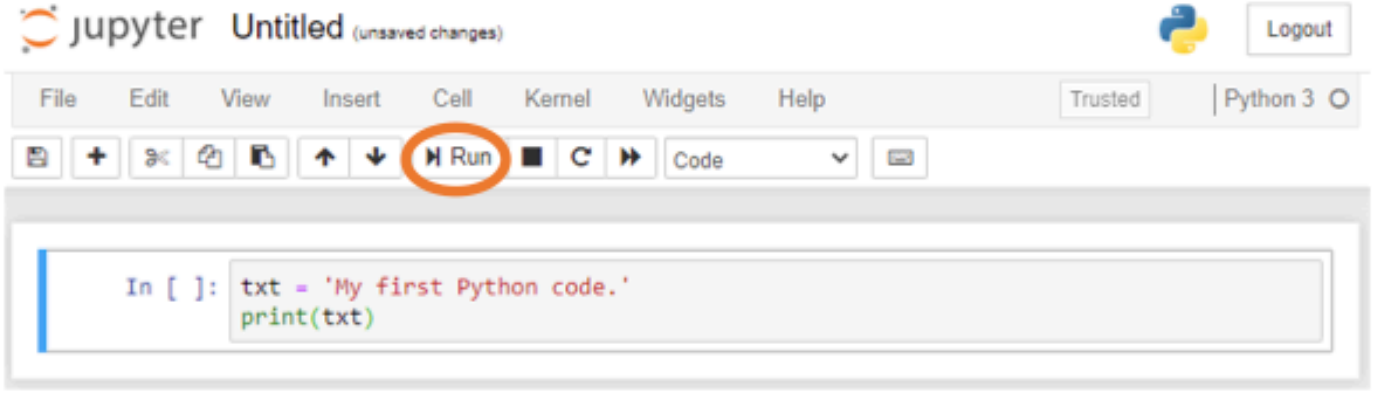


# 4. Use Jupyter Notebook

4.9. In the cell, type the texts as shown below.

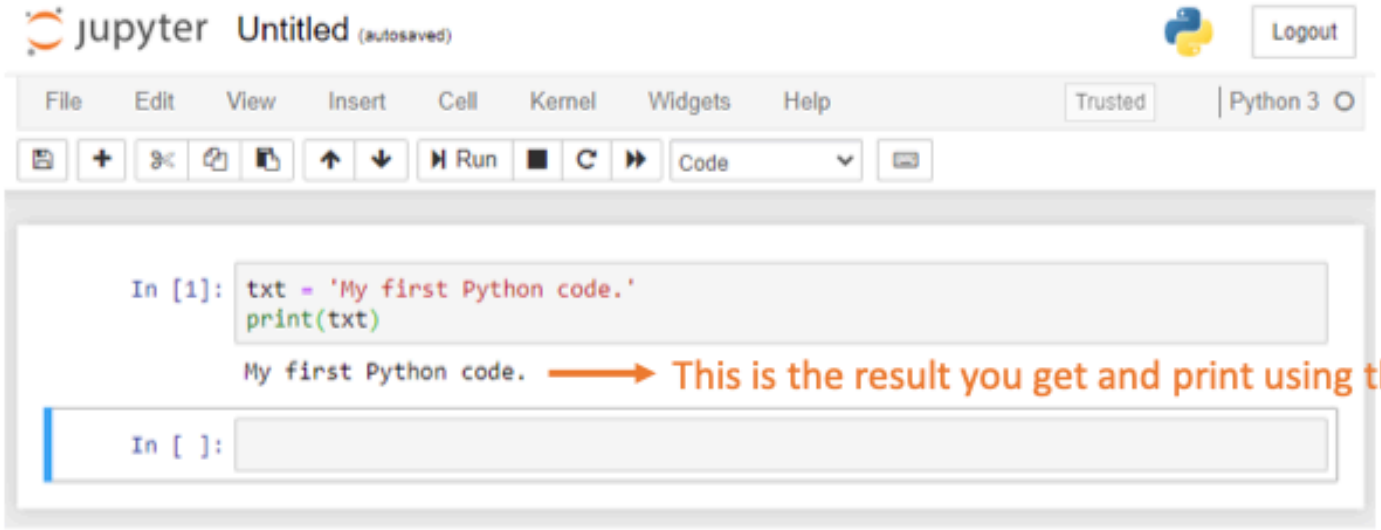



4.10. Click “Run” to run the code in the cell.

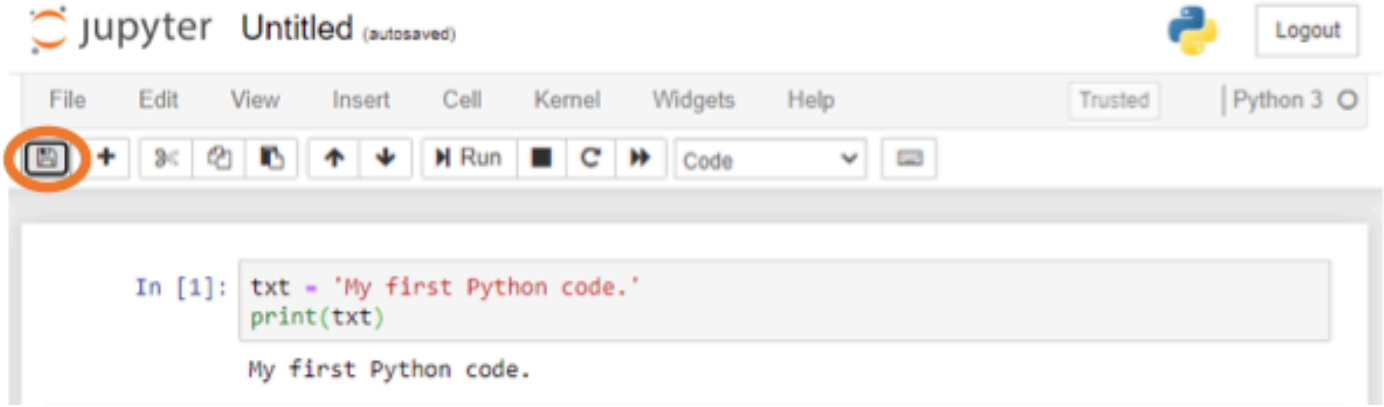


# 4. Use Jupyter Notebook

## 4.11. Check the printed result.




## 4.12. Save your notebook by clicking the “Save”-button.



## Jupyter Notebook interface options

We will use Jupyter Notebooks extensively in this course and you will benefit from learning how to work efficiently with the Jupyter interface. Please read and practice these short cuts.

To run a line in Jupyter Notebook, the "Run" button or preferably "SHIFT + ENTER" can be used. To add a line in Jupyter Notebook, hit "ALT + ENTER" or simply use "Insert -> Cell Below." "Insert Cell Above can also be used for inserting a cell above where the current cell is. To delete a line in Jupyter Notebook, while that line is selected, hit "DD" (in other words, hit the "D" word key button twice in a row). If at any point when coding, the Jupyter Notebook would like to be stopped, select "Kernel -> Interrupt" or "Kernel -> Restart" to restart the cell. "Kernel -> Restart and Run All" is another handy tool in Jupyter Notebook that can be used to run the whole notebook from top to bottom as opposed to using "SHIFT + ENTER" to run each line of code manually which can reduce productivity. Below are some of the handy shortcuts that are recommended to be used in Jupyter Notebook:

- Shift + Enter -> Run the current cell, select below
- Ctrl + Enter -> Run selected cells
- Alt + Enter -> Run the current cell, insert below
- Ctrl + S -> Save and checkpoint
- Enter -> Takes you into an edit mode
- When in command mode "ESC" will get you out of edit mode.
- H -> Shows all shortcuts (use H when in command mode)
- Up -> Select cell above
- Down -> Select cell below
- Shift + Up -> Extends selected cells above (use when in command mode)
- Shift + Down -> Extends selected cells below (use when in command mode)
- A -> Inserts cell above (use when in command mode)
- B -> Inserts cell below (use when in command mode)
- X -> Cuts selected cells (use when in command mode)
- C -> Copy selected cells (use when in command mode)
- V -> Paste cells below (use when in command mode)
- Shift + V -> Paste cells above (use when in command mode)
- DD (press the "D" keyword twice) -> Deletes selected cells (use when in command mode)
- Z -> Undo cell deletion (use when in command mode)
- Ctrl + A -> Selects all (use when in command mode)
- Ctrl + Z -> Undo (use when in command mode)

We suggest you spend some time using these key shortcuts to get comfortable with the Jupyter Notebook user interface. Other notes:

- Jupyter Notebook is extremely helpful when it comes to autocompleting some codes. The keyword to remember is the "tab" keyword which will help in autocompleting and faster coding. For example, if one wants to import the matplotlib library, simply type in "mat" and hit tab. Two available options such as "math" and "matplotlib" will be populated. This important feature enables one to obtain a library more quickly. In addition, it helps with remembering the syntax, library, or command names when coding. Therefore, for faster coding habits, feel free to use the "tab" keyword for autopopulating and autocompleting.

- Another especially useful shortcut is "shift + tab." Pressing this keyword inside a library's parenthesis one time will open all the features associated within that library. For example, if after importing "import numpy as np" np.linspace() is typed and "shift + tab" is hit once, it will populate a window that will show all the arguments that can be passed inside. Pressing "shift + tab" two, three, and four times will keep expanding the argument window until it occupies half of the page.

# 5. Learn More by Yourself

Anaconda documentation:

- https://docs.anaconda.com/anaconda/user-guide/getting-started/

Youtube videos introducing Jupyter Notebook (their contents are quite similar):

- https://www.youtube.com/watch?v=nYHzEcIkv4g
- https://www.youtube.com/watch?v=3C9E2yPBw7s
- https://www.youtube.com/watch?v=HW29067qVWk

Youtube video introducing Python for beginners:

- https://www.youtube.com/watch?v=p1PKGDz0Y6A

Well Structured Python Tutorial

- https://www.w3schools.com/python/