

Introduction to Programming Environment

Machine Learning

Notice

■ Code Practice

- It is Python programming practice of what you have learned in the lecture
- Code practice file (**Week**_given_code.ipynb**) will be provided. It consists of practice code template & Quiz with desired results of each cell
 1. Follow TA's explanation and fill the '**None**' parts (~ 1 hour)
 2. Write the codes for Quiz yourself (~ 1 hour)
 3. TA and assistants will help programming if you need
- After you completed each practice, submit your practice code file(**Week**_studentID_name.ipynb**) to e-class by Saturday night
- Some part of the Quiz may be include in homework or exam later

■ Homework

- Every 3 weeks, homework will be given
- It covers contents of last 3 weeks lecture and code practice

What is Python?

■ Python

- High-level programming language released in 1991, which was created by Guido van Rossum
- Python is interpretive, object-oriented, dynamic typed(check the data type in run time) and interactive programming language
- Python supports multiple programming paradigms, including procedural, object-oriented, and functional programming
- The Zen of Python
 - Beautiful is better than ugly
 - Explicit is better than implicit
 - Simple is better than complex
 - Flat is better than nested
 - Sparse is better than dense
 - Readability counts
 - ...



<https://www.python.org/dev/peps/pep-0020>

Anaconda

- Anaconda
 - A free and open-source distribution of the Python programming languages for scientific computing
 - Python + Libraries + Tools
- Typical AI/ML-related libraries supported by Anaconda
 - Numpy
 - It provides multidimensional array object, vector operation and linear algebra
 - Pandas
 - It provides 'Dataframe' to address the type of table data
 - Matplotlib
 - It provides several tools of drawing graph, chart and visualization
 - Scikit-Learn
 - It provides packages of some machine Learning algorithms and various models of machine learning functions

<https://www.anaconda.com/>

[Products ▾](#)[Pricing](#)[Solutions ▾](#)[Resources ▾](#)[Partners ▾](#)[Blog](#)[Company ▾](#)[Contact Sales](#)

New! Code with Anaconda in the Cloud **for Free**

Start coding immediately in a fully-loaded, ready-to-code notebook

[Get Started](#)

Data science technology for groundbreaking research.

Anaconda offers the easiest way to perform Python/R data science and machine learning on a single machine. Start working with thousands of open-source packages and libraries today.

[Download](#)

For Windows

Python 3.9 • 64-Bit Graphical Installer • 621 MB

[Get Additional Installers](#)



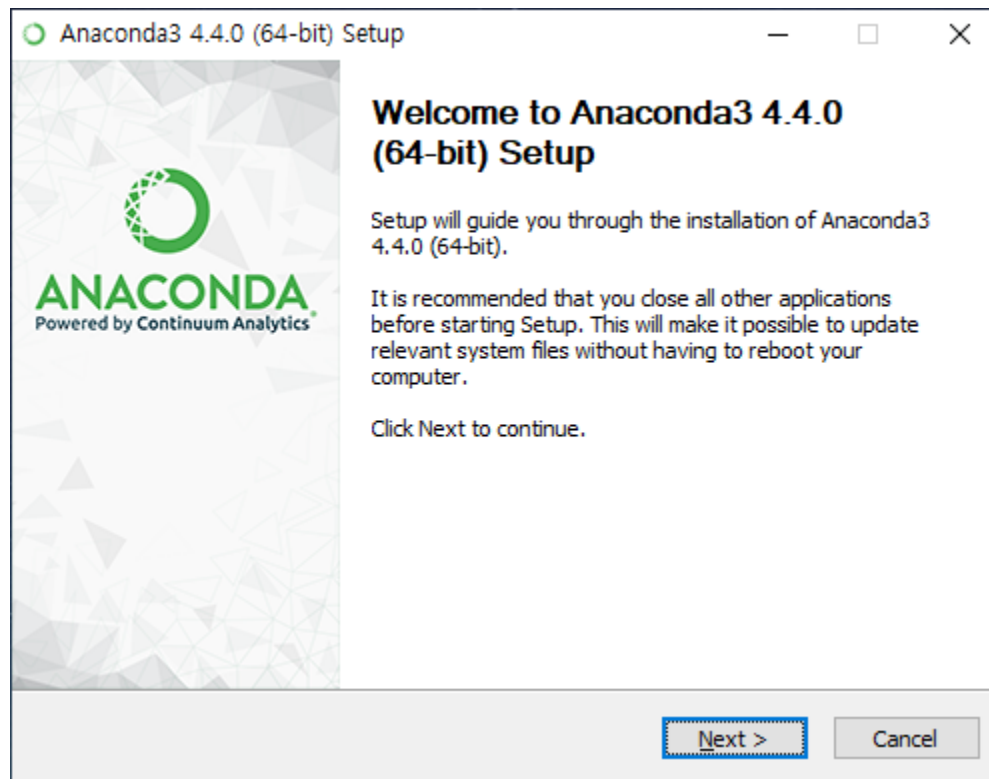
This website uses cookies to ensure you get the best experience on our website. [Privacy Policy](#)

[Accept](#)

<https://www.anaconda.com/>

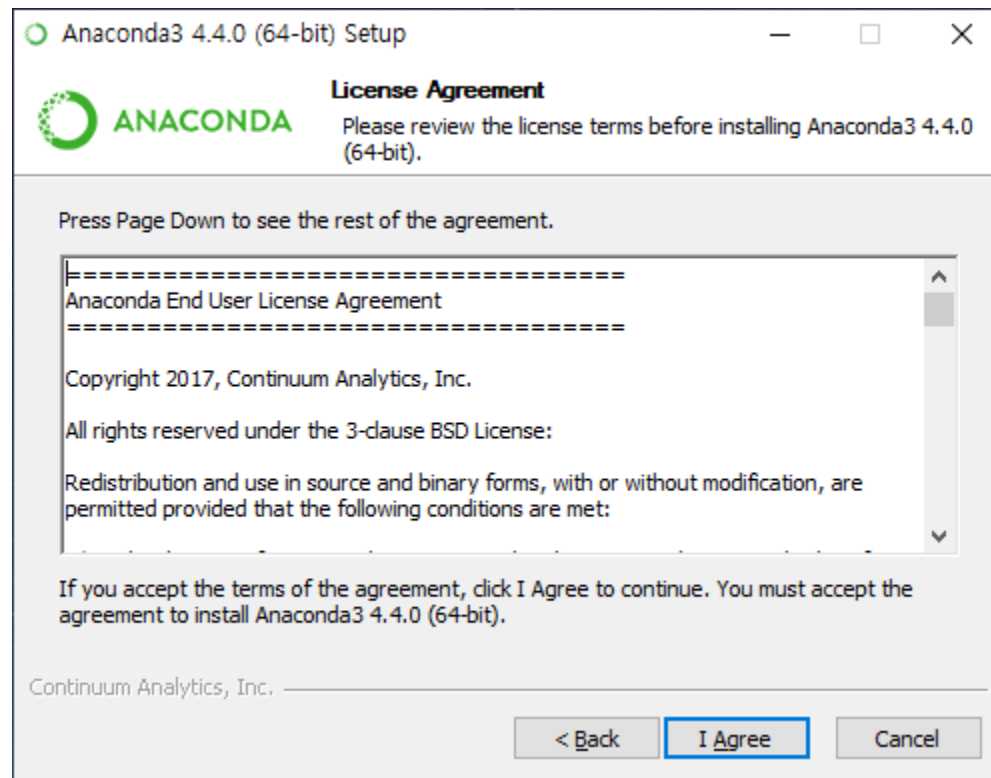
How to Install Anaconda

3. Run the install programs, click the “next” button.



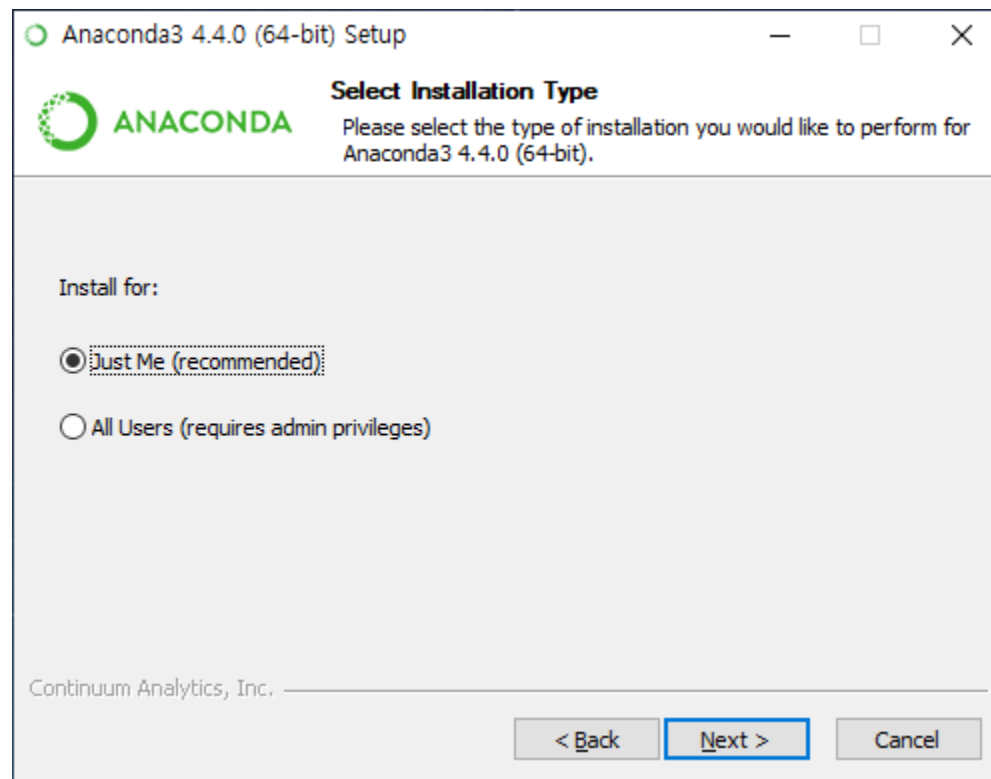
How to Install Anaconda

4. Click “I Agree” button



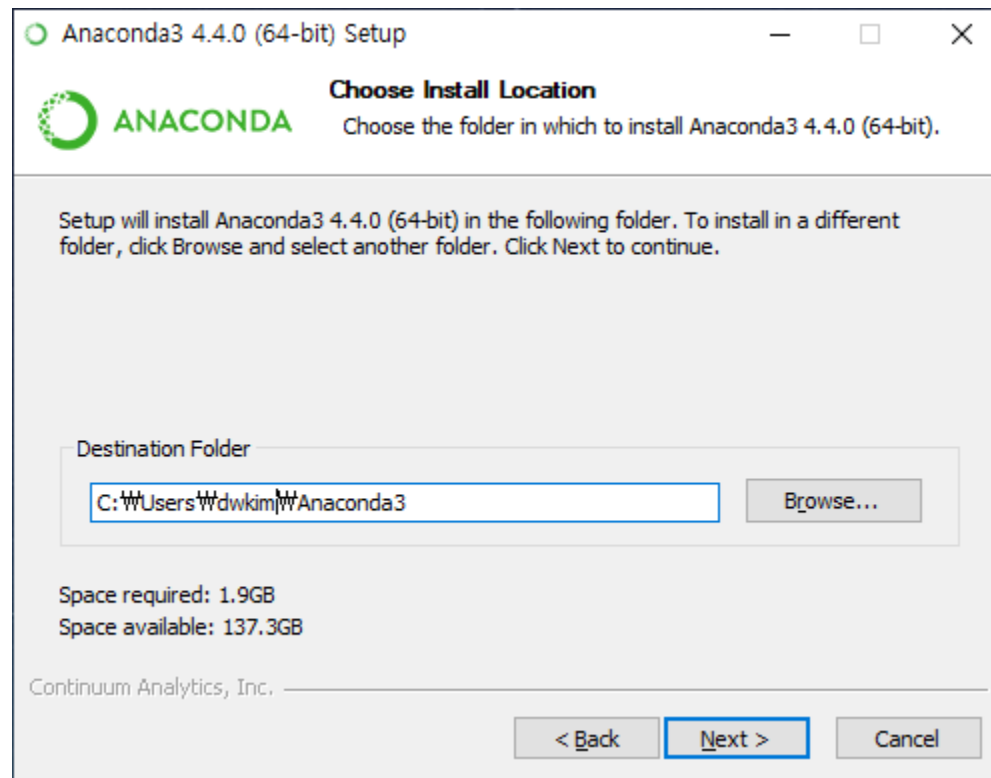
How to Install Anaconda

5. Go on with default value("Just Me"), and Click the "next" button



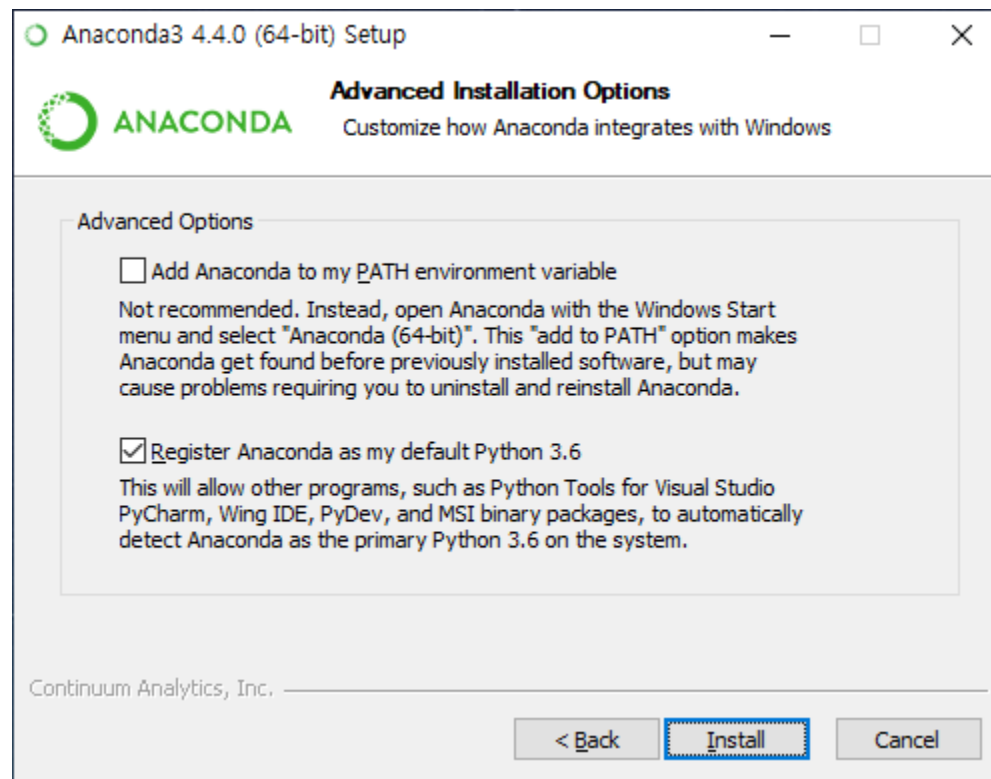
How to Install Anaconda

6. Click the “next” button



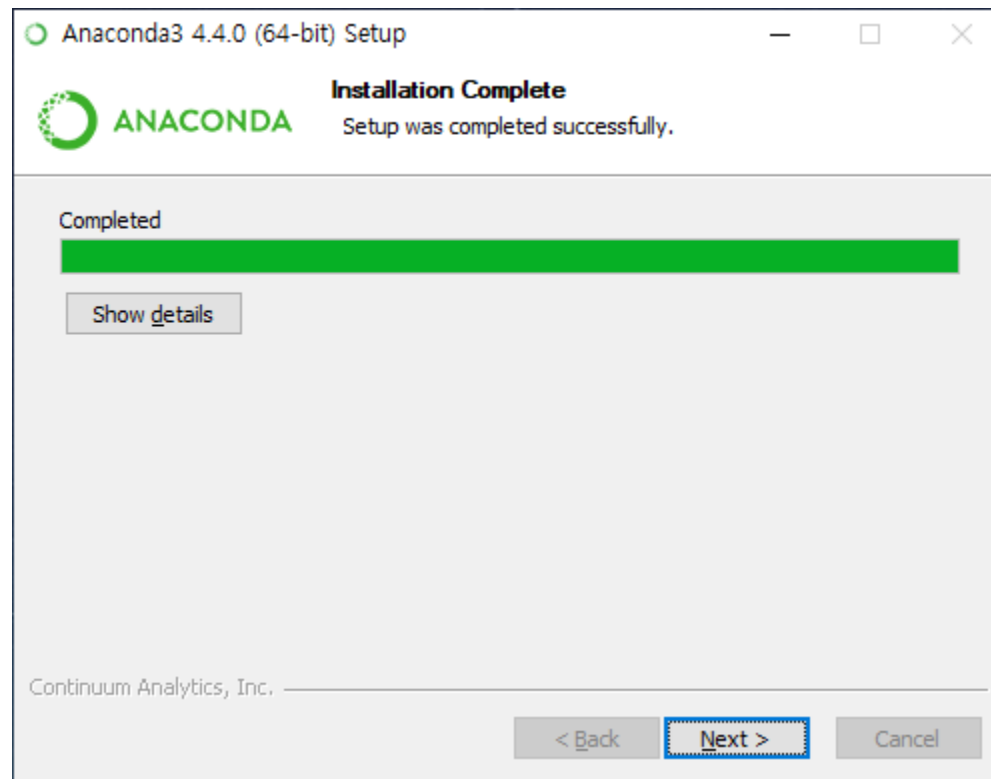
How to Install Anaconda

7. Go on with default value, Click the “Install” button



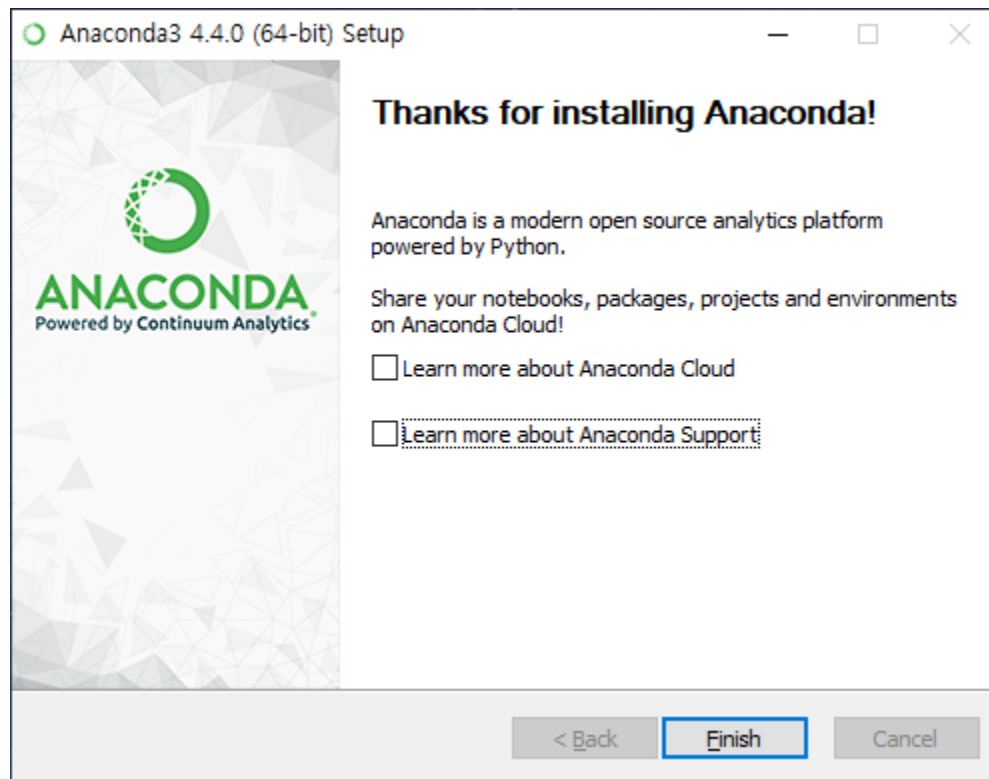
How to Install Anaconda

8. Install Complete, Click the “Next”.



How to Install Anaconda

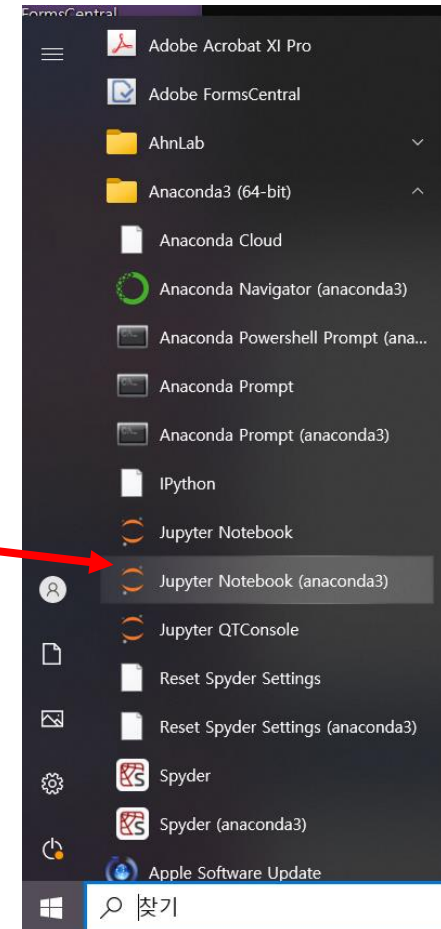
9. Uncheck all boxes, And Click the “Finish”.



What is Jupyter Notebook?

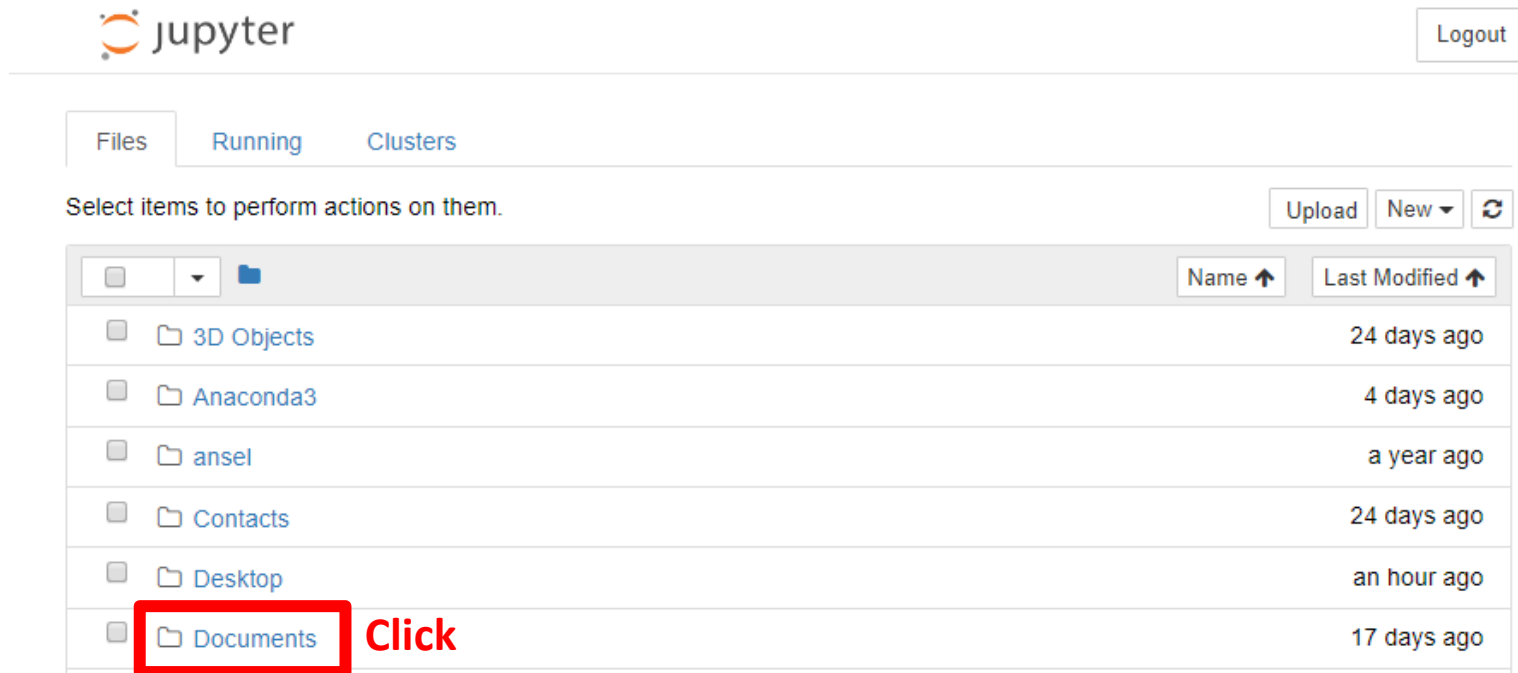
- Jupyter Notebook

- It is a tool for writing codes and executing the codes in the web browser such as Chrome, Edge etc.
- Starting Jupyter Notebook
 - Start– Anaconda3 – Click the Jupyter Notebook
 - Run – Anaconda Prompt –Type “jupyter notebook” and enter



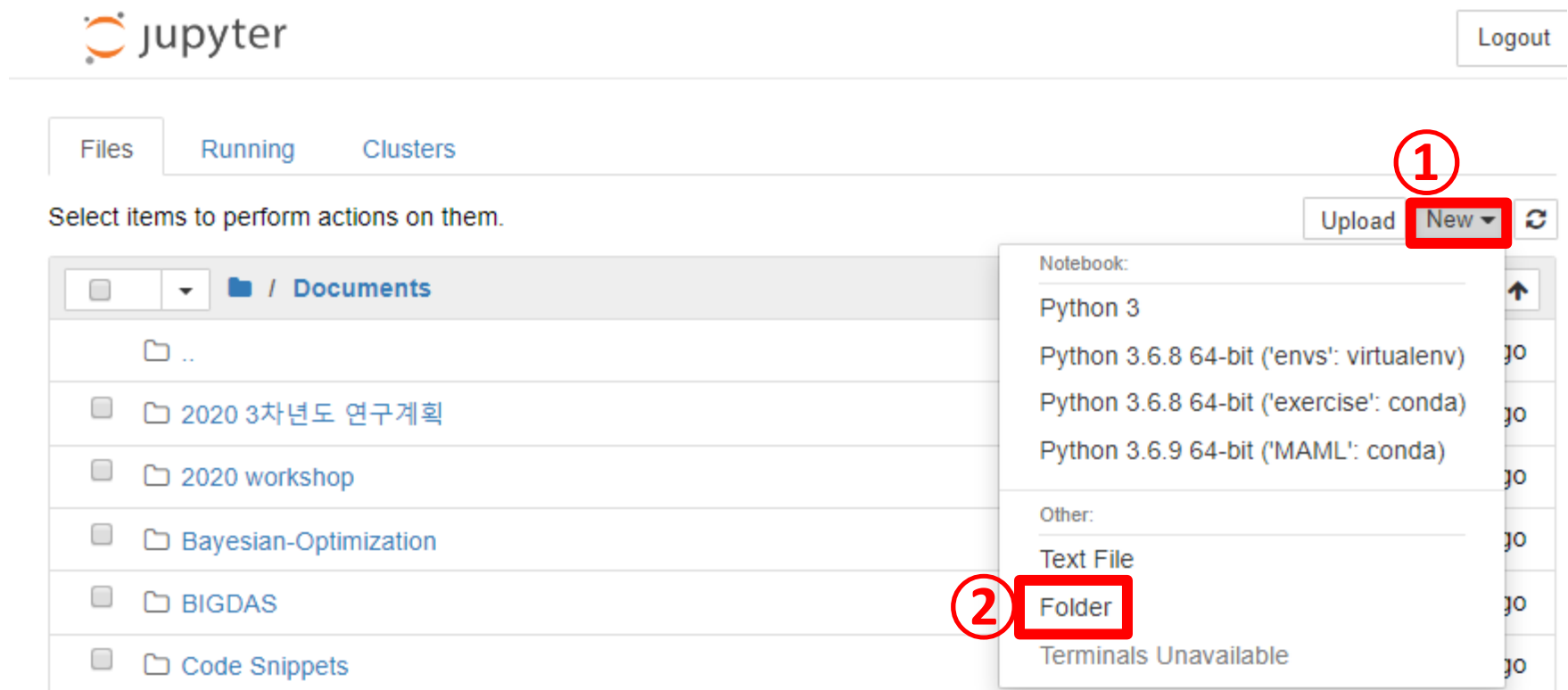
How to create folder and file

1. We will make a workspace folder for this lecture named “2023ML”, on this path.
“C:\Users\{UserName}\Documents\2023ML”
you can follow this step or use other file explorer(It will be much easier than this).



How to create folder and file

2. Click “New” and “Folder” to make the “Untitled Folder”



The screenshot displays the JupyterLab web interface. At the top left is the Jupyter logo. To the right is a 'Logout' button. Below the logo are three tabs: 'Files', 'Running', and 'Clusters'. The 'Files' tab is active, showing a file browser for the 'Documents' directory. The file list includes '..' (parent directory), '2020 3차년도 연구계획', '2020 workshop', 'Bayesian-Optimization', 'BIGDAS', and 'Code Snippets'. In the top right corner of the file browser, there are buttons for 'Upload', 'New', and a refresh icon. The 'New' button is highlighted with a red box and a circled '1'. A dropdown menu is open from the 'New' button, showing options under 'Notebook:' (Python 3, Python 3.6.8 64-bit ('envs': virtualenv), Python 3.6.8 64-bit ('exercise': conda), Python 3.6.9 64-bit ('MAML': conda)) and 'Other:' (Text File, Folder, Terminals Unavailable). The 'Folder' option is highlighted with a red box and a circled '2'.

How to create folder and file

3. Check the box of “Untitled Folder” and Click the “Rename” and type “2023ML”.

The image shows a JupyterLab interface with a file browser on the left and a 'Rename directory' dialog box on the right.

Left Panel (File Browser):

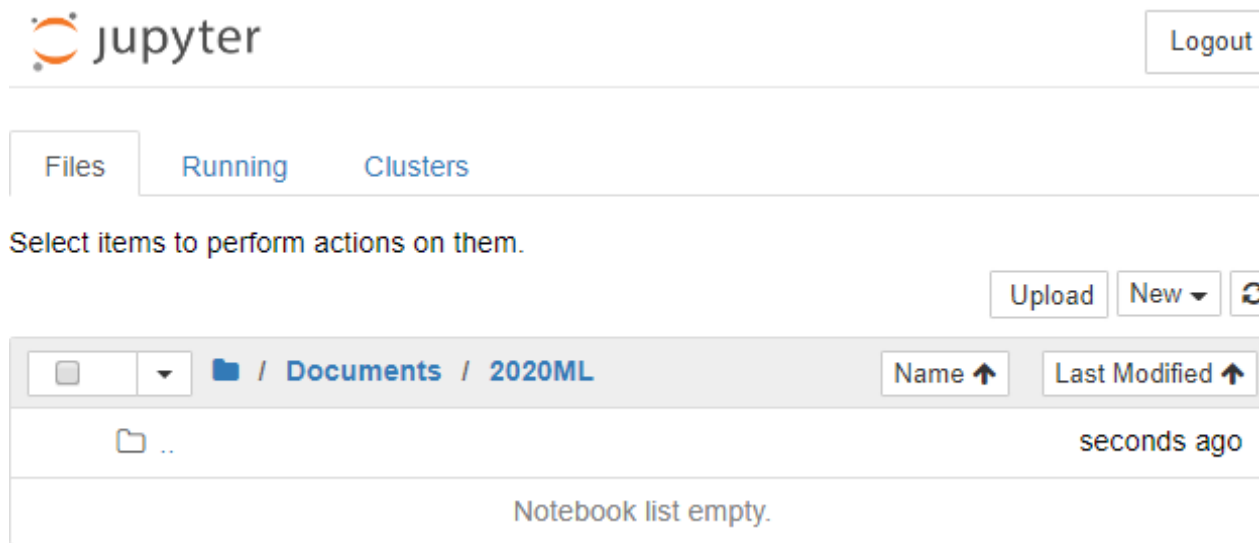
- Buttons: Files, Running, Clusters.
- Buttons: **Rename** (highlighted with a red box and a red circle with the number 2), Move, Delete.
- Path: / Documents
- Files and folders:
 - ..
 - ☒ **Untitled Folder** (highlighted with a red box and a red circle with the number 1)
 - ☐ 카카오톡 받은 파일
 - ☐ 2020 workshop

Right Panel (Rename directory dialog):

- Title: Rename directory
- Text: Enter a new directory name:
- Input field: 2020ML
- Buttons: Cancel, Rename

How to create folder and file

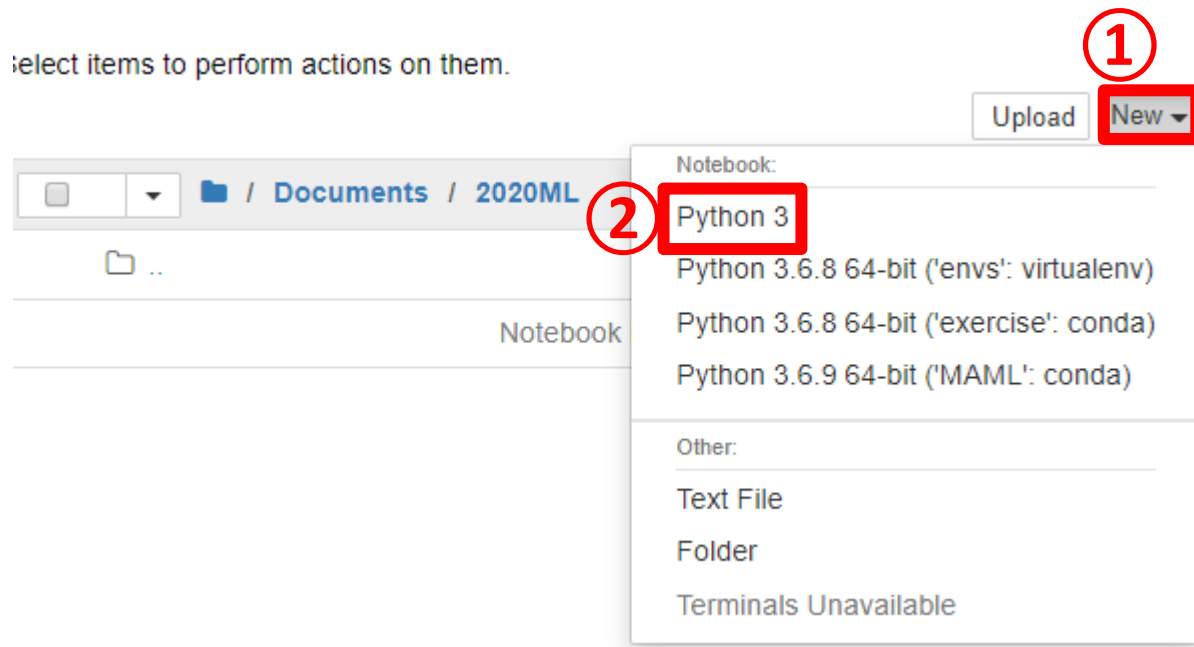
4. “2023ML” folder has been created.



How to create folder and file

5. Let's create test file(*.ipynb(ipython notebook file)).

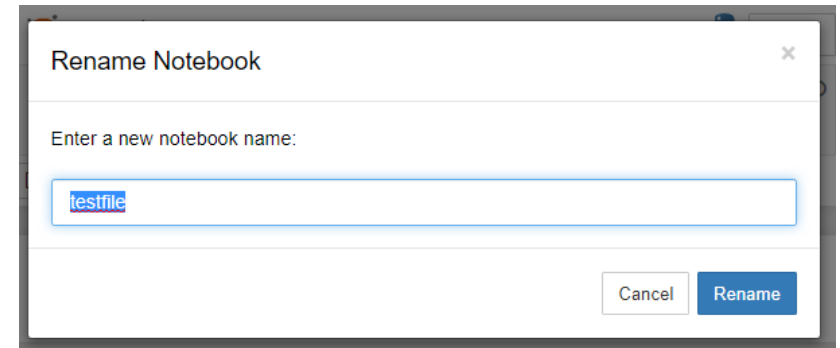
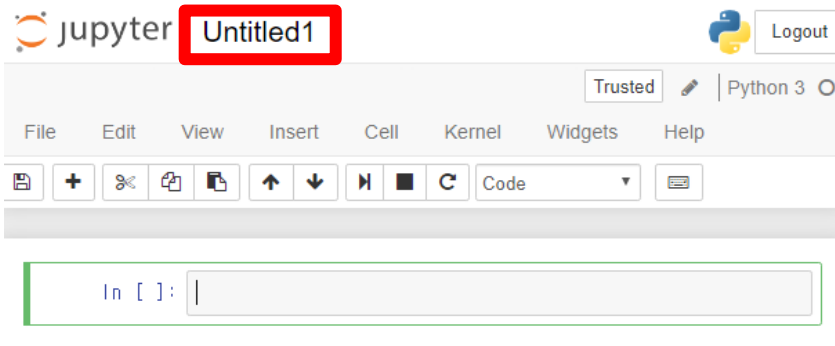
Click “New” and “Python3”



How to create folder and file

6. “Untitled1.ipynb” file has been created.

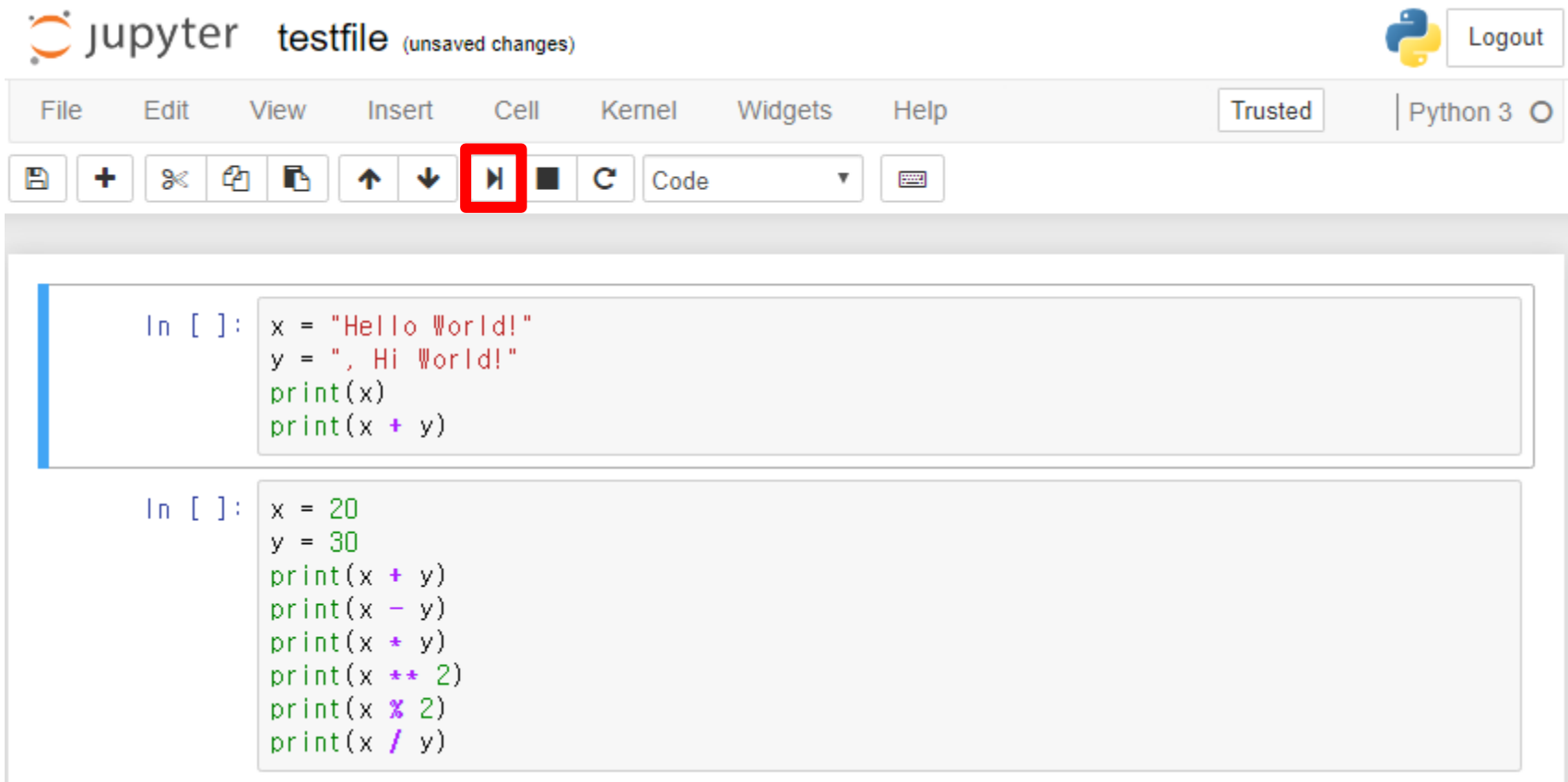
You can modify the file name by just click the title(Untitled1).



How to create folder and file

7. Let's run some sample code.

Type this code, and run the code by click  button.



Jupyter testfile (unsaved changes)

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

Run button highlighted

```
In [ ]: x = "Hello World!"
        y = ", Hi World!"
        print(x)
        print(x + y)
```

```
In [ ]: x = 20
        y = 30
        print(x + y)
        print(x - y)
        print(x * y)
        print(x ** 2)
        print(x % 2)
        print(x / y)
```

How to create folder and file

8. Because python is interpreter language, We can run these codes cell by cell.

```
In [1]: x = "Hello World!"  
y = ", Hi World!"  
print(x)  
print(x + y)
```

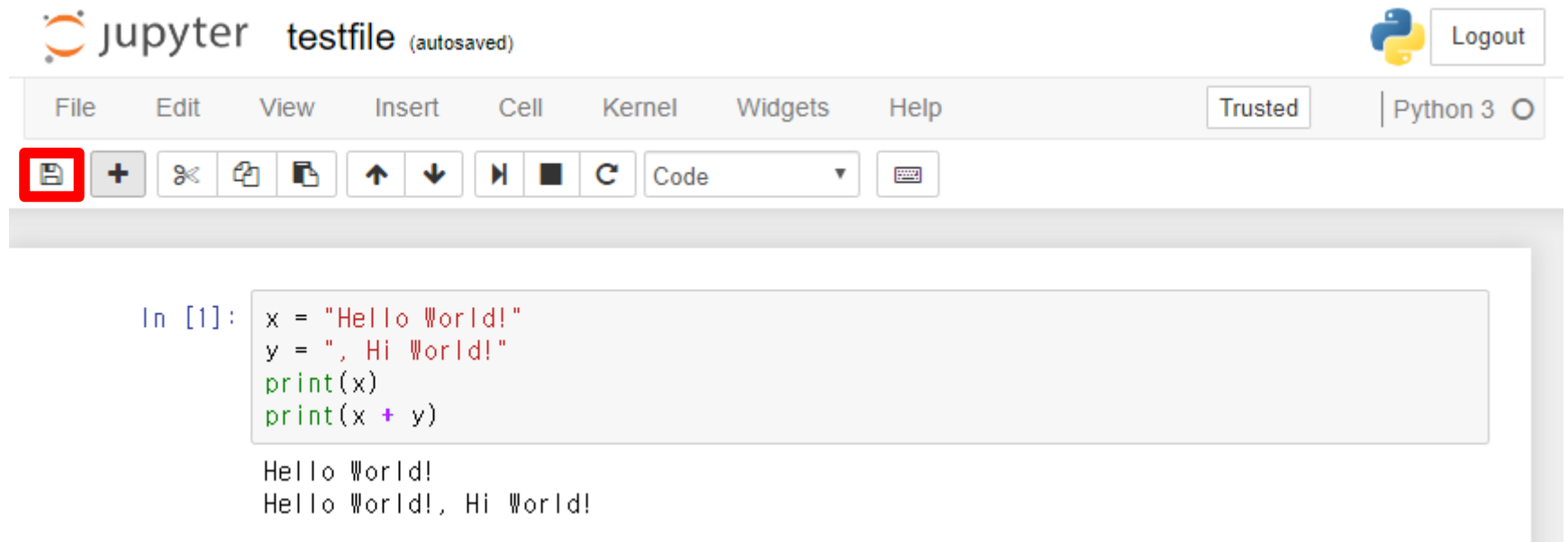
```
Hello World!  
Hello World!, Hi World!
```

```
In [2]: x = 20  
y = 30  
print(x + y)  
print(x - y)  
print(x * y)  
print(x ** 2)  
print(x % 2)  
print(x / y)
```

```
50  
-10  
600  
400  
0  
0.6666666666666666
```

How to save and delete file

1. To save this file, just click 



The image shows a Jupyter Notebook interface. At the top, the title bar says "jupyter testfile (autosaved)". On the right, there is a "Logout" button. Below the title bar is a menu bar with "File", "Edit", "View", "Insert", "Cell", "Kernel", "Widgets", and "Help". To the right of the menu bar are "Trusted" and "Python 3" buttons. Below the menu bar is a toolbar with various icons. The "Save" icon (a floppy disk) is highlighted with a red square. To the right of the "Save" icon is a "+" icon, followed by icons for undo, redo, copy, paste, and a keyboard icon. Below the toolbar is a code cell with the following code:

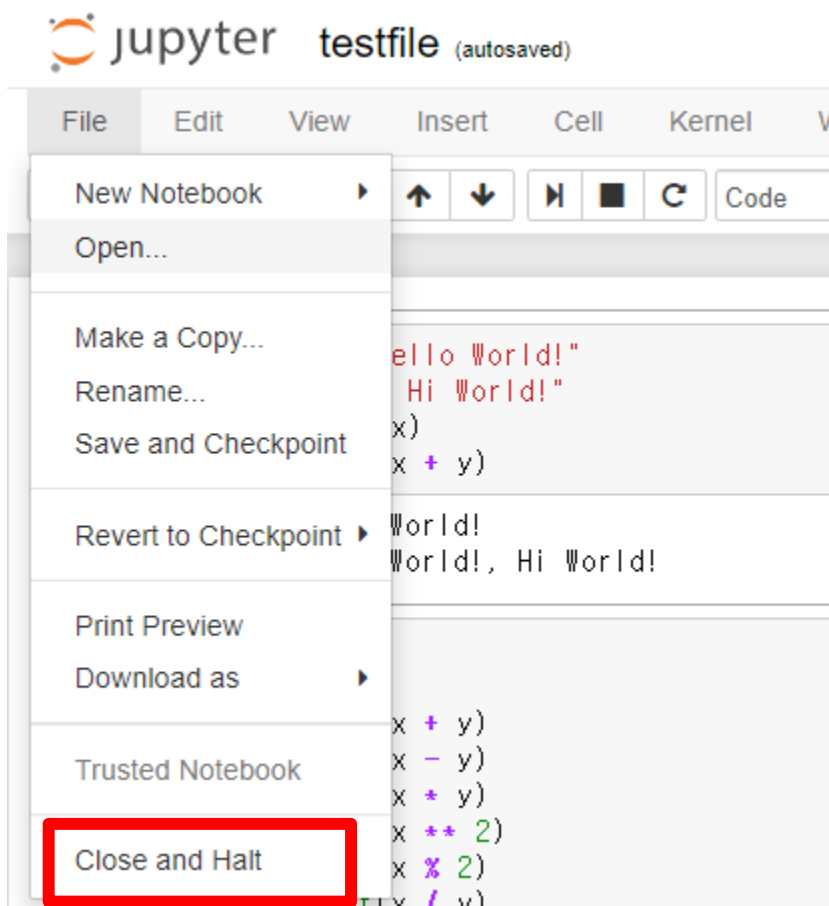
```
In [1]: x = "Hello World!"
        y = ", Hi World!"
        print(x)
        print(x + y)
```

The output of the code cell is:

```
Hello World!
Hello World!, Hi World!
```

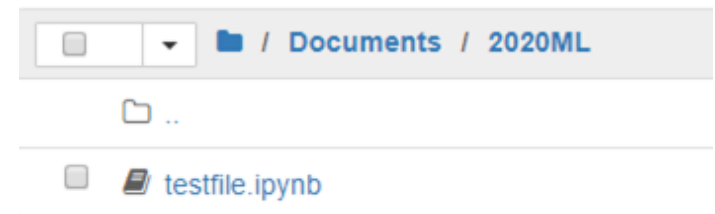
How to save and delete file

2. To close this file, click “File” button, and “Close and Halt” button.



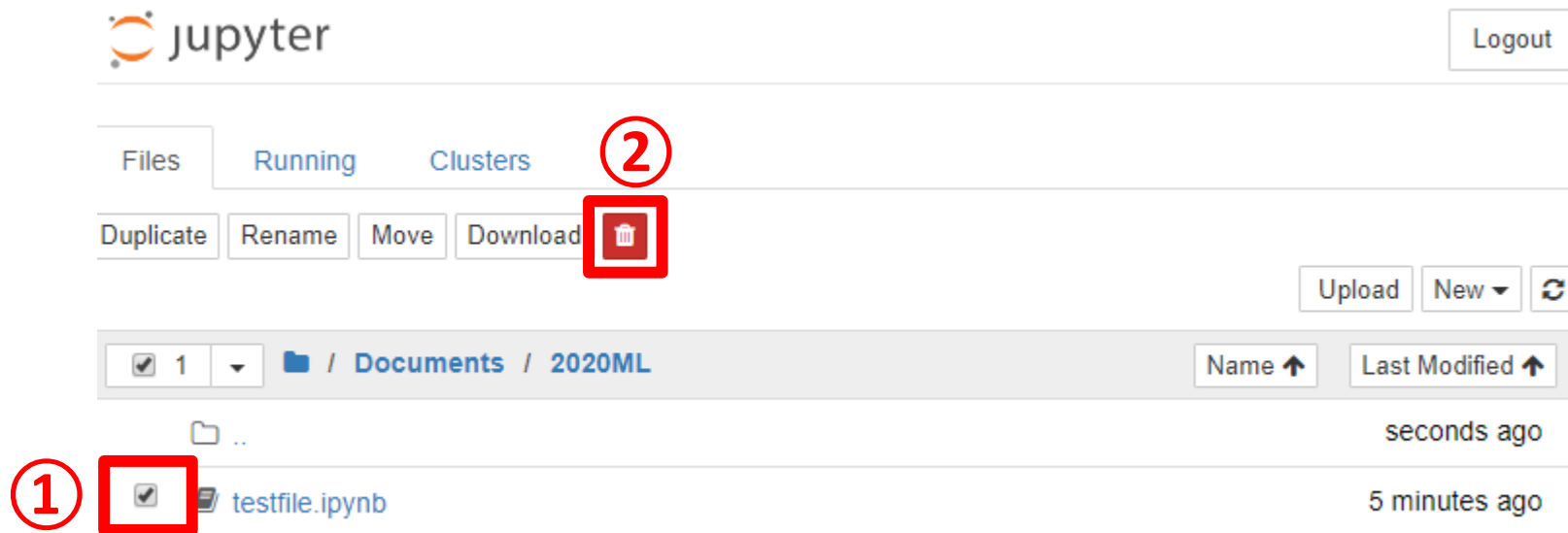
Files Running Clusters

Select items to perform actions on them.



How to save and delete file

3. To delete this file, check this file, and click  button.

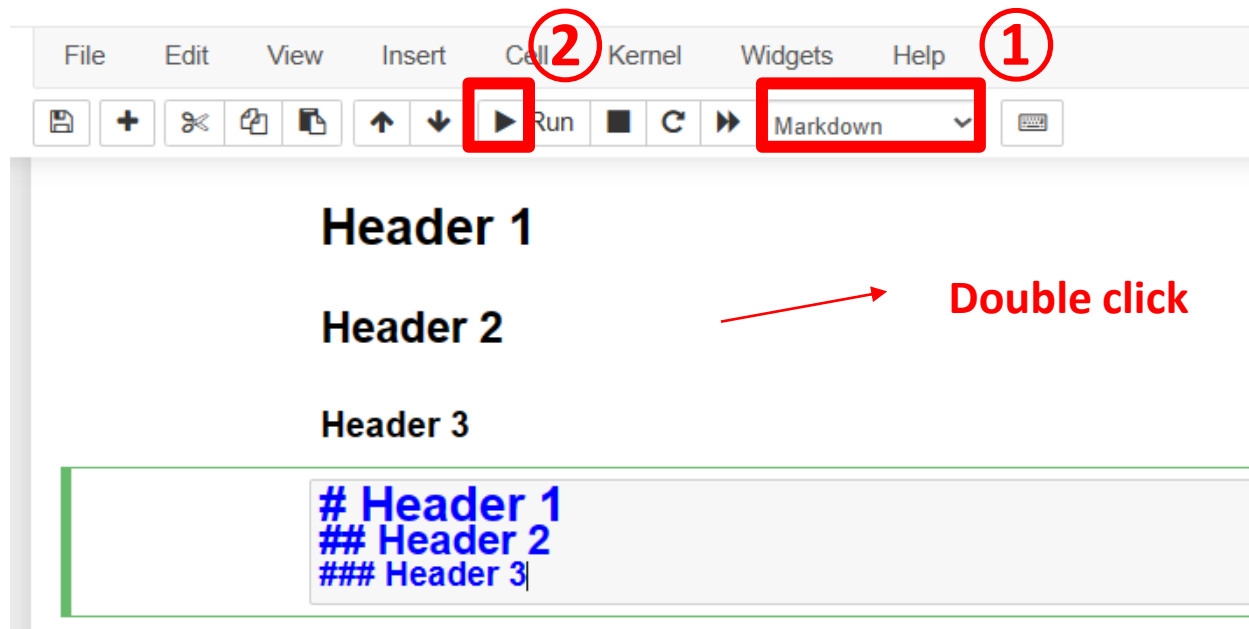


The image shows the JupyterLab interface. At the top left is the 'jupyter' logo. At the top right is a 'Logout' button. Below the logo are three tabs: 'Files', 'Running', and 'Clusters'. The 'Files' tab is active. Below the tabs are four buttons: 'Duplicate', 'Rename', 'Move', and 'Download'. To the right of these buttons is a trash icon, which is circled with a red '2'. Below these buttons is a file list. The first item in the list is a folder named '..'. The second item is a file named 'testfile.ipynb'. To the left of the file name is a checkbox, which is circled with a red '1'. To the right of the file name is the text '5 minutes ago'. The file list is titled 'Documents / 2020ML'. At the top right of the file list are two buttons: 'Upload' and 'New'. At the bottom right of the file list are two buttons: 'Name' and 'Last Modified'.

Markdown

■ Markdown

- **Markdown** is a lightweight markup language with plain-text-formatting syntax
- Select 'Markdown' ^① edit using markdown language ^② run the cell
- Double click the markdown cell to edit the contents



<https://en.wikipedia.org/wiki/Markdown>

Markdown

- Lists

Lists : use '-' for following format

- Item 1
- Item 2

```
- Item 1  
- Item 2
```

Ordered lists : use '1' for following format

1. Item 1
2. Item 2

```
1. Item 1  
1. Item 2
```