

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 helper students will answer any questions and 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 (11:59 pm). Students who finish and submit it by the end of the class will get bonus point.
- Some part of the Quiz may be included in homework or exam later

■ Homework

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

Anaconda

■ Anaconda

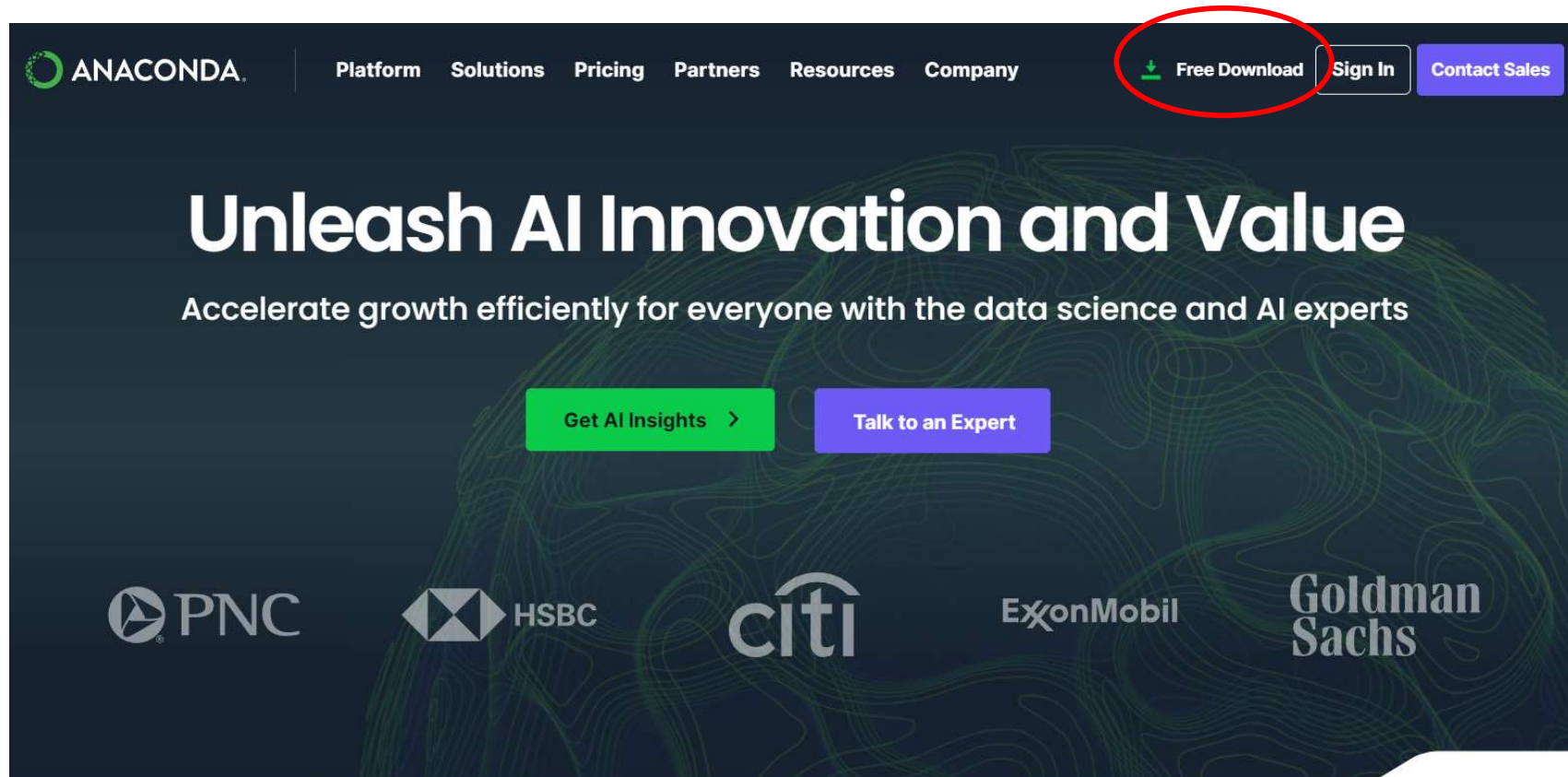
- A free and open-source distribution of the Python programming languages for scientific computing
- Python + Libraries + Tools

■ 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/>

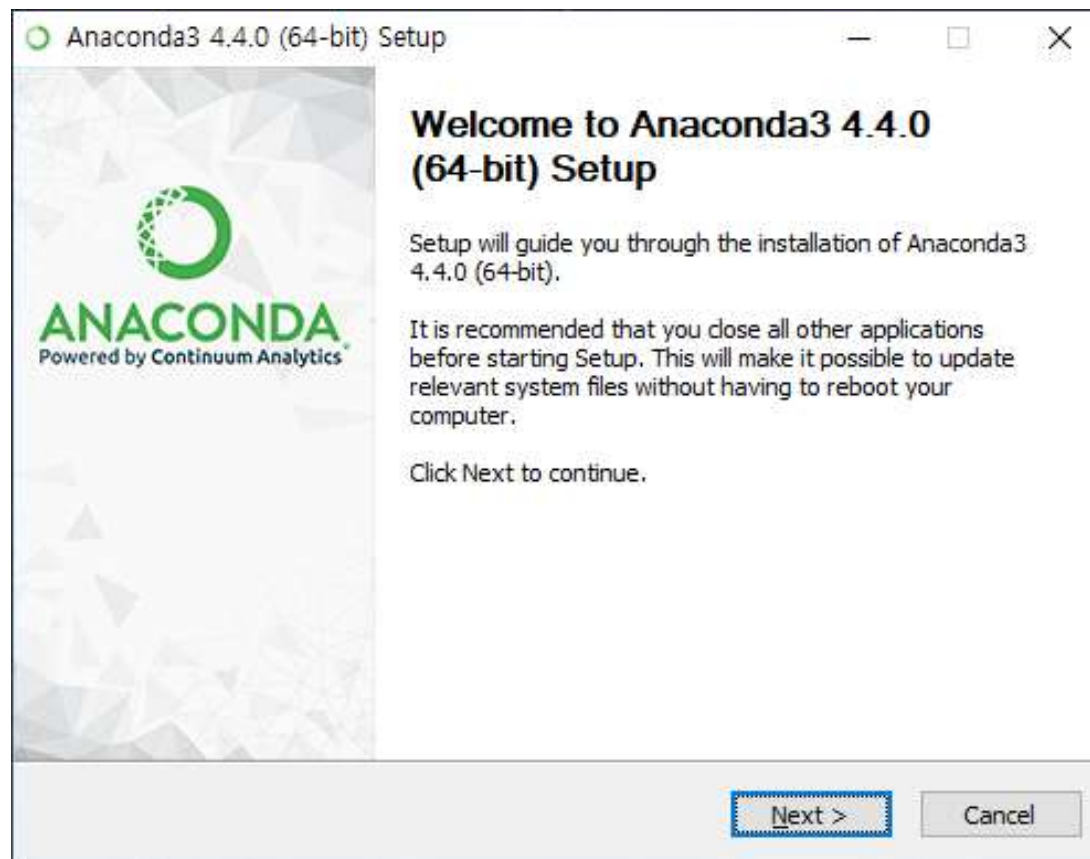
www.anaconda.com



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

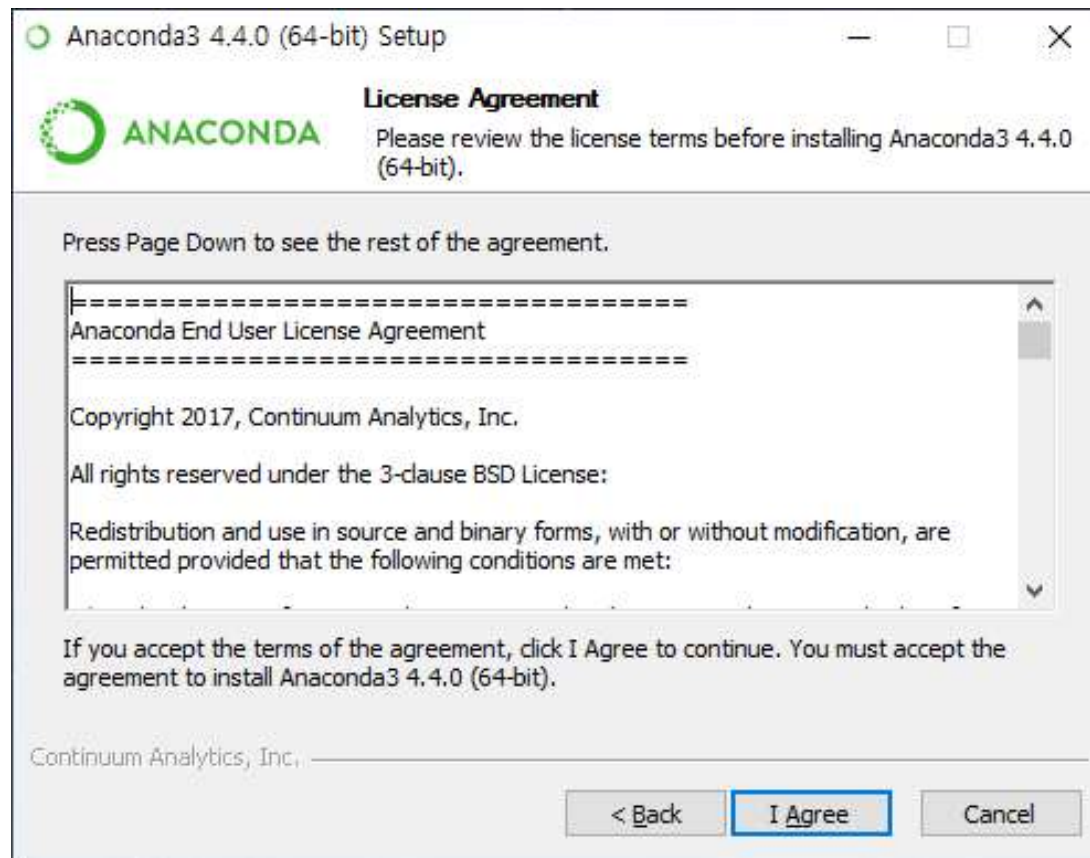
How to Install Anaconda

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



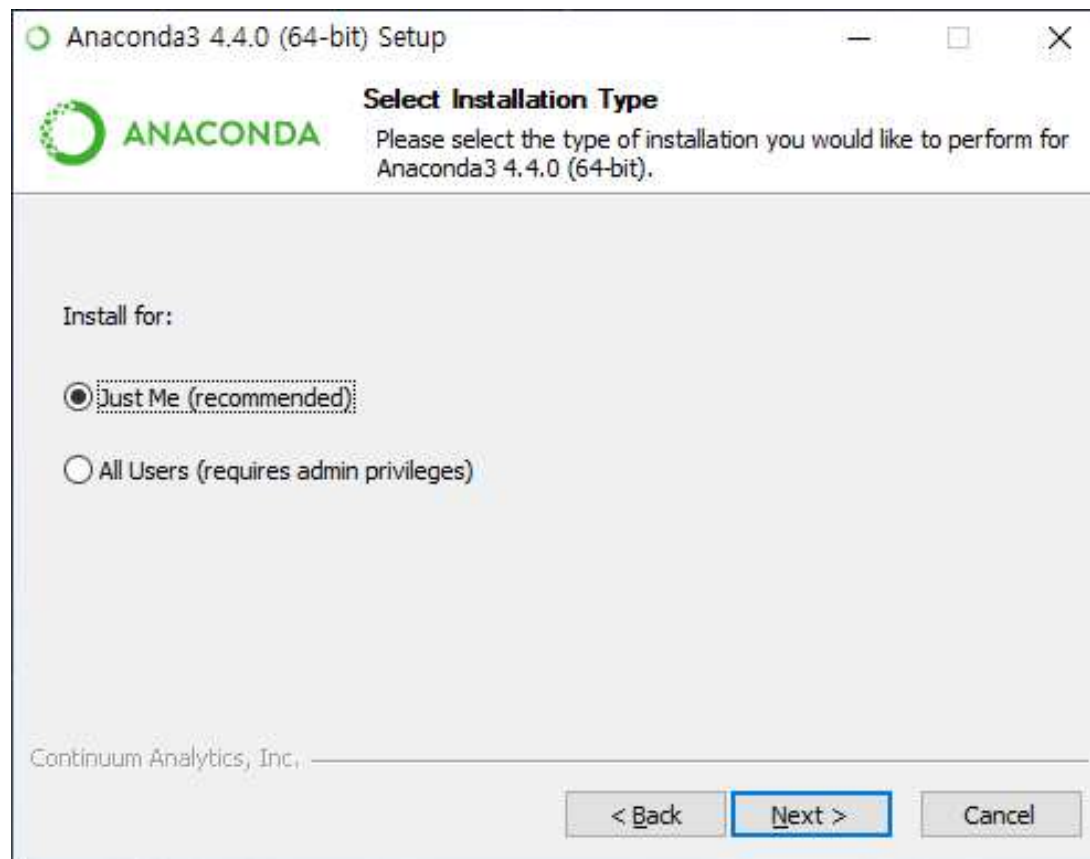
How to Install Anaconda

2. Click “I Agree” button



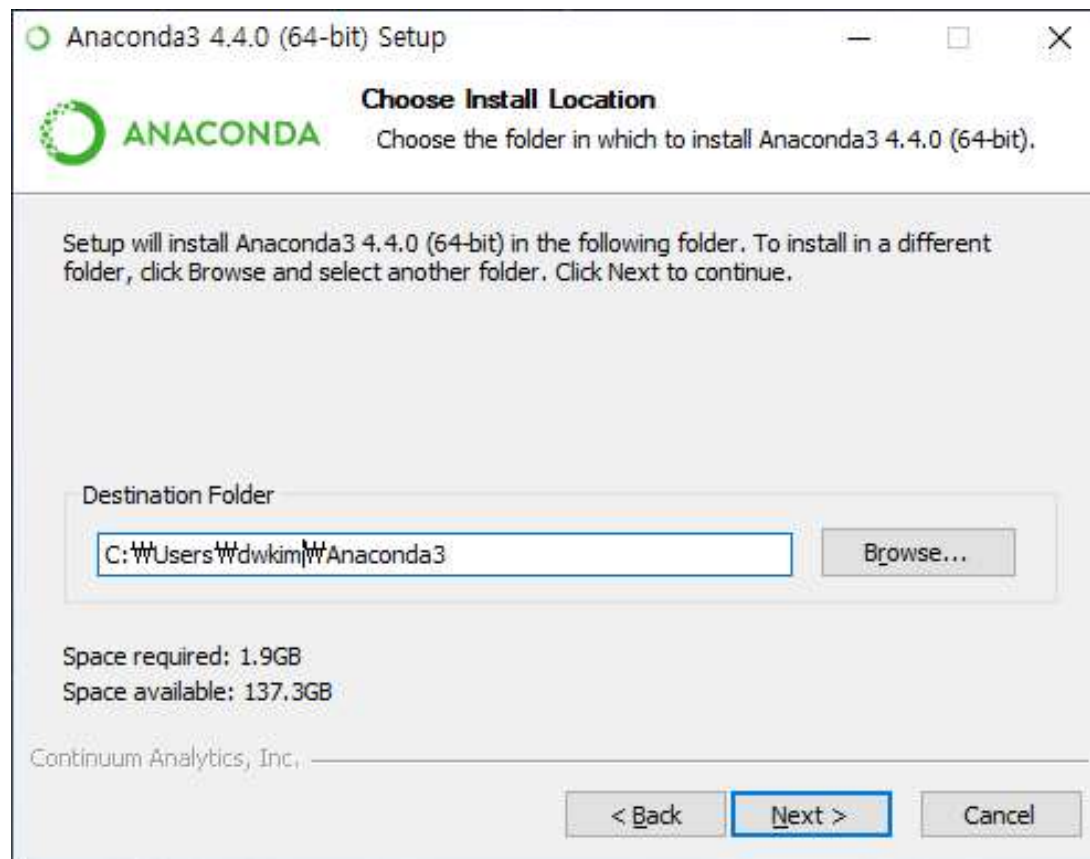
How to Install Anaconda

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



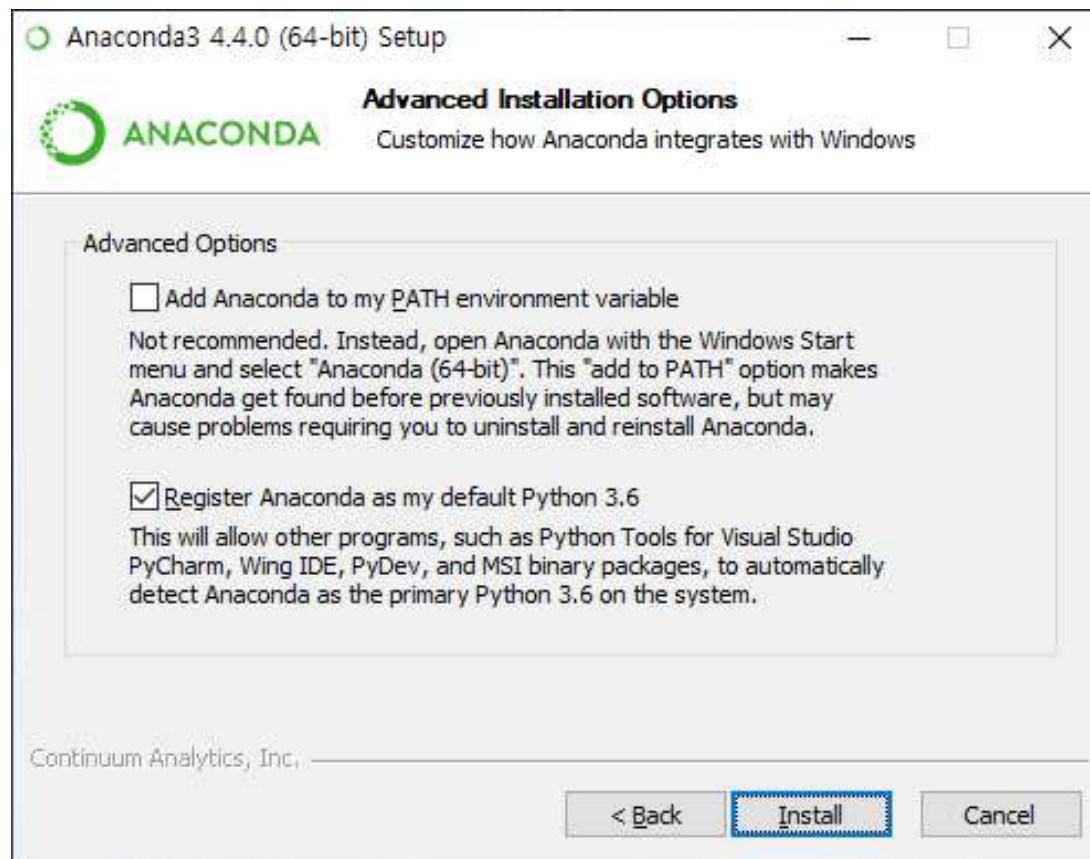
How to Install Anaconda

4. Click the “next” button



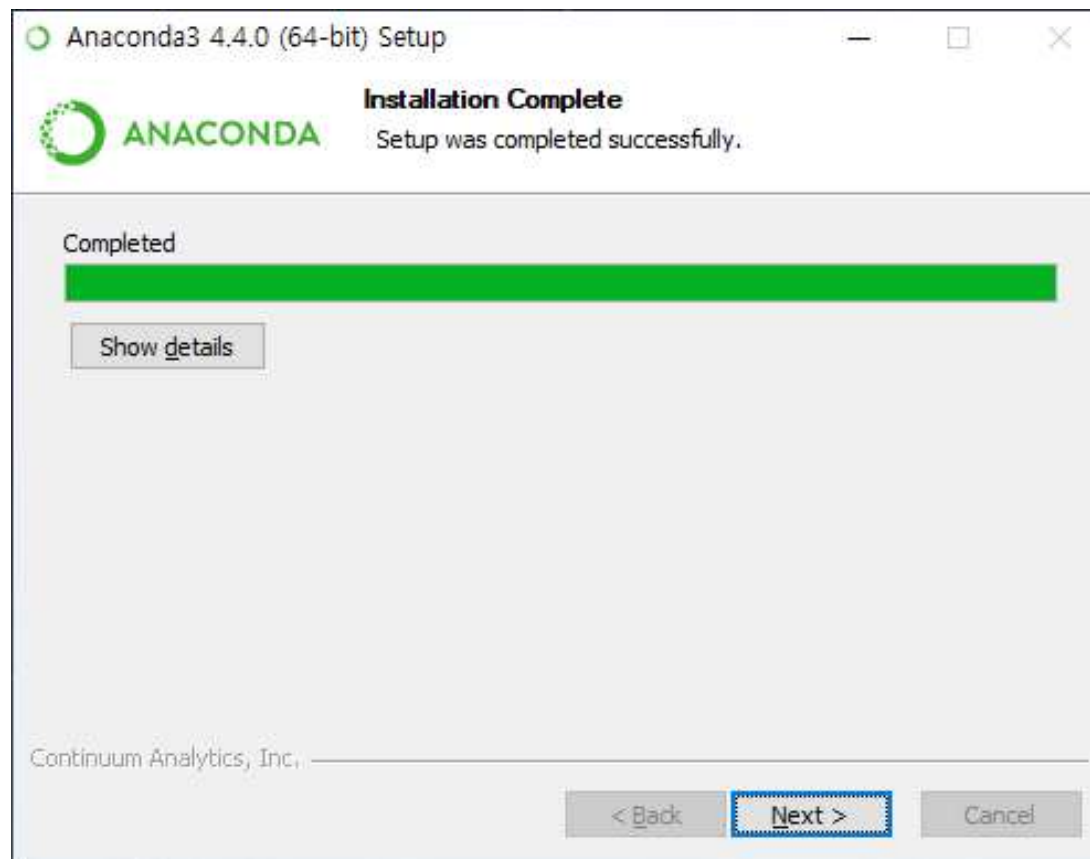
How to Install Anaconda

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



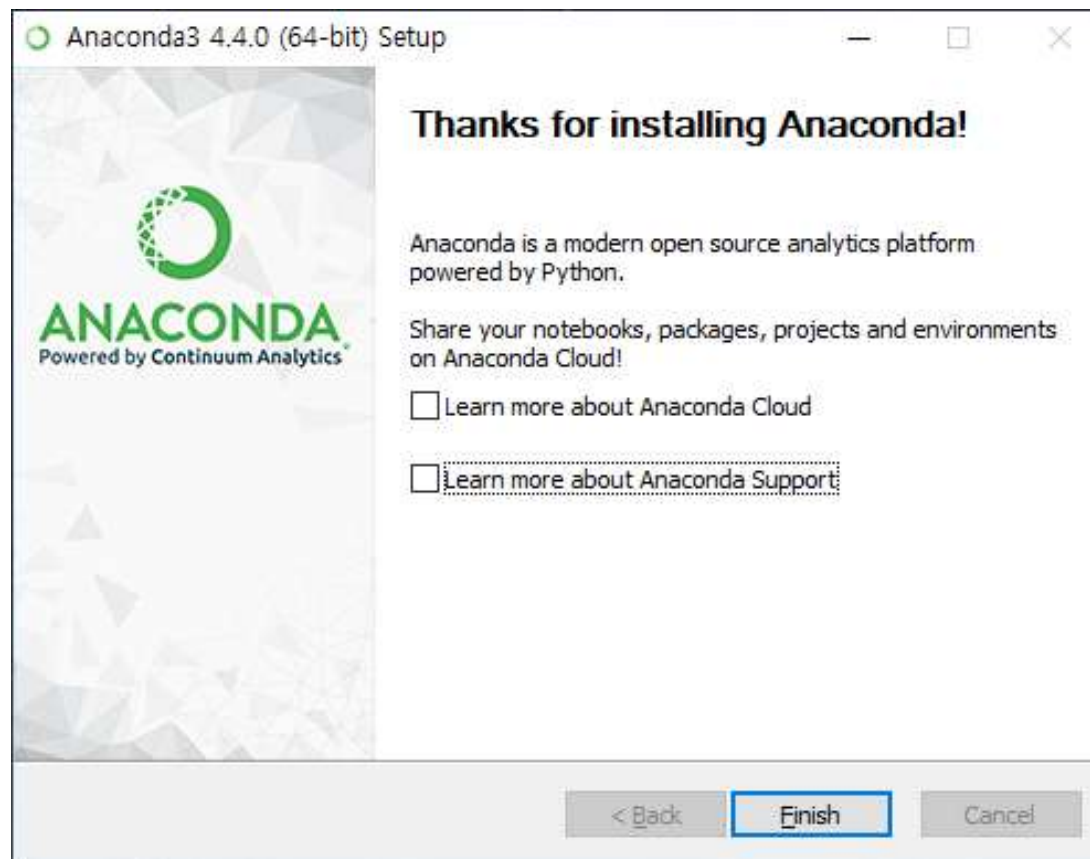
How to Install Anaconda

6. Install Complete, Click the “Next”.



How to Install Anaconda

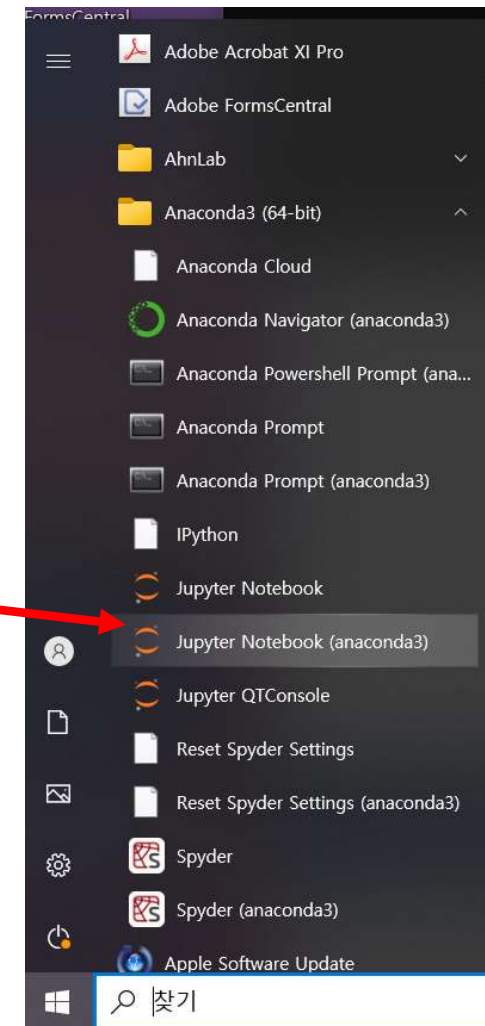
7. Uncheck all boxes, And Click the “Finish”.



What is Jupyter Notebook?

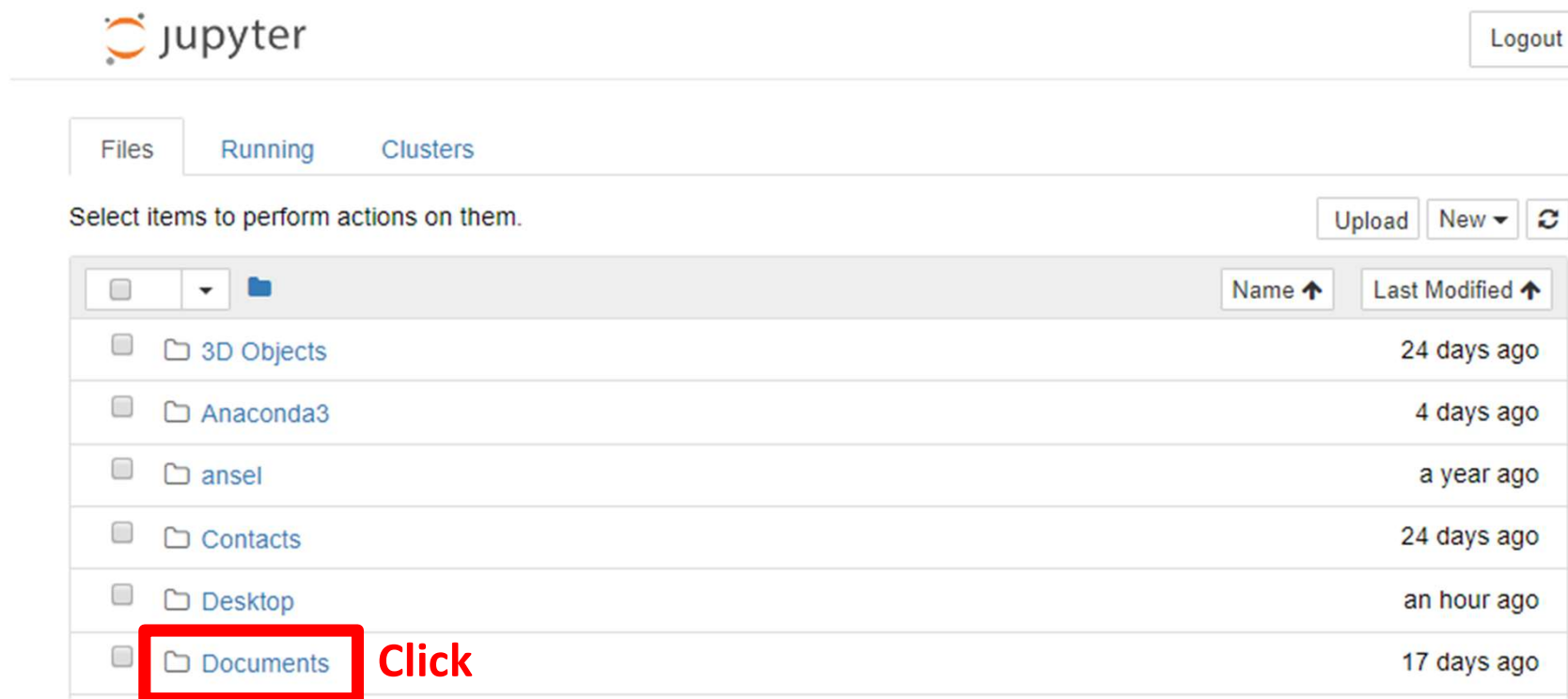
■ Jupyter Notebook

- 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



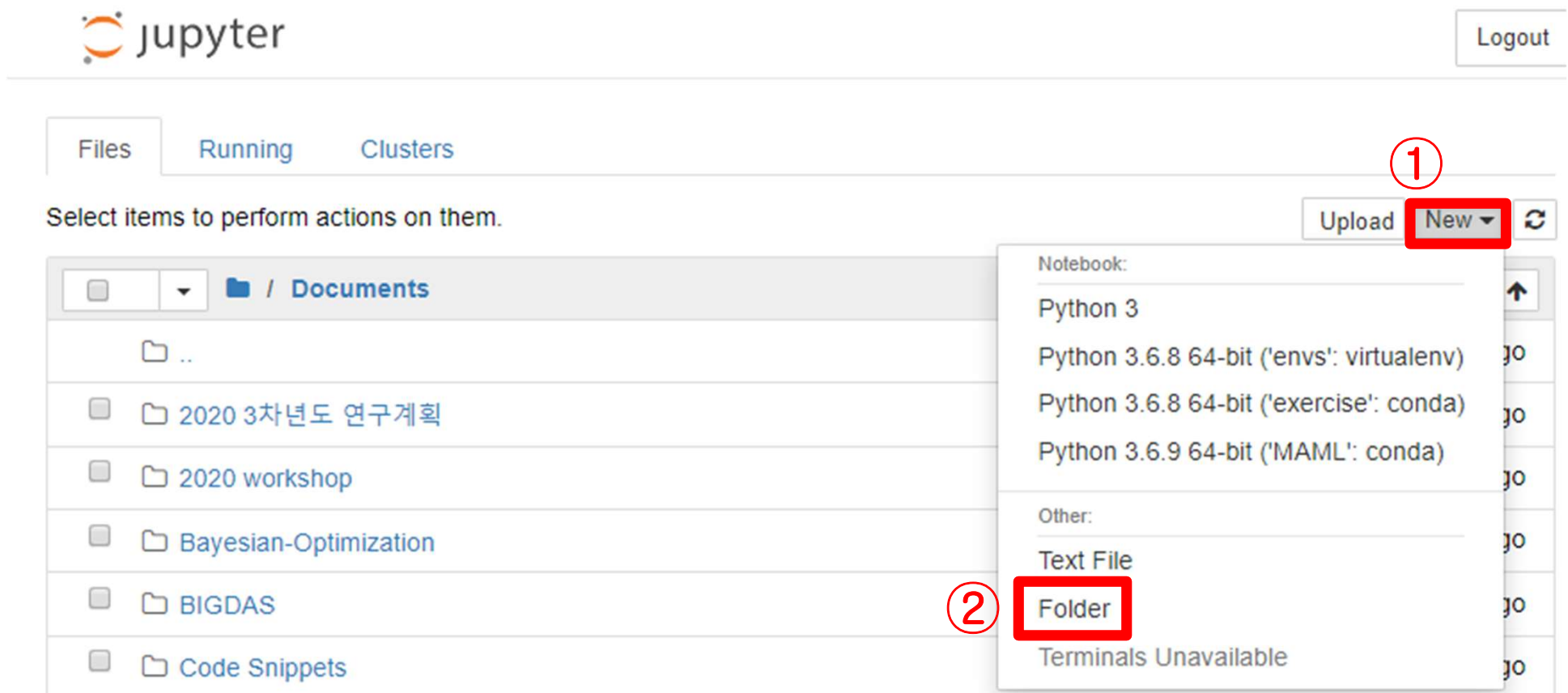
How to create folder and file

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”



How to create folder and file

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

The image shows the JupyterLab interface with the 'Files' tab selected. In the left sidebar, the 'Untitled Folder' is highlighted with a red box and a circled '1', indicating it should be selected. The 'Rename' button is also highlighted with a red box and a circled '2'. A modal dialog titled 'Rename directory' is open, showing the current directory name '2020ML' and a text input field where '2023ML' has been entered. The dialog has 'Cancel' and 'Rename' buttons.

1

2

Rename

Move

1

2

Rename directory

Enter a new directory name:

2020ML

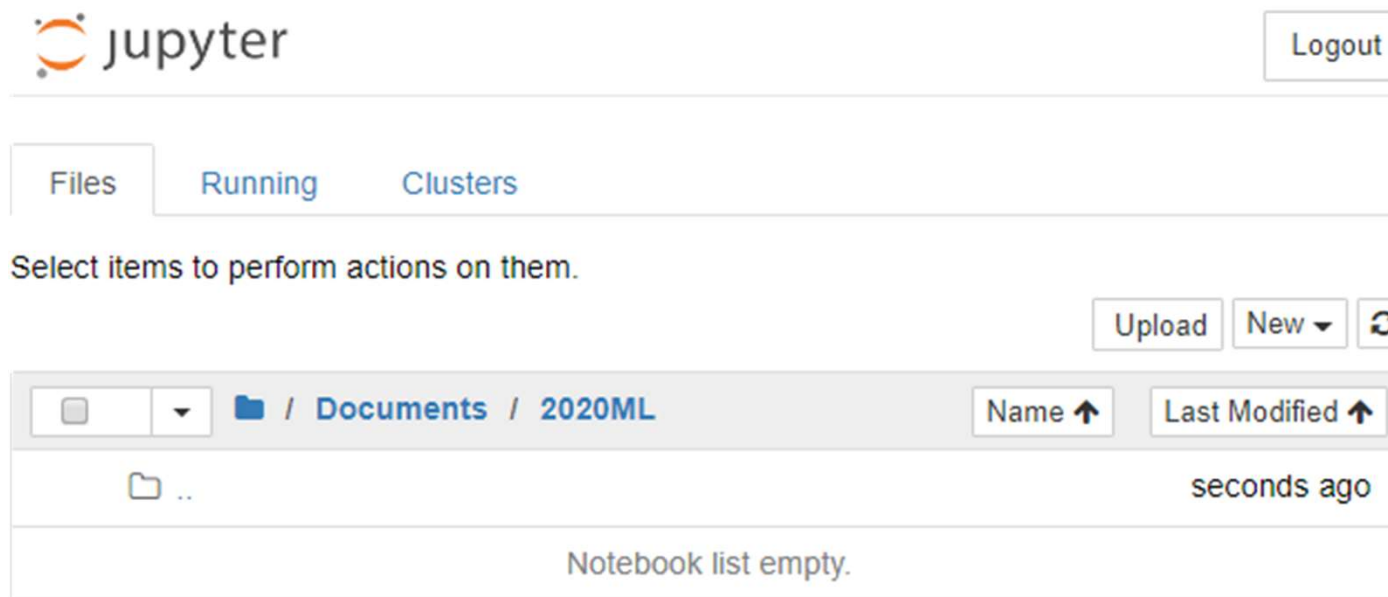
Cancel Rename

2020 3차년도 연구계획 a month ago

2020 workshop 12 days ago

How to create folder and file

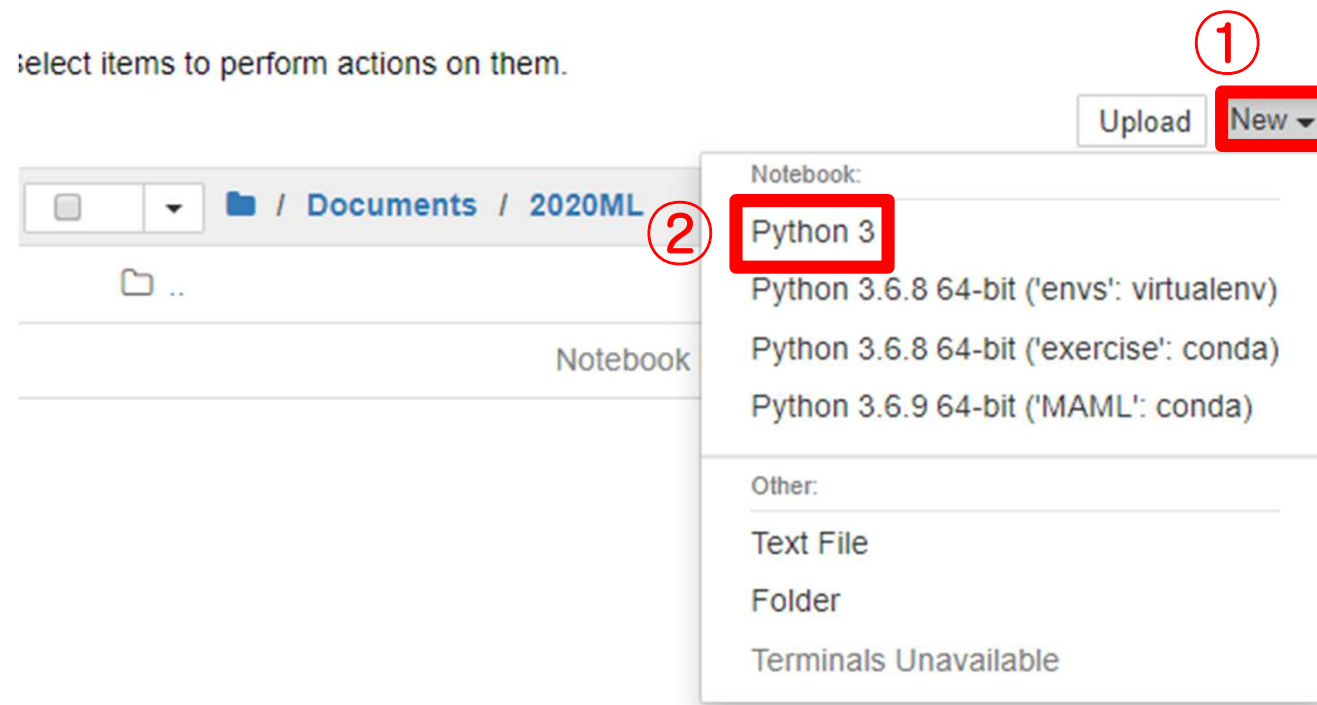
4. “2023ML” folder has been created.



How to create folder and file

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

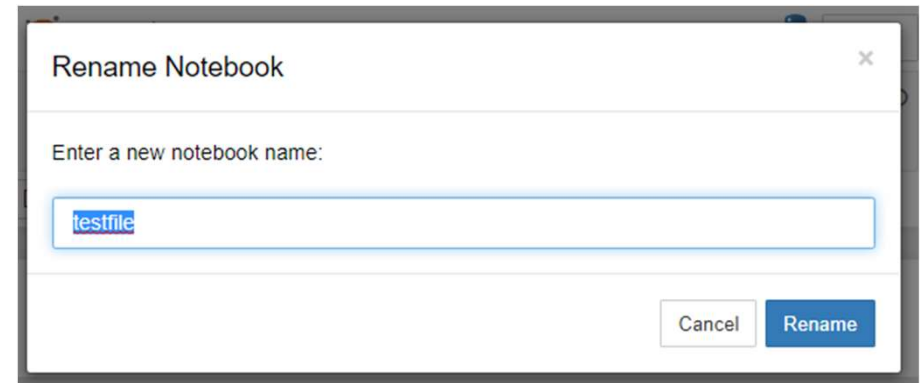
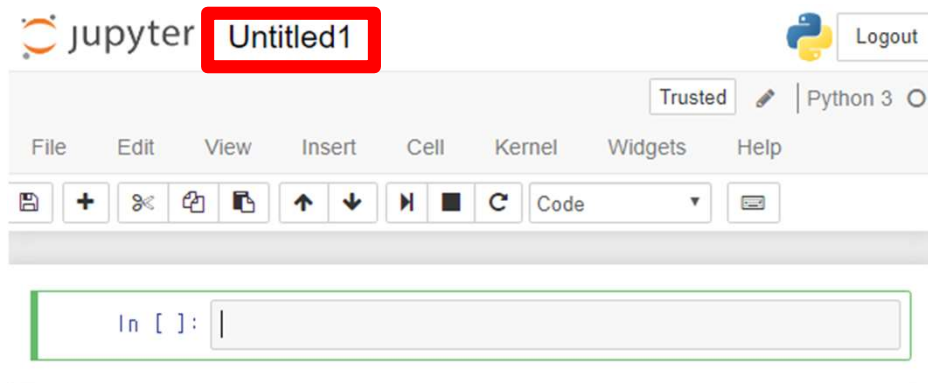
Click "New" and "Python3"



How to create folder and file

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

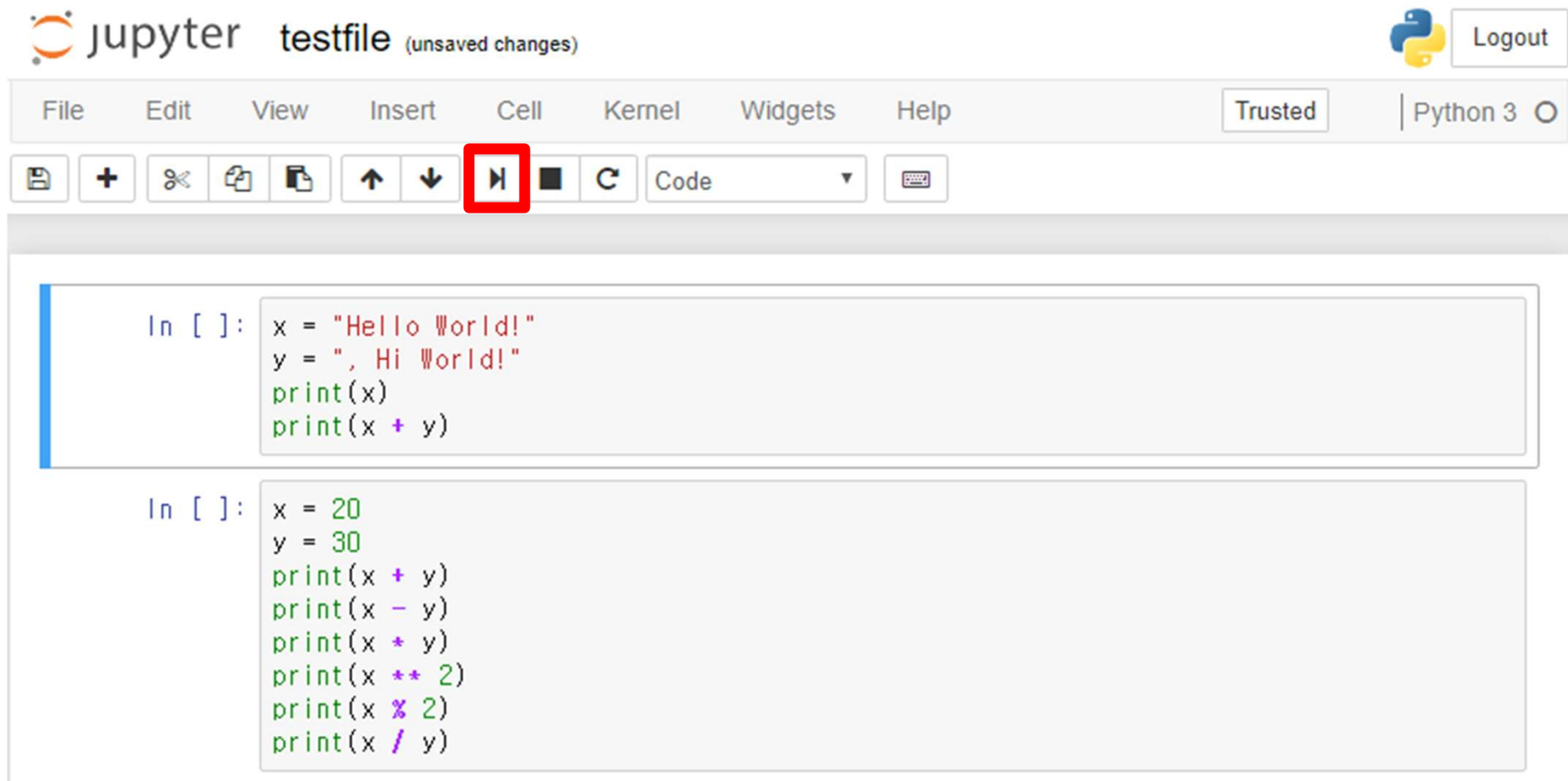
You can modify the file name by just click the title(Untitled1).



How to create folder and file

7. Let's run some sample code.

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



The image shows a Jupyter Notebook interface with the following components:

- Header:** "jupyter testfile (unsaved changes)" and a "Logout" button.
- Menu Bar:** File, Edit, View, Insert, Cell, Kernel, Widgets, Help.
- Toolbar:** Includes icons for saving, adding, undo, redo, and running code. The run button (a right-pointing arrow) is highlighted with a red box.
- Code Cells:**
 - Cell 1:**

```
In [ ]: x = "Hello World!"
        y = ", Hi World!"
        print(x)
        print(x + y)
```
 - Cell 2:**

```
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)
```

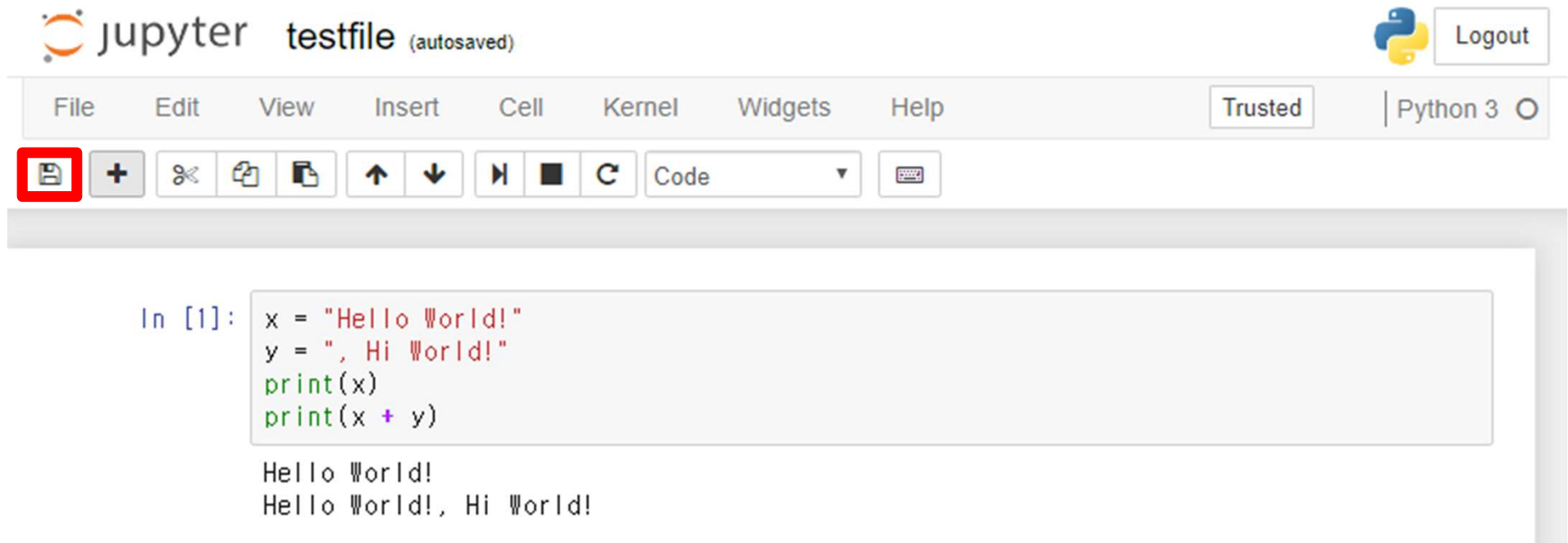
```
Hello World!  
Hello World!, Hi World!
```

```
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. The first button in the toolbar, which represents the "Save" function, is highlighted with a red square. Other buttons in the toolbar include a plus sign, a scissors icon, a copy icon, a paste icon, up and down arrows, a play icon, a stop icon, a refresh icon, a dropdown menu currently showing "Code", and a keyboard icon. Below the toolbar is a code cell. The code cell contains the following Python code:

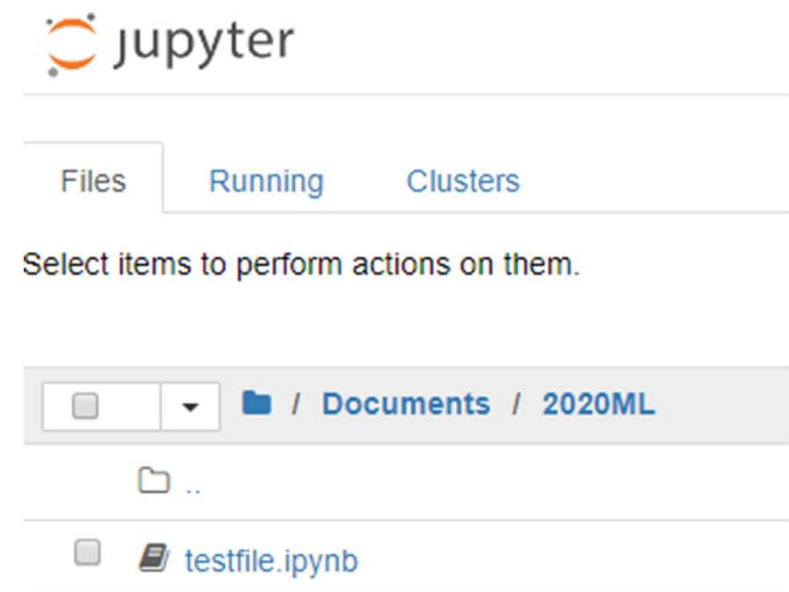
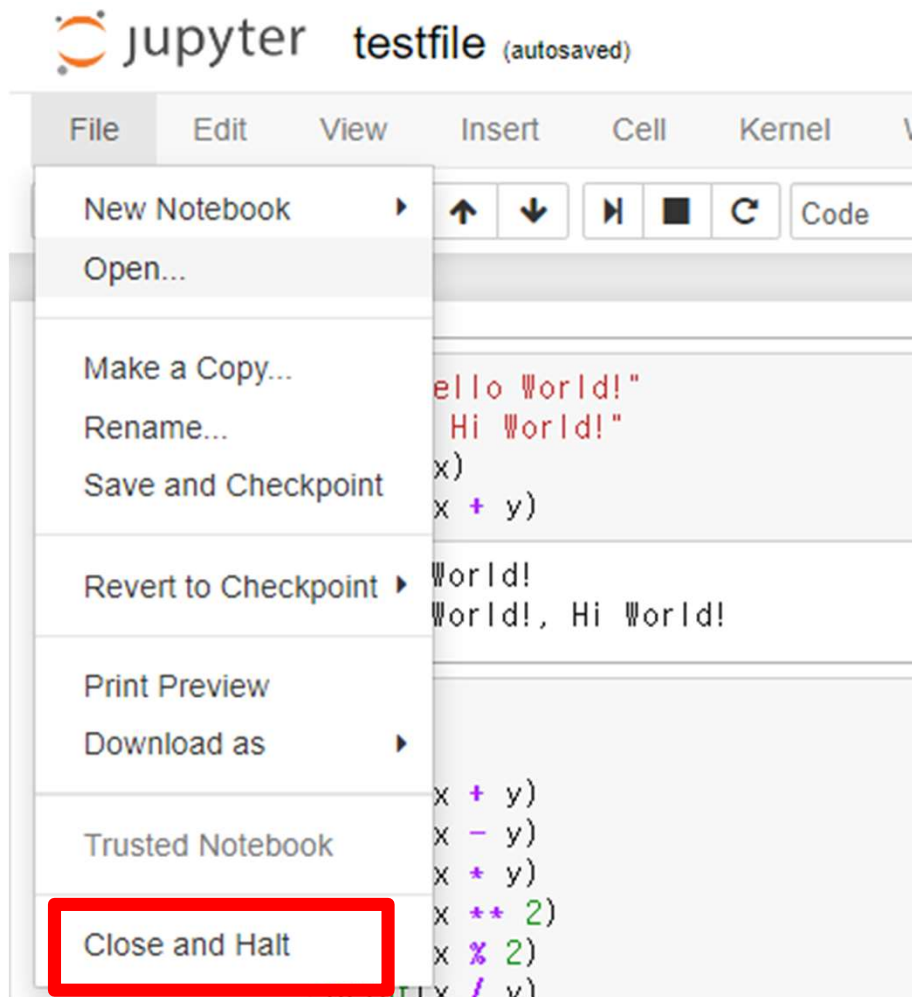
```
In [1]: x = "Hello World!"  
        y = ", Hi World!"  
        print(x)  
        print(x + y)
```

Below the code cell, the output of the code is displayed:

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

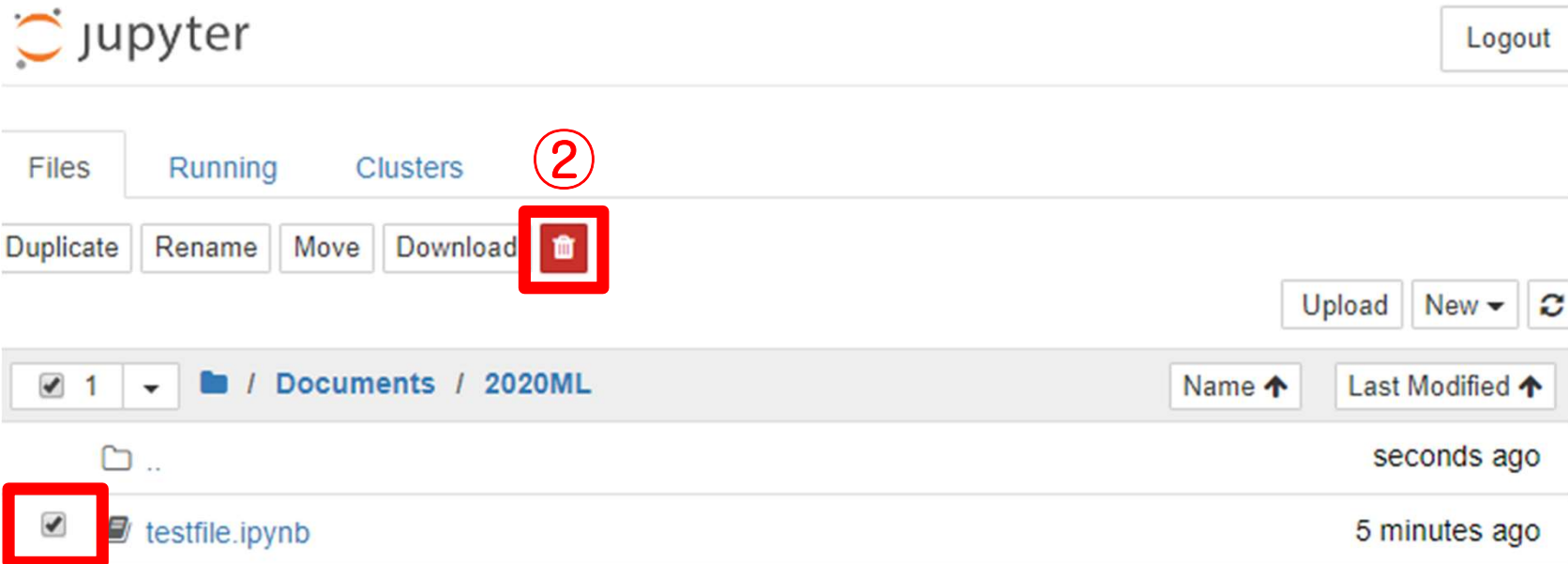
How to save and delete file

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



How to save and delete file

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

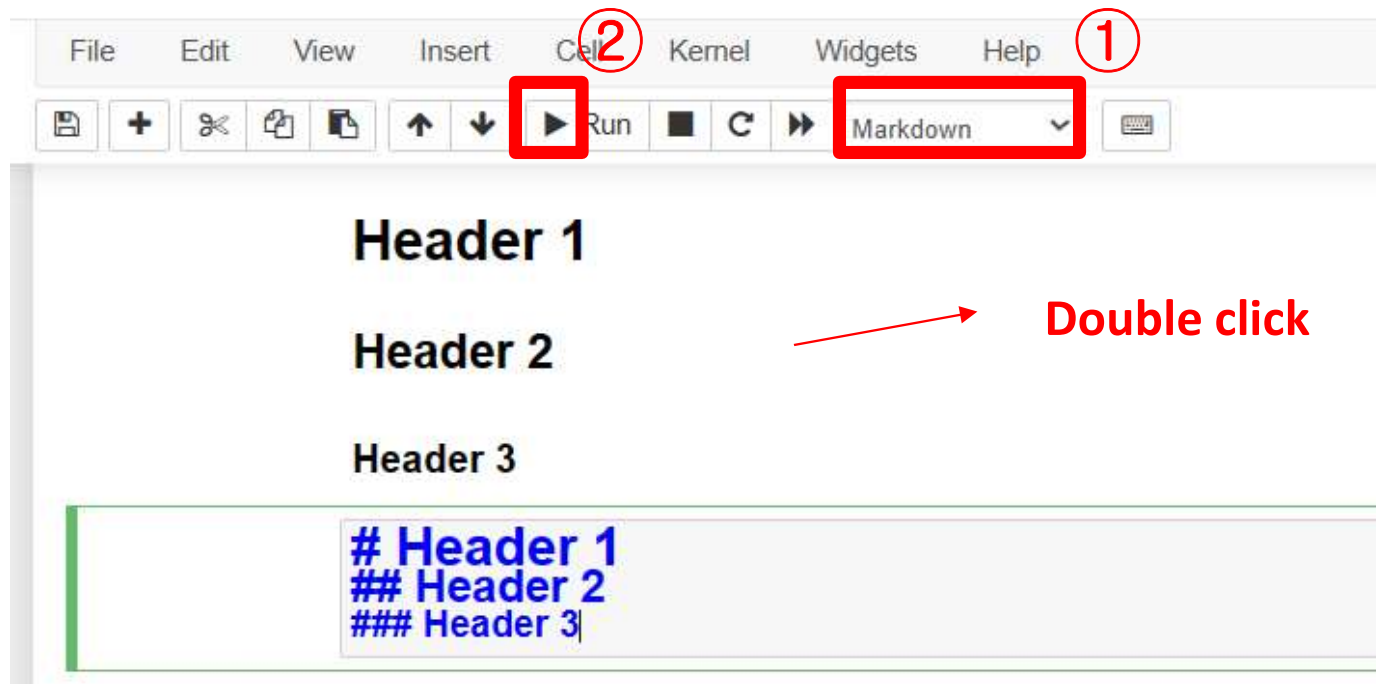


The image shows the JupyterLab interface. At the top left is the Jupyter logo and the word "jupyter". At the top right is a "Logout" button. Below the logo are tabs for "Files", "Running", and "Clusters". The "Files" tab is active. Below the tabs are buttons for "Duplicate", "Rename", "Move", "Download", and a trash icon. The trash icon is circled with a red "2". To the right of these buttons are "Upload", "New", and a refresh icon. Below the buttons is a file list. The first row shows a folder icon, a checkbox with "1" next to it, a dropdown arrow, a folder icon, and the path "/ Documents / 2020ML". To the right of the path are two columns: "Name" with an upward arrow and "Last Modified" with an upward arrow. Below the path is a row of files. The first file is "testfile.ipynb". To its left is a checkbox, which is circled with a red "1". To its right is the text "5 minutes ago".

Markdown

■ Markdown

- **Markdown** is a lightweight markup language with plain-text-formatting syntax
- Select 'Markdown' → edit using markdown language → 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
```