

Introduction to Coding Pt. 1

CB 2010/6010

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Learning objectives for Wed/Fri:

- Log into and learn the basics of Jupyter notebooks
- Learn the basic syntax of bash
 - cd, ls, pwd
- Learn the basic syntax of Python
 - variables, if/else, for/while loops
- Learn the basics of modules including matplotlib and numpy
 - Make data
 - Make charts
 - Perform basic statistics

This class is NOT a comprehensive 'Learn to Program' class!

CS 1110

<https://vod.video.cornell.edu/channel/CS+1110+Fall+2020/179890731>



Tons of free online resources:

- YouTube
- Khan academy
- Coursera
- Etc.

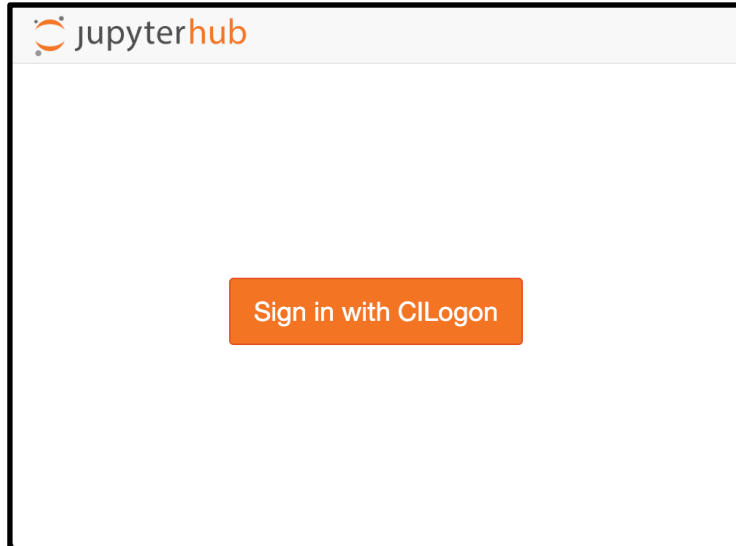
A Good Programmer is a Lazy Programmer



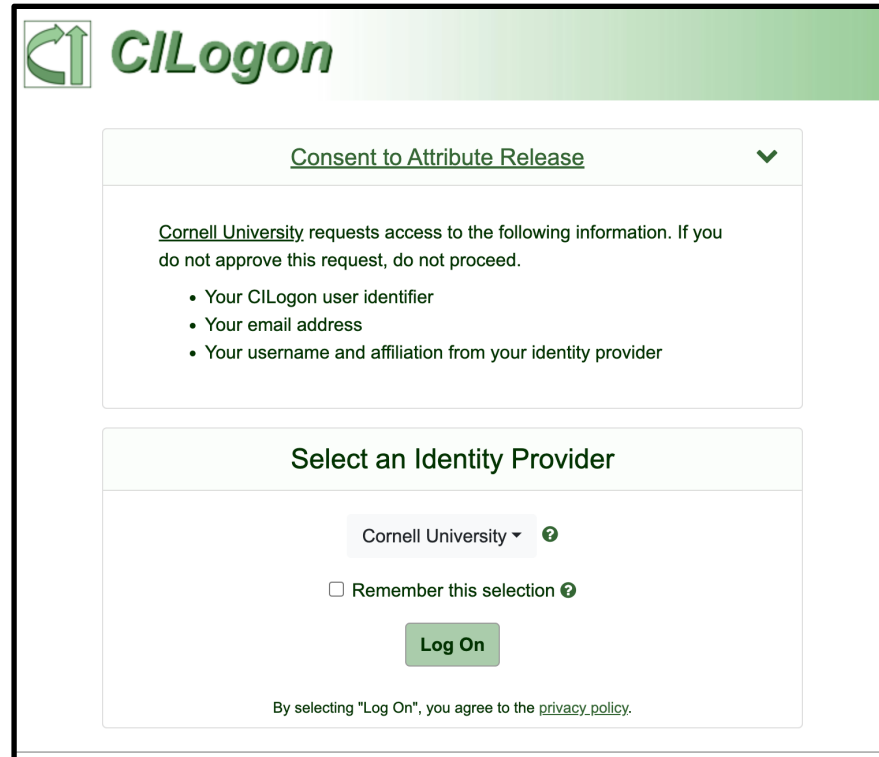
https://eduhub.cac.cornell.edu/



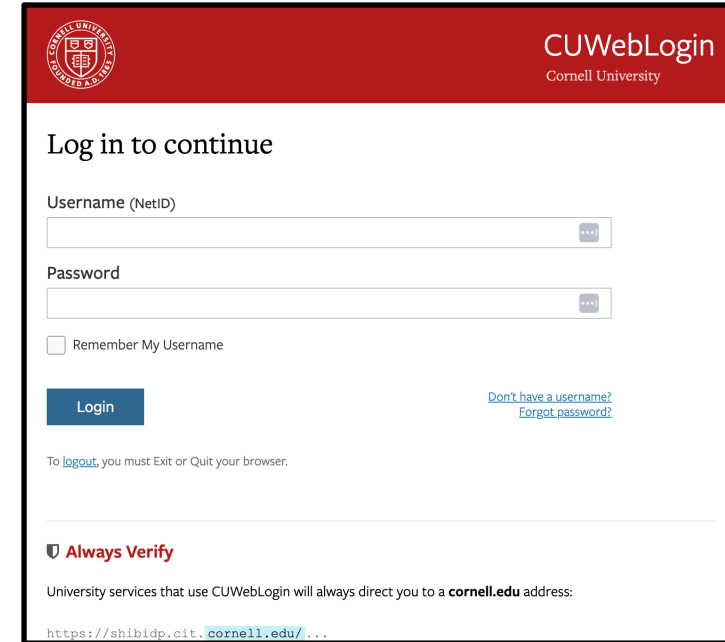
1.



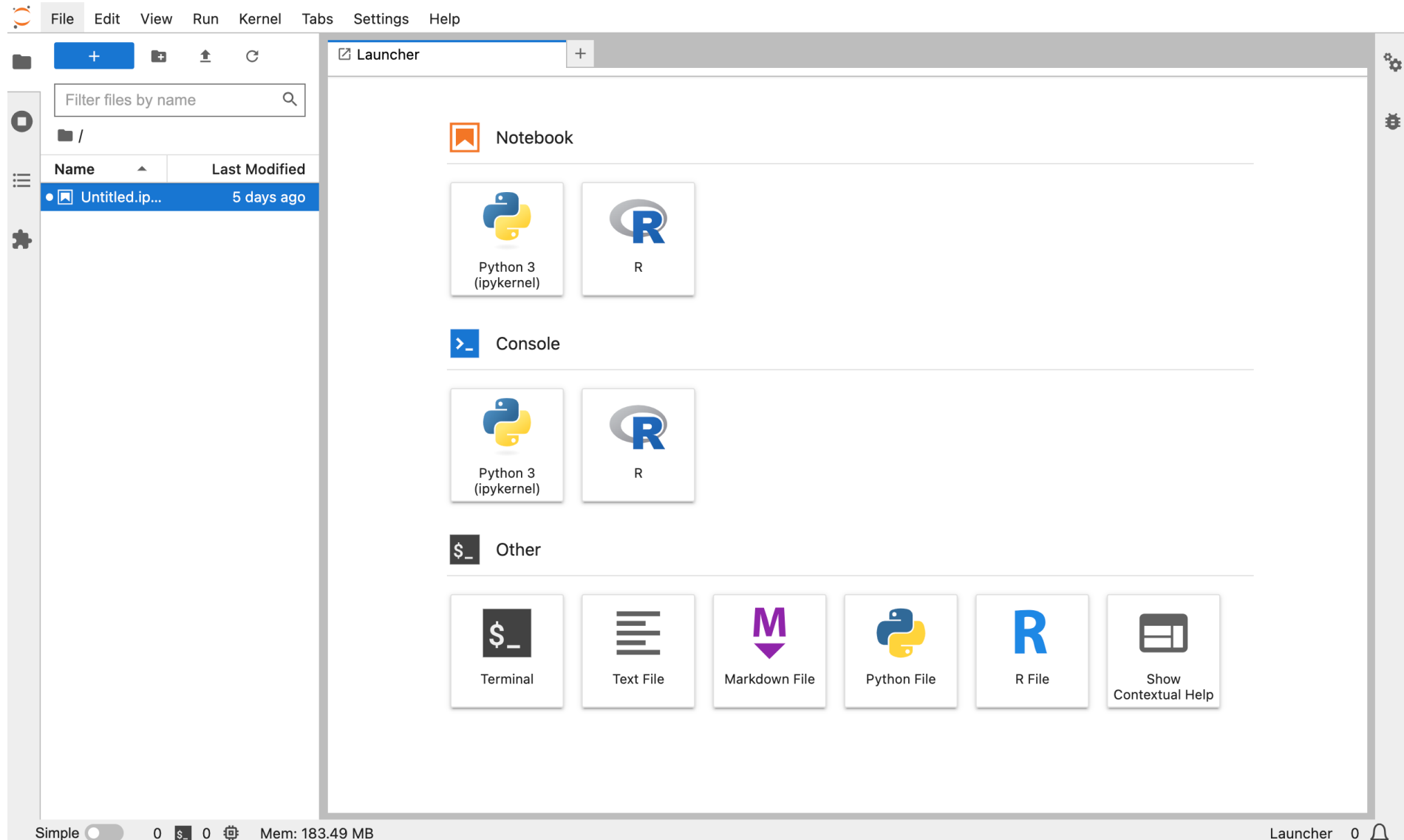
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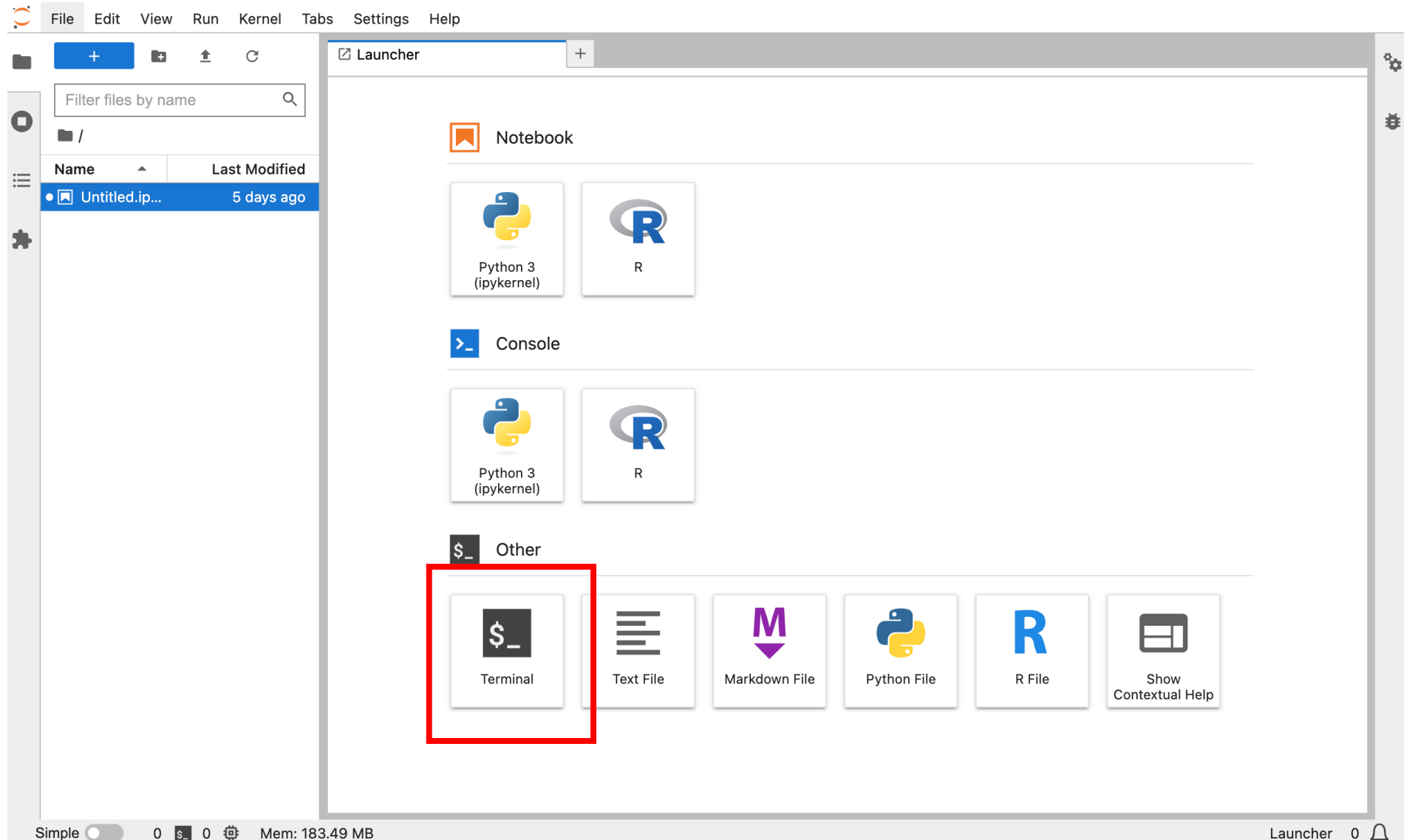
3.



Default JupyterLab interface



Default JupyterLab interface



Bash overview

Basic bash commands:

ls – list information about files

pwd – print working directory

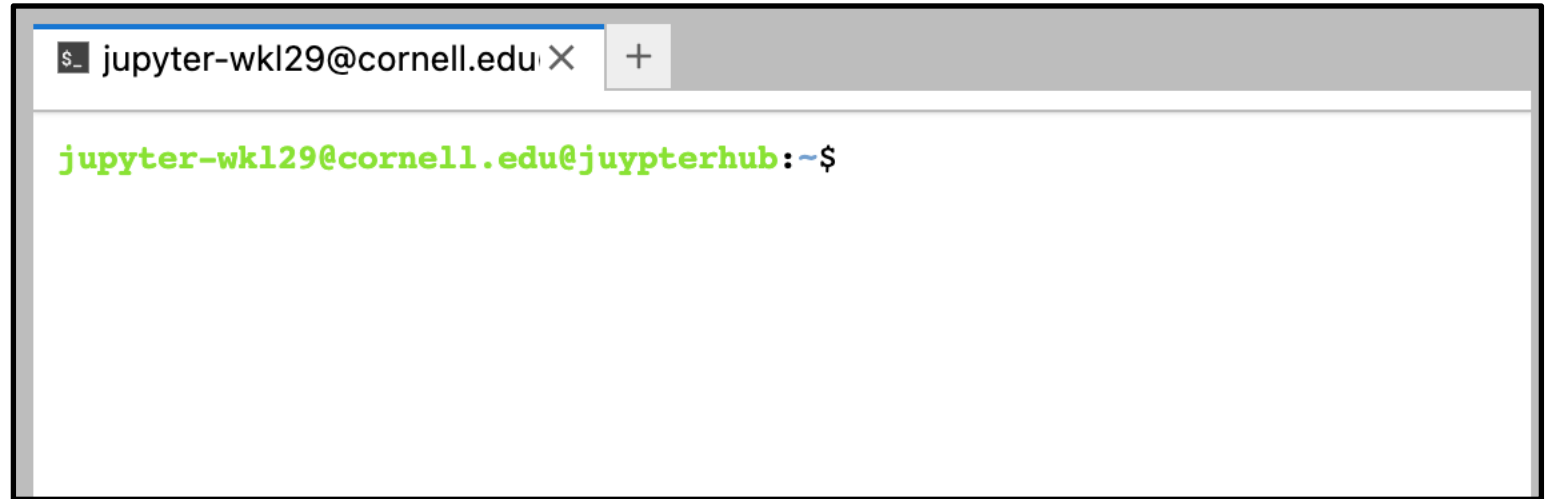
cd – change directory

mkdir – make directory

rm – remove ****danger****

touch – change timestamp, make empty file is nonexistent

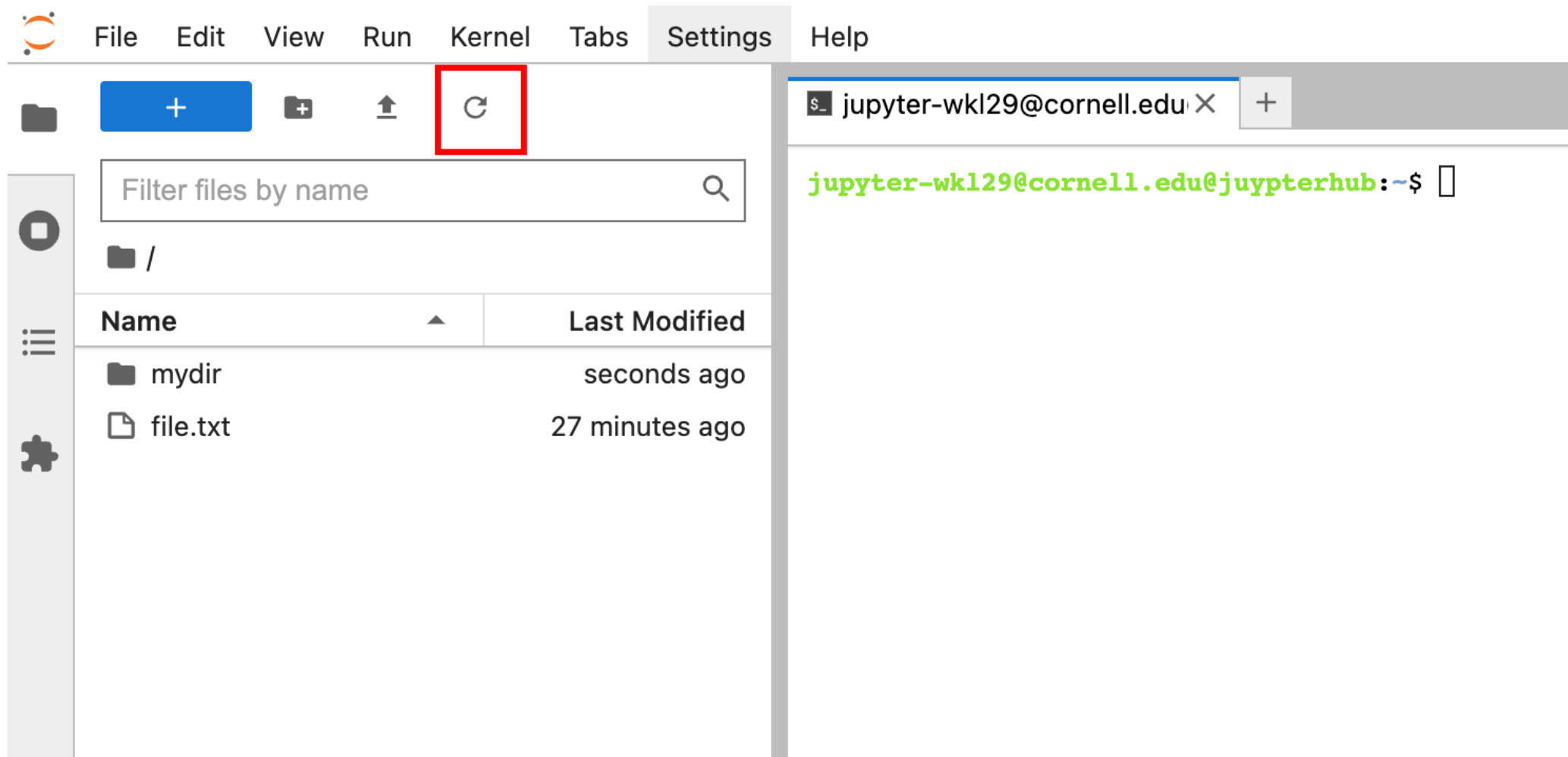
history – show the history of the commands you entered



Google and ChatGPT are your friends!!!!

```
> pwd
/home/jupyter-wkl29@cornell.edu
> touch file.txt
> ls
file.txt
> mkdir mydir
> ls
file.txt mydir
> cd mydir
> pwd
/home/jupyter-wkl29@cornell.edu/mydir
> cd ..
> pwd
/home/jupyter-wkl29@cornell.edu
```


What do you see?



The screenshot displays the JupyterLab user interface. At the top is a menu bar with options: File, Edit, View, Run, Kernel, Tabs, Settings, and Help. Below the menu bar is a toolbar containing icons for file operations: a folder icon, a blue '+' button, a folder with a '+' icon, an upload icon, and a circular refresh icon which is highlighted with a red square. To the left of the main content area is a sidebar with icons for home, a list view, and settings. The main area is divided into two panes. The left pane is the file browser, featuring a search bar labeled 'Filter files by name' and a table of files and directories. The table has two columns: 'Name' and 'Last Modified'. It lists a directory 'mydir' (modified 'seconds ago') and a file 'file.txt' (modified '27 minutes ago'). The right pane is a terminal window with a tab labeled 'jupyter-wkl29@cornell.edu'. The terminal shows a green prompt 'jupyter-wkl29@cornell.edu@jupyterhub:~\$' followed by a cursor.

File Edit View Run Kernel Tabs Settings Help

Folder icons: +, +, ↑, ↻ (highlighted with a red square)

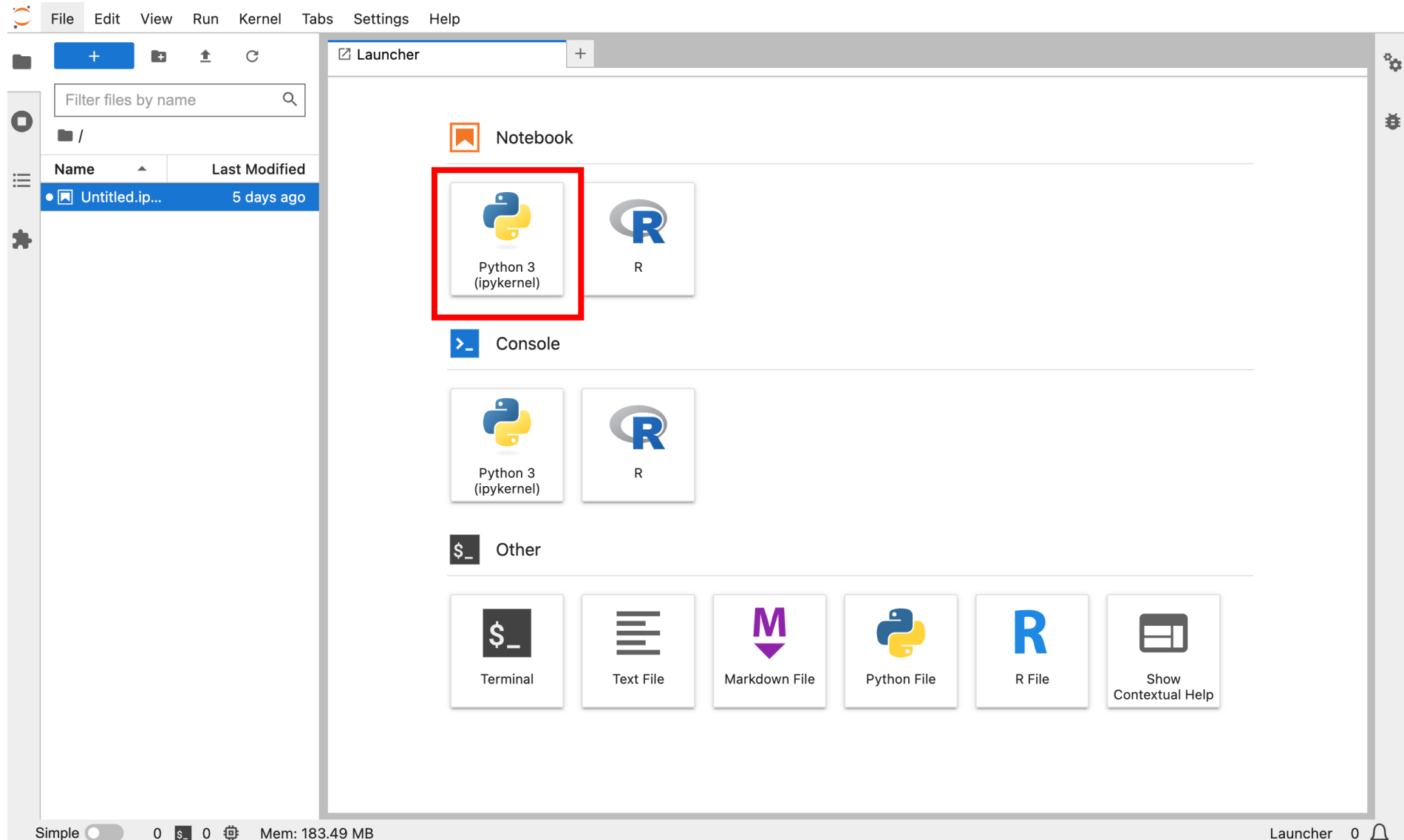
Filter files by name

Name	Last Modified
mydir	seconds ago
file.txt	27 minutes ago

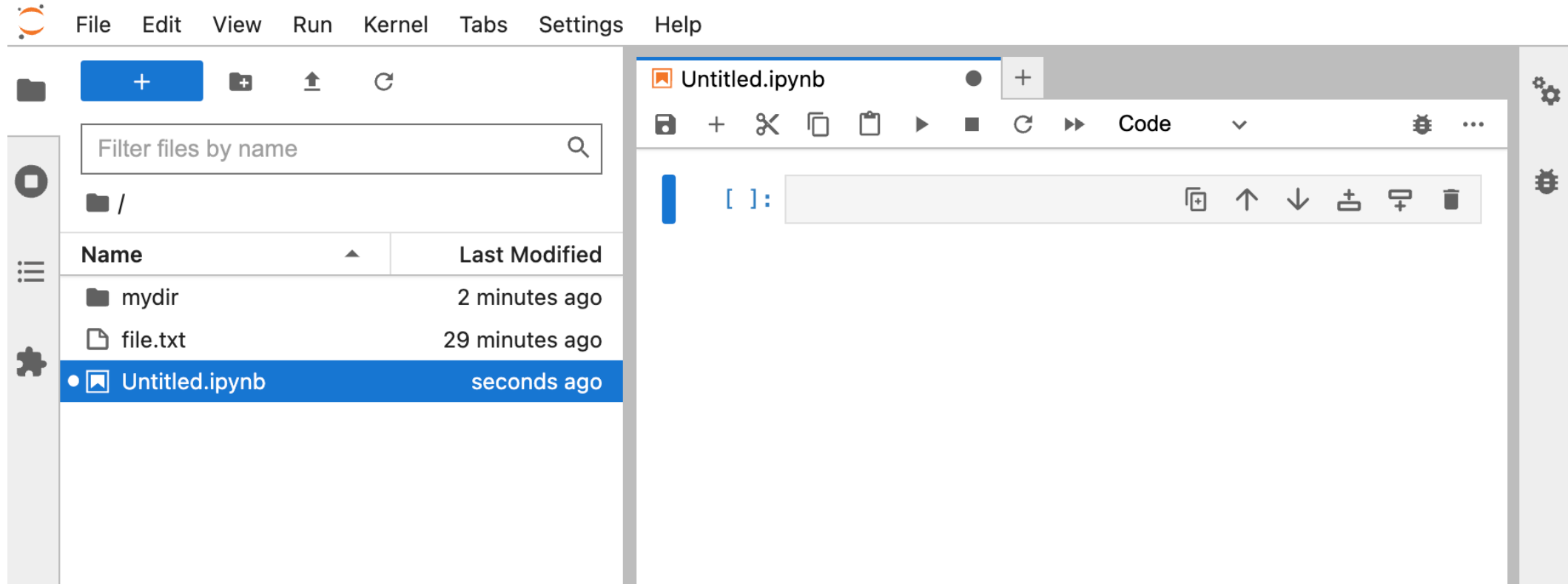
Terminal tab: jupyter-wkl29@cornell.edu

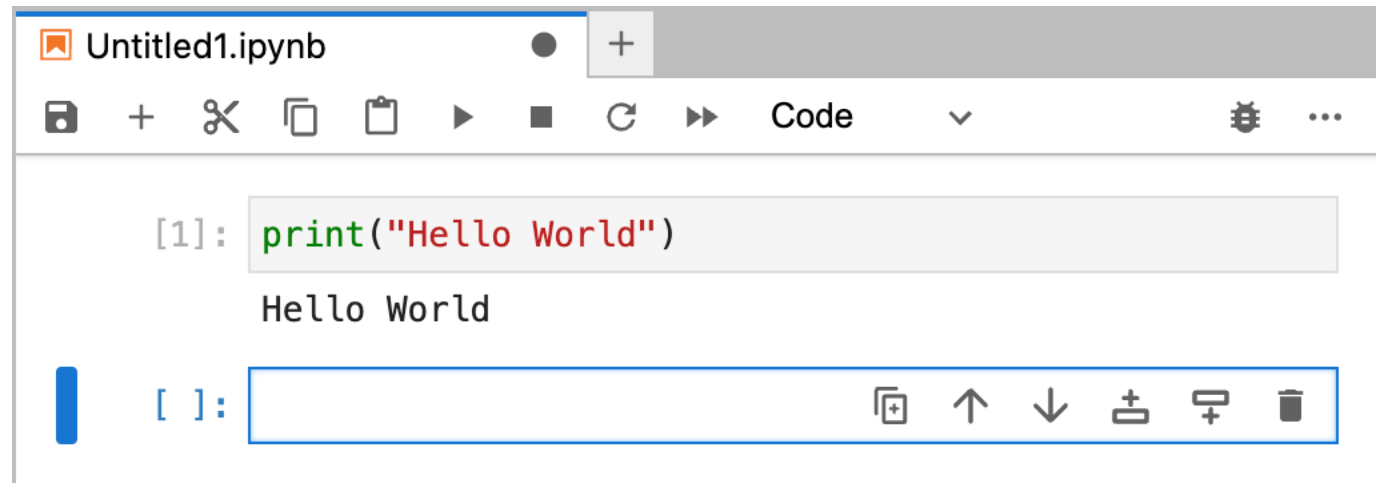
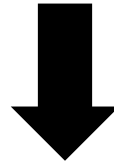
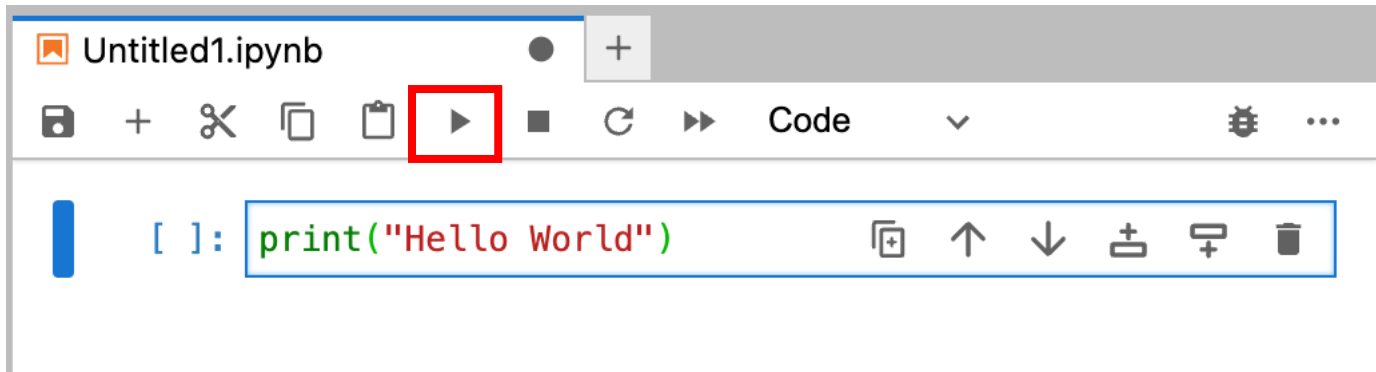
Terminal prompt: `jupyter-wkl29@cornell.edu@jupyterhub:~$`

Python crash course!

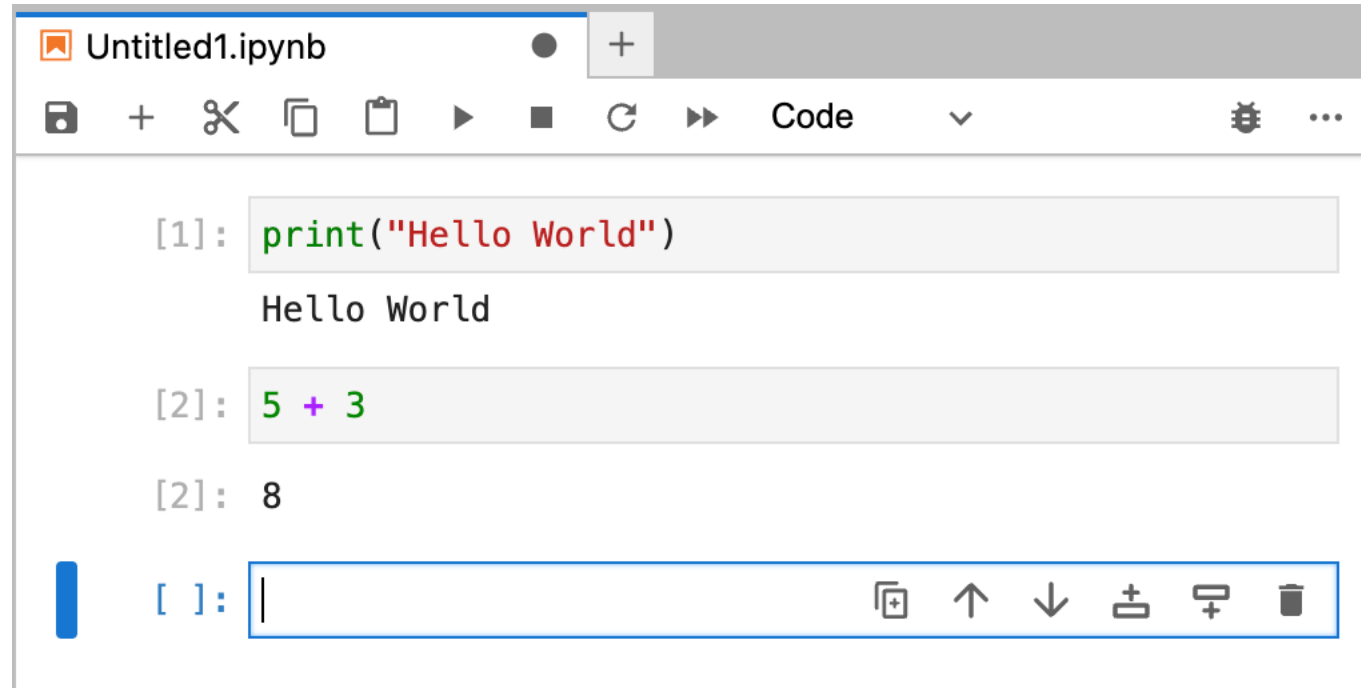


What do you see?





What's 5 + 3?



Untitled1.ipynb

[1]: `print("Hello World")`

Hello World

[2]: `5 + 3`

[2]: 8

[]: |

Introduction to ‘variables’

What's 5188 + 3274?

[11]: X=5188

[12]: Y=3274

[13]: X + Y

[13]: 8462

What's 1 + 2?

[14]: X=1

[15]: Y=2

[16]: X + Y

[16]: 3

A Good Programmer is a Lazy Programmer

Variables in Python can contain almost anything!

```
[1]: X = "Hello"  
     Y = " "  
     Z = "World!"
```

```
[2]: X + Y + Z
```

```
[2]: 'Hello World!'
```

What do we think this code does?

```
[ ]: if X + Y == 8:  
    print "X + Y equals 8!"  
else:  
    print "X + Y does not equal 8!"
```

```
[22]: if X + Y == 8:  
    print "X + Y equals 8!"  
else:  
    print "X + Y does not equal 8!"
```

Oh no!

```
Cell In[22], line 2  
    print "X + Y equals 8!"  
      ^
```

SyntaxError: Missing parentheses in call to 'print'.
Did you mean print("X + Y equals 8!")?

Let's fix the code!

```
[23]: if X + Y == 8:  
        print("X + Y equals 8!")  
    else:  
        print("X + Y does not equal 8!")
```

X + Y does not equal 8!

Now change X and Y so that they add to 8 and rerun!

```
[24]: X=3
```

```
[25]: Y=5
```

```
[26]: if X + Y == 8:  
        print("X + Y equals 8!")  
    else:  
        print("X + Y does not equal 8!")
```

X + Y equals 8!

What's the sum of every number between 1 & 10 (inclusive)?

```
[ ]: 1 + 2 + 3 + ...
```



```
[27]: total = 0
      num = 1

      while num <= 10:
          total += num
          num += 1

      print("Sum of numbers from 1 to 10:", total)
```

Sum of numbers from 1 to 10: 55

'while' loop

Introduction to 'loops'

`+=` adds a value to the variable

What's the sum of every number between 1 & 10 (inclusive)?

'for' loop

```
[28]: total = 0

for num in range(1, 11):
    total += num

print("Sum of numbers from 1 to 10:", total)
```

Sum of numbers from 1 to 10: 55

range - https://www.w3schools.com/python/ref_func_range.asp

Introduction to 'loops'

What's the sum of every ODD number between 1 & 500?

```
[27]: total = 0
      num = 1

      while num <= 10:
          total += num
          num += 1

      print("Sum of numbers from 1 to 10:", total)
```

Sum of numbers from 1 to 10: 55

Re-use your old code!

```
[23]: if X + Y == 8:
      print("X + Y equals 8!")
      else:
          print("X + Y does not equal 8!")
```

X + Y does not equal 8!

A Good Programmer is a Lazy Programmer

What's the sum of every ODD number between 1 & 500?

```
[39]: total = 0
      num = 1

      while num <= 500:
          if num % 2 != 0:
              total += num
          num += 1

      print("Sum of odd numbers from 1 to 500:", total)
```

Sum of odd numbers from 1 to 500: 62500

% - Modulus division

!= Not equal

== equal