

# Introduction to Python

2019 SPLIT Program #6  
Orientation

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- What is Python?
- Programming Essentials
- Get Ready!
  - Anaconda
  - Jupyter Notebook
  - Colab Research Notebook (Google)
- Python Programming
  - Variables
  - Print()
- Plan

# This workshop

- Durations: 8 weeks, 8 hours minimum
- Location: *will be announced*
- Materials : [github.com/yoonlee78/pythonbootcamp](https://github.com/yoonlee78/pythonbootcamp)
- Bring your own laptop
- Window users: install Git Bash  
(<https://gitforwindows.org/>)
- Minimum 2 hours of self-practice is expected

# Contact

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Or message me in  slack

# Ice breaking!

Instructor: Yoon Kyung Lee  
Ph.D. Program in Cognitive Psychology  
Studying Human-Computer/AI Interaction

Nice to meet you. Now your turn!

# Programming Essentials I

# What is a programming language?

- Program
  - A series of instructions/commands (a.k.a. bossing around)

# What is a program?

- Program
  - A series of instructions/commands to be carried out by a computer
  - Like a recipe:

## Algorithm Example #2

Making a peanut butter and jelly sandwich

- Get the ingredients & tools
  - Two slices of bread
  - Peanut Butter
  - Jelly
  - Knife
- Spread peanut butter on one slice
  - Dip knife into peanut butter
  - Remove knife, collecting peanut butter
  - Place knife peanut butter side down on bread
  - Swirl knife to spread peanut butter
- Spread jelly on other slice
- Place two slices together



# Exact Instructions Challenge: Peanut Butter Sandwich



[https://www.youtube.com/watch?v=cDA3\\_5982h8](https://www.youtube.com/watch?v=cDA3_5982h8)

# What is it to program?

- Programming (to program)
  - Building programs. In other words, making series of instructions for a computer to follow.



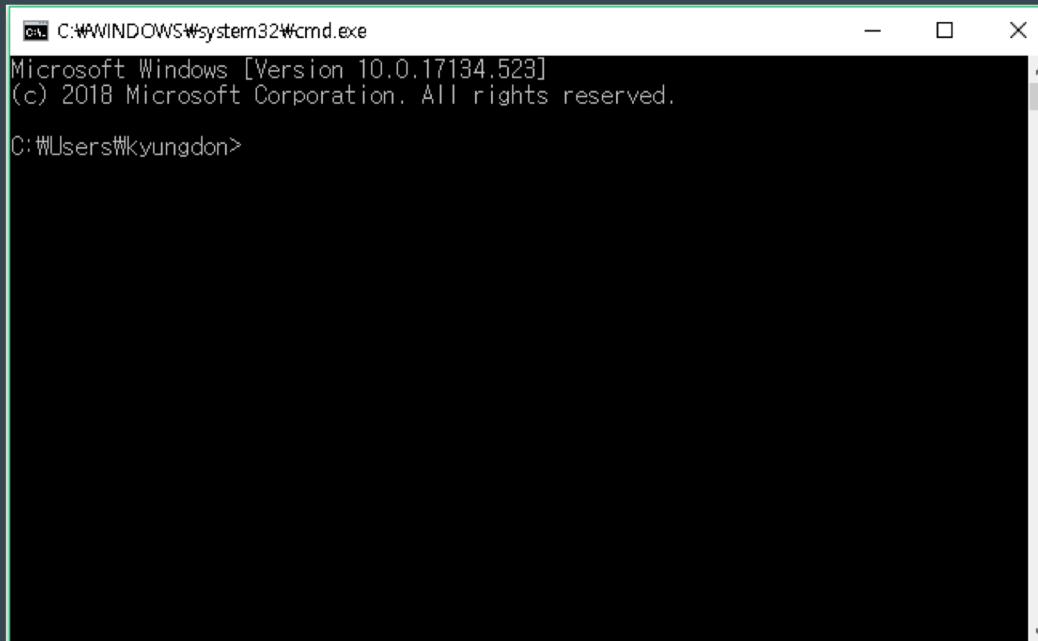
# What is a programming language?

- Program Language
  - An “artificial language” used for programming

# What is a programming language?

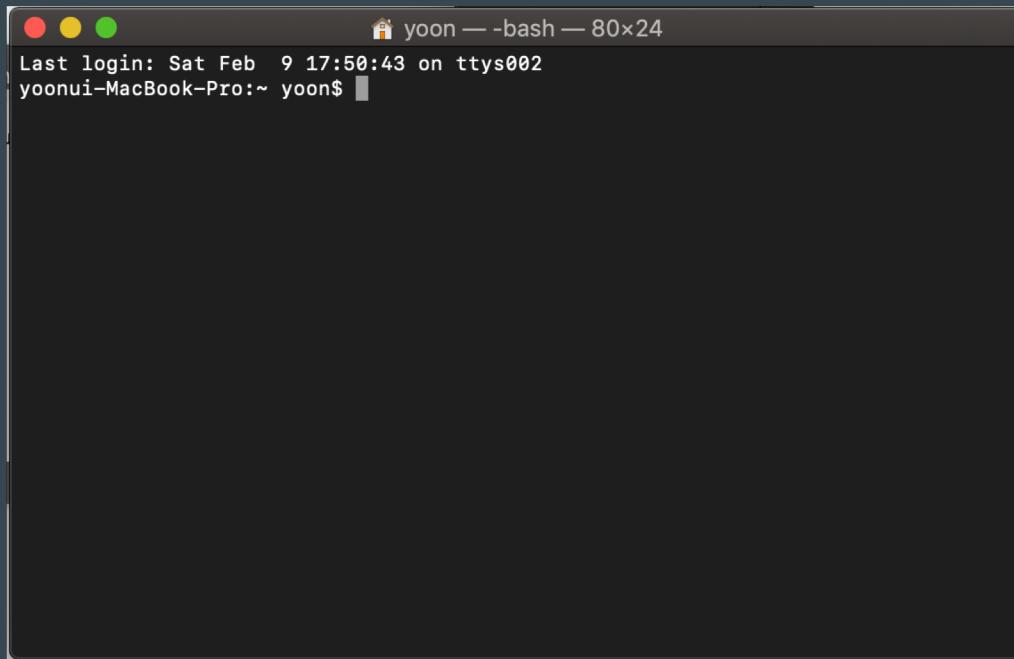
- Program Language
  - An “artificial language” used for programming
  - You can make various types of data with a programming language: text, image, sound, video, 3D motion...etc.
  - Global Language : even better than English!
  - C, C++, JavaScript, Ruby ... and Python!

# Terminal/Command



Windows Command

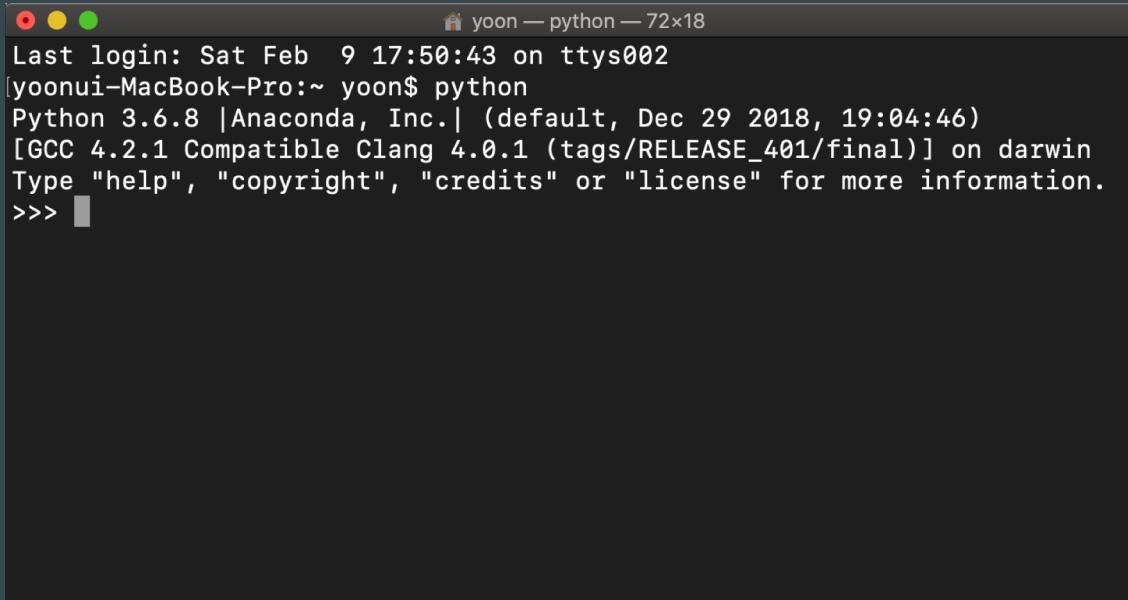
# Terminal/Command



MacOS Terminal

# Console

- Python console starts with ‘>>>’ sign
- To start, ‘python’ > [Enter]
- To quit, type ‘quit()’ or [ctrl + ‘d’]

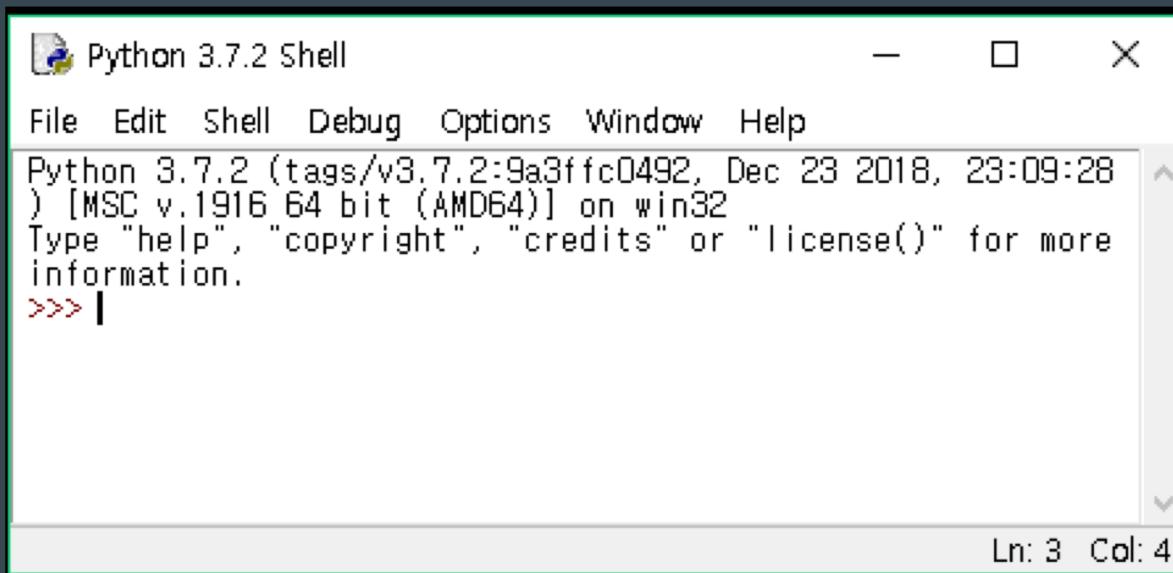


A screenshot of a macOS terminal window titled "yoon — python — 72x18". The window shows the following text:

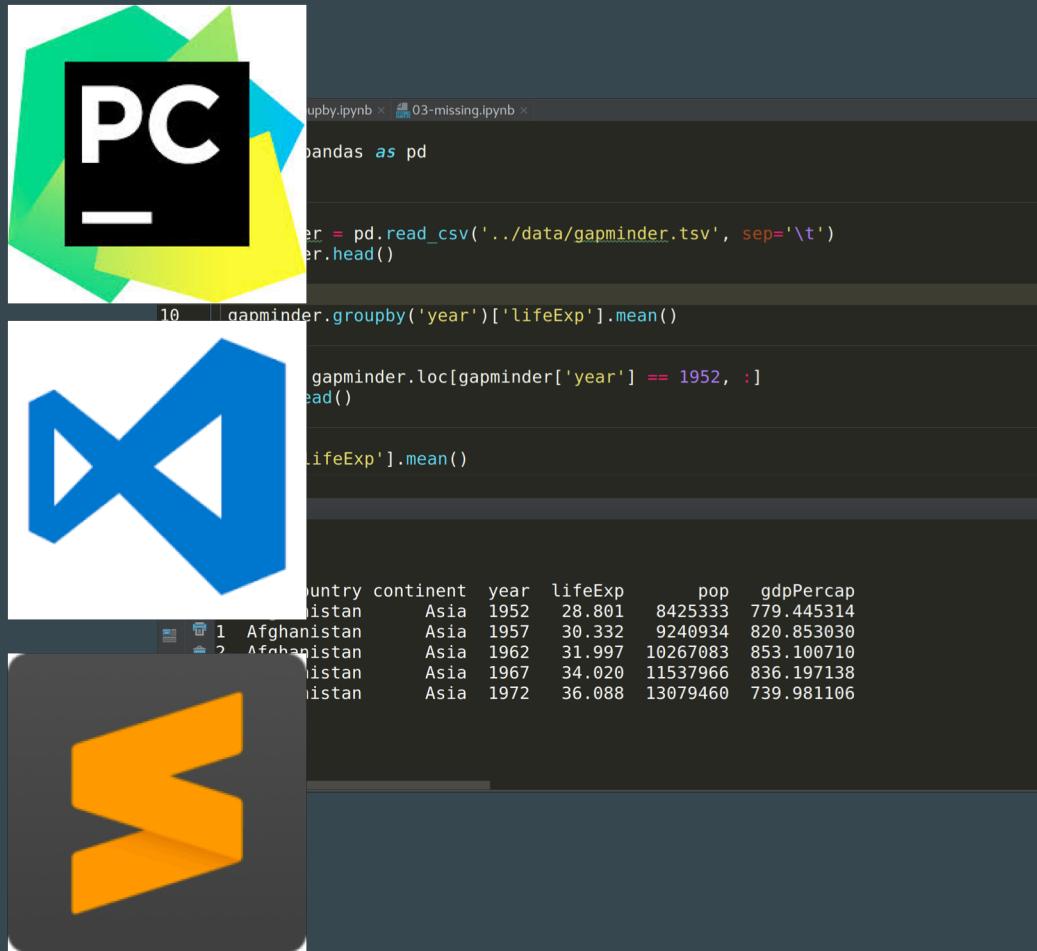
```
Last login: Sat Feb  9 17:50:43 on ttys002
[yoonui-MacBook-Pro:~ yoon$ python
Python 3.6.8 |Anaconda, Inc.| (default, Dec 29 2018, 19:04:46)
[GCC 4.2.1 Compatible Clang 4.0.1 (tags/RELEASE_401/final)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> ]
```

# IDLE

- When you install Python, an IDLE (Integrated Development and Learning Environment) platform comes with it.
- We won't use this often, instead we will use Jupyter Notebook (later in the slides).



# Editor(s)



The slide features three large, semi-transparent logos of code editors at the bottom: PyCharm (orange 'S' icon), VS Code (blue 'X' icon), and Sublime Text (yellow 'S' icon). Above them is a screenshot of a Jupyter Notebook interface showing Python code and data output.

```
upby.ipynb × 03-missing.ipynb ×
In [1]: import pandas as pd
        gapminder = pd.read_csv('../data/gapminder.tsv', sep='\t')
        gapminder.head()

Out[1]:
          country continent  year  lifeExp      pop  gdpPercap
1  Afghanistan      Asia  1952  28.801  8425333  779.445314
2  Afghanistan      Asia  1957  30.332  9240934  820.853030
3  Afghanistan      Asia  1962  31.997 10267083  853.100710
4  Afghanistan      Asia  1967  34.020 11537966  836.197138
5  Afghanistan      Asia  1972  36.088 13079460  739.981106
```

- You can open/edit codes with text editors
- There are many of them but some popular ones are: Microsoft VS code, SublimeText, Pycharm, Atom, and Notepad!

# Programming Essentials II

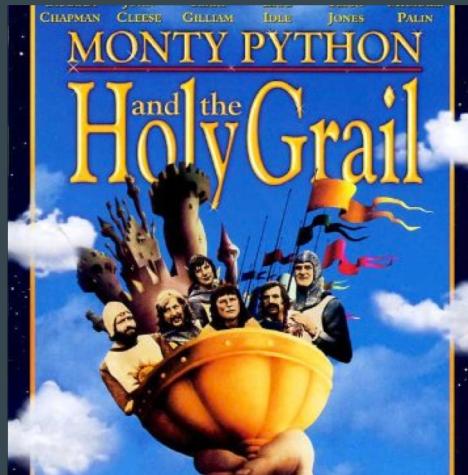
# What is Python?

- Open-source, available at [www.python.org](http://www.python.org)
- An **interpreted**, object-oriented language



# What is Python?

- Open-source, available at [www.python.org](http://www.python.org)
- An interpreted, object-oriented language
- Created by Guido van Rossum
- Made over a night of Christmas! (1989.12.25)
- Named after British comedy group (TV show), Monty Python



*"Life is too short, You need python."*

*Guido Van Rossum*

# Zen of Python

Beautiful is better than ugly.

Explicit is better than implicit.

Simple is better than complex.

Complex is better than complicated.

Flat is better than nested.

Sparse is better than dense.

Readability counts.

Special cases aren't special enough to break the rules.

Although practicality beats purity.

Errors should never pass silently.

Unless explicitly silenced.

In the face of ambiguity, refuse the temptation to guess.

There should be one-- and preferably only one --obvious way to do it.

Although that way may not be obvious at first unless you're Dutch.

Now is better than never.

Although never is often better than \*right\* now.

If the implementation is hard to explain, it's a bad idea.

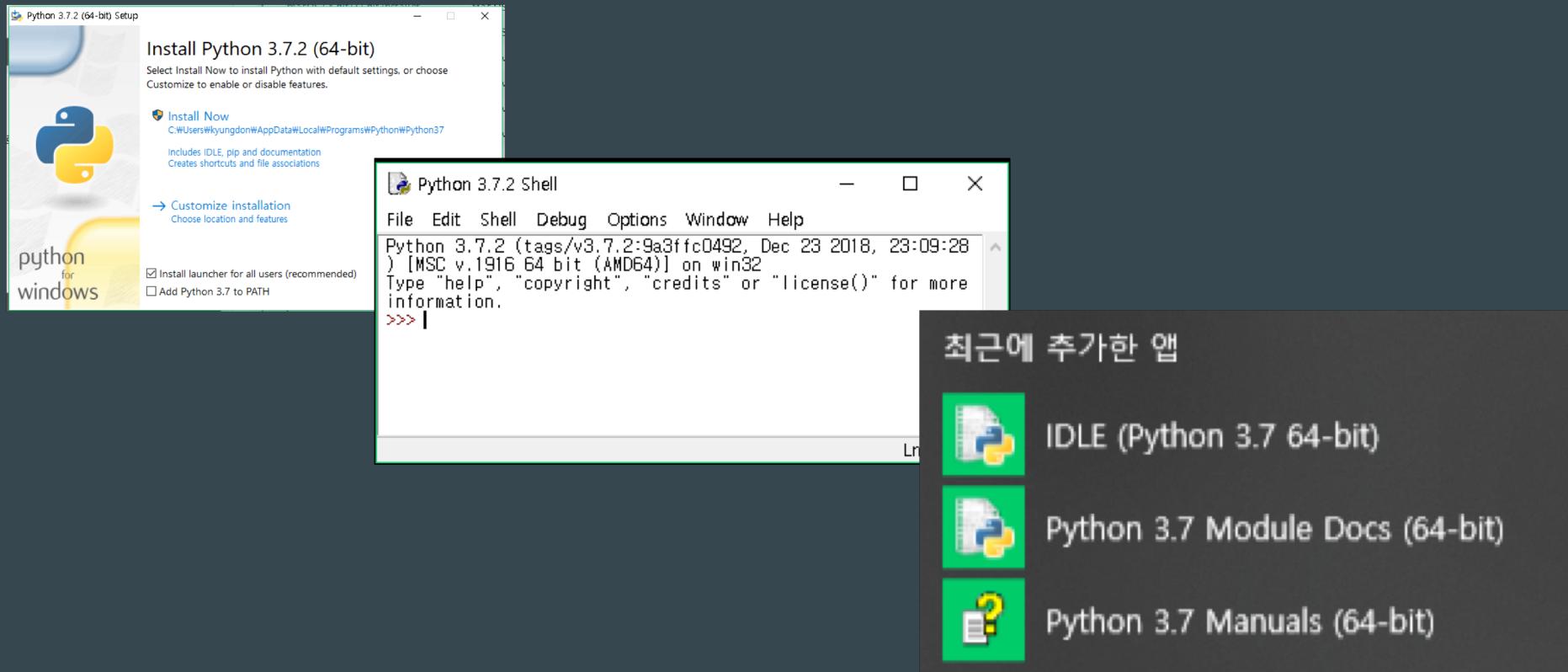
If the implementation is easy to explain, it may be a good idea.

Namespaces are one honking great idea -- let's do more of those!

# How to download python

## 1. DIY

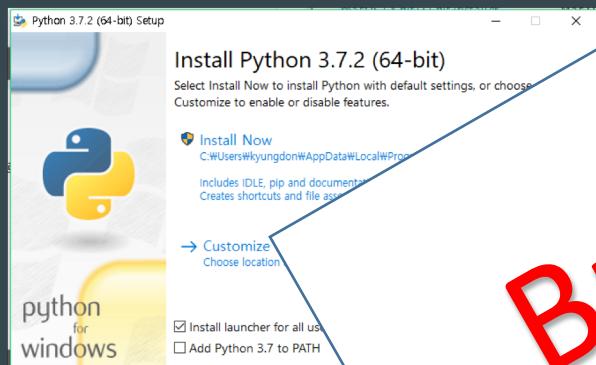
[www.python.org](http://www.python.org)



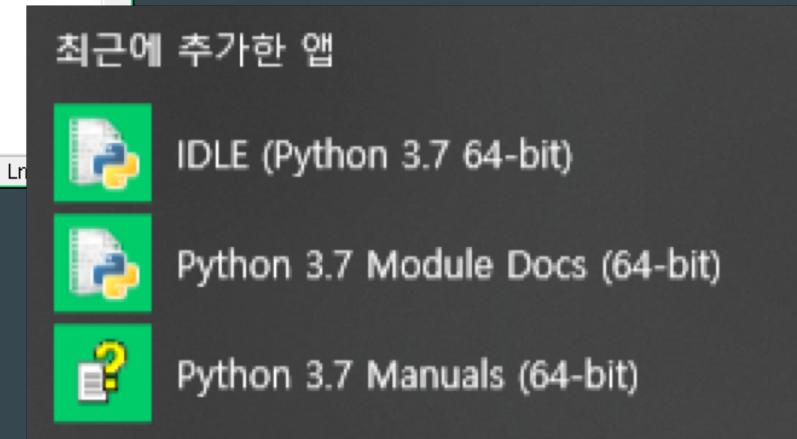
# How to download python

## 1. DIY

[www.python.org](http://www.python.org)



But skip for now



# How to download python

## 2. Anaconda



Python Package Manager  
Includes approx. 453 Python packages

Source: Continuum Analytics

# How to download python

## 2. Anaconda



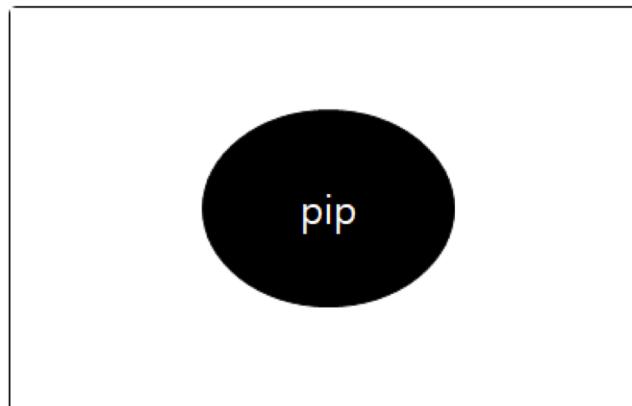
Download Anaconda first and only. It will be troublesome letter if you download both python and Anaconda.

Window users: check the version of your Windows!

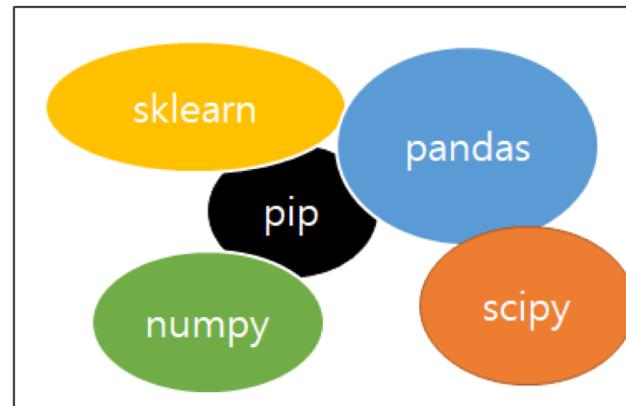
Source: Continuum Analytics

# Anaconda vs Python Pip

Python과 아나콘다(Anaconda)의 차이점은 다음과 같습니다.



Python

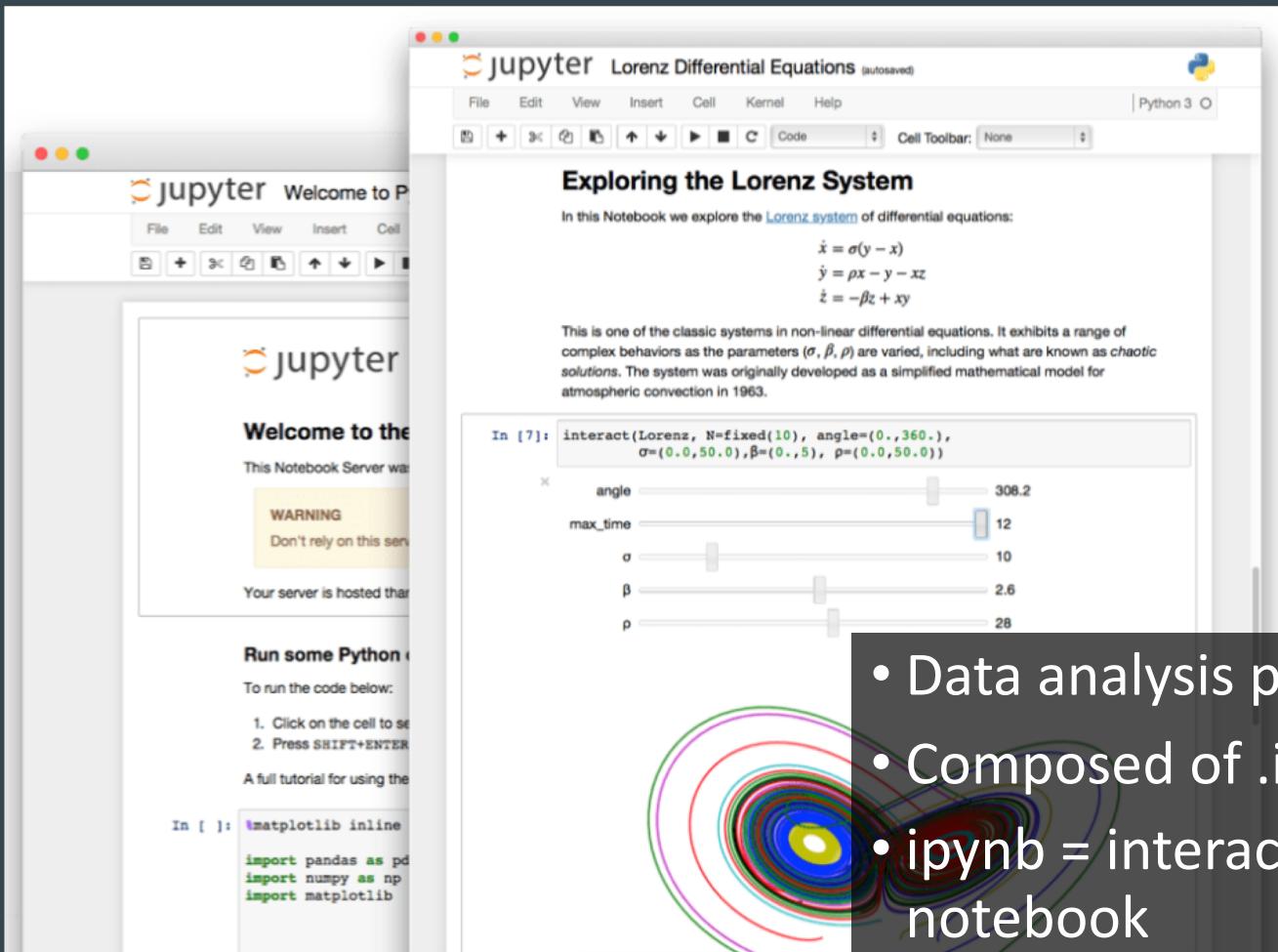


Anaconda

Python은 [파이썬 공식 홈페이지](#)에서 받을 수 있으며, `pip` 툴만을 포함하고 있습니다. 필요한 패키지나 라이브러리 등을 설치할 때 모두 수동으로 해줘야 합니다.

아나콘다는 Python 기본 패키지에 각종 수학/과학 라이브러리들을 같이 패키징해서 배포하는 버전입니다. [여기](#)에서 다운로드 할 수 있습니다. 아나콘다에 포함된 툴들로는 대표적으로 `panda`, `numpy`, `scipy`, `sklearn`, `matplotlib`, `Jupyter Notebook` 등이 있습니다.

# Jupyter Notebook



- Data analysis platform
- Composed of .ipynb file
- ipynb = interactive python notebook
- We are going to use this **A LOT**

# Jupyter Notebook

Check this out:

- Tutorial 1 :

[Jupyter Notebook Tutorial: Introduction, Setup, and Walkthrough] by Corey Schafer

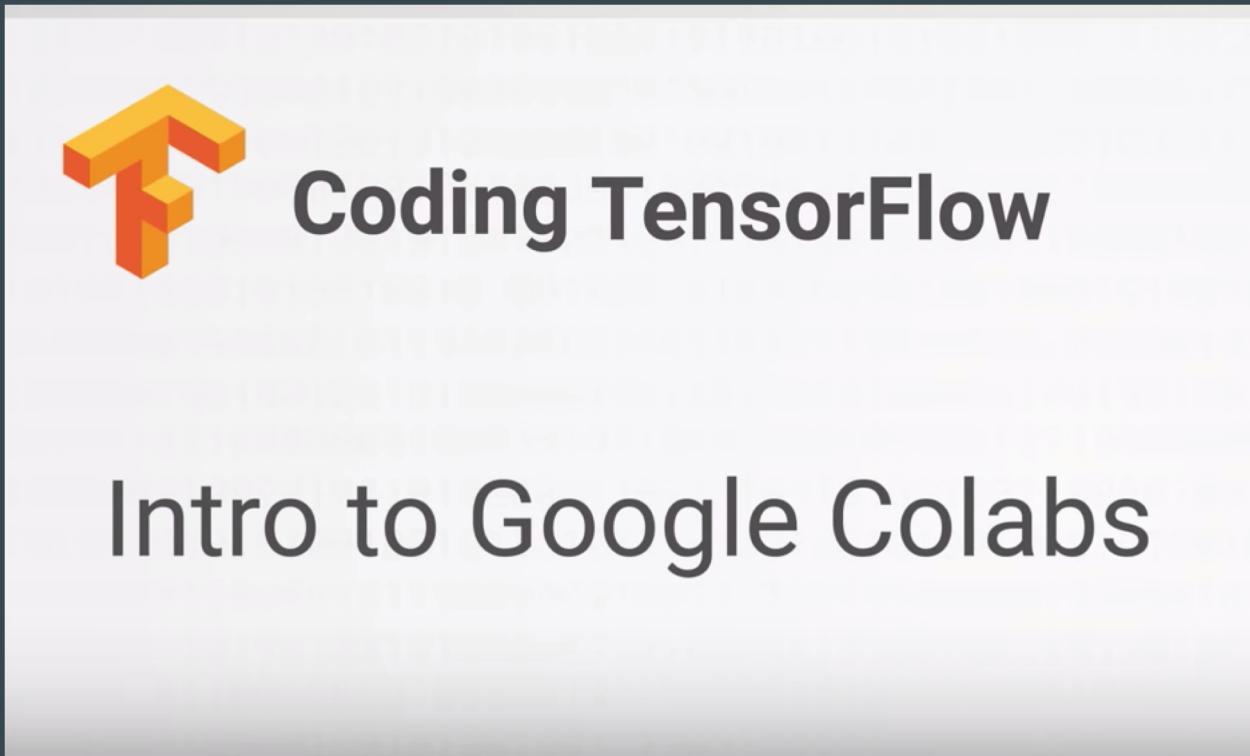
<https://www.youtube.com/watch?v=HW29067qVWk>

- Tutorial 2:

[Jupyter Notebook, readthedocs]

<https://jupyter-notebook.readthedocs.io/en/stable/notebook.html>

# Colab Research Notebook



<https://www.youtube.com/watch?v=inN8seMm7UI>

<https://colab.research.google.com/>

# Library & Package

- List of python files you can summon and use whenever needed.
- There are default ones embedded in Python
- But most of the times you have to manually install them (or import them)

# Library & Package

- Python standard libraries:

<https://docs.python.org/3/library/>

# Library & Package

TOP libraries you must know (2019 ver.)

- TensorFlow, Scikit-Learn, Numpy, Keras, PyTorch, SciPy, Pandas

# Plan

- W1: Orientation
- W2: Numbers and Strings
- W3: String Expression Methods and Formatting
- W4: List, Tuple, Dictionary, Set, and Bool
- W5: Flow, Control, If, While, For
- W6: Functions and Files
- W7: Class, Module, Packages
- W8: NumPy and Pandas Quick Introduction

# Next Week

- Go to :  
<https://github.com/yoonlee78/pythonbootcamp>
- Click each .ipynb file and check out the material
- If .ipynb file does not load, try this:
  - Go to <https://nbviewer.jupyter.org/>
  - Insert the link of each notebook. For example, for W2 notebook insert this link:  
[https://github.com/yoonlee78/pythonbootcamp/blob/master/W2\\_Numbers\\_and\\_String.ipynb](https://github.com/yoonlee78/pythonbootcamp/blob/master/W2_Numbers_and_String.ipynb)

# Next Week

- Create your github account!
  - Github.com

- What is Github?

<https://www.youtube.com/watch?v=w3jLJU7DT5E>