



Orientation and Overview

Introduction to computation with python

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D E M O

Agenda

1

What is Python?

2

Why is Python?

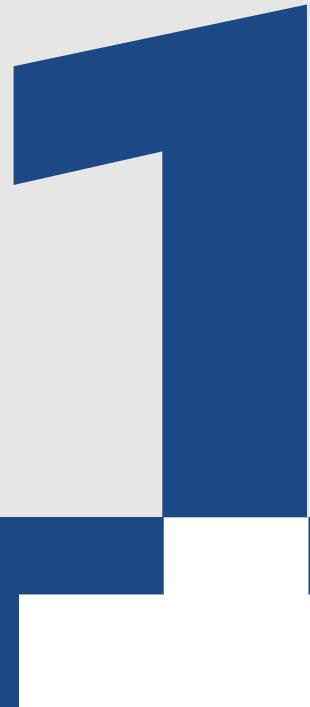
3

How to begin?

4

About the course





What is Python?



1. What is Python?



- It is an open source programming language
- Created by Guido van Rossum in 1989
- First version released in 1991



2

Why is Python?



2. Why is Python?



Very easy to use



Let you work quickly



Integrate systems more effectively



One of the most popular programming languages in the planet



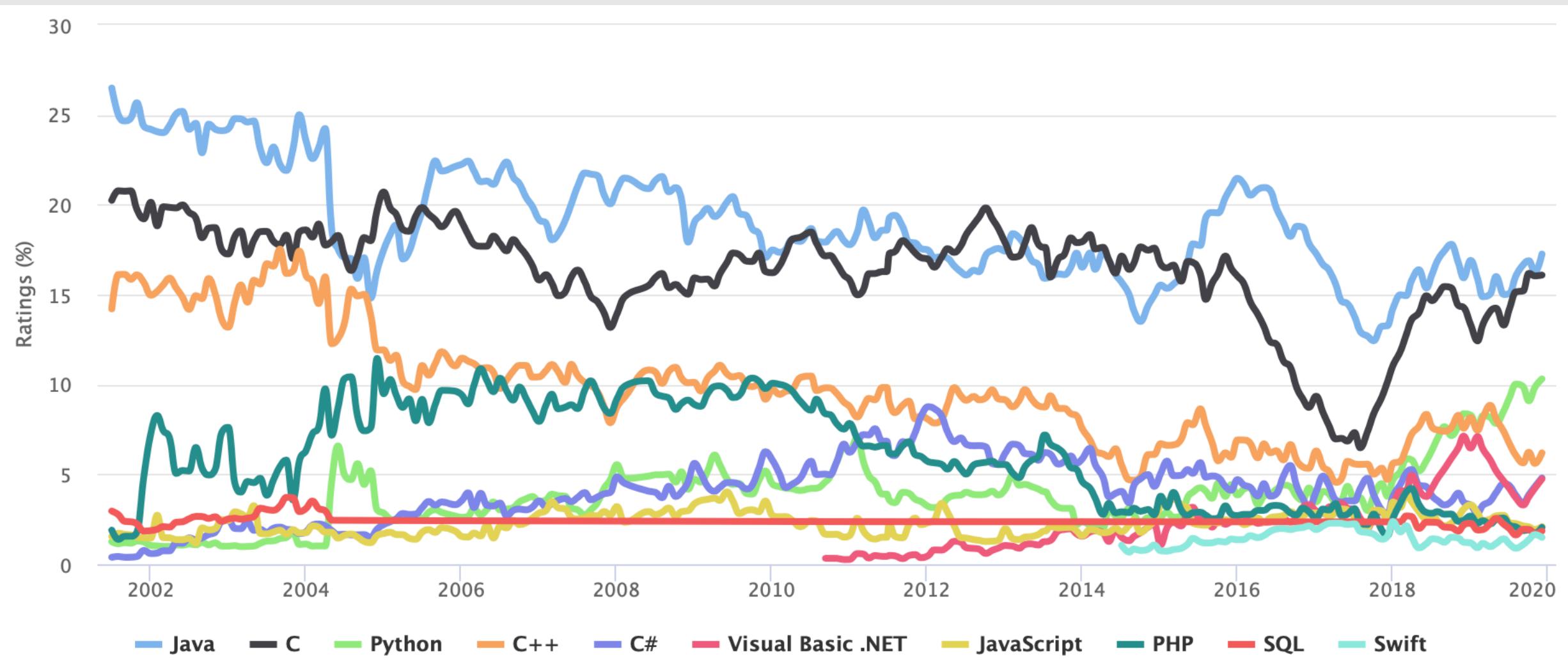
The Top Programming Languages 2019

Rank	Language	Type	Score
1	Python	🌐💻⚙️	100.0
2	Java	🌐📱💻	96.3
3	C	📱💻⚙️	94.4
4	C++	📱💻⚙️	87.5
5	R	💻	81.5
6	JavaScript	🌐	79.4
7	C#	🌐📱💻⚙️	74.5
8	Matlab	💻	70.6
9	Swift	📱💻	69.1
10	Go	🌐💻	68.0

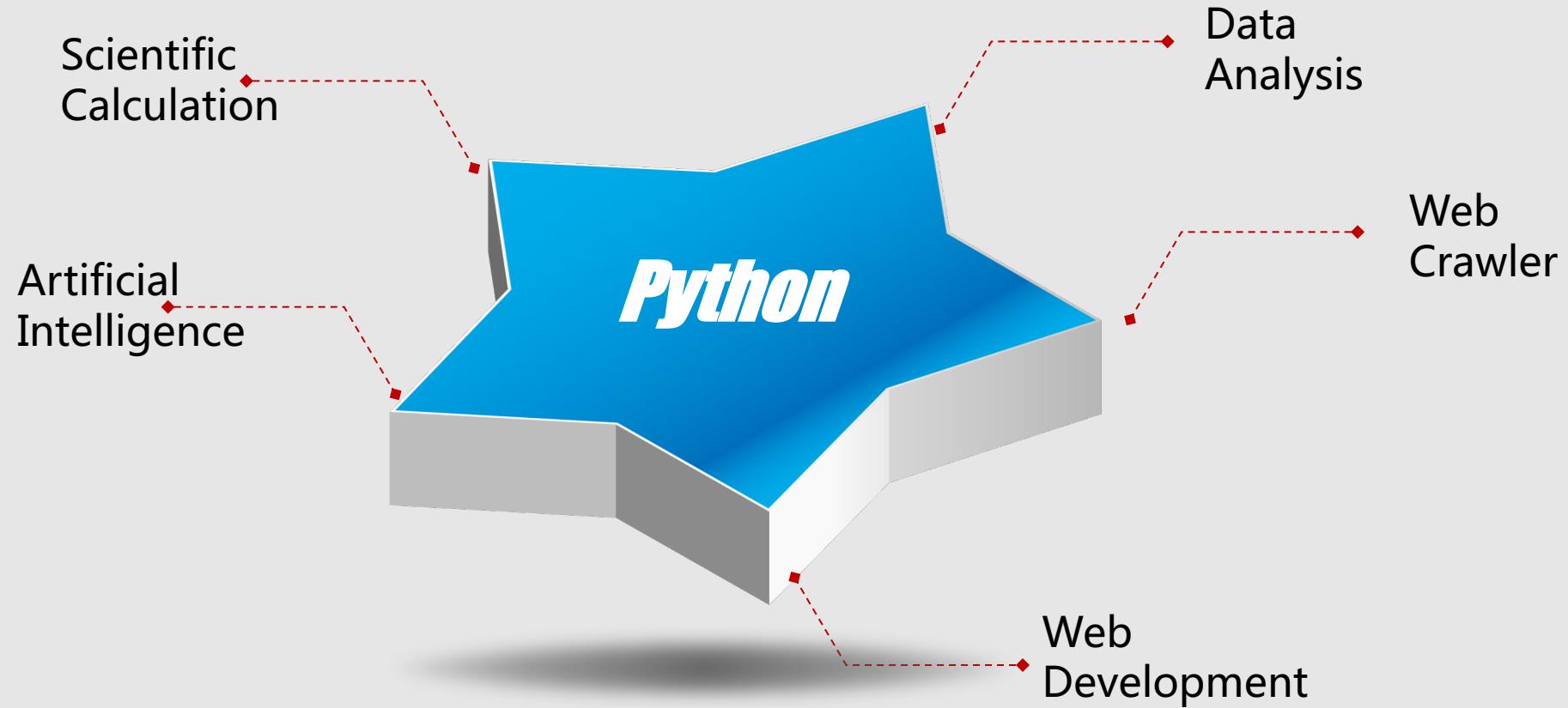
TIOBE Index for December 2019

Dec 2019	Dec 2018	Change	Programming Language	Ratings	Change
1	1		Java	17.253%	+1.32%
2	2		C	16.086%	+1.80%
3	3		Python	10.308%	+1.93%
4	4		C++	6.196%	-1.37%
5	6	▲	C#	4.801%	+1.35%
6	5	▼	Visual Basic .NET	4.743%	-2.38%
7	7		JavaScript	2.090%	-0.97%
8	8		PHP	2.048%	-0.39%
9	9		SQL	1.843%	-0.34%
10	14	▲	Swift	1.490%	+0.27%

TIOBE Mutation Analysis of top 10 Programming Languages



2 Why is Python?--Area



Web Crawler



Scrapy

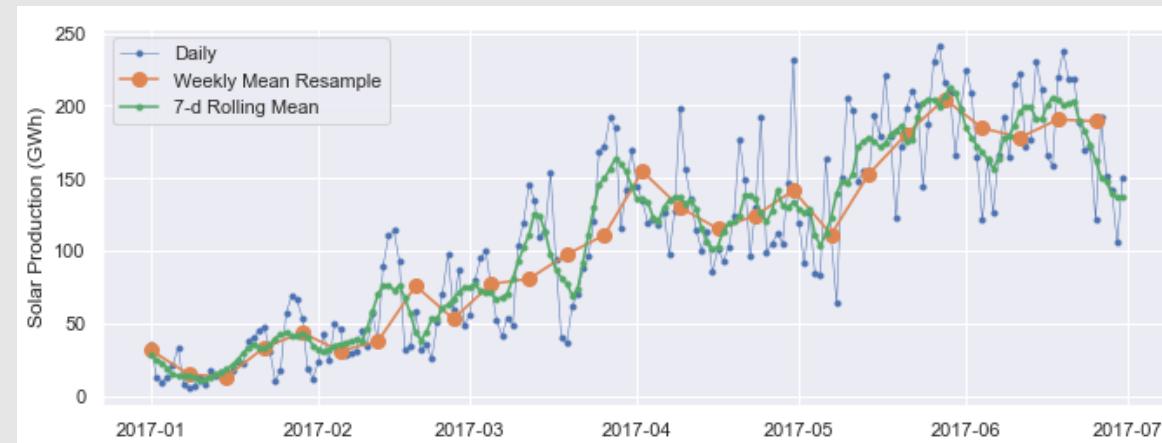
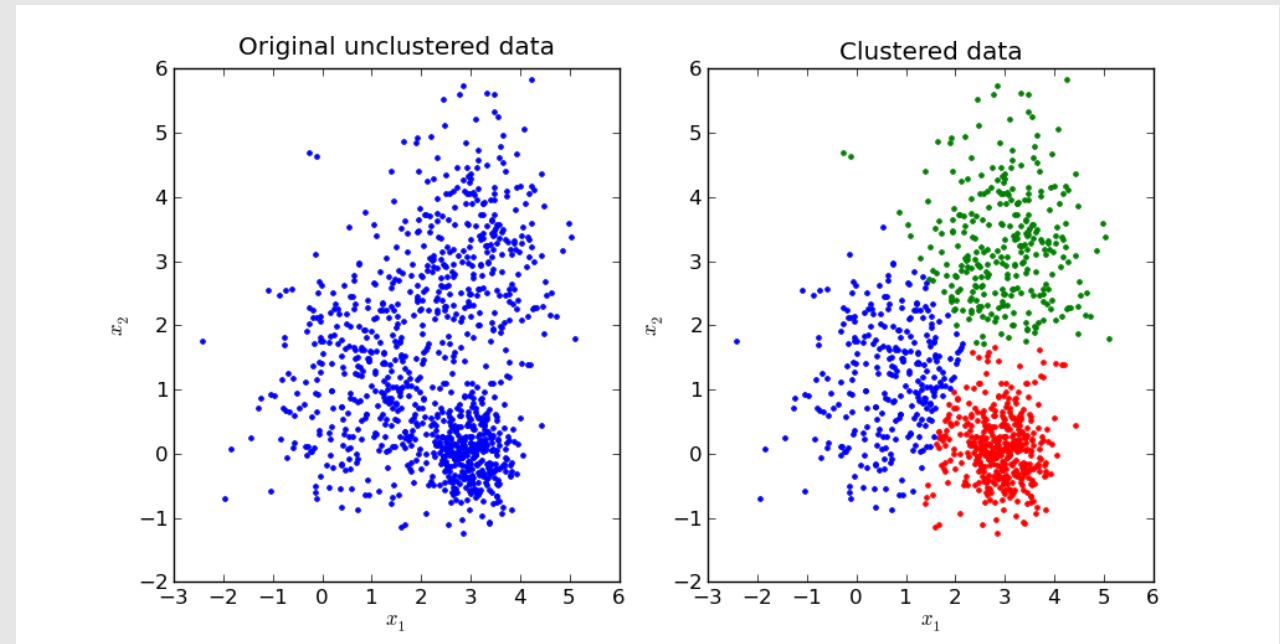
```
76 Python Shell
File Edit Shell Debug Options Windows Help
Python 3.2.2 (default, Sep 4 2011, 09:51:08) [MSC v.1500 32 bit (Intel)] on win
32
Type "copyright", "credits" or "license()" for more information.
>>> ===== RESTART =====
>>>
>>> spider("http://www.dreamhost.com", "secure", 200)
1 Visiting: http://www.dreamhost.com
**Success!**
2 Visiting: http://dreamhost.com
**Success!**
3 Visiting: https://panel.dreamhost.com/
**Success!**
4 Visiting: http://www.dreamhost.com/webmail/
**Success!**
5 Visiting: http://webftp.dreamhost.com/
**Success!**
6 Visiting: http://dreamhost.com/
**Success!**
7 Visiting: http://dreamhost.com/domains/
**Success!**
8 Visiting: http://dreamhost.com/web-hosting/
**Success!**
The word secure was found at http://dreamhost.com/web-hosting/
>>> |
Ln: 23 Col: 4
```

Data Analysis



NumPy , Pandas , Matplotlib

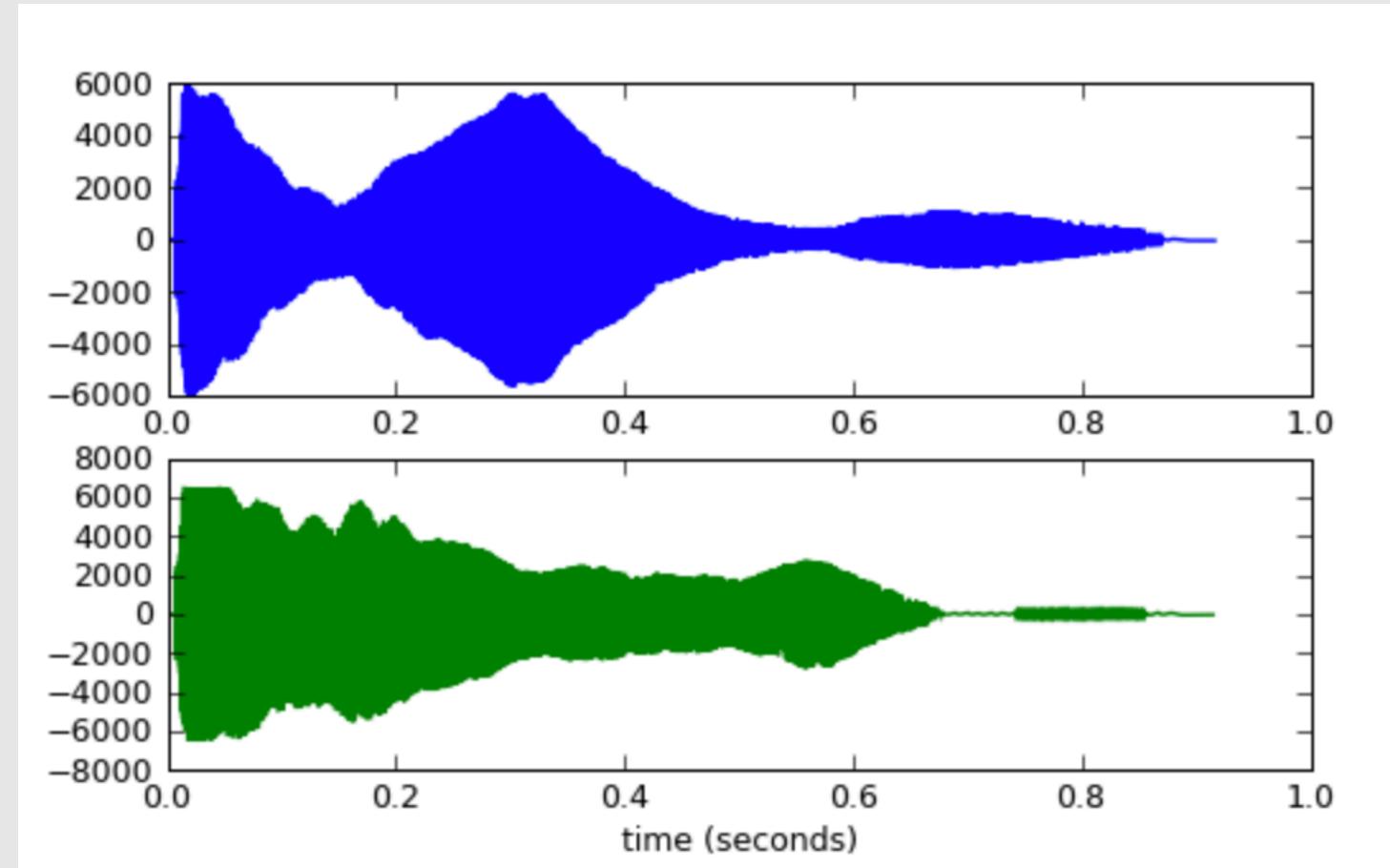
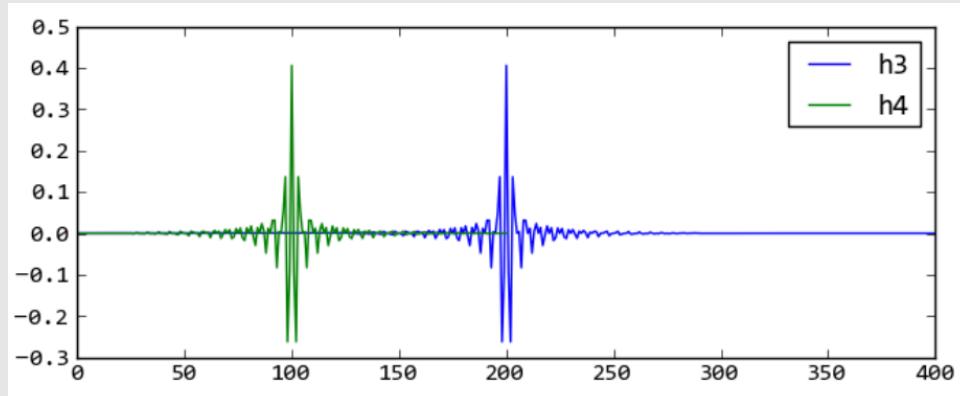
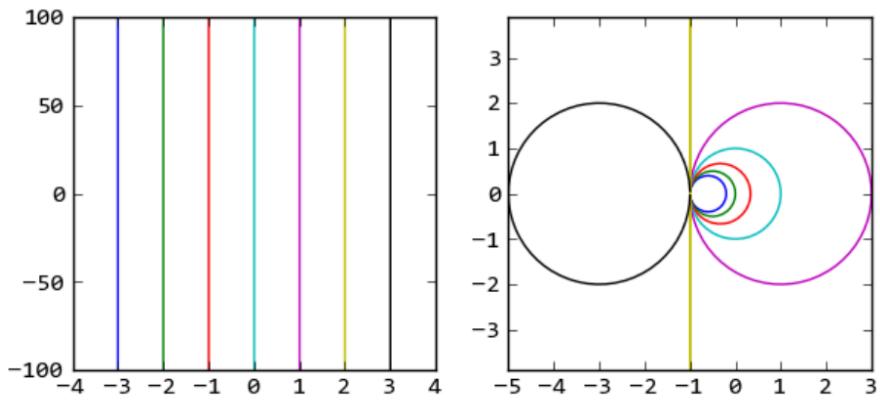
	Floor	Id	Price	Size	Year
count	23677.000000	2.367700e+04	23677.000000	23677.000000	23677.000000
mean	12.765088	1.011024e+11	610.668319	99.149301	2001.326519
std	7.643932	5.652477e+05	411.452107	50.988838	9.001996
min	1.000000	1.010886e+11	60.000000	2.000000	1950.000000
25%	6.000000	1.011022e+11	365.000000	66.000000	1997.000000
50%	11.000000	1.011025e+11	499.000000	88.000000	2003.000000
75%	18.000000	1.011027e+11	717.000000	118.000000	2007.000000
max	57.000000	1.011028e+11	6000.000000	1019.000000	2017.000000



Scientific Calculation



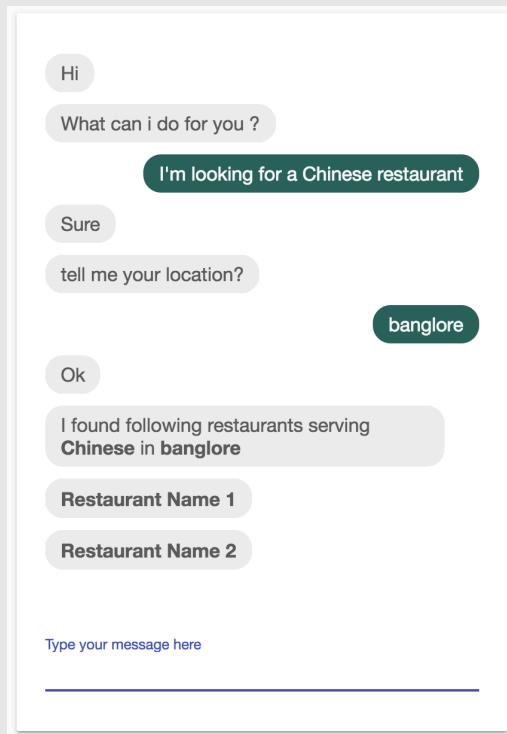
NumPy , SciPy , BioPython



Artificial Intelligence

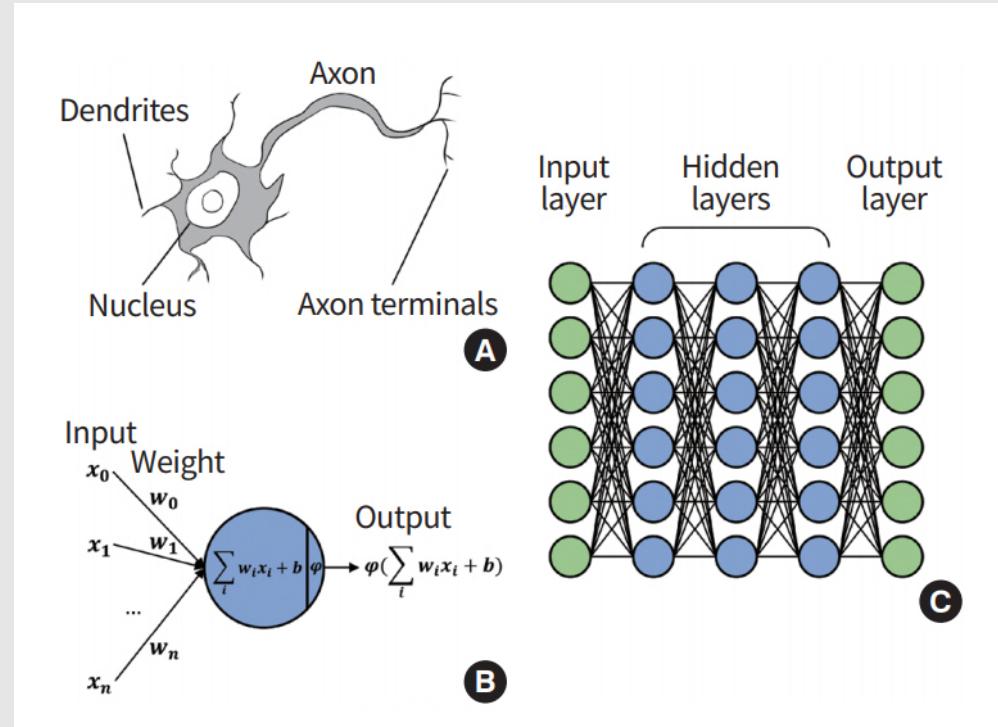


Scikit-learn , NLTK, Keras, TensorFlow, PyTorch



POST /api/v1

```
{
  "currentNode": "location",
  "complete": true,
  "parameters": [
    {
      "required": true,
      "type": "free_text",
      "name": "location"
    },
    {
      "required": true,
      "type": "free_text",
      "name": "cuisine"
    }
  ],
  "extractedParameters": {
    "cuisine": "Chinese",
    "location": "banglore"
  },
  "missingParameters": [],
  "owner": "chat",
  "intent": {
    "confidence": 0.9334882924890925,
    "name": "Restaurant search",
    "id": "5adb265507440e00128fcfa1"
  },
  "context": {},
  "date": "2018-04-28T08:15:21.100Z",
  "input": "banglore",
  "speechResponse": [
    "Ok",
    " I found following restaurants serving <b>Chinese</b> in <b>banglore</b>\n",
    "\n <b> Restaurant Name 1</b>\n",
    "\n<b> Restaurant Name 2</b>"
  ]
}
```



Web Development



Django , Flask, Tornado

The screenshot shows the Reddit homepage with the URL [reddit.com](https://www.reddit.com) in the address bar. The interface includes a search bar, a login/signup button, and navigation options like 'VIEW' and 'SORT'. The main content features a 'Trending today' section with three items:

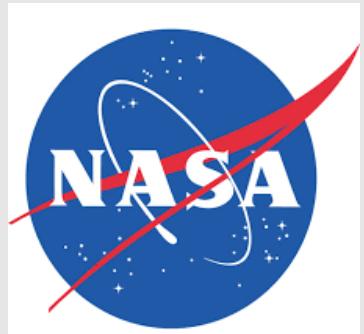
- Ari Behn: Ari Behn er død (Ari Behn is dead) - A post from r/norge with 18.9k upvotes.
- PROMOTED: The Grudge Movie - Discover What Critics Are Calling "Creepy as Hell" - A post from u/TheGrudgeMovie with 18.9k upvotes.
- guys literally only want one thing and it's fucking disgusting - A post from r/destiny2 with 18.9k upvotes.

Below this is a 'Popular posts' section, currently displaying a single post from r/UpliftingNews:

18.9k [r/UpliftingNews](#) · Posted by u/Horskr 3 hours ago
A very select few people have reached 300 wishes granted with the Make-A-Wish Foundation. Earlier this year, John Cena granted his 600th wish.
people.com/movies...

At the bottom of the post are interaction buttons for comments, share, save, and more.

Who is using Python ?



Tencent



<https://www.python.org/about/success/>

Coding is never so easy like this.....

```
import matplotlib.pyplot as plt
import matplotlib.tri as tri
import numpy as np

# First create the x and y coordinates of the points.
n_angles = 36
n_radii = 8
min_radius = 0.25
radii = np.linspace(min_radius, 0.95, n_radii)

angles = np.linspace(0, 2 * np.pi, n_angles, endpoint=False)
angles = np.repeat(angles[...], n_radii, axis=1)
angles[:, 1::2] += np.pi / n_angles

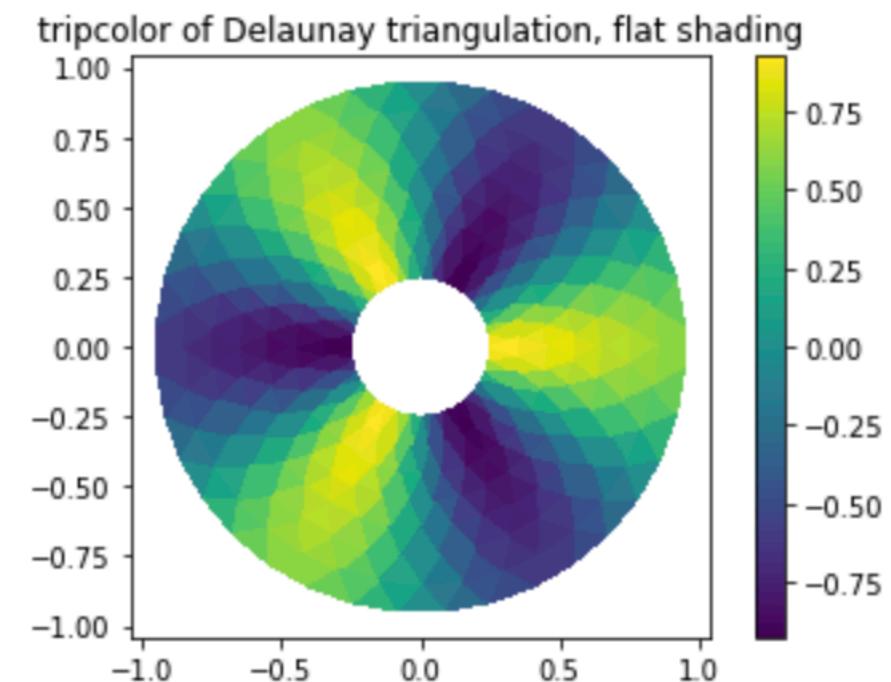
x = (radii * np.cos(angles)).flatten()
y = (radii * np.sin(angles)).flatten()
z = (np.cos(radii) * np.cos(3 * angles)).flatten()

# Create the Triangulation; no triangles so Delaunay triangulation
# won't work.
triang = tri.Triangulation(x, y)

# Mask off unwanted triangles.
triang.set_mask(np.hypot(x[triang.triangles].mean(axis=1),
                         y[triang.triangles].mean(axis=1)) < min_radius)

# visualize the data above
fig1, ax1 = plt.subplots()
ax1.set_aspect('equal')
tpc = ax1.tripcolor(triang, z, shading='flat')
fig1.colorbar(tpc)
ax1.set_title('tripcolor of Delaunay triangulation, flat shading')
```

y good."'''



No. 1 vs No. 2

Dimensions	Python	Java
Verbosity	Concise	Verbose
Performance	Interpreted, slower	Faster
Learning Curve	Easier than Java	Easy
Typing discipline	Dynamically-typed (duck-typing)	Statically-typed
Best for	Data Science, AI, Machine Learning	Embedded and cross-platform applications

3

How to begin ?



All can be done in clouds



Google Colab

<https://colab.research.google.com/notebooks/welcome.ipynb>



GitHub

<https://github.com>

4

About the course



Goals

- Master basic concepts and components of a computer program
- Know the function and application field of Python
- Master the basic procedure and skill of Python programming with Cloud
- Master the usage of basic data type, functions, controls, loops and recursion
- Master the usage of advanced data type, at least List, Sets, Tuple, Dictionaries
- Write Python programs to access and process data sets and local files
- Write Python programs to access and operate data table in MySQL including create, retrieval, update and delete
- Master the popular usages of data visualization by Python



Materials—Textbook(required)



Downey, Allen B. (2016). Think Python: How to Think Like a Computer Scientist, 2nd Edition. O'Reilly, ISBN-13: 978-1-491-93936-9.



Igor Milovanovic, Dimitry Foures, Giuseppe Vettigli. (2015). Python Data Visualization Cookbook, 2nd Edition, Packt Publishing, ISBN-13: 978-1784396695.



Albert Lukaszewski. (2010). MySQL for Python. Packt Publishing, ISBN-13: 978-1849510189.



Supplement Materials(recommended)



Python Documentation (<https://www.python.org/doc/>)



Google's Python Class (<https://developers.google.com/edu/python/>)



A Byte of Python (<https://python.swaroopch.com/>)



Think Python (<https://greenteapress.com/wp/think-python/>)



Pythonspot (<https://pythonspot.com/>)



Grading

- **Attendance (5%)**
- **Assignments (40%)—about 14 assignments**
- **Quizzes (15%)—about 5 online quizzes**
- **Mid-term Exam (5%)--online**
- **Final Exam(35%)--online**



About me

- **Associated Professor / Ph.D. of information science**
- **Sun Certificated Programmer for Java (SCJP)**
- **Java (16Y+), Web Development (17Y+)**
- **Patent (3 items), Software Copyright (9 items)**
- **Systems developed (countless)**



About me

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Thank you

