

INTRODUCTIONTO DATA VISUALIZATION WITH PYTHON

- INTRODUCTIONS
- LEARNING OBJECTIVES
- PYTHON OVERVIEW

AGENDA

Frank Callaly



Technical Instructor

- Agile Software Development
- Python for Data Science
- Full-Stack Development
- Machine Learning Applications

Qualifications

- BSc Electronic & Computer Engineering
 - National University of Ireland, Galway (NUIG)
- Senior Researcher NUIG
 - A/V Compression Techniques
 - Neural Network Applications
 - Si-Elegans Al Project
- Development Team Lead
- Technical Architect

Key Technical Competencies

- Python, Java, C, JavaScript
- Web Applications
- Visualisation for Data Science
- Big Data Technologies
- Cloud Architectures
- Applied Machine Learning

Business Domains

- FinTech
- Mobile Telecoms
- Consumer Electronics Applications



WHAT IS PYTHON?

The world's fastest growing programming language



Software Engineers

Data Analysts

Accountants

Mathematics

Scientists

+ Kids

WHY IS IT SO POPULAR?



Beginner Friendly

uses considerably less code than other languages while producing similar outcomes, "reads like English"



Batteries Included

ships with many standard libraries right out of the box



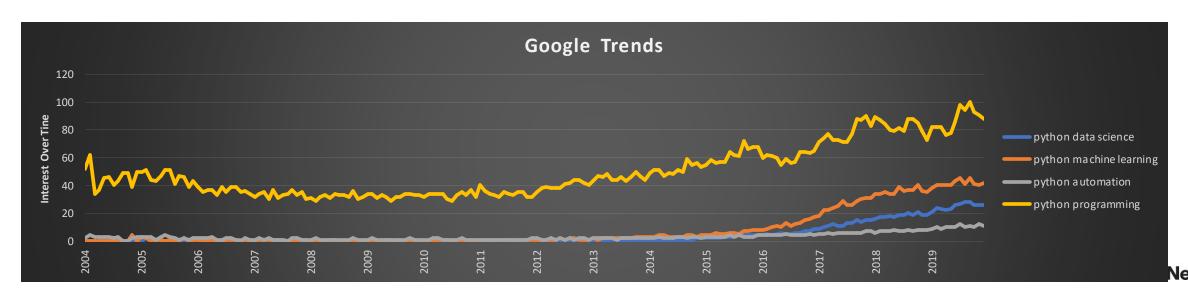
Libraries

a wealth of open source libraries built on Python



Versatility

mobile & web, ML, NLP data science, gaming, task automation, finance



HISTORY & ADOPTION BY BUSINESS COMMUNITY

1989

- Core Datatypes & Collections
- Classes, functions, exceptions

2000 - V 2.x

- Comprehensions
- Generators
- Context Manager









1994 - V 1.x

- Functional Programming (map,reduce,filter)
- Keyword arguments





- •Not compatible with V 2.x
- •Reduce feature duplication by removing old ways of doing things















Every time you watch a video, you're executing Python code

An official language at Google used – in things such as system administration tools and many Google App Engines

It's application servers are written in Python using Django as the web framework

Rewritten in Python in 2005 to gain greater development flexibility

Python module, Luigi, is used to power the Radio and Discover features, as well as recommendations Both the Dropbox server (running on the cloud) and desktop client software were primarily written in Python.

LiveNode, one of the internal systems that manages the displayof content on the webpage, is partly written in Pvthon



DATA VISUALIZATION WITH PYTHON

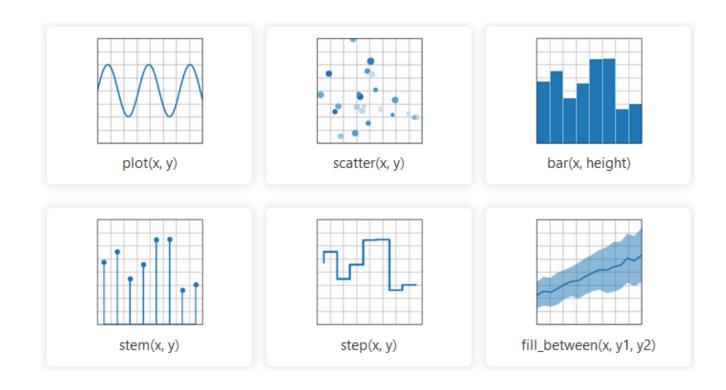
- Matplotlib the "original" popular plotting library for python
 - Open-Source, first introduced in 2002
 - Originally designed to be similar to Matlab hence the name!
 - Pandas ".plot()" uses Matplotlib by default
- Seaborn
 - Open-Source, 0.1 release in 2013
 - Built "on-top" of Matplotlib often considered a superset of Matplotlib
 - Uses Pandas DataFrames
 - Has some important chart styles and features that Matplotlib lacks
- Plotly
 - Commercial, company founded in 2013
 - A set of data visualisation libraries for a number of languages, including Python, R & JS
 - Plotly commercial offering "dash" is built around the core libraries
- All commonly used in combination with Pandas!



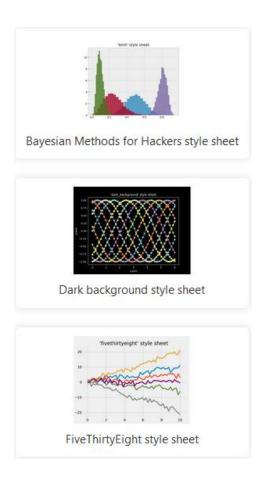




MATPLOTLIB - WHAT CAN WE DO WITH IT?



- https://matplotlib.org/stable/plot_types/index.html
- https://matplotlib.org/stable/gallery/style_sheets/index.html



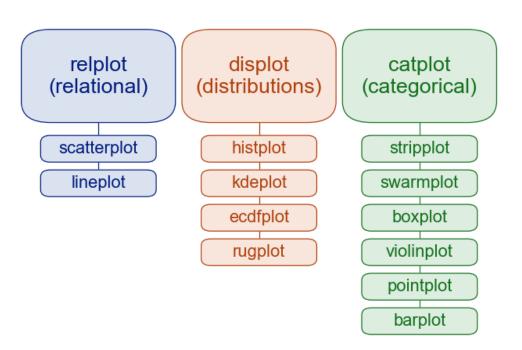


SEABORN

Related plot types are accessed through a single function

```
sns.relplot(
    data=tips_df,
    x="total_bill",
    y="tip",
    col="time",
    hue="smoker",
    style="smoker",
    size="size",
)
```

```
sns.relplot(
    data=fmri_df,
    kind="line",
    x="timepoint",
    y="signal",
    col="region",
    hue="event",
    style="event",
)
```

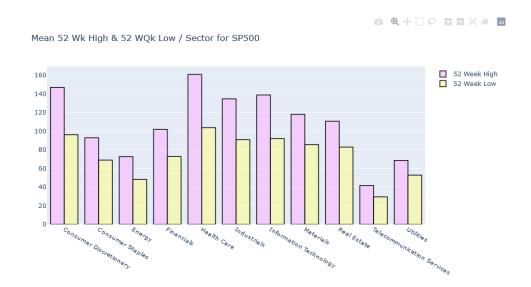


https://seaborn.pydata.org/tutorial/function_overview.html



PLOTLY

More interactive charts in a notebooks environment



Sector		Price/Earnings			
Consumer Discretionary	124.03	25.54	4.88	146.93	96.09
Consumer Staples	79.76	21.96	3.66	92.83	68.93
Energy	57.89	38.56	-1.65	72.59	48.14
Financials	89.06	17.20	4.44	101.82	72.69

https://plotly.com/python/



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FURTHER TOOLS

- Dash A data dashboard platform built around plotly
 - https://plotly.com/dash/
- Bokeh In a similar vein to plotly, bokeh allow creating charts and exposing them on the web
 - http://bokeh.org/

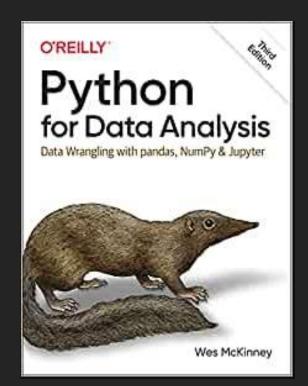
AUTOMATE THE BORING STUFF WITH PYTHON

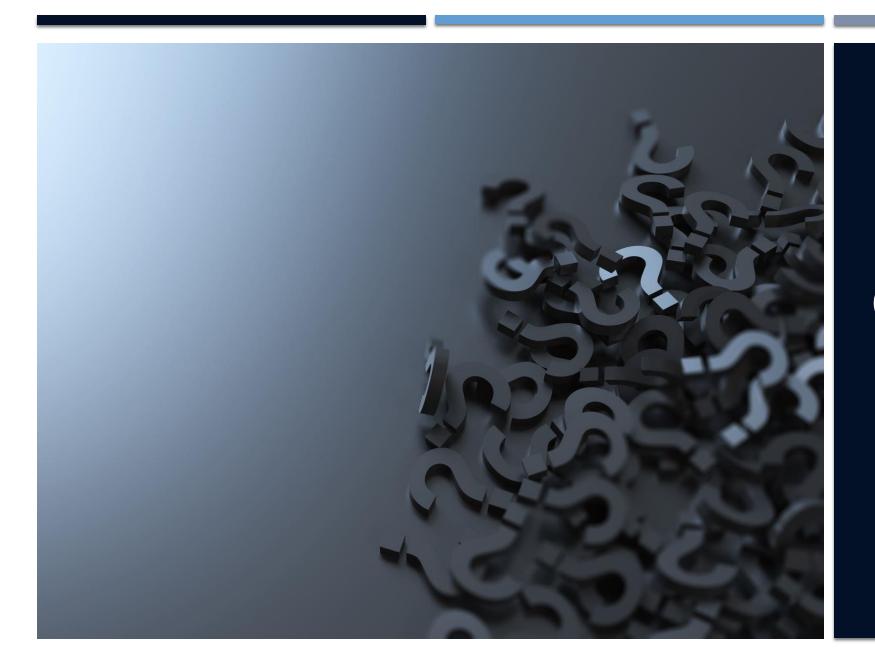
PRACTICAL PROGRAMMING FOR TOTAL BEGINNERS

AL SWEIGART



BOOKS





QUESTIONS