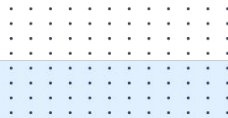


Data Analysis with Python

Full tutorial for beginners

RMOTR

Hands-on, online Data Science training.



12

COURSES



20

GITHUB
PROJECTS



88_h

CONTENT



210

LESSONS



Get 10% off your first month
with a **RMOTR** subscription

%

USE COUPON CODE
FREECODECAMP

>_



About this tutorial



1. What is Data Analysis
2. [Real example Data Analysis with Python](#)
3. [How to use Jupyter Notebooks](#)
4. [Intro to NumPy \(exercises included\)](#)
5. [Intro to Pandas \(exercises included\)](#)
6. [Data Cleaning](#)
7. Reading Data SQL, CSVs, APIs, etc
8. [Python in Under 10 Minutes](#)



● **What is Data Analysis?**



What is Data Analysis

> A process of inspecting, cleansing, transforming and modeling data with the goal of discovering useful information, informing conclusion and supporting decision-making.

[Definition by Wikipedia.](#)





What is Data Analysis

> A process of *inspecting, cleansing, transforming* and modeling data with the goal of discovering useful information, informing conclusion and supporting decision-making.

[Definition by Wikipedia.](#)





What is Data Analysis

> A process of inspecting, cleansing, transforming and **modeling data** with the goal of discovering useful information, informing conclusion and supporting decision-making.



[Definition by Wikipedia.](#)



What is Data Analysis

> A process of inspecting, cleansing, transforming and modeling data with the goal of **discovering useful information**, informing conclusion and supporting decision-making.



[Definition by Wikipedia.](#)



What is Data Analysis

> A process of inspecting, cleansing, transforming and modeling data with the goal of discovering useful information, **informing conclusion and supporting decision-making**.



[Definition by Wikipedia.](#)



Data Analysis Tools

Auto-managed closed tools



Programming Languages



Auto-managed closed tools

👎 Closed Source 🙈

👎 Expensive 💸

👎 Limited 😞

👍 Easy to learn 🧑💻

Programming Languages

👍 Open Source 🤩

👍 Free (or very cheap) 😄💰

👎 Extremely Powerful 💪

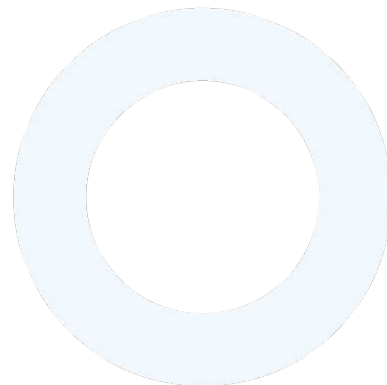
👎 Steep learning curve 🧑💻

Why Python for Data Analysis?

Why Python for Data Analysis?

Why would we choose Python over R or Julia?

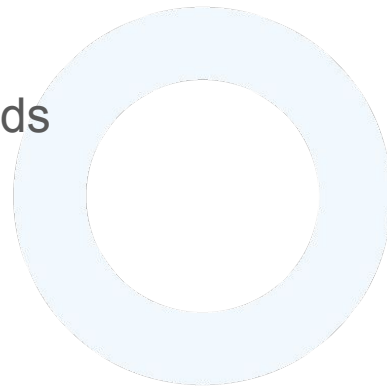
- 👍 very simple and intuitive to learn
- 👍 “correct” language
- 👍 powerful libraries (not just for Data Analysis)
- 👍 free and open source
- 👍 amazing community, docs and conferences




When to choose R?

Python, sadly, is not always the answer

- When R Studio is needed
- When dealing with advanced statistical methods
- When extreme performance is needed



The Data Analysis Process



Data Extraction

- SQL
- Scrapping
- File Formats
 - CSV
 - JSON
 - XML
- Consulting APIs
- Buying Data
- Distributed Databases

Data Cleaning

- Missing values and empty data
- Data imputation
- Incorrect types
- Incorrect or invalid values
- Outliers and non relevant data
- Statistical sanitization

Data Wrangling

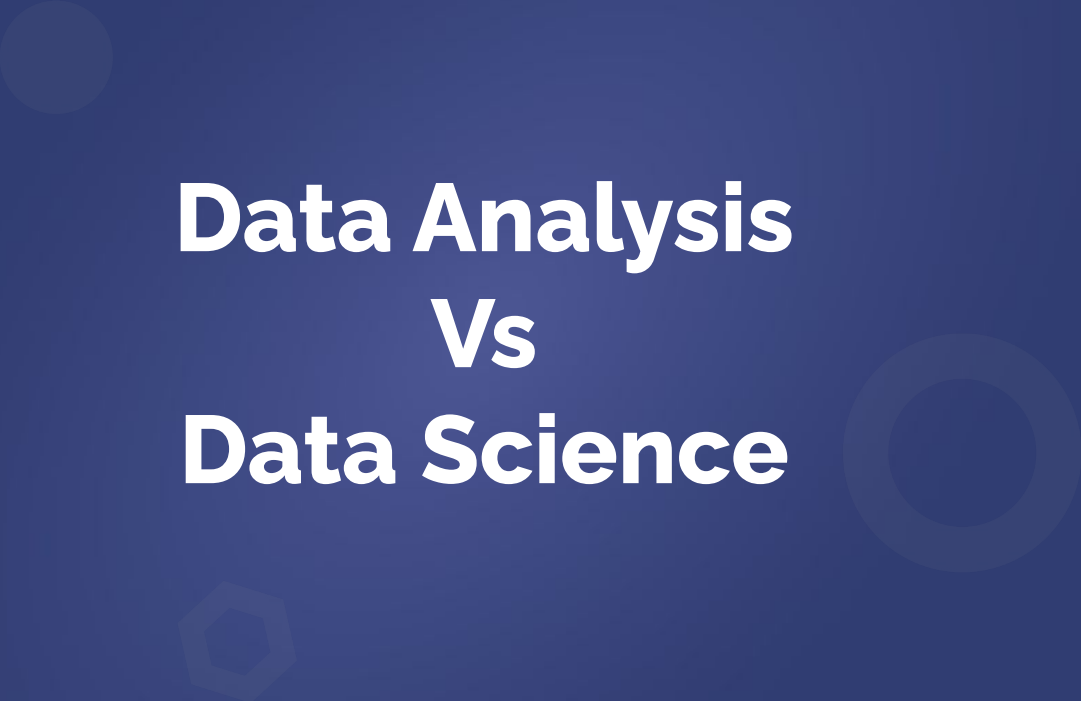
- Hierarchical Data
- Handling categorical data
- Reshaping and transforming structures
- Indexing data for quick access
- Merging, combining and joining data

Analysis

- Exploration
- Building statistical models
- Visualization and representations
- Correlation vs Causation analysis
- Hypothesis testing
- Statistical analysis
- Reporting

Action

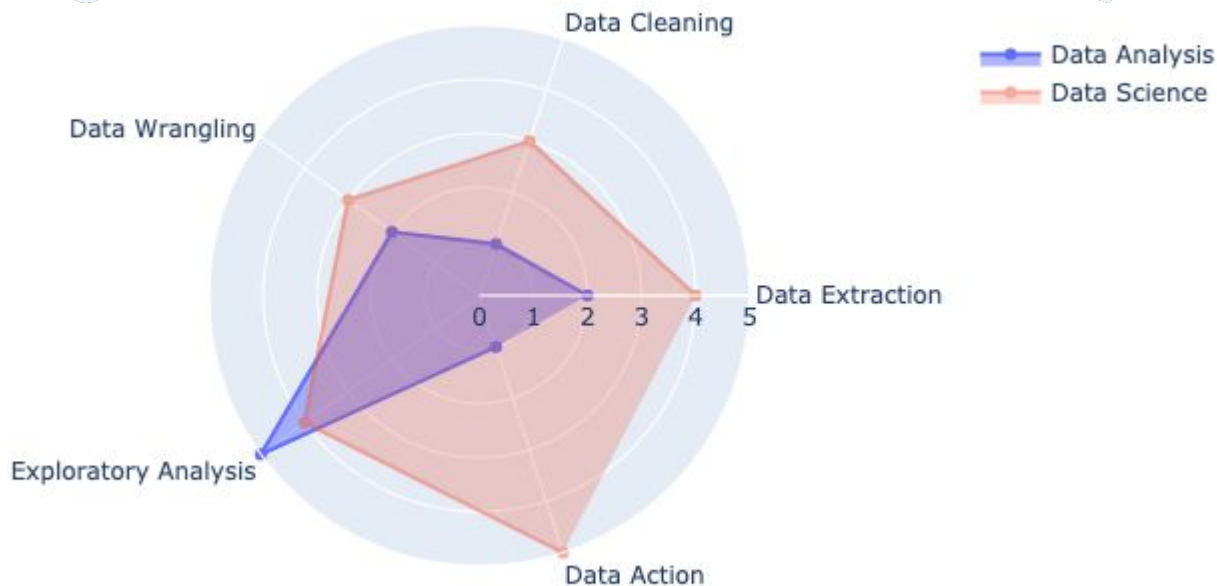
- Building Machine Learning Models
- Feature Engineering
- Moving ML into production
- Building ETL pipelines
- Live dashboard and reporting
- Decision making and real-life tests



Data Analysis Vs Data Science

DATA ANALYSIS VS DATA SCIENCE

The traditional view



Python & PyData Ecosystem

PYTHON ECOSYSTEM:

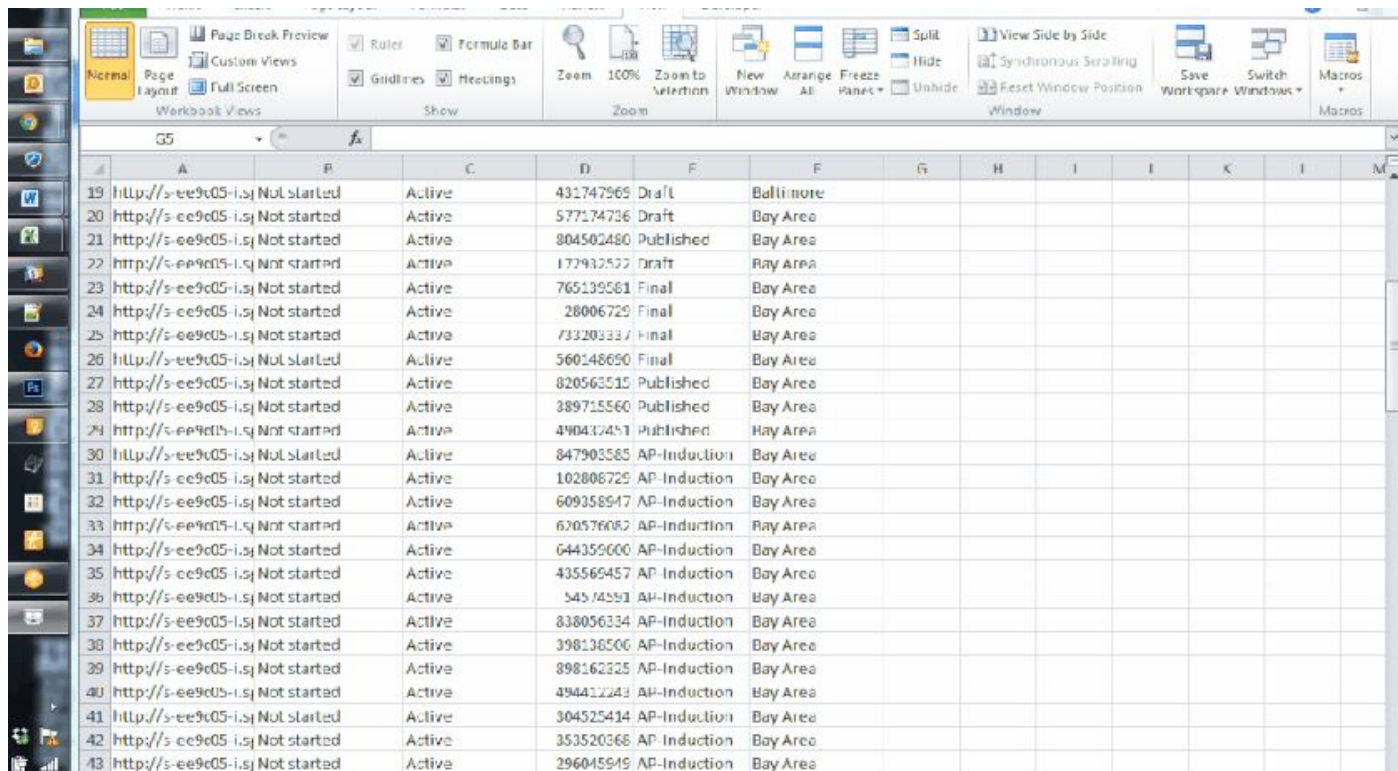
The libraries we use...

- [pandas](#): The cornerstone of our Data Analysis job with Python
- [matplotlib](#): The foundational library for visualizations. Other libraries we'll use will be built on top of matplotlib.
- [numpy](#): The numeric library that serves as the foundation of all calculations in Python.
- [seaborn](#): A statistical visualization tool built on top of matplotlib.
- [statsmodels](#): A library with many advanced statistical functions.
- [scipy](#): Advanced scientific computing, including functions for optimization, linear algebra, image processing and much more.
- [scikit-learn](#): The most popular machine learning library for Python (not deep learning)

How Python Data Analysts Think

EXCEL, TABLEAU, ETC.

They're all visual tools...

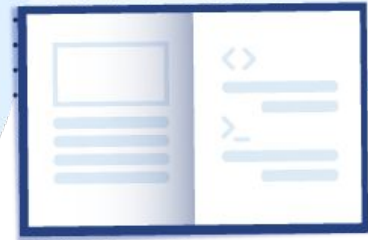


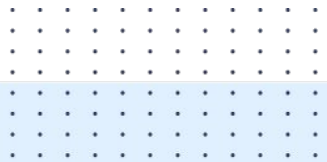
	A	B	C	D	E	F	G	H	I	J	K	L	M
19	http://s-ee9c05-i.sj	Not started	Active	431747969	Draft	Ballimore							
20	http://s-ee9c05-i.sj	Not started	Active	577174736	Draft	Bay Area							
21	http://s-ee9c05-i.sj	Not started	Active	804502480	Published	Bay Area							
22	http://s-ee9c05-i.sj	Not started	Active	172932522	Draft	Bay Area							
23	http://s-ee9c05-i.sj	Not started	Active	765139581	Final	Bay Area							
24	http://s-ee9c05-i.sj	Not started	Active	28006729	Final	Bay Area							
25	http://s-ee9c05-i.sj	Not started	Active	73320333	Final	Bay Area							
26	http://s-ee9c05-i.sj	Not started	Active	560148690	Final	Bay Area							
27	http://s-ee9c05-i.sj	Not started	Active	820563515	Published	Bay Area							
28	http://s-ee9c05-i.sj	Not started	Active	389715560	Published	Bay Area							
29	http://s-ee9c05-i.sj	Not started	Active	490432451	Published	Bay Area							
30	http://s-ee9c05-i.sj	Not started	Active	847903585	AP-Induction	Bay Area							
31	http://s-ee9c05-i.sj	Not started	Active	102806729	AP-Induction	Bay Area							
32	http://s-ee9c05-i.sj	Not started	Active	609358947	AP-Induction	Bay Area							
33	http://s-ee9c05-i.sj	Not started	Active	670576082	AP-Induction	Bay Area							
34	http://s-ee9c05-i.sj	Not started	Active	644359600	AP-Induction	Bay Area							
35	http://s-ee9c05-i.sj	Not started	Active	435565457	AP-Induction	Bay Area							
36	http://s-ee9c05-i.sj	Not started	Active	54574591	AP-Induction	Bay Area							
37	http://s-ee9c05-i.sj	Not started	Active	838056334	AP-Induction	Bay Area							
38	http://s-ee9c05-i.sj	Not started	Active	398138506	AP-Induction	Bay Area							
39	http://s-ee9c05-i.sj	Not started	Active	898162325	AP-Induction	Bay Area							
40	http://s-ee9c05-i.sj	Not started	Active	494412243	AP-Induction	Bay Area							
41	http://s-ee9c05-i.sj	Not started	Active	304525414	AP-Induction	Bay Area							
42	http://s-ee9c05-i.sj	Not started	Active	353520368	AP-Induction	Bay Area							
43	http://s-ee9c05-i.sj	Not started	Active	296045949	AP-Induction	Bay Area							

Thinking like a Python Data Analyst



**And finally,
why Python?**





>20%

Salary increase for a Data Analyst
that knows Python and SQL.



About this tutorial



1. What is Data Analysis
2. **Real Example Data Analysis with Python**
3. How to use Jupyter Notebooks
4. Intro to NumPy ([exercises included](#))
5. Intro to Pandas ([exercises included](#))
6. Data Cleaning
7. Reading Data SQL, CSVs, APIs, etc
8. Python in Under 10 Minutes