PYDATA GLOBAL 2021

KNOW YOUR DATA FIRST:

AN INTRODUCTION TO EXPLORATORY DATA ANALYSIS

Sin-seok SEO, Safran Tech, Safran SA

OUTLINE

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   - ✓ *Pandas*
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4. (Easy Enough) Interactive Visualizations
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5. Automatic EDA Report
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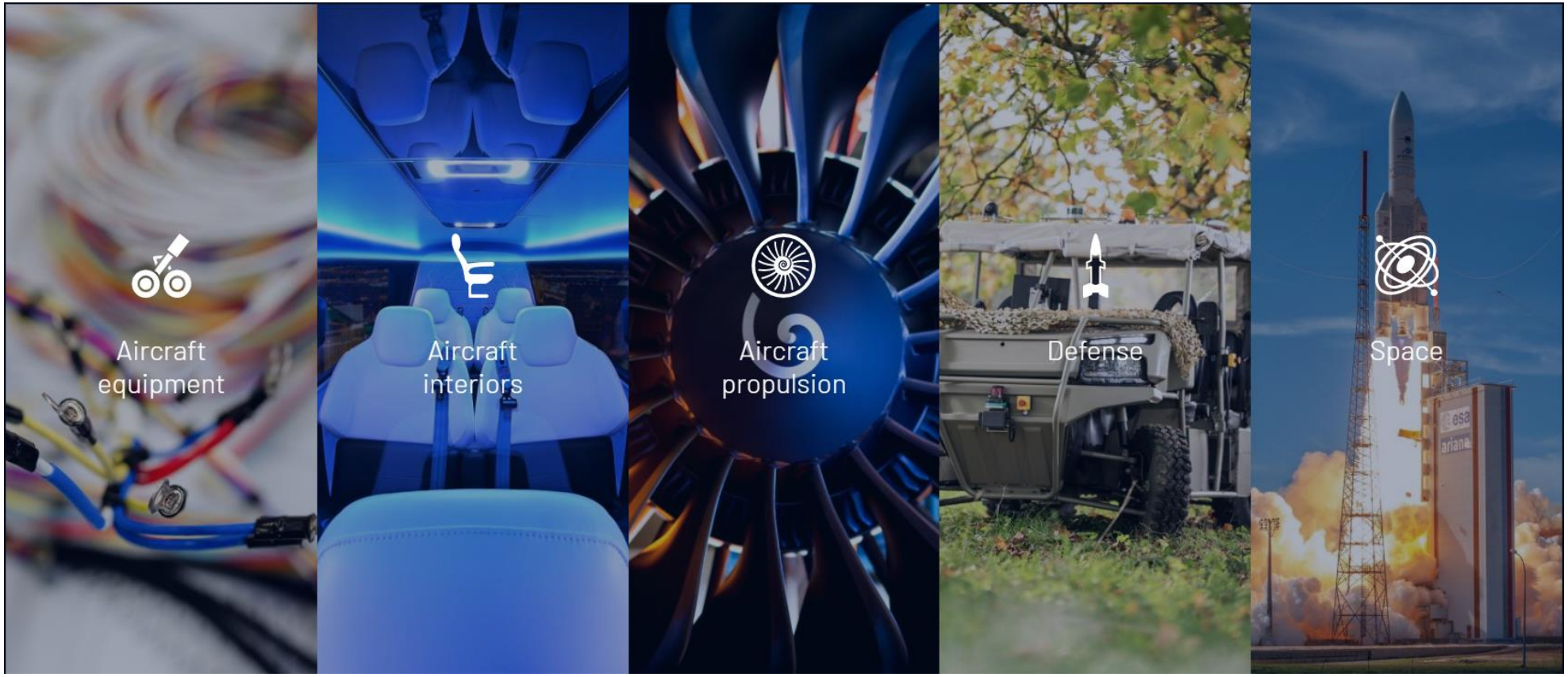
   - ✓ *Pandas-profiling*
   - ✓ *Sweetviz*
   - ✓ *Autoviz*
6. Wrap-up and Some Tips

ABOUT SAFRAN GROUP

More than 76000 employees in 350 locations across 31 countries



SAFRAN'S AIRCRAFT ENGINES

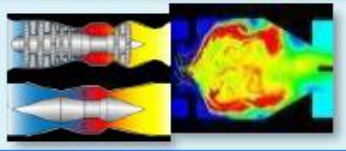
Through CFM International (the 50/50 joint company between Safran Aircraft Engines and GE) we produce the LEAP® turbofan, successor to the best-selling CFM56®. The LEAP powers new-generation single-aisle commercial jets: the Airbus A320neo, Boeing 737 MAX and COMAC C919. We're also a leading military aircraft engine manufacturer, supplying the M88 for the Rafale fighter, and as part of a consortium making the TP400 turboprop engine for the Airbus A400M transport aircraft

Safran Tech

Safran Research Center at Paris-Saclay
About 500 persons including 80 experts

6 Research Departments
Up to TRL 3-5*

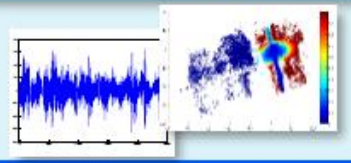
Energy & Propulsion



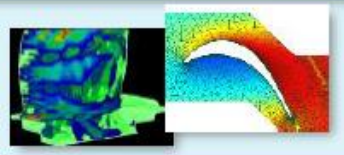
Electrical & Electronical Systems

Materials & Processes

Signal and Information Technologies



Modelling & Simulation



Sensors Technologies & applications

4 Technological Platforms
Up to TRL 6*

Safran Composites

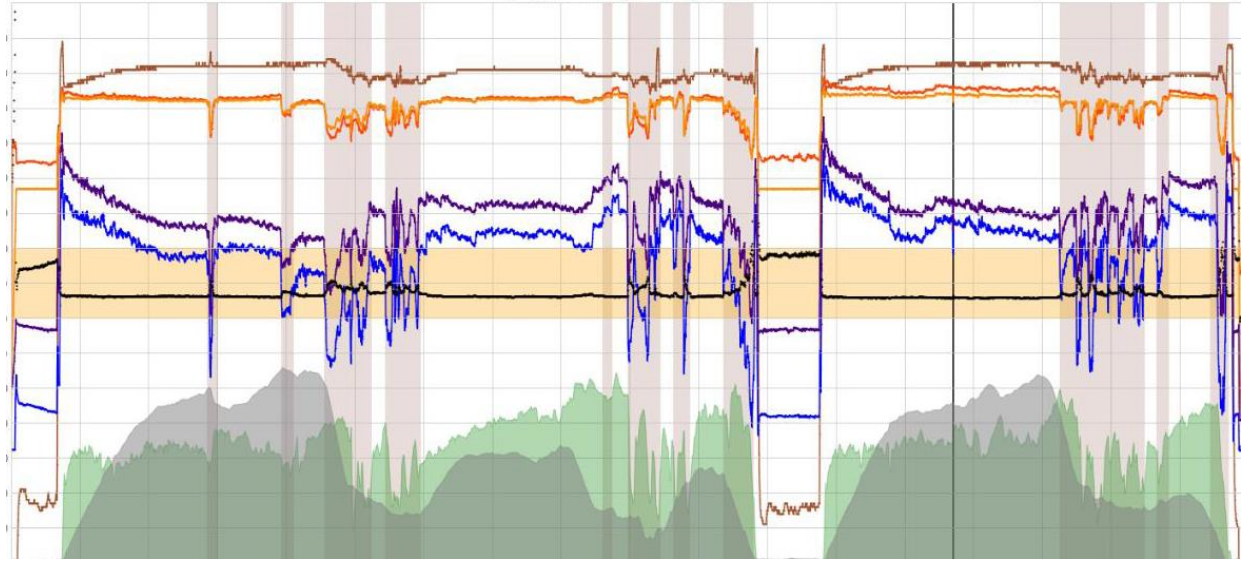
Safran Advanced Turbine Airfoils (Experimental Foundry)

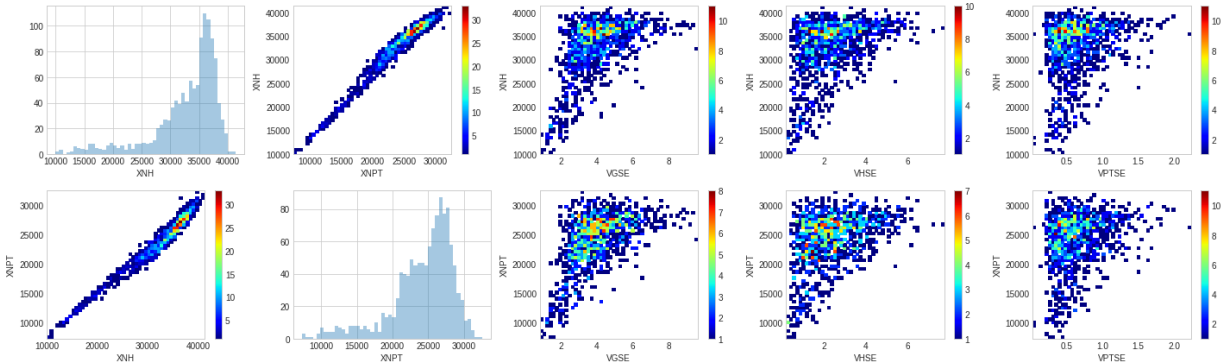
Safran Additive Manufacturing

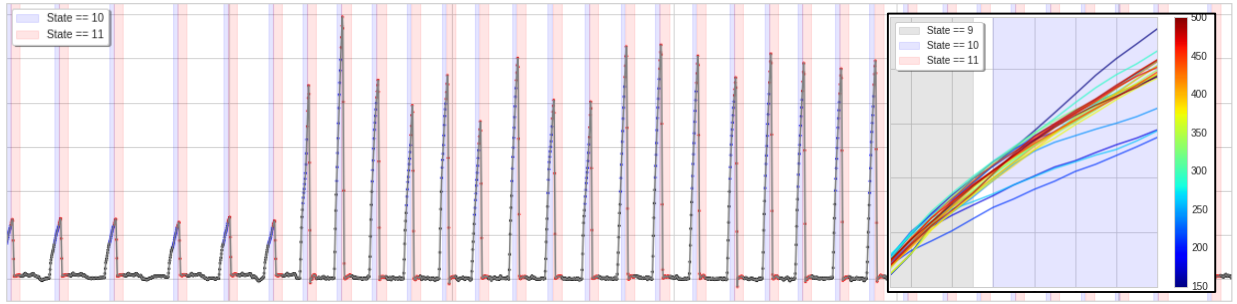
Safran Ceramics

* Technology Readiness Level

Plateforme digital







Things I do @Safran Tech

Since 2017. 04

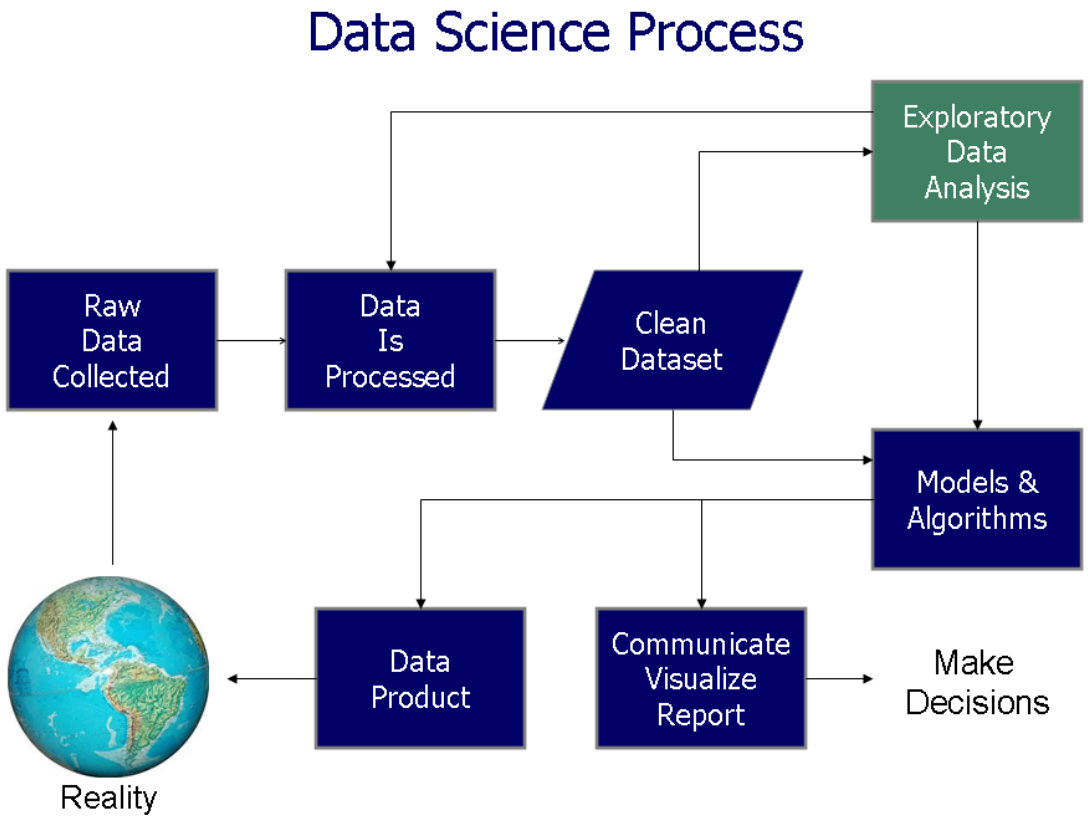
Data scientist & SW engineer

- Analyzing data obtained from airplanes and helicopters (mostly from engines)

- Applying various statistical models and machine learning algorithms to improve performances and reduce costs

- Optimizing maintenance policies

EXPLORATORY DATA ANALYSIS (EDA)



- An approach of analyzing data sets to summarize their main characteristics, often using **statistical graphics** and other **data visualization** methods
- **Objectives**
  - ✓ Suggest hypotheses about the causes of observed phenomena
  - ✓ Assess assumptions on which statistical inference will be based
  - ✓ Support the selection of appropriate statistical tools and techniques
  - ✓ Provide a basis for further data collection through surveys or experiments

Source: https://en.wikipedia.org/wiki/Exploratory_data_analysis

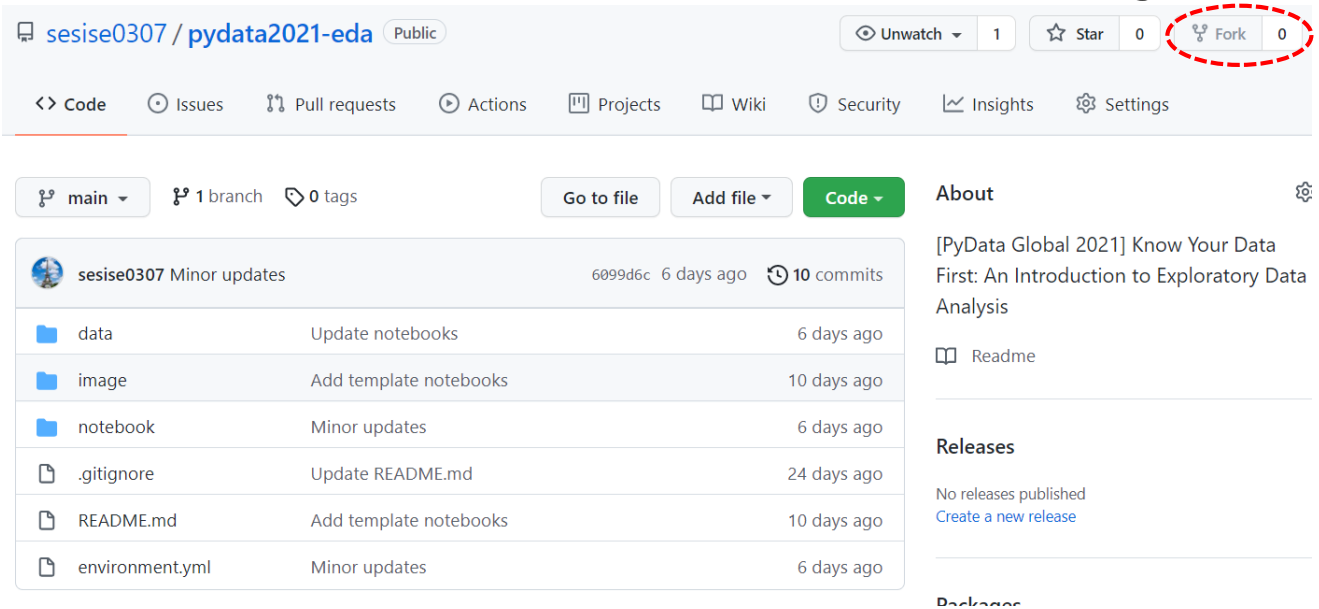
PREREQUISITE

- Some Experiences with:
  - ✓ Python
  - ✓ Pandas
  - ✓ Matplotlib
  - ✓ Jupyter Notebook (or similar)
- GitHub & Google Accounts

Go to: https://github.com/sesise0307/pydata2021-eda/

Fork the repo

Click!



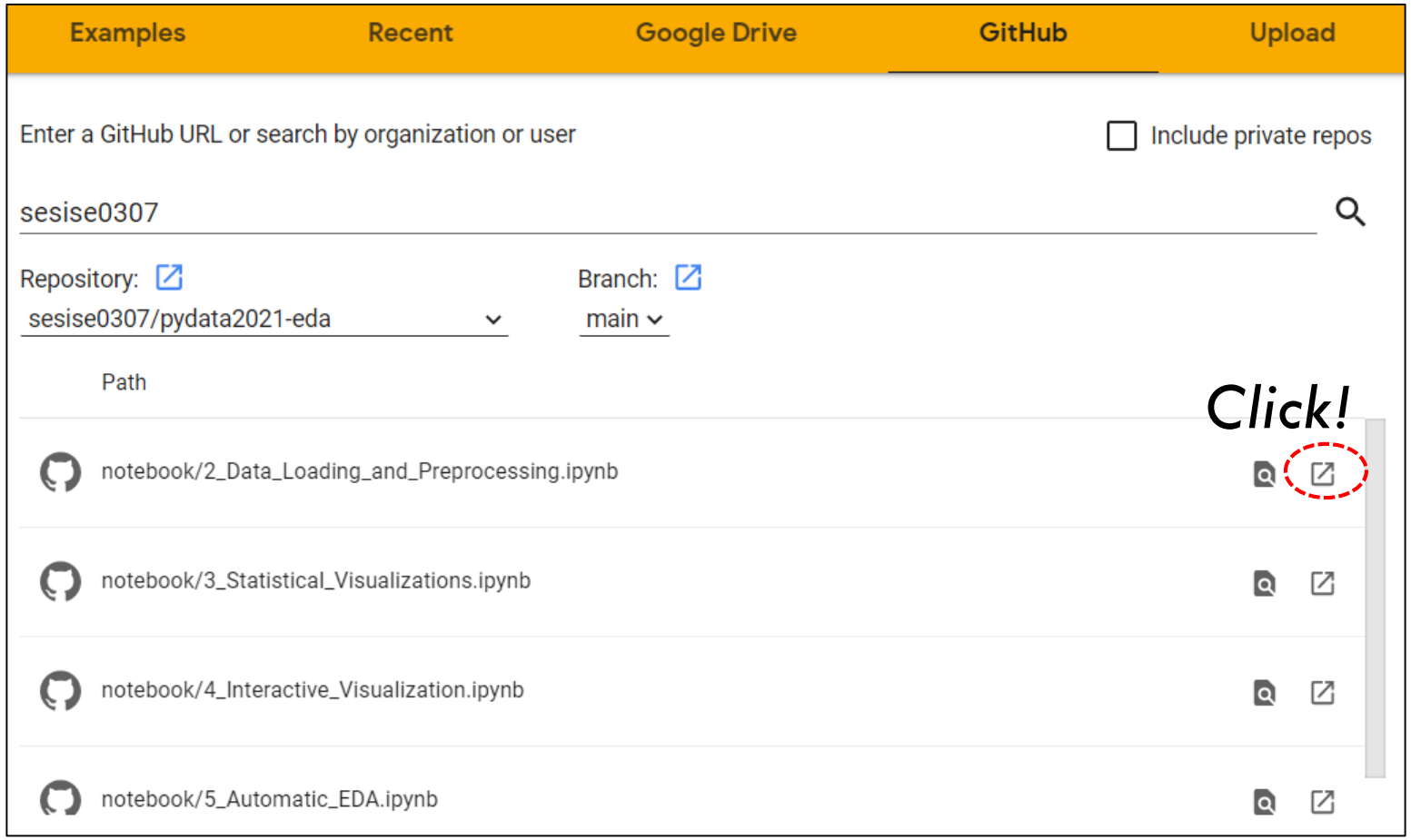
LET'S GET YOUR HANDS DIRTY

Go to:

https://colab.research.google.com/github/**{your_github_id}**/pydata2021-eda/

For example:

https://colab.research.google.com/github/**sesise0307**/pydata2021-eda/



WRAP UP

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  - ✓ *Autoviz*

SOME TIPS

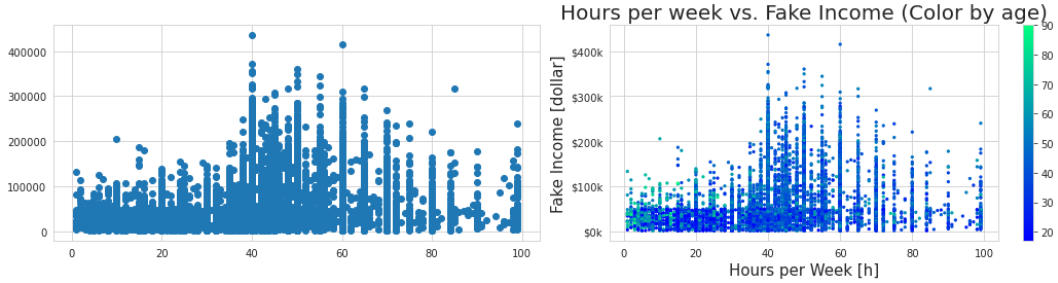
RTFM (Read The F* Manual)

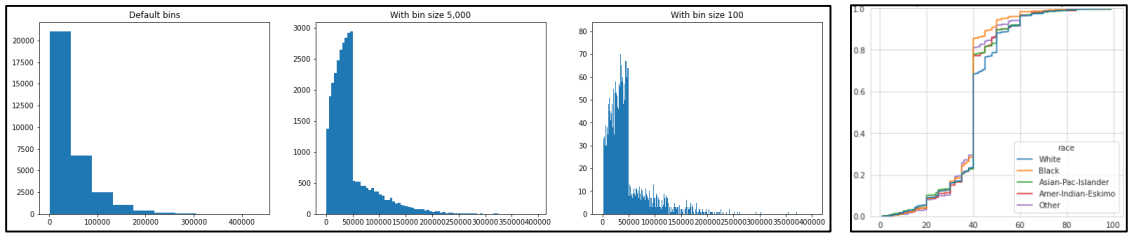
- Official documentations (web sites)
- Shift + tab or "?" in Jupyter Notebook
- Googling and Stackoverflow

Set default figure size and style

```
plt.rcParams['figure.figsize'] = 10, 5
sns.set_style('whitegrid')
```

Aesthetics matter





Try different bins for a histogram

- Consider ECDF (Empirical Cumulative Distribution Function) plot as well

Visualization Gallery Sites

- https://www.python-graph-gallery.com/
- https://www.data-to-viz.com/
- https://viz.wtf/
- https://seaborn.pydata.org/examples/index.html
- https://plotly.com/python/

Fundamentals of Data Visualization

- https://clauswilke.com/dataviz/

Thank you for your attention!

Q&A