Data Visualization, Interaction and Dashboard

11/15/2021

Data Science Academy: season II week 4
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Learning Goals

Week 4: Visualization and Dashboarding

- Matplotlib, seaborn
- Ipywidgets, plotly
- Dashboard: viola/streamlit
- Demo of use cases at ETS
- Lab:
    - Create plots using matplotlib, seaborn, plotly and ipywidgets based on the provided data
    - Create a voila and a streamlit dashboard based on the provided data.
- Homework/mini project: complete the dashboards in the lab session.

Data Visualization

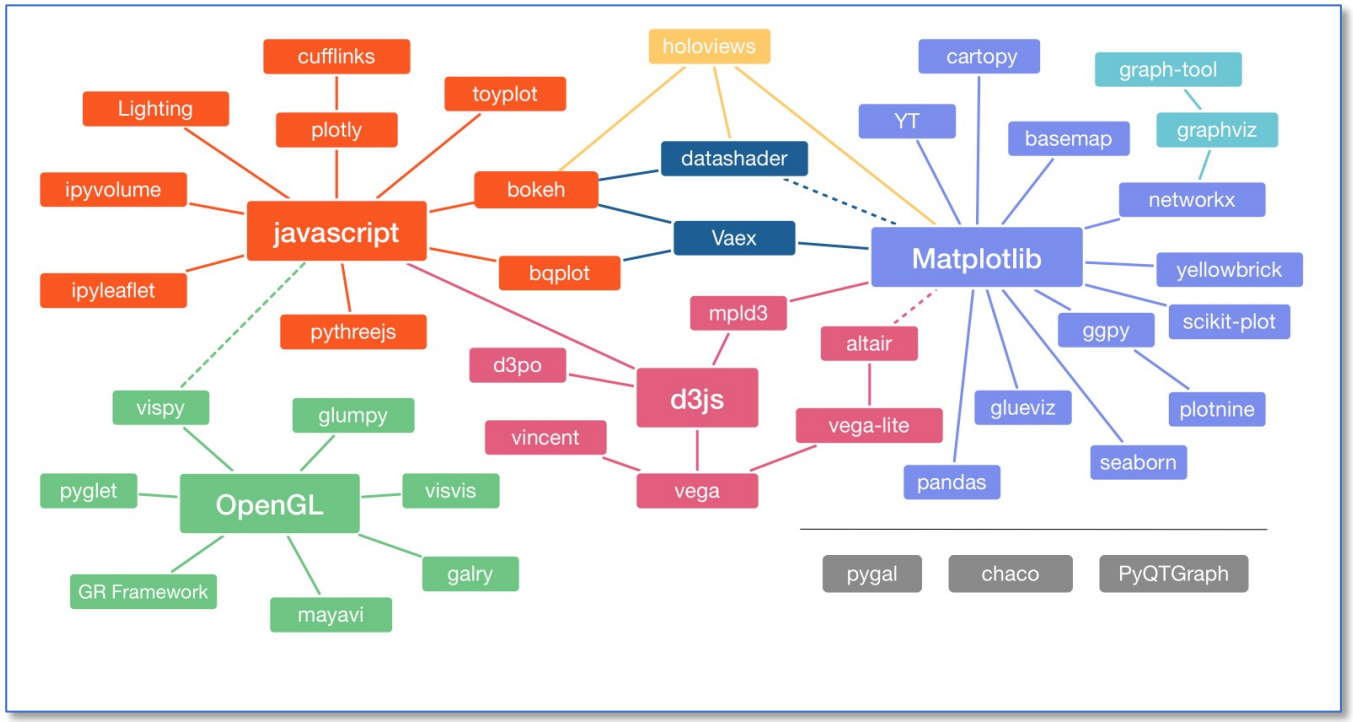
Steps to Visualization

- Understand the nature of your data
  - Categorical/continuous
  - Sparse
- Understand your goal
  - Audience
  - Production/exploration?
  - Interactivity required?
- Plan the types of visualizations you'll create
  - Scatter plot, distribution, dendrogram, etc.
- Choose a visualization framework(s)
- Do it!

https://chart.guide/topics/chartguide-poster-4-0/

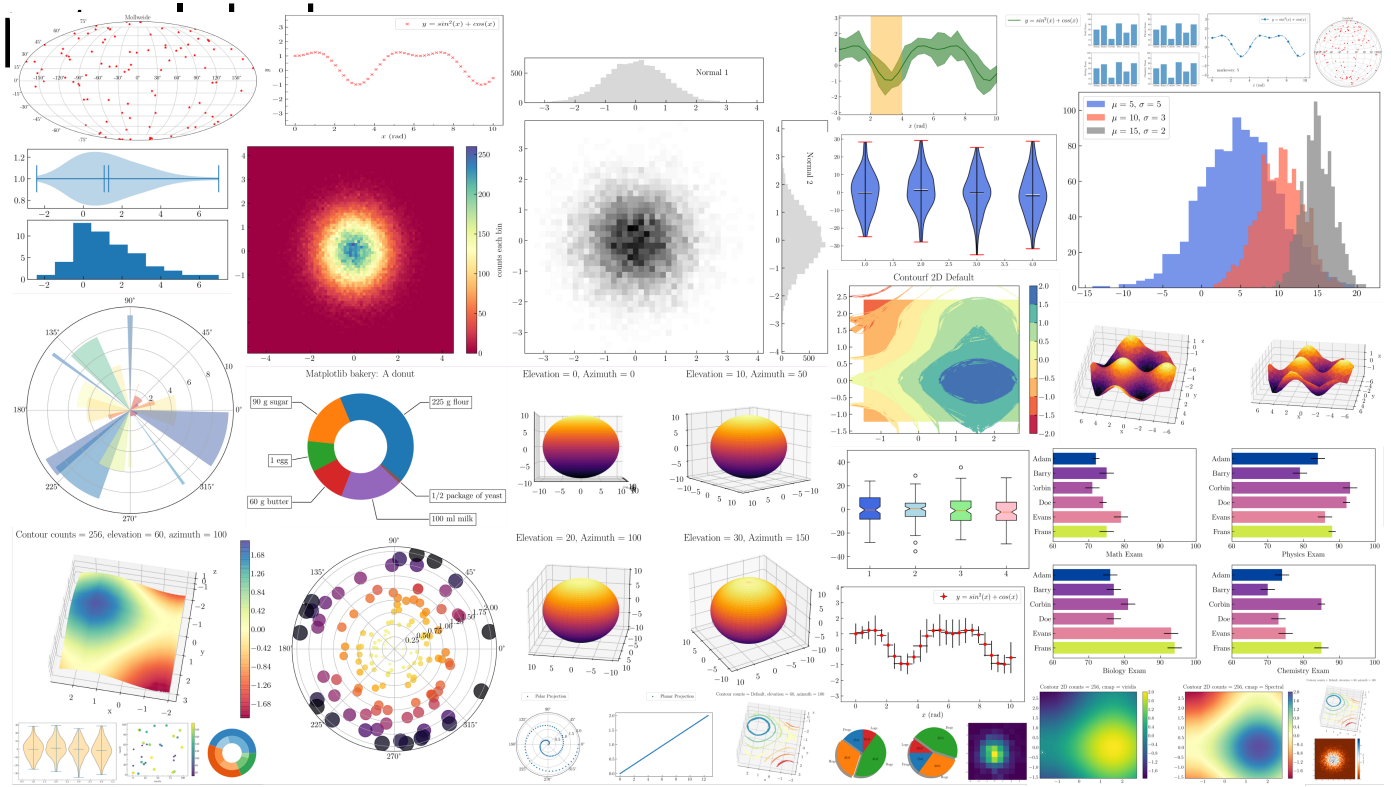
Visualization in Python

- PyViz is your gateway: www.pyviz.org
- Visualization paradigms



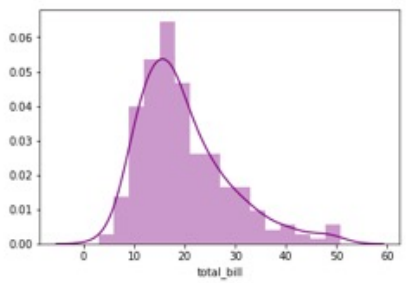
Matplotlib

- jupyter lab demo
- Seaborn - ju

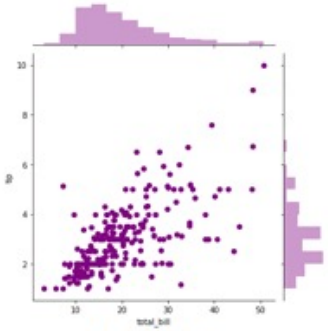


Seaborn: built on top of matplotlib

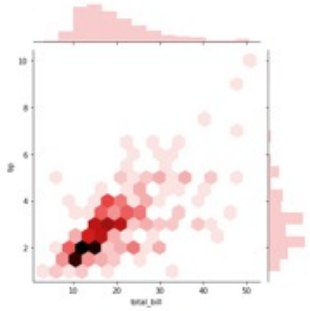
- jupyter lab demo



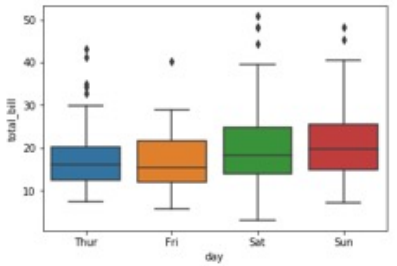
distplot



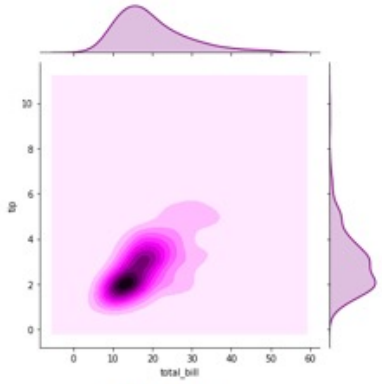
Jointplot



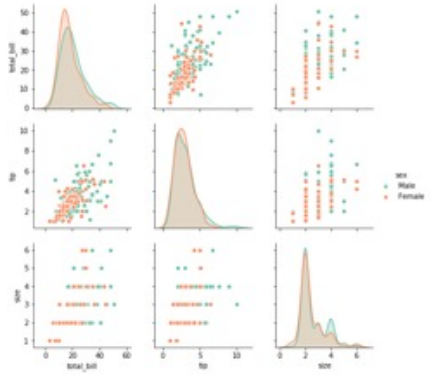
Hexplots



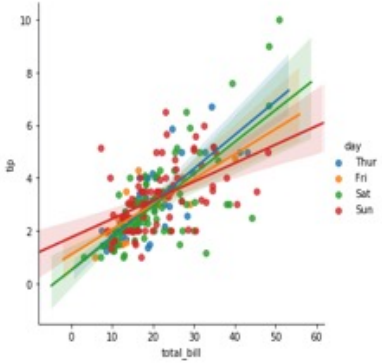
Boxplots



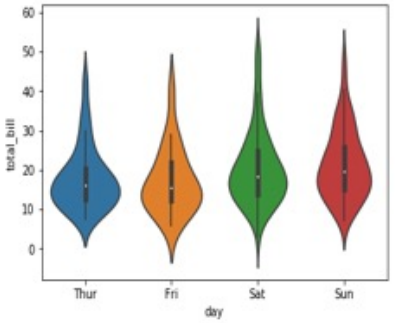
KDE Plot



Pair Plots



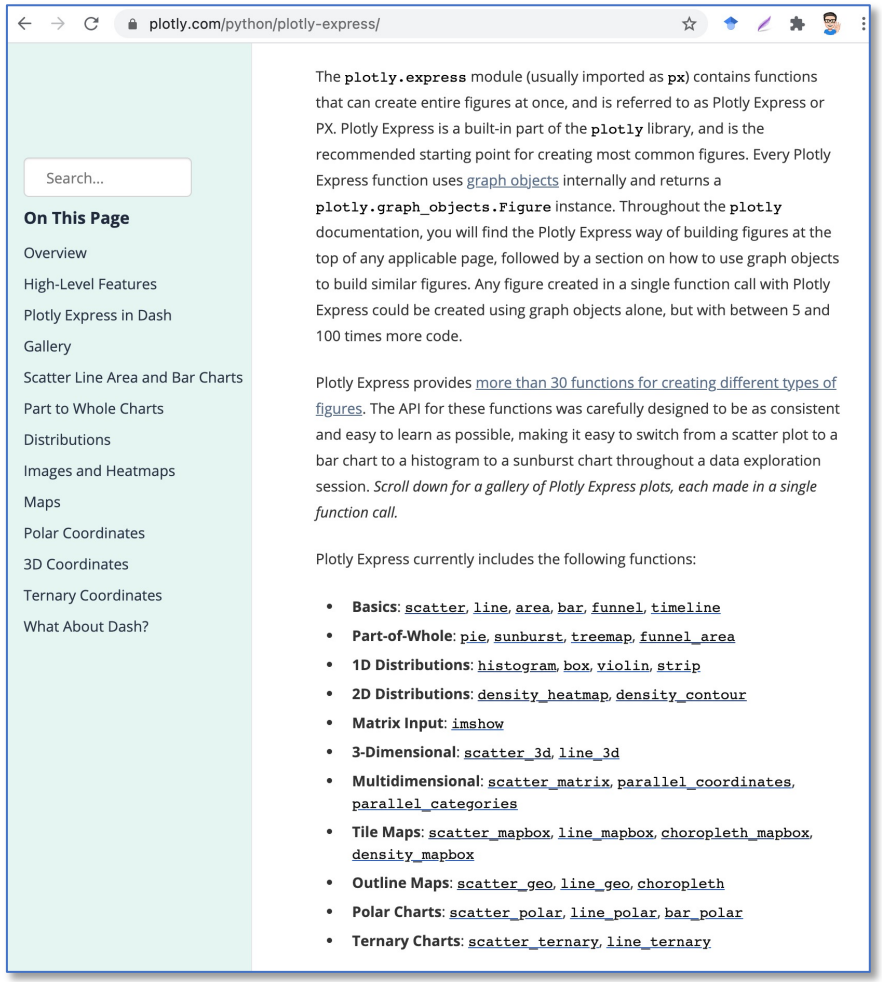
LM Plots

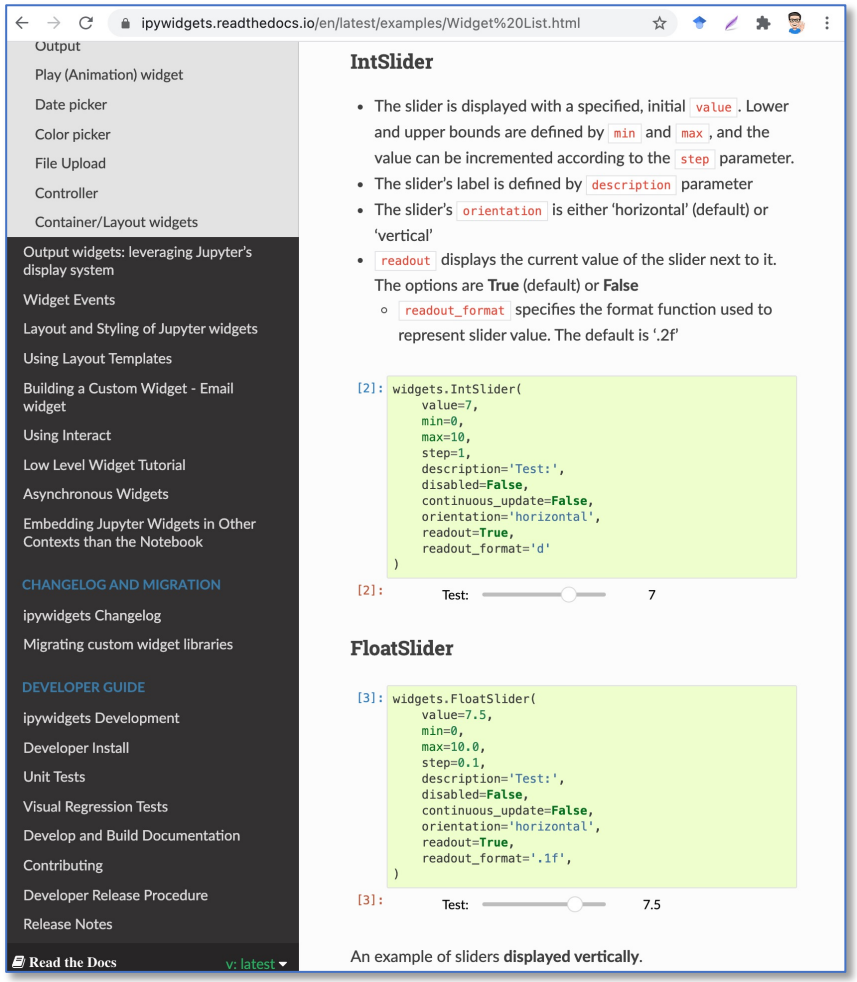


Violin Plots

Interactive Visualization

Plotly Express and ipywidgets

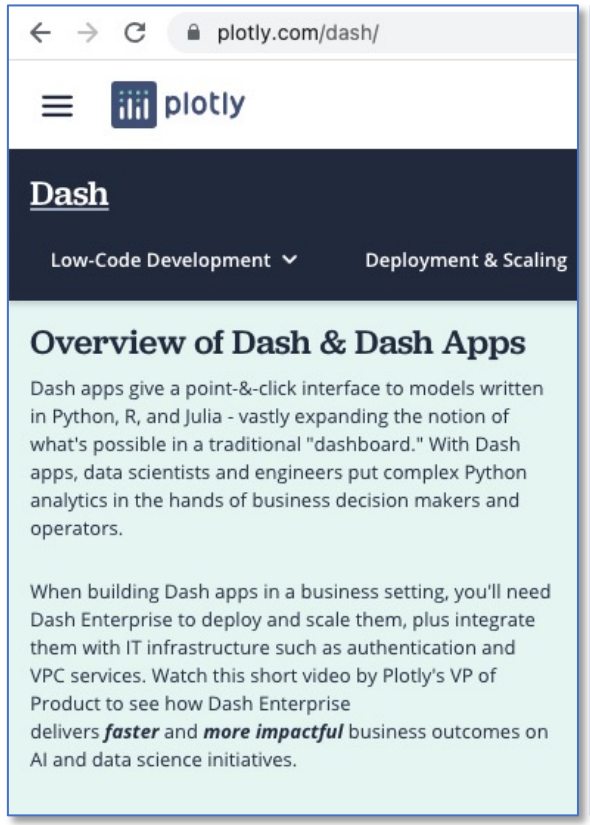


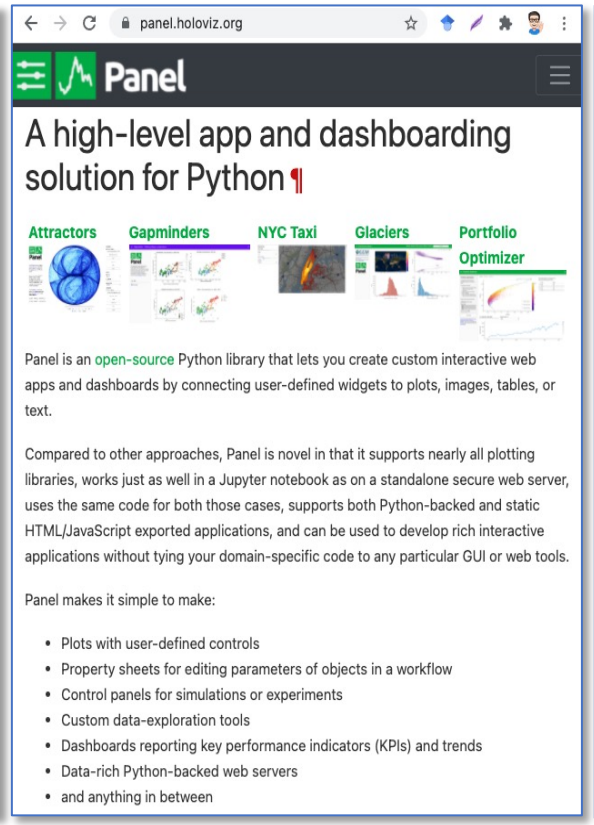


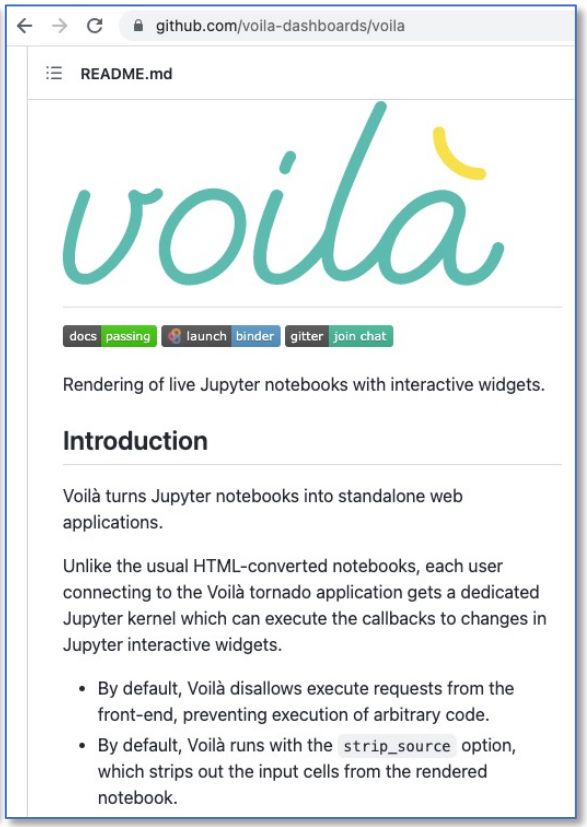
Demos

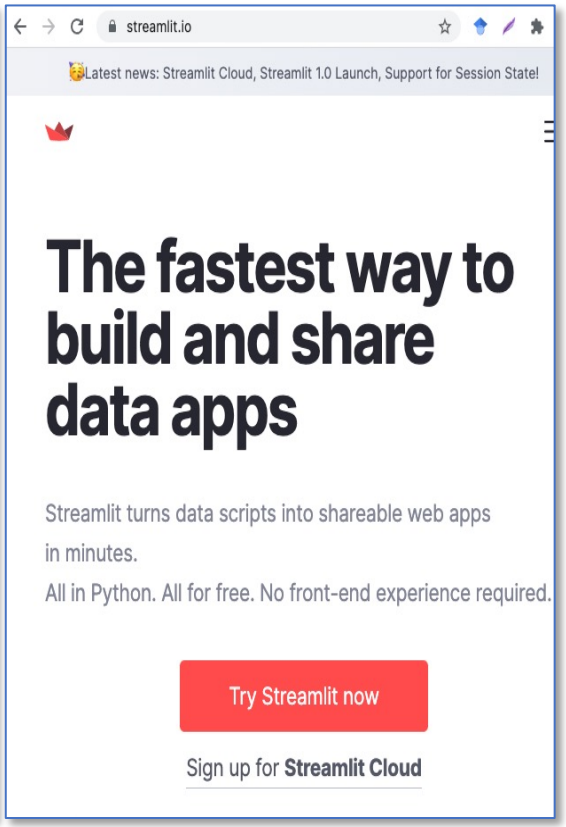
Dashboarding

Major Dashboard Tools in Python









Use Cases

- Voila
  - Simple example
  - Covid insight
- Streamlit
  - Simple example
  - GRE log safari
  - GRE session deep dive
  - EPCAL analytics

Hands-on Lab

Lab

- Create visualizations using matplotlib, seaborn, plotly and ipywidgets using the dataset
  - Histogram, scatter plot, pie, others
- Create one voila dashboard (homework if not completed in the lab)
- Create one streamlit dashboard (homework if not completed in the lab)

Assignments

- Matplotlib:
  - Exercises 1.1, 2.1, 2.2 in Matplotlib tutorial notebooks.
  - Read and run the examples in the examples folder.