CSCE 5320 Scientific Data Visualization

Multiple Linked Views

ICE-11: Tutorial

Making Interactive Visualizations with Python

Resources for data visualization in Python:

https://byuidatascience.github.io/python4ds/data-visualisation.html

You can import any library for this lab.

Import library in Python for data visualization:

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

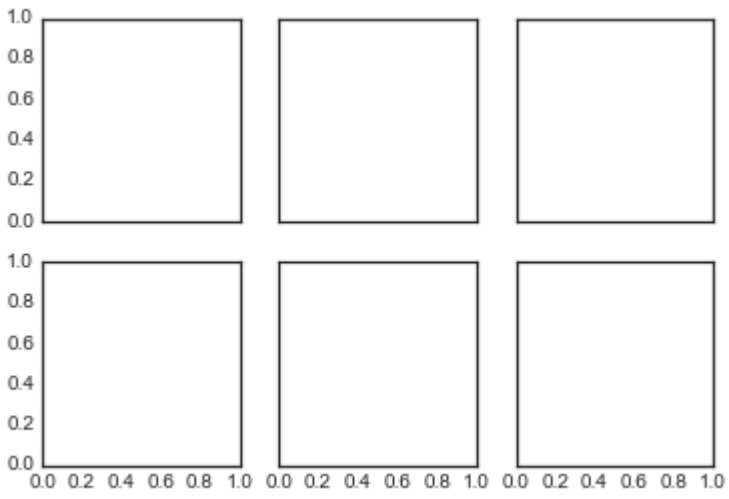
Python Data Visualization Libraries: https://mode.com/blog/python-data-visualization-libraries/

You should use your own data for this lab. The data should contain multiple quantitative values to show different attributes.

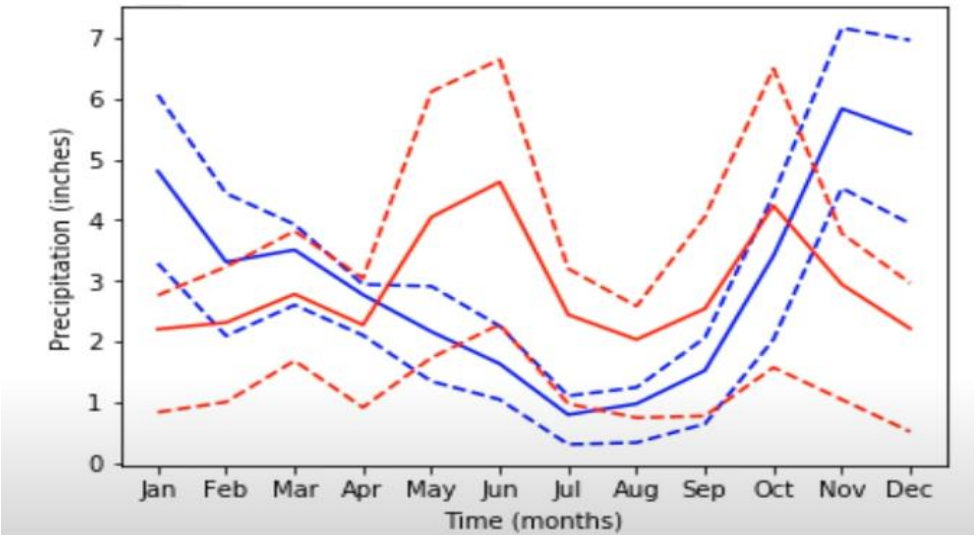
- **Small Multiples**

Adding too much data into one plot can make the plot too busy. So we can use smaill multiples to show similar data across different conditions:

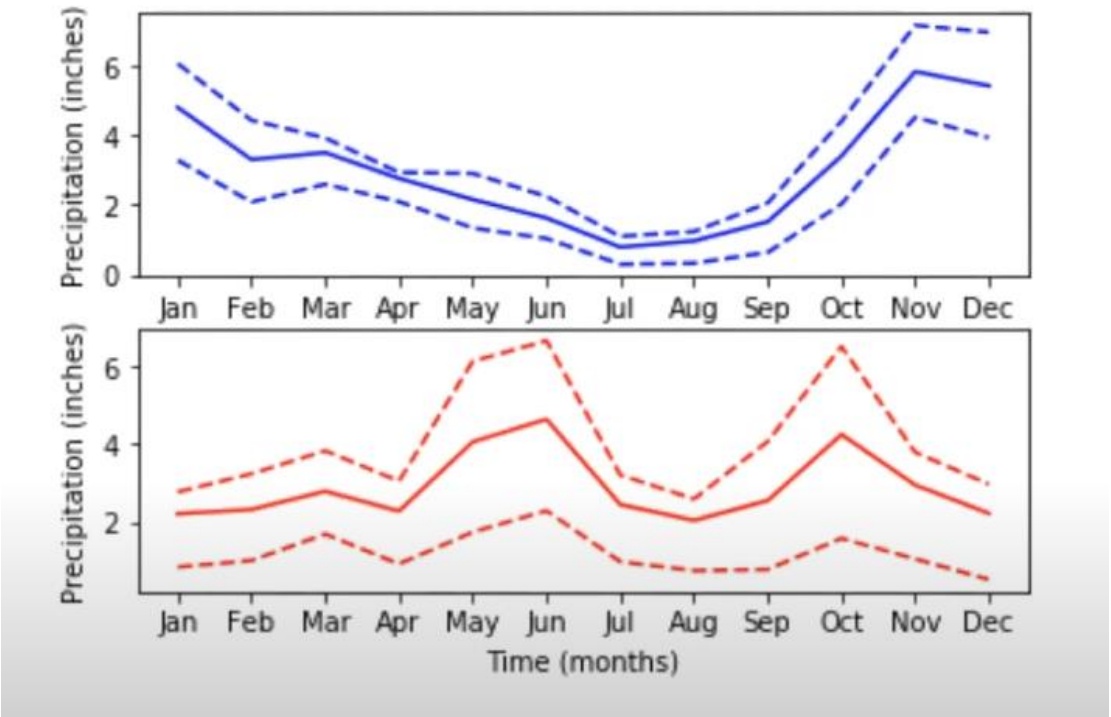
Use plt.subplots to create a 2 X 3 grid of subplots:



For example, the following plot shows the average precipitation in Seattle and Austin during the course of the year:

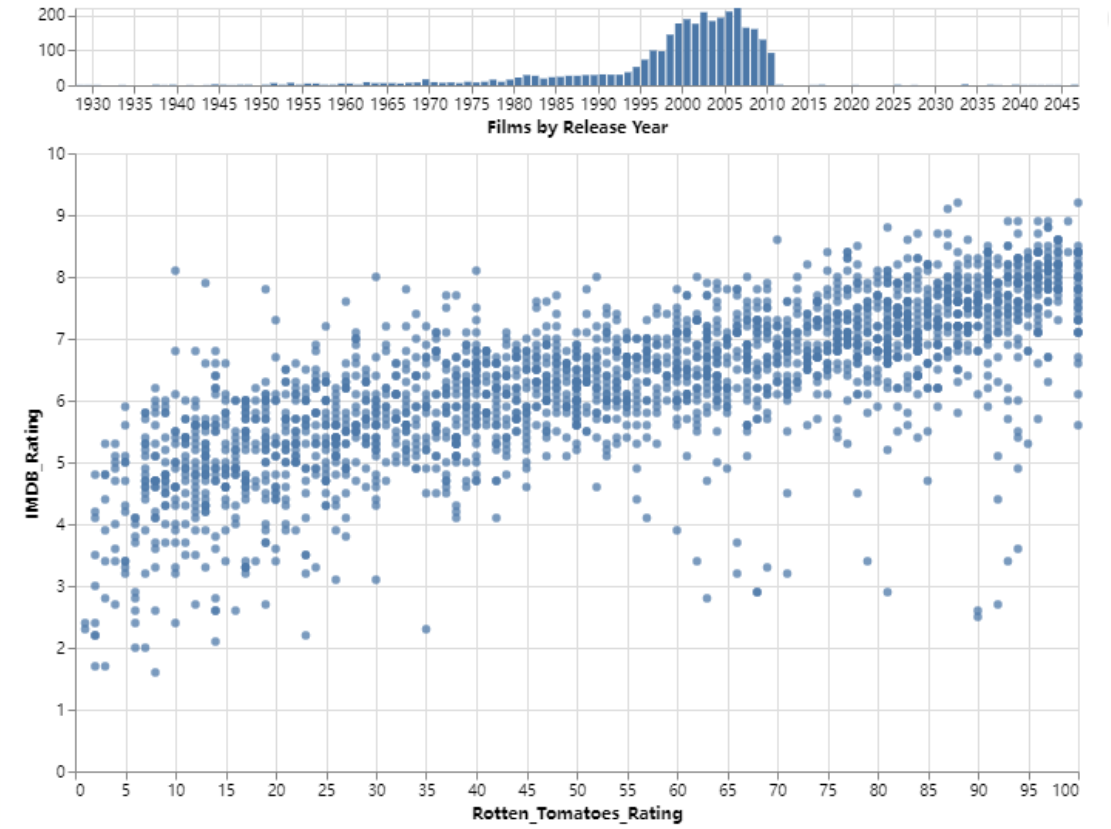


Small Multiples with plt.subplots: Fig, ax = plt.subplots():



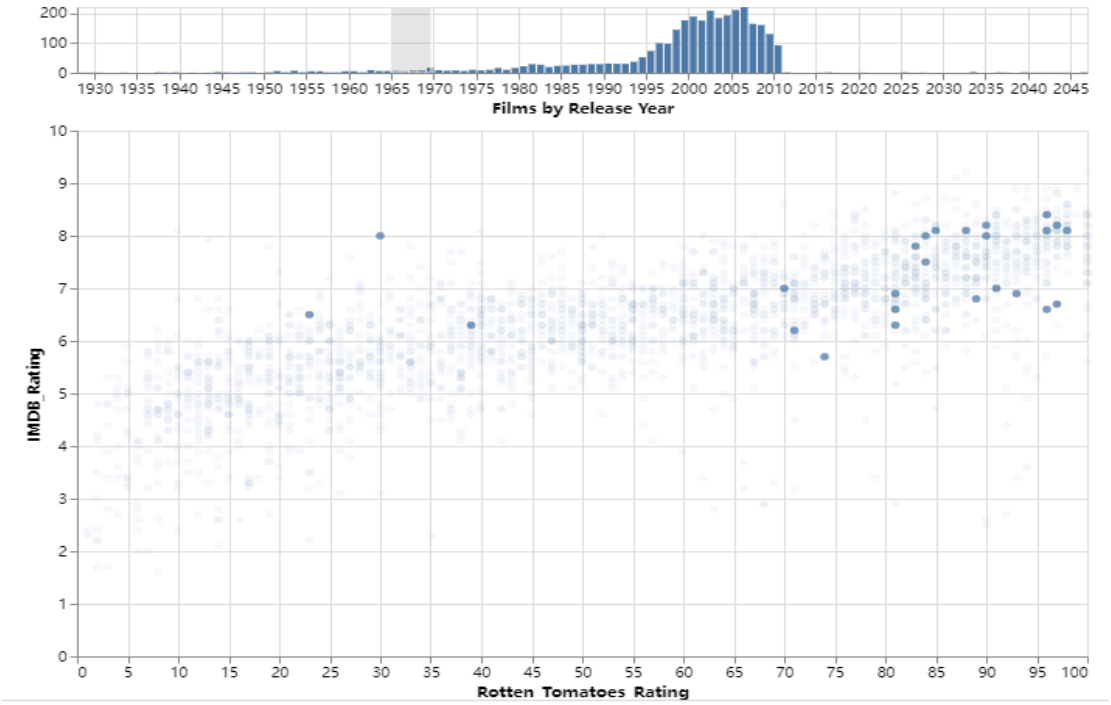
- **Linked Highlighting with Brushing:**

Selecting elements in one chart and seeing linked highlights in one or more other chart. For example: the following chart shows the movie ratings on different platforms for each year: https://cdn.jsdelivr.net/npm/vega-datasets@1/data/movies.json



Brushing & linking: Modify opacity on the scatter plot based on selection on the histogram.

For example: Moves from 1965-1970:



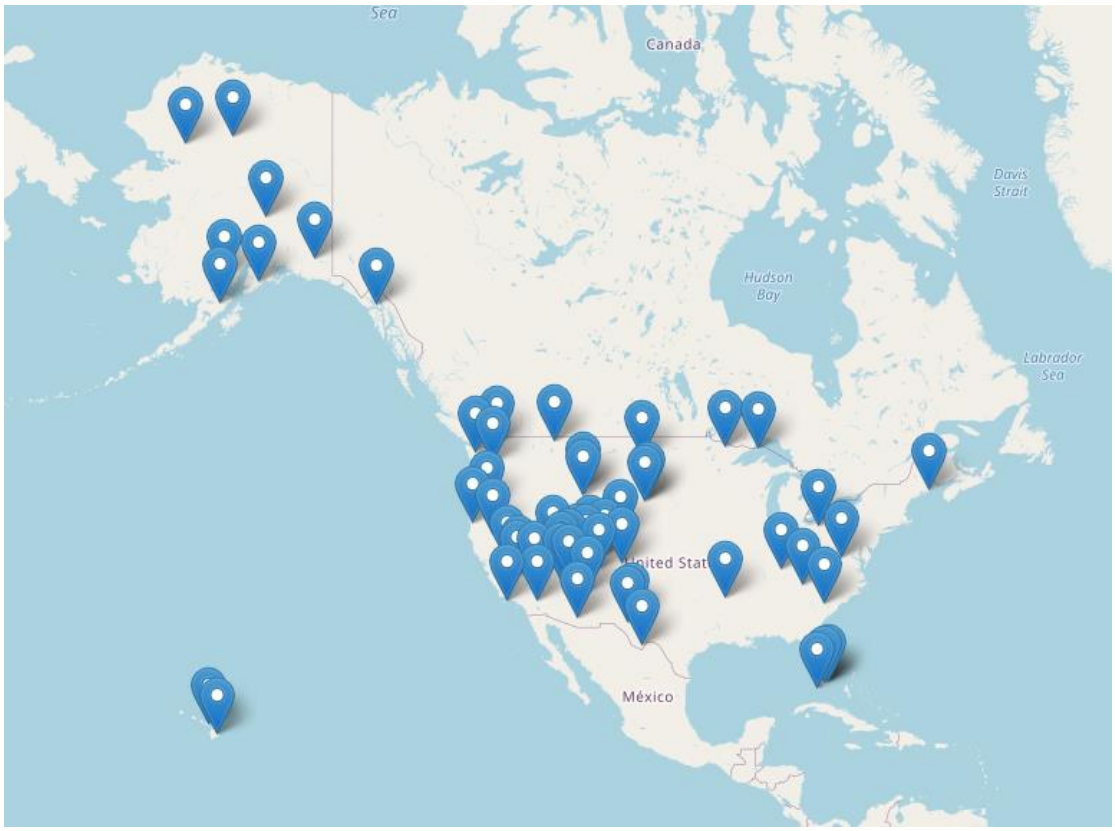
- **Linked Navigation:**

Find or create a location csv, for example: the following csv shows the location data of US National Parks: https://raw.githubusercontent.com/sughodke/D3-US Graph/master/nationalparks.csv

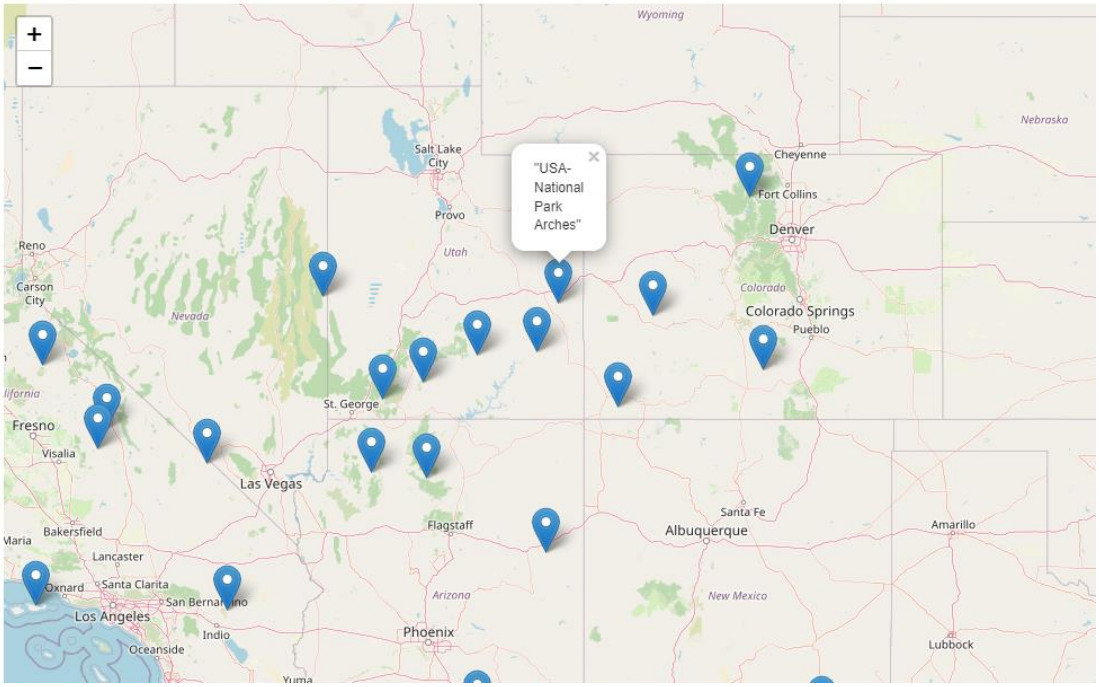
Show part of the dataset:

	longitude	latitude	details
0	-154.88689	58.58305	"USA-National Park Katmai"
1	-116.00890	33.95290	"USA-National Park Joshua Tree"
2	-88.89170	47.96240	"USA-National Park Isle Royale"
3	-93.02210	34.37960	"USA-National Park Hot Springs"
4	-155.30000	19.40000	"USA-National Park Hawaii Volcanoes"

Import folium to show these locations on the Map:



Add Tooltip or Popup to your map:

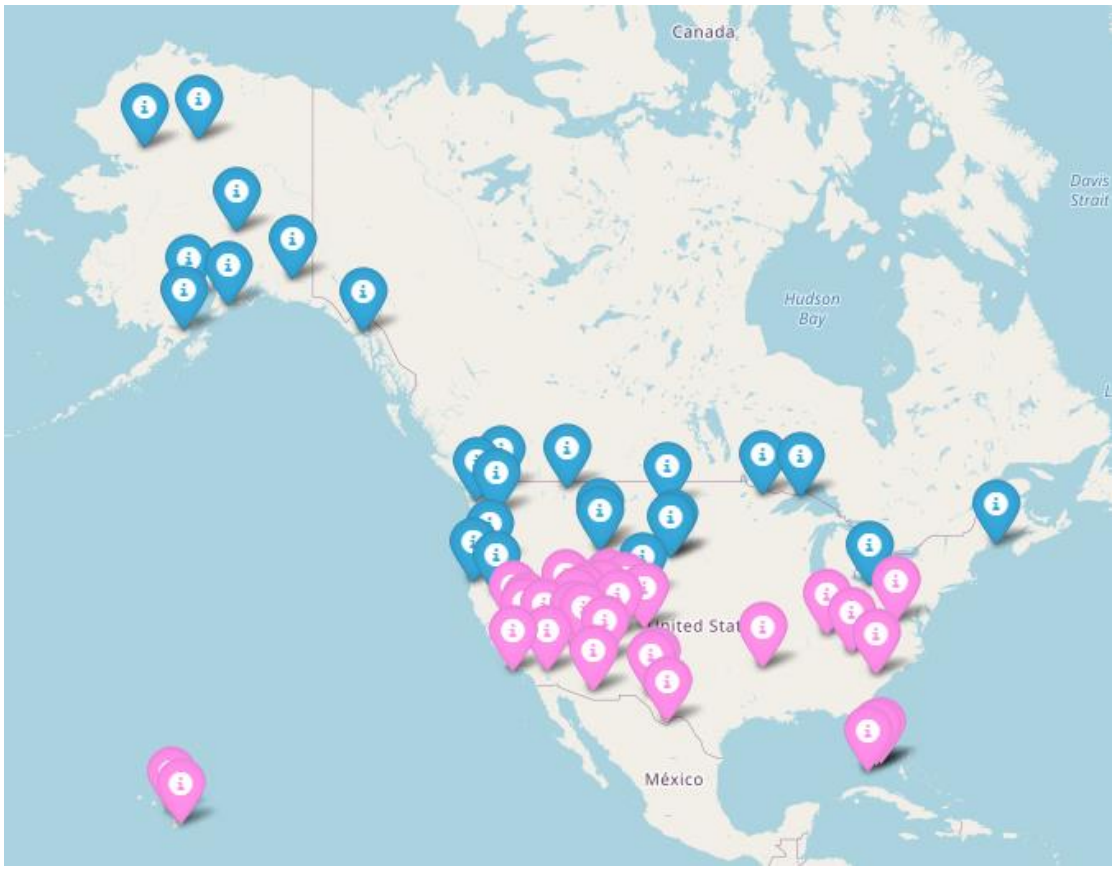


Add a new column 'color' to your csv:

Build a function for your map, separate all the locations into different colors. For example: If the latitude is less than 40, set the color to pink, otherwise, the color is blue.

	longitude	latitude	details	color
0	-154.88689	58.58305	"USA-National Park Katmai"	blue
1	-116.00890	33.95290	"USA-National Park Joshua Tree"	pink
2	-88.89170	47.96240	"USA-National Park Isle Royale"	blue
3	-93.02210	34.37960	"USA-National Park Hot Springs"	pink
4	-155.30000	19.40000	"USA-National Park Hawaii Volcanoes"	pink

Reload the map with color:


Canada
Davis Strait
Hudson Bay
México