

# **MLDS 411**

# **DATA VISUALIZATION**

Winter 2024 Labs

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**ENGINEERING**

# Schedule

Week	Date	Time	Tableau Topics	Python Topics
1	January 12	11am	Tableau Review	Library Overview
2	January 19	12pm	Joining, Blending & Relationships	Plotly, Dash
3	January 26	11am	Hierarchies, Groups & Sets	Bokeh
4	February 2	11am	Filters, Parameters & Tooltips	Wordcloud
5	February 9	11am	Dashboards, Stories & Actions	NetworkX
6	February 16	11am	Maps	GeoPandas, Folium
7	February 23	11am	Calculated Fields, Calculations	Plotnine
8	March 1	11am	Forecasting, Clustering	Python + Tableau

# Lab 4 Follow Ups

- **Tooltips in practice**
  - Useful example of showing another sheet
- **How to exclude items from filters**
  - Filter on the Data Source tab
  - Create a Set of items to include >> Add to Filters
- **How to reset or clear a parameter**
  - Create a Change Parameter Action
  - One click version: <https://kb.tableau.com/articles/howto/reset-parameters-with-a-single-click>

# Today's Theme: Interactivity

## Dashboards

- Combines multiple sheets (visualizations) into a single, consolidated view of the data

*We've already covered this in the Tableau Tutorial & Lab 1*

## Stories

- Combines multiple sheets (visualizations) and/or dashboards into a presentation

*We'll go through a brief demo*

## Actions

- Adds interactivity to a dashboard

*We'll spend the majority of our time on this today*

# Demo: Actions

## Filtering Actions

- Filter
  - Use as Filter
- Highlight
  - Dashboard >> Actions >> Add Action >> Highlight

## Navigation Actions

- Go to URL
- Go to Sheet

## Change Actions

- Change Parameter
- Change Set Values

# Exercise: Adding Actions to a Dashboard

- Action: Filter
  - Create a sheet that shows a map for the sales in each state. Create another sheet that shows a bar chart for the sales in each city.
  - Create a dashboard with both sheets. Create an action to filter the cities in the second sheet based on clicking the state in the first sheet.
- Action: Highlight
  - Create a sheet that shows line charts of the sales in each region over the years.
  - Add the sheet to the dashboard. Create an action to highlight states belonging to each region when hovering over lines in the line chart.
- Action: Set
  - Create a sheet that shows a bar chart of the profit for each region. Create another sheet that shows a bar chart of the profit for each sub-category.
  - Create a dashboard with both sheets. Create an action so that selecting regions in the first sheet will highlight the proportion that is coming from the region in the second sheet.

# Interactivity Summary

## 1. If you'd like to combine your visualizations

- Create a dashboard

## 2. If you'd like to make your dashboard interactive

- Create actions

## 3. If you'd like to make a presentation

- Create a story

# Data Visualization in Python Overview

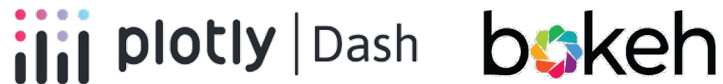
## Standard Libraries



## Mapping



## Interactive Visualizations



## Specialty





# NetworkX

## NetworkX

- Allows for graph or network analysis within Python

## DataFrames vs Graphs

- DataFrame = table with rows and columns
- Graph = collection of nodes and edges

## NetworkX Gallery

- [https://networkx.org/documentation/stable/auto\\_examples/index.html](https://networkx.org/documentation/stable/auto_examples/index.html)

## Demo

- NetworkX\_Demo.ipynb