Data Visualization with Python
Ach 02.02

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1. Part 1: Make a plan for your dashboard.

- ***Planned Dashboard Sections:***
    - *Intro Section*
        - Project context
        - Data sources
        - KPIs summary (total rides, total users, avg. ride time)
    - *Temporal Trends*
        - Monthly ride volume (line chart)
        - Weekday/weekend comparison (bar or boxplot)
        - Hour-of-day vs. day-of-week heatmap
    - *Station Usage*
        - Top 10 starting stations (bar chart)
        - Top 10 ending stations (bar chart)
        - Map of station demand (geospatial heatmap)
    - *User Segments*
        - User type breakdown (subscriber vs. casual)
        - Gender distribution
        - Avg. trip duration by user type
    - *Weather Influence*
        - Temp vs. ride volume (line or scatter plot)
        - Precipitation vs. ride volume

- *Route Popularity*
  - Map of common station-to-station routes
- *Recommendations Section*
  - Summary of findings
  - Strategic suggestions (e.g. station rebalancing, capacity planning)

- ***NOTE:***
  - This amount of charts may turn out to be overkill or even cluttered but I'm more banking on some of them turning out to being lower value so I can drop them as needed. Figure it's easier to drop off than have to scramble to make more at the last minute.

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2. Write Down Some Questions:

Question	***Purpose***	***Planned Visualization***
What are the busiest stations for starting and ending trips?	Identify high-traffic locations and potential for shortages	Horizontal bar charts of top 10 start and end stations
How does ridership vary by month or season?	Detect seasonal demand patterns	Line chart of monthly trip volume
What are the most popular times of day for riding?	Understand hourly demand cycles	Heatmap of hour vs. day-of-week usage
Do weekends show different usage patterns from weekdays?	Explore commuter vs. leisure usage	Boxplot comparing ride counts by day of week
How does weather (temperature and precipitation) affect ride volume?	Assess if poor weather impacts ride frequency	Dual-axis line chart or scatterplot with weather and trip data

Question	*Purpose*	*Planned Visualization*
Are casual and subscriber users behaving differently?	Support customer segmentation and marketing	Grouped bar chart by user type and gender
Where are geographic hotspots or underserved areas?	Uncover distribution imbalances across the city	Kepler.gl map of start station densities
What are the most frequent station-to-station routes?	Identify high-volume travel paths	Arc map or sankey diagram of top trip pairs
How long are rides on average, and do they differ by user type?	Analyze utilization and rider behavior	Boxplot or bar chart of ride duration by user category